

10.3 ORGANIZATIONS OF MUNICIPALITIES OUTSIDE CDS

Municipalities outside the CDS mostly belong to the 4th and 5th income classes, based on Executive Order No. 249, issued on July 25, 1987.

These municipalities are:

Cavite City	4th
Bacoor	4th
Imus	3rd
Kawit	4th
Noveleta	5th
Rosario	4th
Antipolo	3rd
Cainta	2nd
Rodriguez (Montalban)	5th
San Mateo	5th
Taytay	3rd
(Excluding 9 municipalities of B. P. 799)	

From the Bureau of Local Government Finance of the Department of Finance, the income brackets for the classification of provinces and cities are as follows:

First Class : Average annual income of P30,000,000 or more;

Second Class: Average annual income of P20,000,000 or more but less than P30,000,000;

Third Class : Average annual income of P15,000,000 or more but less than P20,000,000;

Fourth Class: Average annual income of P10,000,000 or more but less than P15,000,000;

Fifth Class : Average annual income of P5,000,000 or more but less than P10,000,000;

Sixth Class : Average annual income of P5,000,000.

The income brackets for the classification of municipalities are:

- First Class : Average annual income of P15,000,000 or more;
- Second Class: Average annual income of P10,000,000 or more but less than P15,000.000;
- Third Class : Average annual income of P5,000,000 or more but less than P10,000.000;
- Fourth Class: Average annual income of P3,000,000 or more but less than P5,000.000;
- Fifth Class : Average annual income of P1,000,000 or more but less than P3,000.000;
- Sixth Class : Average annual income of P1,000,000.

The elective officials of the municipality are the Municipal Mayor, Vice Mayor and Sangguniang Bayan members; the appointive officials are the Municipal Secretary, Treasurer, Municipal Assessor, Budget Officer and a Planning and Development Coordinator. The last position takes charge of matters related to planning and development, including these water supply utilities.

In addition to the abovementioned positions, the following positions may be allowed on need basis; Municipal Attorney, Personnel Officer, Book-keeper and a Civil Security Officer.

At any rate, there is no particular division/section which takes charge of water supply exclusively in each municipality. Generally, in these municipalities, the number of personnel which belongs to the Office of the Municipal Planning and Development Coordinator is strictly limited, and it is very difficult to find personnel whose expertise lie in the field of sanitary engineering.

Figure 10.3.1 to Figure 10.3.4 show the organizations of Cavite City and the other municipalities respectively.

TABLE 10.1.1 TOTAL NUMBER OF MWSS PERSONNEL

(AS OF MAY 31, 1991)

AREA	TOTAL	REGULAR	CASUAL
TOTAL	9,087	4,833	4,254
MWSS Board	14	14	0
Office of the Administrator:	280	256	25
Engineering	386	231	155 /a
Construction Management	3,060	196	2,864 /b
Operations	1,872	1,589	283
Customers's Service	2,753	1,847	906
Finance	393	383	10
Administration	328	317	11

/a Engineering Area

BDED (Main)	13
PPD (Main)	7
MSWSP (Main)	14
Fringe Area (Main)	10
Rizal Province (Main)	16
AWSOP (Eng'g)	95

TOTAL 155

/b Construction Management Area

Restoration Task Force (Main)	56
LFPD (Main)	11
MMWDP	428
MWSP III (Skeletal Group)	14
MMSSP - AWSOP I	175
MWSRP I	1,377
MWSRP II	739
AWSOP I	64

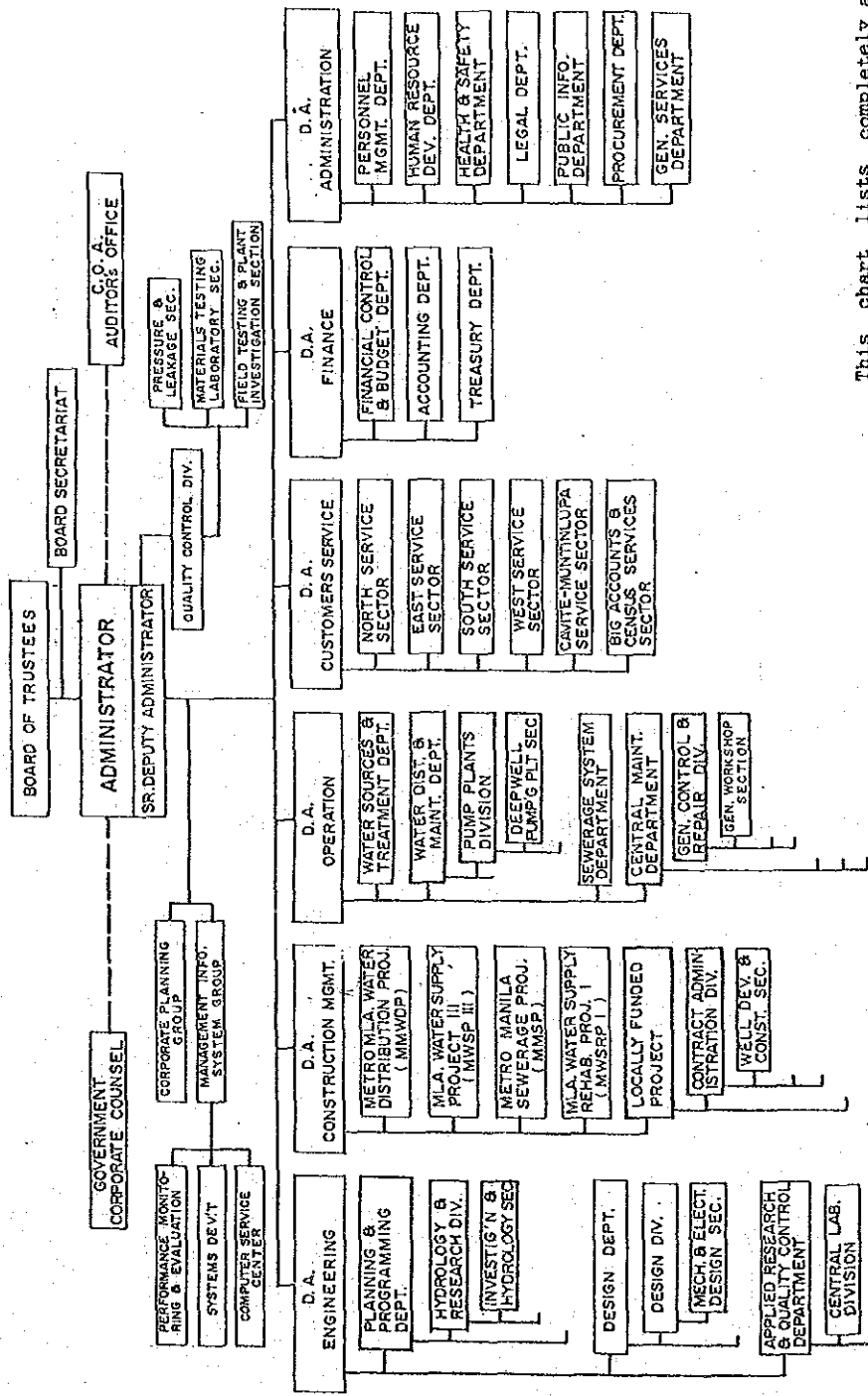
TOTAL 2,864

TABLE 10.1.2 NO. OF MWSS PERSONNEL, BY DEPARTMENT
(AS OF MAY 31, 1991)

AREA/DEPARTMENT	REGULAR			CASUAL			GRAND
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	TOTAL
	TOTAL	3667	1166	4833	3584	670	4254
Office of the Board of Trustees	4	10	14	0	0	0	14
Office of the Administrator	15	23	41	0	0	0	41
Public Information	14	20	34	1	0	1	35
Inspectorate Group			0	10	2	12	12
CORPLAN Group	4	11	15	0	0	0	15
MIS Group	2	2	4	0	1	1	5
PHED	10	16	26	0	0	0	26
Systems Development	3	11	14	0	1	1	15
Computer Service Center	56	66	122	7	3	10	132
Engineering	3	3	6	0	0	0	6
BDED	11	9	20	8	5	13	33
* Fringe Area			0	8	2	10	10
* Rizal Province			0	8	8	16	16
* Planning & Programming	44	20	64	6	1	7	71
Design	76	29	105	0	0	0	105
Applied Res. & Quality Con.	10	26	36	0	0	0	36
AWSOP			0	80	15	95	95
* MSWSP			0	12	2	14	14
Construction Management	3	4	7	0	0	0	7
Restoration Task Force			0	53	3	56	56
MRWDP	14	1	15	295	133	428	443
MWSP III - Skeletal Group	3	2	5	11	3	14	19
MISSP - AWSOP II	6	1	7	127	48	175	182
MWSRP I	4	4	8	1206	171	1377	1385
MWSRP II	7	1	8	630	109	739	747
Locally Funded	134	12	146	9	2	11	157
AWSOP I	0	0	0	40	24	64	64
Operations	3	3	6	0	0	0	6
Water Sources & Treatment	238	25	263	0	0	0	263
Water Distribution & Maint.	791	25	816	241	7	248	1064
Sewerage Systems	262	22	284	13	5	18	302
Central Maintenance	206	14	220	17	0	17	237

TABLE 10.1.2 (CONTINUATION)

AREA/DEPARTMENT	REGULAR			CASUAL			GRAND
							TOTAL
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	
Customers Service	3	3	6	0	0	0	6
North Sector	249	67	316	104	7	111	427
East Sector	280	86	366	144	10	154	520
South Sector	239	80	369	141	15	156	525
West Sector	284	79	363	194	8	202	565
Cavite-Munti Sector	218	62	300	72	8	80	380
Big Accounts & Census Sector	89	38	127	130	73	203	330
Finance	3	2	5	0	0	0	5
Financial Control & Management	20	51	71	0	0	0	71
Accounting	34	111	145	0	0	0	145
Treasury	98	64	162	6	4	10	172
Administration	2	3	5	0	0	0	5
Personnel Management	7	39	46	0	0	0	46
Human Resource Dev't	14	19	33	0	0	0	33
Health & Safety	10	29	39	0	0	0	39
Procurement	12	7	19	0	0	0	19
Legal	18	10	28	0	0	0	28
General Services	111	36	147	11	0	11	158

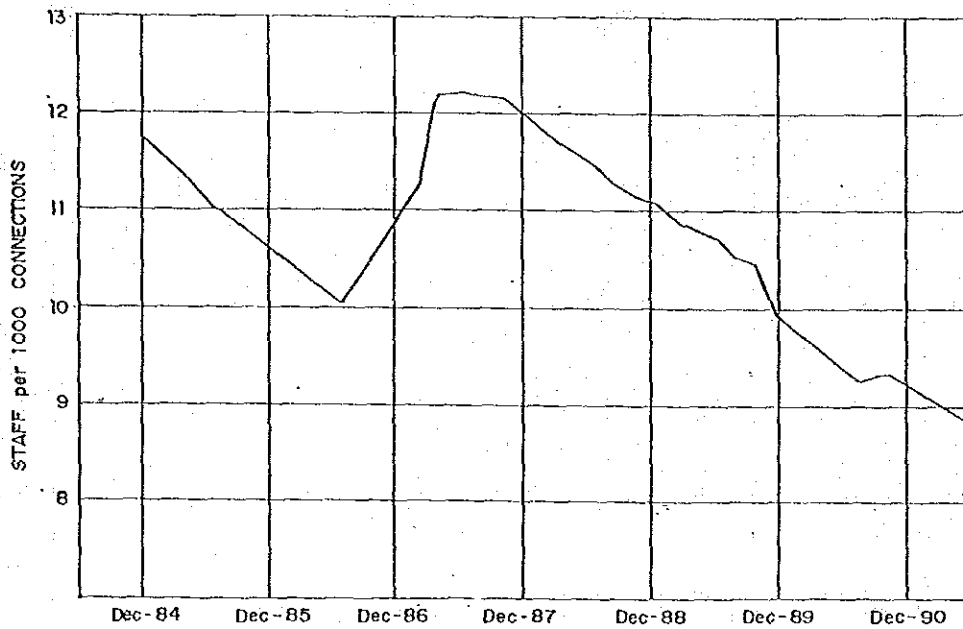


This chart lists completely all offices of MWSS up to the Department level, however, only particular divisions and sections involved in groundwater activities are included in the chart.

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FIGURE 10.1.1

MWSS ORGANIZATION CHART



SOURCE : FINANCIAL AND OPERATIONAL PERFORMANCE CHART
PREPARED BY CORPLAN GROUP

DATE : 18 JUNE 1991

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IN METRO MANILA

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FIGURE 10.2.1

STAFF PER 1000 CONNECTIONS
(PERMANENT & CASUAL OF WATER SECTOR)

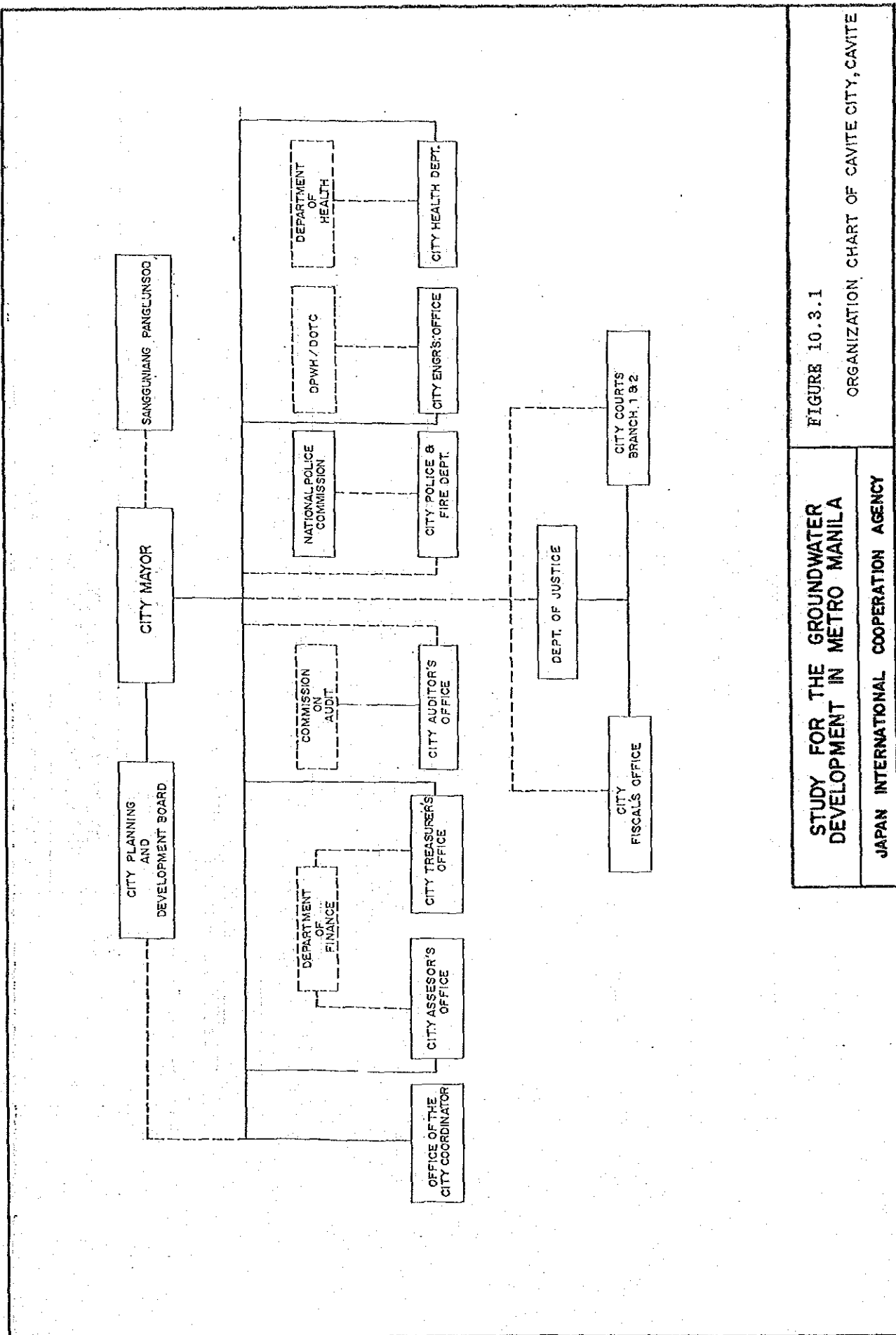
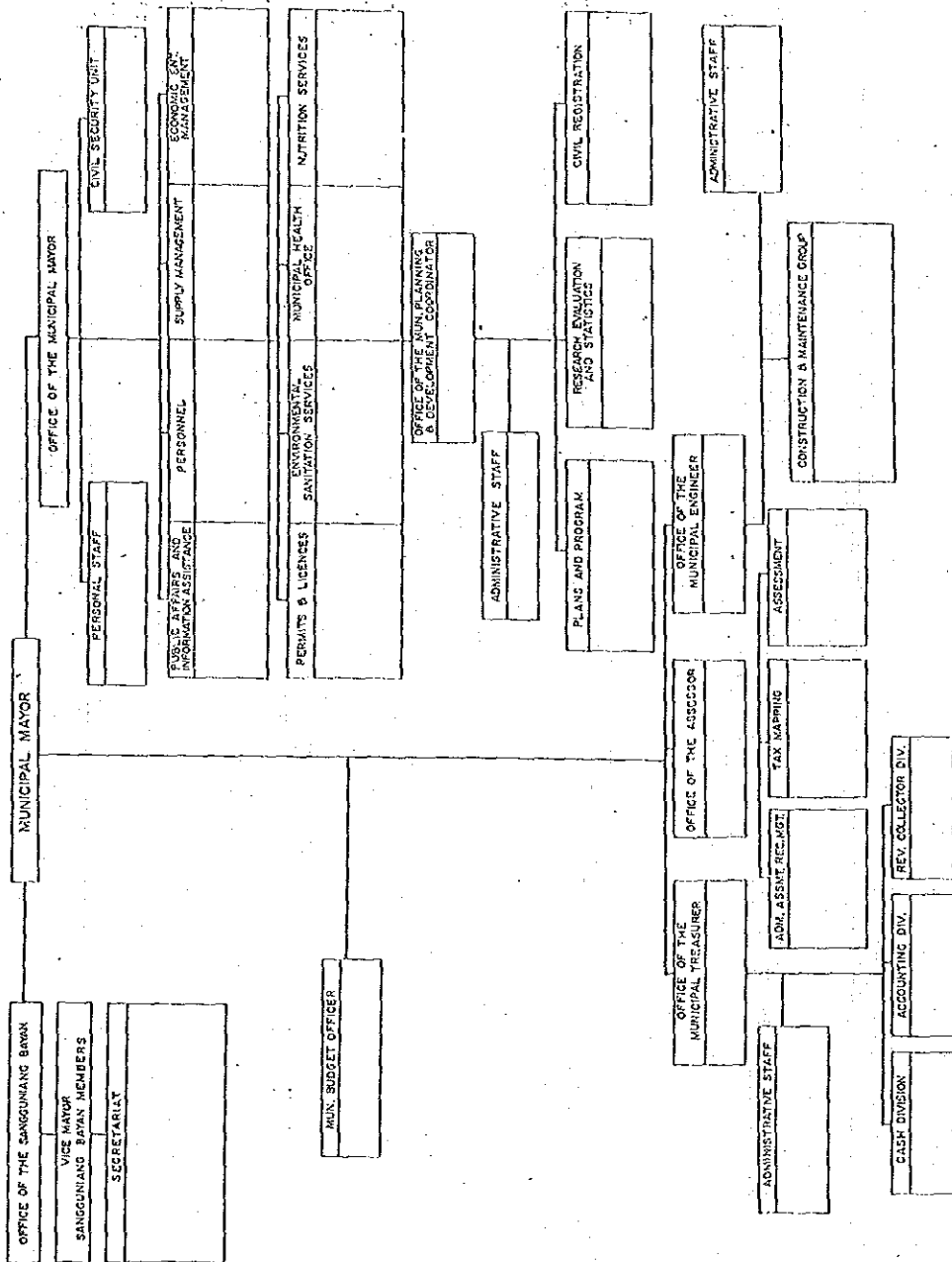


FIGURE 10.3.1
ORGANIZATION CHART OF CAVITE CITY, CAVITE

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FIGURE 10.3.2

ORGANIZATION CHART OF MUNICIPALITY OF CAINTA, RIZAL

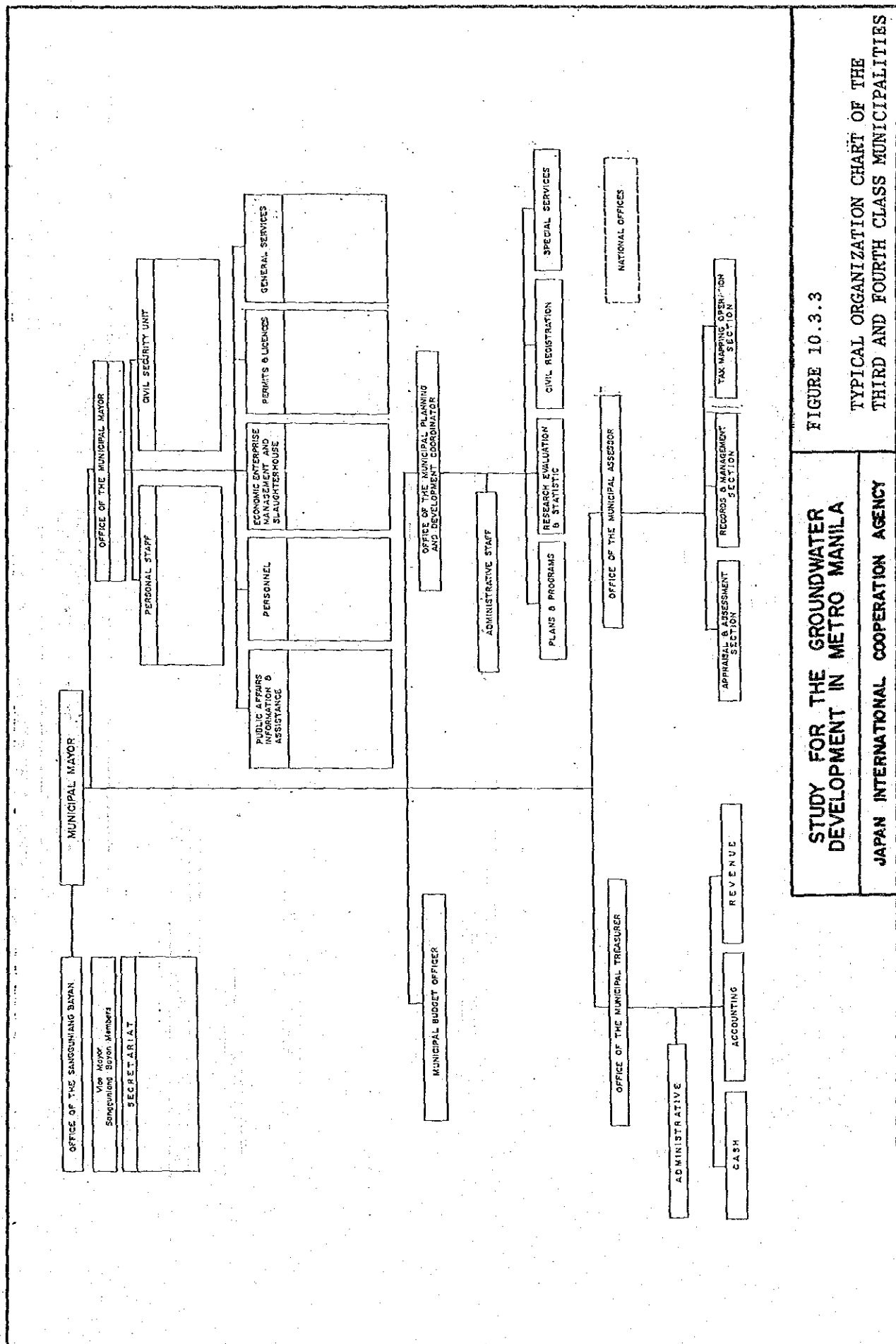


FIGURE 10.3.3
TYPICAL ORGANIZATION CHART OF THE
THIRD AND FOURTH CLASS MUNICIPALITIES

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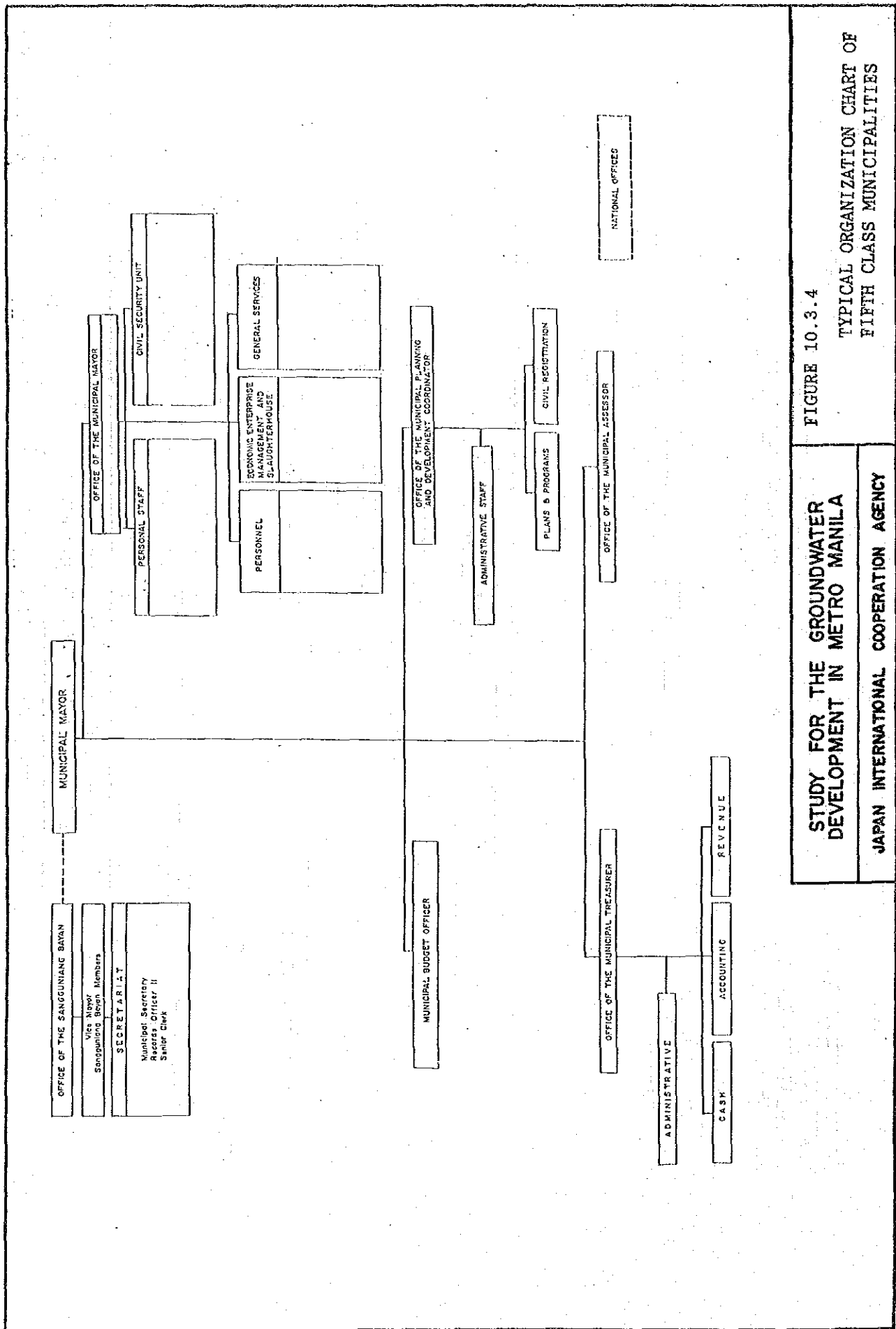


FIGURE 10.3.4

TYPICAL ORGANIZATION CHART OF FIFTH CLASS MUNICIPALITIES

STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA
JAPAN INTERNATIONAL COOPERATION AGENCY

CHAPTER 11

URBAN DEVELOPMENT PLANNING

CHAPTER 11 URBAN DEVELOPMENT PLANNING

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CHAPTER 11 URBAN DEVELOPMENT PLANNING

11.1 BRIEF BACKGROUND OF THE STUDY AREA

11.1.1 Political Delineation

There are thirteen administrative regions in the Philippines including the National Capital Region (NCR). The Study Area comprises the NCR and the two provinces (Rizal and part of Cavite) of Region IV.

The NCR, better known as Metro Manila, is composed of four (4) cities and thirteen (13) municipalities, namely: the cities of Manila, Quezon, Pasay and Caloocan; and the municipalities of Las Piñas, Makati, Malabon, Mandaluyong, Marikina, Muntinlupa, Navotas, Parañaque, Pasig, Pateros, San Juan, Taguig, and Valenzuela.

Region IV has the most number of provinces, totaling eleven (11): Aurora, Batangas, Cavite, Laguna, Mindoro Oriental, Mindoro Occidental, Marinduque, Palawan, Quezon, Rizal and Romblon. Rizal has fourteen (14) municipalities, while Cavite has one city and five (5) municipalities.

Manila was proclaimed the capital of the Philippines on 24 June 1571 and remained so until Quezon City became the capital on 17 July 1948. By Presidential Decree No. 940, Manila was restored as the capital and the permanent seat of the National Government on 14 June 1976.

11.1.2 Land Area and Population

(1) Land Area

The Philippines has a total land area of approximately 300,000 square kilometers. Region IV, among all the regions, has the largest land area (46,924.10 km²), representing 15.64 percent of the country's total. NCR, on the other hand, has the smallest land area (636 km²), representing only 0.21 percent of the country's total.

(2) Population and Distribution

The 1990 Philippine Population Census (Preliminary Count by the National Statistics Office as of May 1990) placed the population of the country at 60,685,000. This figure is 12,587,000 more than the population ten years ago (1980) and reflects an annual growth rate of 2.3 percent (Table 11.1.1 and Figure 11.1.1).

Among the thirteen regions, the NCR and the Southern Tagalog Region (Region IV) account for the bulk (36.7 percent) of the country's total population. The total population of Metro Manila is 7,833,000. Cavite and Rizal have respective populations of 458,771 and 880,608. NCR and Region IV are the most urbanized and economically developed of the 13 regions.

The MSA covers the whole of NCR and 3.2 percent of Region IV. It comprises five (5) cities and thirty-two (32) municipalities whose combined population in 1990 was 9,172,379 (6,805,630 in 1980). This population figure represents 15.17 percent of the country's total and reflects an increase of 34.78 percent over the 1980 figure, or an annual growth rate of 3.03 percent.

The population densities in the MSA are shown in Table 11.1.2 and Figures 11.1.2 and 11.1.3.

11.2 SOCIAL-ECONOMIC PROFILE

In view of the inadequate economic accounts at the municipal level, the summary values of economic indicators for the Study Area were drawn from provincial and regional data using employment and income participation ratios as basic parameters.

11.2.1 Social Profile

(1) Social Development Indicators

The NCR and Region IV as a whole has the major advantage among the regions in terms of social services, physical facilities and those

amenities associated with urban life. However, a large portion of its population still bears the brunt of poverty and its attendant ills: unemployment, underemployment, congestion, ill-health and malnutrition, poor delivery of basic services, etc. Table 11.2.1 shows the social profile of the regions using major indicators.

(2) Labor Force

The economically active population within the age range of 15-64 years constitutes the country's labor force (NSO definition). In 1988, the total population of those who are 15 years old and above was 35,865,000 (Table 11.2.2B).

For Metro Manila, its labor force in 1989 was estimated to be 3.1 million, representing around 60 percent of the working age population, and which for the last three years increased at an annual average rate of 3.0 percent.

(3) Employment

Total employment in the Philippines was 20,595,000 in the third quarter of 1986 (Table 11.2.2B). Employment rate for the same period was 88.9 percent, a reduction from the 95.0 percent registered in 1980. The employment rate, however, improved to 91.7 percent in 1988.

For Metro Manila, the employment rate was estimated at 82.2 percent in 1989, slightly lower than the 84.8 percent registered in the third quarter of 1988 and slightly higher than the 1986 average of 80.6 percent.

11.2.2 Economic Profile

(1) Gross Regional Domestic Product

The National Capital Region (NCR) maintained in 1989 its traditional lead among the regions by producing a hefty ₱33.2 billion worth of Gross Regional Domestic Product (GRDP). The primacy of NCR in setting the trend of the national economy may be gleaned from its performance during the 1980-1986 period when its annual contribution to the total Gross

Domestic Product (GDP) averaged as much as 31 percent (Table 11.2.3A-C)

(2) Economic Sectors

In the medium- and long-term periods, the capital region is envisioned to have its industry dominance gradually reduced by the transfer of its major socio-economic activities to the industrial centers of its regional neighbors. It will, however, hold on to its lead as center for trade, finance and commerce and education, and as seat of the National Government. In consonance with the limits that its environment and geography can provide, existing levels of industrial activity shall be maintained.

(3) Household Income

According to the Family Income and Expenditures Survey (FIES) conducted by the NSO in 1985, the average annual family income in the Philippines was P31,052. It was P29,985 in Region IV, P57,193 in NCR, P39,759 in Cavite Province, and P38,518 in Rizal (Table 11.2.3D).

With the current economic situation, declining real incomes place increased demands on the government's shelter, health and social infrastructure programs.

(4) Industry and Trade

The industry sector in the Philippines is dominated by manufacturing whose contribution since 1972 to the value added by industry averages to around 75%. The share of construction and utilities has varied between 15% to 20% of total industry value added.

In the Study Area, the industry sector is composed of manufacturing, construction, electricity, gas and water.

11.3 Housing

11.3.1 Housing Statistics or Present Situation

Housing is a basic need which contributes to a population's productivity, welfare, social stability and economic development. Despite well-meaning intentions and modest accomplishments in the past, there yet remain vast number of Filipinos living in unacceptable and substandard housing. It is recognized that fundamental changes in policies and strategies are necessary for a better and more effective service delivery of housing to the intended beneficiaries, especially those most in need.

In recent years, the country has been experiencing a serious economic crisis that has adversely affected the people's income and employment opportunities. The Study Area is not spared by this crisis which has negatively impacted on the housing supply.

The country's housing problem is twofold: first, it is a problem of quantity, i.e., the need for new housing stock for natural population and household growth; and second, it is a problem of quality, i.e., the need to upgrade existing stock of makeshift and light material housing.

The bulk of the Philippine population reside in private households while very few live in institutional types of residences. In 1980, there were 8.6 million households with an average size of 5.6 persons per household (Table 11.3.1A).

As of May 1990, there were about 11.4 million households with an average size of 5.3 persons per household (Table 11.3.1A). Apparently, the basic social unit in the Philippine society, which is the household, has become smaller in size giving rise to speculations that the extended family systems may be breaking up in response to present economic conditions.

The clamor for home ownership and security of tenure has increased. In NCR, it is estimated that about 58 percent of Filipino households do not own the houses they live in while 22 percent do not have tenure of the land on which their houses are built.

According to the 1990 Census of Population and Housing of the National Statistics Office (NSO), there are about 1,836,564 unit-houses in the MSA. Of this total, Metro Manila accounted for 1,557,000 units (84.8%), Cavite (that part of the Study Area) for 91,435 units (5.0%), and Rizal Province for 188,129 units (10.2%).

Table 11.3.1B presents by type of building the number of families in the country and the NCR. The majority (67.1%) of families in the NCR live in single houses. The remaining 32.9% live in duplex (4.23%), apartment/accessoria/condominium (21.62%), improvised buildings or shanties (4.9%), commercial/industrial/agricultural buildings (1.8%) and other dwellings (0.4%) such as natural shelters, boats, etc.

Table 11.3.1B shows by type of building the number of occupied units. The majority (90.3%) of dwelling units in Cavite (Study Area) is occupied by single houses and only 9.7% lives in the remaining types of buildings (Table 11.3.1C). According to the 1989 Census of Buildings (NSO), there were 893,534 building units in NCR (about 21% of the total number in the Philippines), 116,158 units in Cavite Province and 105,496 units in Rizal. These figures are shown in Table 11.3.1D.

11.3.2 Housing Demand

Housing needs are subdivided into backlog and future needs. The backlog consists of two major components: (1) the reduction of doubled-up households and substandard dwelling units, (2) the provision of sites and services for marginal income families. Future needs, on the other hand, include: the need for new houses due to new household formation, rural to urban in-migration and replacement of existing stock due to age deterioration. With households in 1986 numbering about 10 million nationwide, and an annual average rate of increase of 2.13% in the rural areas and 4.58% in the urban areas, housing needs have been given due attention in the government's plan for the period of 1987-1992.

The projected housing needs of the country for the period 1987-1992 was estimated at 3.4 million dwelling units. Of this total, 576,000 or 17.1 percent will be needed for NCR and 205,000 for Region IV.

The number of households in the Study Area which was 1.8 million in 1990, is estimated to reach 3.1 million in 2010 for a yearly average

increase of 27 percent (Table 11.3.2)

PROJECTED HOUSING NEEDS, 1987-1992
(Thousand Dwelling Units)

	1987	1988	1989	1990	1991	1992	1987- 92
Philippines	531	545	558	570	580	592	3,376
NCR	91	93	96	98	98	100	576
Region IV	31	32	34	35	36	37	205

Source: 1980 Census of Housing (NEDA)

11.3.3 Housing Regulation

The Housing and Land Use Regulatory Board (HLURB) eased the housing standards and rules under Batas Pambansa Blg. 220 (Standards for Socialized and Economic Housing) to make lots and housing units affordable to more families in the lower income bracket and to further encourage the housing program. The HLURB introduced major changes to BP 220. For example, for owners of subdivision with minimum development, lots with minimal provisions and utilities may be sold to the public and further improvements may be made by the homeowners themselves.

11.3.4 Issues and Problems

Despite the increase in the number of units constructed by the private and the public sectors for low-income housing, the production of affordable housing has not matched the rapid population increase, and thus, the growing demand for housing in Metro Manila. Aggravated by land speculation and increases in prices of construction materials, and compounded further by peace and order problems in some provinces which helps increase in-migration to Metro Manila, squatting has risen to alarming levels. This led to substandard living due to inadequate, sanitation facilities, water supply, electricity livelihood and educa-

tion opportunities. It is estimated that about one-third of Metro Manila's population are squatters.

NCR as an urban center has progressively deteriorated. The rapid urbanization has overtaken the existing supply of basic amenities resulting to an imbalance of too many people with less or no basic services. Squatter colonies have become part of the metropolitan landscape.

Inevitably, social ills became as alarming as the aforesaid problems and are hurting the citizenry considerably. Together with unemployment, underemployment, traffic and transportation mess, a rise in criminality has been noted. In addition, there is a breakdown in the educational system.

A conservative estimate of the number of squatter households, based on surveys conducted by the NHA in 1990, is as follows:

National Total	:	710,000 households
Metro Manila	:	430,000 households
Regional Urban Center	:	280,000 households

The squatting problem particularly in Metro Manila is so large that there is a need to address the problem on a priority basis. The highest priority for clearing and resettlement are squatters impeding public access, those occupying land needed for government infrastructure programs and those residing in dangerous areas. The latest survey conducted by the NHA in coordination with local government units and other government agencies indicates that there are 220 such priority sites in Metro Manila that are occupied by 59,071 families (Table 11.3.3).

The major problems of the housing sector may be identified as follows:

- o Mushrooming of squatter areas resulting in inadequate sanitation facilities
- o People migrate from agriculture to industrialized place.
- o High cost of construction materials

- o Lack of financial resources for the replacement of unacceptable dwelling units or for the provision of low-cost housing for low-income local residents.

All these manifestations are built within the problem of lack of proper and adequate urban planning to emphasize owning decent and affordable housing units.

11.4 LAND USE

11.4.1 Methodology

In accordance with the concept of the framework plan, the present land use conditions were analyzed as the basic data for the groundwater development in Metro Manila.

A land use map covering the entire Study Area of about 212,560 hectares was produced following the guidelines on map preparation:

- o pre-field work which involves the collection of available data and field checking of Cavite and Rizal provinces.
- o post-field work which involves the compilation of all data and making of final land use map.

The main maps and data for the analysis are the contour map with 1/50,000 scale (NAMRIA, reprinted 1990) and the land use map with 1/50,00 and 1/75,00 scales (BSWM, 1988).

11.4.2 Classification of Land Use

The total land area of the Study Area is estimated at 212,555 hectares and is divided as follows:

NCR	:	63,600 Has.
Cavite (S.A.)	:	18,572 Has.
Rizal (*)	:	130,383 Has.
(*) NCSO, Bureau of Lands	:	130,383 Has.

BSWM : 130,892 Has.
Office of the Provincial Assessor : 157,345 Has.

Land use is classified into the following six major categories: (a) Built-up area; (b) Agricultural area; (c) Forest; (d) Wetland; (e) Open Space; and (f) Others.

(a) Built-up Area

In Metro Manila the built-up area occupies 47 percent of the total area. That of the Rizal province occupies 11.7 percent of the province's total.

The built-up areas of the Rizal Province are sporadically scattered. Major ones are concentrated in Cainta, Taytay and Antipolo because of their contiguity to Metro Manila.

The major built-up areas of Cavite are composed of the municipalities ringing the Metropolitan Area, namely, Bacoor, Kawit, Noveleta and Cavite City. Imus is also rapidly expanding and experiencing the suburbanizing trend of Metro Manila.

(b) Agricultural Area

This category includes all areas that are intended for agriculture: rice field, cropland, plantation, etc.

In Rizal, the total agricultural area is about 19,167 hectares or 14.7 percent of the total area of the province. The southern part of Imus constitutes this type of area in Cavite.

(c) Forest

Forests are found mainly in the mountainous parts of Montalban, Antipolo and Tanay, and also in the lower hills and along waterways or creeks. They cover about 16,618 hectares or 12.7 percent of the total area of the Rizal province and are the next most extensive natural cover of the Rizal province.

(d) Wetland

Wetland areas are found in low-lying coastal plains adjacent to large bodies of water.

(e) Open Space

This category consists of those areas associated or mixed-up with built-up areas. Most of the open spaces are found in the NCR.

(f) Others

Under this category are areas which could not be classified under the preceding five categories.

11.4.3 Land Use Development

Responding to the social, economic and political activities in recent years, changes in the land use pattern in Metro Manila may be summarized as follows:

- Increase in the number and density of squatter housing areas.
- The development of middle and upper class residential subdivisions on urban peripheries where land is inexpensive.
- The development in the main urban area of townhouses and high-rise condominiums for the middle and upper income market.
- The conversion of agricultural and fishpond areas for residential and/or commercial use.
- The emergence and intensification of suburban commercial nodes at intersections of major transport routes in response to the need of the growing number of residential subdivisions in the suburbs.
- The location of new and the relocation of existing industries at cheaper sites to the north (Bulacan), east (Rizal) and south (Cavite). These sites are along major transport routes.

11.5 INFRASTRUCTURE

In contrast to the rapid population growth witnessed during the past few decades, the infrastructure situation in the NCR has not kept pace as to be adequate to the basic needs of the inhabitants.

11.5.1 Transportation

The transport system of the country and Study Area remains to be dominated by land transportation facilities. This type of system accounts for 65 percent of the total domestic passenger traffic. The latest technology in land transport is the Light Rail Transit (LRT) which was opened in Metro Manila to decongest the streets.

The public transportation in Metro Manila, Cavite and Rizal is predominantly road-based, consisting largely of jeepneys and buses for primary and secondary routes, and tricycles and pedicabs for feeder routes.

11.5.2 Sewerage System

Two sewerage systems are working in the NCR. One is the Central Manila Sewerage System constructed before 1909 with an original overload capacity of 450,000 people. Presently, this system covers 1,850 hectares and serves 530,000 people. It has a total length of 240 km. The other is located in Quezon City and Makati, and which is made up of isolated systems in subdivisions and commercial areas serving 350,000 people. Total length is about 140 km. The rest of the NCR populace discharges its wastewater either into storm drains, septic tanks or directly to esteros (small streams).

11.5.3 Power Supply

The country's electric power is generated by the state-owned National Power Corporation (NPC). Power generation is done through geothermal means or through the use of oil, coal, hydropower, and other energy resources. The generated power is supplied (at 115 kv or at 230 kv) to the Manila Electric Company (MERALCO) which distributes it over the whole of NCR, Rizal and Cavite.

11.6 DEVELOPMENT FRAMEWORK

The Chapter delves into conditions of zones and existing and future urban uses. It organized the background information used in Stage I and the complementary data generated during the second survey to estimate future populations, economic growth and future land use. These data sets were also used in the development of the specific proposal for this study for the period 1990-2010.

Total population projections data were based on the 1980 and 1990 census of NCSO and were adjusted to reflect the yearly growth. More precise estimates on the number of people, family size, number of subdivisions, conditions of land use and other information which will be useful inputs in urban development planning were derived for the Antipolo area through detailed field survey. In addition, extensive spot surveys were conducted in the various areas of the NCR, the Cavite and Rizal provinces in order that the whole study area may be more generally viewed.

The planning period adopted is the next twenty (20) years; that is from 1990 to 2010. A 20-year horizon is adopted for two reasons: first, reasonable projections of population and service demands cannot be made for more than 20 years, using the base year data for 1980 and those available for 1990 when this study began; second, developments after the year 2010 will have little effect on future project selection, as discounting makes relatively insignificant the present value of future costs.

11.6.1 General

The study for the groundwater development of the MWSS service area analyzed the data on socio-economic conditions with the insights that these data may yield the needs of groundwater development. As the study covers a large area and encompasses quite a number of cities and municipalities, making it feasible required setting up background information and updated data for the whole Study Area. The urban development plan focused on the Antipolo area and some parts of its surrounding municipalities, namely, Taytay, Angono, Teresa and Binangonan, the aggregate area of which is about fifty-one (51) square kilometers.

11.6.2 Regional Development Plan in the Study Area

(1) Regional Development Priorities

The overriding socio-economic goals based on the NEDA guidelines for the preparation of the Medium-Term Regional Development Plan are economic recovery in the short-term and sustainable growth in the long-term, the generation of employment, the alleviation of poverty of the great masses of the population, and the provision of a more just and equitable sharing of the fruits of development. As these goals fit the regional situation, they have therefore been adopted also as the regional goals.

As Metro Manila continues to attract migrants and investors due to its inherent amenities and attractions, the existing pressures on urban services and facilities reflected by water and transport crises, increasing blightedness, housing shortage, traffic congestion and so forth, are expected to persist within the medium-term period (1990-1994).

Within this scenario, the impact of these metropolitan concerns could only be mitigated through the development of growth centers outside the National Capital Region which would act as complementary urban satellites (Figure 11.6.1).

Some of the current functions within the metropolis, such as primary manufacturing, may be transferred to these growth centers and thus complement the activities and services offered by Metro Manila.

Within the metropolitan area, there is a need to formulate measures to discourage further congestion, particularly highly dense urban zones. This may cover an expansion of industries or even the closing down of pollutive ones.

The regional development goals of poverty alleviation, employment generation and the promotion of an efficient urban system be the guiding policy thrusts of the metropolitan government. Thus, the promotion of micro, cottage, small and medium industries and the efficient mobility of people and goods shall be basic requisites of all related action programs.

With the other regions' development of their resource base and the increases in their respective contributions to the national economy, the NCR is expected to play a larger role in international trade, commerce and finance in light of the encouraging prospects within the Asia Pacific Region.

(2) Policies and Strategies

a. *Alleviation of Poverty*

The principles of self-reliance and social justice guide the poverty alleviation efforts of the government in Metro Manila. Increasing the access of the underprivileged to answer basic needs, developing their capabilities and promoting their self-organization would be the key strategies towards providing greater equity.

More specifically, reducing the incidence of poverty in Metro Manila shall be pursued through a coordinated, area-specific and multi-sectoral approach. This shall be undertaken through high-impact, horizontally-integrated programs which cover the provision of employment and livelihood, land and housing, health, social welfare, education and training, infrastructure support and environmental sanitation services. As a basic criterion, target areas shall be identified based on their compatibility with the land use and road transport system within the metropolis and its peripheral areas.

b. *Delivery of Urban Services*

Greater access by the people to goods and urban services is a key element in reducing poverty incidence. Specific measures in this regard shall be undertaken through concerted efforts of the public and private sectors.

Coordination with Local Government Councils and the Legislative Body shall be undertaken by the concerned sectors or by the metropolitan government in the updating of laws and the formulation of appropriate policy measures required for a more efficient and effective delivery of services within the metropolitan area.

Information dissemination shall be strengthened to promote consumer protectionism/assistance, awareness of product standards, and help in the conservation of water supply and power.

c. Creation of a Healthy Urban Environment

Efforts to bring about greater equity shall be coupled with those on improving the environment and use of urban land.

In particular, formulation of a Land Use Plan will pave the way for sound land allocation for urban uses and establish the basis for an updated Zoning Ordinance as a more meaningful land development control.

The improvement/rehabilitation/maintenance of natural drainage courses and existing facilities, particularly water supply, flood control/drainage and sewerage networks, should be given priority so as to prevent further deterioration of the urban ecosystem. Anti-pollution laws should likewise be strictly enforced, particularly on industries along Laguna Lake and water bodies.

These activities should be backstopped with massive information dissemination to promote public awareness and encourage active public participation and cooperation should be optimized.

The expected growth within the "CALABAR" area is seen as an opportunity to decongest the high density areas of the metropolis. Thus, strong coordination and support shall be provided in the:

- o development of all growth corridors outside the peripheral areas of the metropolitan region, and
- o the development of complementary centers to the North and the South of the NCR

An inter-regional planning system between the NCR, Regions III and IV shall be initiated to integrate the thrusts and growth directions of the three regions and to establish linkages between the technical and social infrastructure services network of Metro Manila with those of Central and Southern Luzon. It is necessary that the consolidation of develop-

ment efforts be coordinated in such a way as to assign specific areas the functions for which they are most suitable and hence optimize their potentials.

Figure 11.6.1 illustrates in detail the policies and strategies for a more desirable physical growth of Metro Manila.

11.6.3 Growth of the Study Area

(1) Urban Growth

Like most primate cities in the developing world, Metro Manila has continued to grow in a deteriorating environmental setting --- urbanization accelerated with emphatic regard to economic growth with little being done to preserve or enhance the quality of the environment.

Metro Manila's rapid urbanization has led to congestion and intensification of urban activities that:

(a) placed serious strains and pressures on supporting infrastructures and have rendered existing services and systems inadequate;

Decreasing water pressure, rampant illegal water and power connections, uncollected garbage, congested road junctions, buses and jeepneys overflowing with passengers, clogged drainage networks, proliferation of makeshift housing structures are some of the more visible evidence of the inadequacy or insufficiency of the present systems and services.

(b) resulted to incompatible and conflicting land uses;

The intensifying urban development on the lower lands without proper drainage facilities will aggravate the area's vulnerability to flooding.

(c) encouraged growth on the peripheries where basic infrastructure services are not available;

The absence of drainage facilities in the lower lands where water table is high offers opportunity for human contact with untreated wastes during flooding.

Unregulated pumping of groundwater in areas where surface water supply is not available has led to the depletion of aquifers and, particularly along the coast, to saline water intrusion.

Largely dictated by private sector investment decisions, the growth of Metro Manila, to date, has remained uncontrolled. Government response is currently weak. There are no specific provisions for the guidance of private sector and government agencies engaged in development, and upon which an environmentally sound Land Use Plan can be based. The current Zoning Ordinance is based on existing land use patterns and, therefore, reinforces existing development trends. The legislation on idle land tax, which has been in existence since 1978 to encourage development of vacant lands, has not been implemented.

(2) Growth of the Study Area

The geographical spread of Metro Manila, measured from the mouth of the Pasig River, has increased from an 8-kilometer radius after 1950 to some 20 kilometers in 1990.

The present trend indicates that the continuous increase of the urban area -- up to a 25-kilometer radius involving the whole Cavite area (South corridor), the Antipolo urban area (East corridor), and the urban spot locations along the Laguna coastal corridor -- may continue up to the year 2010 (Figure 11.6.2).

Outside its political boundaries, Metro Manila's population and industrial activities have spilled over to:

- (a) the provinces of Bulacan -- to the north through MacArthur Highway (North corridor);
- (b) the municipalities of Cainta, Taytay, San Mateo and Antipolo of Rizal -- to the east through Sumulong Highway and Ortigas Avenue Extension (East corridor); and
- (c) the municipalities of Bacoor and Imus of Cavite through Gen. Aguinaldo Highway and San Pedro through South Super Highway to the South (South corridor).

Meanwhile, population spills are sited in strips along major corridors, with industries appearing in spot locations.

It is anticipated that for the planning period (Medium-Term NCR Development Plan, 1990-1994), Metro Manila shall continue to experience infilling in the main urban area. It shall undergo simultaneous outward expansion in all directions largely due to private sector-initiated development. Infilling will cause the further reduction of idle and open spaces in the core and intensification of and/or change in land use patterns. New developments are expected to proceed in a sporadic manner, and largely as opportunity responses to the free operation of market forces.

Both trends shall continue to bring about the unwelcome effects of:

- (a) development going ahead in areas where infrastructure systems and basic utilities are inadequate;
- (b) development exacerbating flooding problem by preventing natural drainage or run-off; and
- (c) development contributing further to inefficient land use patterns in the absence of an updated Land Use Plan and/or Zoning Ordinance.

Apparently, it is no longer pragmatic to confine planning for Metro Manila's growth within the boundaries of the National Capital Region.

11.6.4 Land Use Development

The social, economic and political activities in recent years effected changes in the pattern of land use which can be summarized as follows:

- increase in the number and density of blighted areas;
- the development of middle and upper class residential subdivisions on the urban periphery where land is cheaper;
- the development of townhouses and high-rise condominiums for

- the middle- and upper-income markets in the main urban area;
- the conversion of agricultural and fishpond areas to residential and/or commercial uses;
- the development of high intensity commercial activities along major transport routes;
- the emergence of intensifying suburban commercial nodes at intersections of major transport routes in response to the need of the growing number of residential subdivisions in the suburb; and
- the location of new and relocation of existing industries at cheaper sites to the North, East and South, along major transport routes.

Apparently, the existing land use pattern has contributed much to the current major problems and has widened the gap between demand for and delivery of basic services. Pursuing development without due regard to the opportunities and constraints posed by the inherent characteristics of the land compounds the deterioration of the urban environment. In the absence of a sound and environment-oriented Land Use Plan and complementing development controls and regulations, current land use trend is expected to continue up to the year 2000, and up to year 2010, if no measure is implemented to control the current problem.

(1) Industrial Development

As emphasized earlier, the main objective of the urban growth corridor development is the continuing promotion and strengthening of urban/ industrial development, particularly of the urban growth corridor in the provinces of Rizal and Cavite.

The pressure along the Laguna coast in Rival could be reduced if the two planned industrial areas (San Mateo and Pinugay) are developed rapidly. Location of industries poses the most serious problem in Cavite. This need for an industrial area could be answered by encouraging the industrial growth toward Silang, and not along the Laguna de Bay. Pursuing this option would direct industrial/urban development out of the water

shed area of Laguna de Bay. Furthermore, this growth axis could be combined with that of Cavite by not allowing industrial location along the coast beyond Rosario.

There are 10,000 ha. of land in that area in Cavite (Study Area) which is not suitable for intensive agriculture (hilly upland with high erosion potential, generally slopes of 8 to 18%). Not all of this land, however, is suitable for industrial/urban development. The determination of specific locations in the area and the determination of the amount of suitable land would a separate study.

Being part of the National Industrial Core Region, the growth of industry in the Study Area will largely reflect overall national trends. Government efforts to restructure the industry and maintain export growth will have a direct bearing on the development of Cavite and Rizal.

Regionally, the key issue is the promotion of a diversified industrial base which will be internationally competitive, and is integrated with downstream industries. This integration is also essential in increasing the stability of the industrial output of Cavite and Rizal, in utilizing the potential of small firms/cottage industries for development, and in more equitable distribution of industrial income.

(2) Integrated Industrial/Urban Development

The present location of industries in areas contiguous to Metro Manila does not serve the government objective of industrial decentralization. The emphasis should be on locating industries in areas separated from Metro Manila.

The present pattern of industrial estates indicates that the plan for such estates has not sufficiently taken into account the housing needs of employees and the development of other urban amenities. The results are unnecessary high commuting time and costs, traffic congestions, and a poor quality of the urban environment.

The land area presently planned for industrial estates appears to be sufficient for the medium-term requirements of large industry. The

emphasis, therefore, should be on the requirements of small cottage industries.

The industrial location will be outside of prime agricultural and the residential areas, and will take into account the long-term spatial development strategy.

(3) Urban Centers

Intermediate-sized urban cities in the Region are not well developed, largely due to polarization effects of Metro Manila. However, there are areas in Rizal which the government plans to develop into administrative centers. For Cavite, and in terms of size of urban centers, no clear delineation could be made.

11.7 CONFIRMATION OF FRAMEWORK

11.7.1 Population

(1) Present Population Distribution

a. Study Area

The Study Area was estimated to have a population of about 9.4 million people in 1990. Almost 84.7 percent of this population reside in the National Capital Region.

Cavite City and the five Cavite municipalities accounted for a total of 0.46 million people, equivalent to 4.9 percent of the Study Area's population. The fourteen municipalities of Rizal have a total population of 0.98 million, equivalent to 10.4 percent of the Study Area's population (Table 11.7.1).

b. Antipolo Area

The 1990 Population Census (NSO) placed the total population of the Antipolo Municipality at about 207,800 or some 137,400 more than its population ten years ago (1980). Annual growth rate is placed at 10.8%.

Table 11.72 shows the total population of the Antipolo Municipality at barangay level.

There is no problem of congestion in the municipality of Antipolo. Population density as of 1990 is about 7 persons per hectare. This figure is expected to soon reach 14 persons per hectare and to be 2.1 times by 2010. However, statistics on available land do not really imply availability of land, since about 72 percent of Antipolo is forest land.

The population is mainly concentrated on 28 percent of Antipolo's area. As a result, overcrowding in urban barangays has already started and squatter communities have also sprouted.

The total land area of the municipality of Antipolo is about 30,610 hectares. Present density of its population is 6.8 persons per hectare. Out of the 207,842 total population of the municipality, 112,717 persons (54.2%) live in urban barangay areas which are now under study.

The present density of the Antipolo Study Area is 24 persons per hectare. This figure is expected to increase to 37 persons per hectare by the year 2000 and to 50 persons per hectare by the year 2010.

Full urbanization of all barangays in Antipolo may not be feasible due to its geographic characteristics. Thus, rural-urban population distribution will not change much within the next five to ten years. However, urbanization in the middle-highland zone between the Antipolo town and the Angono-Cainta-Marcos Highway route may be change drastically within 10 to 20 years (Table 11.7.6).

Table 11.7.7 shows the population distribution, density and land area within the aquifer basin zone for years 1990, 2000 and 2010.

(2) Population Growth of the Study Area

During the period 1980-1990, the population growth rate of the Study Area reached the following rates: 2.83 percent (NCR), 3.43 (Cavite) and 5.46 (Rizal).

Based on NSO data (1980), the population growth rate from 1990 to 2010 is expected to slow down slightly to an average of 2.22 percent for NCR and 2.82 percent for Cavite. For the same period, Rizal's population will show a slight increase with its average annual growth of 3.59 percent. Given these growth rates, the population of Cavite and Rizal are expected to double in a span of 20 years (Table 11.7.3 and Figure 11.7.1).

(3) Population Projections up to Year 2010

Total population is a determinant of total water demand. To project water demand, this study estimated future populations using official population data prepared by the National Statistics Office.

The population projections were based on the results of the 1980 and 1990 Census of Population and Housing (NSO), using three alternative forecasts, namely: high, medium and low forecasts for the Study Area. These are differentiated through the taking of assumptions on the time when the country attains replacement level fertility.

The projections for cities and municipalities inside the Study Area for selected years are given in Table 11.7.4 (Study Area) and Table 11.7.5 (Municipality of Antipolo at barangay level).

(4) Comparison of Population Projection

Figure 11.7.2 shows the comparison of population projections made by AWSOP (Angat Water Supply Optimization Project, 1988) and the JICA Study Team for the municipality of Antipolo.

Using the same method adopted by the NSO, both projected population growth trends were not quite far from each other.

The variance occurred because AWSOP's projections were based on the 1980 National Statistics Office's (NSO's) census data, which at that time was the only one available, while the Study Team's projections were based on the 1980 and the updated 1990 NSO census data.

Given the figure, it shows that the projected population made by the

AWSOP for the year 1990 was two times less than the actual 1990 NSO data.

(5) Projections of Blighted Populations

Total population for Metro Manila reached a staggering 7.929 million in 1990, making it one of the megacities of the world. A significant proportion of its population live in areas considered as unsuitable for human habitation such as along railroad tracks, esteros and river banks. These areas referred to as blighted areas and their residents as the blighted population.

Because of Metro Manila's high population growth, urban blight has become a major problem spawning marginalized conditions among squatters.

In 1985, the National Housing Authority estimated 2.3 million people to be living in blighted areas in the NCR. This population grew to an estimated 2.8 million in 1990, or approximately one-third of the total population. This estimate included those who have benefited from the urban land reform and housing program under the National Shelter Program.

Figure 11.7.3 shows the approximate locations of blighted areas in the various part of NCR.

The distribution and percentage in 1982, 1985 and 1990 of the blighted population in each city/municipality are shown in Table 11.7.8.

The percentage of blighted population was notably high in Pasay City, Quezon City and Navotas.

There was no data on blighted populations in other MWSS service areas outside of the NCR. It is assumed that there are a few blighted areas in the Cavite and Rizal provinces.

Assuming that the high in-migration rate is checked, the blighted population is projected to grow such rate that its proportion to total population in each municipality remains constant.

The projections for the general blighted populations are given in Table 11.7.9.

11.7.2 Economic Growth

(1) Income and Expenditure (Antipolo)

Antipolo is a third class municipality which in 1988 has a total revenue of about P11,596,801. This is double the 1987 amount of about P5,142,350. Most of the year-1988 revenue came from real property taxes amounting to P4,448,106. Earnings of municipality mostly comes from business taxes on goods and services. Operating and miscellaneous income was P1,881. The overall collection performance of the municipality has improved since 1980.

For the next five to ten (5-10) years, revenue collection is anticipated to greatly improve with much of the revenue coming from the local government taxes on real properties.

The next possible major earner for the town will be the public market which will be improved to provide expanded and efficient public service. Other potential revenue earners are the tourist spots of Antipolo.

Projected appropriation from the General Fund is expected to reach P20 million in the year 2000 from the 1988 level of P11.59 million. Expected expenditures to be sourced from the General Fund will remain to be very well within the limits of available funds. These funds which in 1988 totaled P11.46 million are expected to increase gradually until it reaches P99 million in the year 2000.

Table 11.7.10 GENERAL FUND (MUNICIPALITY OF ANTIPOLO), 1988

ACCOUNT DISTRIBUTION	ESTIMATED REVENUE	ACTUAL
Tax Revenue		
Real Property Tax-Current Year	3,990,000.00	2,851,188.18
Real Property Tax-Previous Year	1,722,000.00	1,140,573.76
Real Property Tax-Penalty	262,500.00	456,604.54
TOTAL REAL PROPERTY TAXES	5,974,500.00	4,448,106.48
Taxes on Good and Services	3,494,345.03	2,365,288.18
Other Taxes	2,236,546.00	2,680,718.29
Total Taxes Revenue	11,705,391.03	9,512,112.95
OPERATING & MISCELLANEOUS REVENUE	2,184,278.00	2,082,807.35
MISCELLANEOUS INCOME		1,881.10
TOTAL INCOME	13,889,669.03	11,596,801.40

(2) Economic Growth Projections

As economic growth fosters a proportionate increase in water demand, in the same manner also is per capita domestic demand for water affected. Industrial and commercial demands are also expected to increase in proportion to the growth of their respective gross domestic products.

The MWSS CORPLAN computed growth rates from NSO's special releases of data and projections on family income.

As shown in Table 11.7.11, per capita income is projected to grow in 1991 and to decrease drastically in 1992. From 1994, it is projected to grow minimally up to the year 2010.

TABLE 11.7.11 PER CAPITA INCOME GROWTH (%)

YEAR	PER CAPITA INCOME GROWTH (%)		
	SECTOR		
	1	2	3
1987	-1.37	-1.37	0.00
1988	-3.95	-3.95	0.00
1989	-7.37	-7.37	0.00
1990	-9.17	-9.17	0.00
1992	14.72	-14.72	0.00
1990	-9.17	-9.17	0.00
1992	14.72	-14.72	0.00
1993	-1.22	-1.22	0.00
1994	-1.43	-1.43	0.00
1995	1.49	1.49	0.00
1996	3.11	3.11	0.00
1997	-3.01	-3.01	0.00
1998	-2.92	-2.92	0.00
1999	-3.00	-3.00	0.00
2000	-12.31	-12.31	0.00
2001	-1.28	-1.28	0.00
2002	-1.18	-1.18	0.00
2003	-1.08	-1.08	0.00
2004	-1.00	-1.00	0.00
2005	-0.91	-0.91	0.00
2006	-0.84	-0.84	0.00
2010	-0.56	-0.56	0.00

1. General Population
2. Urban Development Beneficiaries
3. Blighted Population

Source: MWSS (CORPLAN)

Economic growth in the industrial and commercial sectors are measured by growth in gross domestic products (GDP). This is the sum of all goods

and services produced expressed in pesos. Data on GDP for both industrial and commercial sectors in the NCR for previous years, as well as projections up to year 1992, were obtained from NEDA. The gross domestic product of the services sector was used to estimate commercial growth. The output of the industrial and commercial sectors decreased in the 1983 to 1986 period. These sectors are projected to post positive growths from 1987 to 2010.

There were no data on industrial and commercial growths for other areas outside of NCR.

The computed growth rates are shown in Figure 11.7.4.

11.7.3 Industrial Structure

Table 11.7.12 shows the distribution between the NCR and Region IV of manufacturing establishments for 1986 and 1987. Out of the 3,403 manufacturing establishments in 1987, 2,878 or 84.6 percent were located in Metro Manila, the country's industrial center. Region IV accounted for 525, or 15.4 percent of the total.

TABLE 11.7.12 LARGE MANUFACTURING ESTABLISHMENTS,
YEARS 1986 AND 1987

Region	No. of Manufacturing Establishments			
	1986	%	1987	%
NCR	2,801	85.6	2,878	84.6
REGION IV	473	14.4	525	15.4
TOTAL	3,724	100.0	3,403	100.0

As shown in Figure 11.7.5, industries are overconcentrated in Metro Manila. The largest number of manufacturing firms are concentrated in the Valenzuela-Caloocan-Quezon City area which lies northeast of NCR, in the Marikina-Pasig area situated along the Marikina and Pasig rivers, and the Parañaque-Taguig-Muntinlupa area along the South Superhighway.

Meanwhile, as population spills on strips along major corridors, industrial development of areas outside Metro Manila appear in spot locations.

The industrial development of areas outside Metro Manila is hampered by extreme concentration of industries in the NCR -- from manufacturing to resources based industries to food processing and wood products, etc.

At present, there are two major industrial areas outside of the NCR. One is in Rizal and the other is in Cavite. The greater concentration of industries is in Rizal, specifically in the Cainta-Angono area. For Cavite, the concentration is in the area between the towns of Rosario and Silang (outside of the Study Area).

In Rizal, both San Mateo and Pinugay (where industrial estates are planned) are occupying areas suitable for grazing.

Cavite presently has eight existing industrial estates, two of which are located within the Study Area: Cavite Export Processing Zone in Rosario and Informal Industrial Estate in Imus.

The Cavite Export Processing Zone is the fourth Export Processing Zone (EPZ) in the Philippines. It became operational in 1986. If fully developed, about 120 export companies may be located within its 275-hectare area. An initial area of 72 hectares are now fully developed, complete with road network, water and sewer lines, power service and access to communication facilities.

The Informal Industrial Estate in the municipality of Imus and part of Dasmariñas along the General Aguinaldo Highway is situated on a 12-hectare tract of land. Wire harness and electrical components for specific types of cars for export are produced there.

11.8 URBAN DEVELOPMENT PLANNING

11.8.1 General

(1) Basic Structure Plan

A basic structure plan attempts to encompass all plans and regional development plans, in order to make into a coherent whole the plan on what and how Metropolitan Manila and the contiguous provinces of Rizal and Cavite should be (Figure 11.8.1).

The transition area between the inner urban core and outlying area of Metropolitan Manila is seen to provide enough room for expansion while retaining a medium intensity of development. It shall have a balanced distribution of population densities, encouraging concentration of activities at selected centers, and along lines of accessibility.

The areas outside the Metropolitan complex are expected to absorb a considerable amount of urban growth. The emphasis is seen, however, on urban concentration at selected centers of activity along major transport routes, projecting a linear-cellular pattern.

Urban nucleations in the north, east and south are expected to develop into multi-functional activity centers, providing expanded opportunities in housing, employment and social services, as well as education and cultural facilities. In lying areas between the corridors of growth shall, however, be subjected to development guidelines to ensure retention or conservation of major open spaces, forest, watershed and prime agricultural areas.

While the development along the eastern corridor at present has not gained much progress due to the problem of flooding, especially in the coastal towns of Laguna Lake, poor groundwater, and the topographic constraints posed by surrounding mountains. But, it is expected that rational programming will, nevertheless, push its development through. Also, the high-intensive residential development in the slope area located in the middle-land dividing the Antipolo and Angono-Taytay-Marcos Highway areas, will be expected in the near future.

Further growth is anticipated in the south because of its greater ab-

sorptive capacity and the activities of the private sector. The towns in the coastal areas of Cavite and the towns adjacent to Laguna Lake are expected to quickly industrialize.

Utilizing the dominant influence of transportation on urban growth in bringing about desired densities of development, it is envisioned that the planned development for the outer areas shall achieve maximum benefits.

(2) Study Area Planning

The land use plan in essence is the translation into physical form of planning policies and principles. Such policies are based on the realities of the present dynamic, if rather unregulated and chaotic, conditions obtaining in the metropolis.

To sum up the present situation, haphazard and sub-standard development in the metropolitan area is going on at a rapid rate. There is great disparity in residential density in the various cities/municipalities, ranging from 715 persons/hectare to as low as 49 persons/hectare.

The city has grown rapidly making it functionally unbalanced. This has stretched the lines of communication and also made the provision of municipal services and other facilities, which are so essential to urban living, difficult. There is overcrowding, congestion and unsanitary conditions. This is particularly bad in the old Manila residential area. At present, housing is not related to employment centers. The undesirable mixing of land uses is almost everywhere, applying especially to the Metropolitan area as a whole.

Land use and transportation are the main basis for the successful implementation of urban development projects. Land use and transportation are complementary and thus, influence each other.

In order to have systematic urban development, a structure plan of the study area is prepared so that necessary control measures and directives will be formulated towards planned development of the different sectors of the area in view of the present condition of the Metropolitan and surrounding provinces.

11.8.2 Antipolo Area Development Plan

(1) Development and Growth of Antipolo

The Antipolo area encompasses a broad spectrum of levels of development and probable growth

Pasig and Marikina in NCR along the Marikina River are highly industrialized and densely populated. Therefore, the present and emerging growth towards the East corridor covered by Cainta, Taytay and Antipolo, in Rizal Province are trends to continue. The populations of these municipalities are local centers of population and light industry, and the remainder of Rizal Province is agricultural, forest and grassland with a low population density.

Development plans for the Antipolo area are centered on upgrading and enhancing the overall socio-economic conditions. Priorities include the increase of food production and farm income, construction of infrastructure facilities supportive of social and economic development, maintenance of existing watershed areas and other forest lands, development of potential tourist attractions, and establishments of labor-intensive, small-scale rural enterprises which will create employment opportunities. The provision of adequate basic facilities for health, education, housing and protective services is also given attention.

Full urbanization in the municipality of Antipolo may not be feasible due to geographic characteristics. However, urbanization in the East corridor covered by Antipolo town and surrounding municipalities of Taytay and Angono may be changed drastically in the coming years.

(2) Locational Advantage

The locational importance of the town of Antipolo will depend largely on the direction of expansion and development of Metro Manila in the years to come. Antipolo is endowed with natural resources and a favorable climate. These advantages, however, could be overshadowed by many factors, which can also work against the development of the town. Among these unfavorable factors are: poor infrastructure, continuous pollution of precious river and creeks, and fast-rising values of real estate

properties.

In relation to the whole province of Rizal, Antipolo is considered as an agricultural area/town possessing potential agricultural lands. However, it has not produced enough agricultural cash crop. The main constraint is the lack of water source for irrigation of most upland agricultural areas.

(3) Physical Features

The physical characteristics of Antipolo has been described in Stage I. Some of the significant aspects may again be mentioned as they will become useful in the discussion on the land use plan of Antipolo Area.

Antipolo is characterized by the predominance of mountain ranges. The town proper itself which occupies eight percent of the land area lies on a rolling area about 183 m above sea level (on the average). The surrounding areas lie on a higher elevation, with some places peaking as high as 300 m above sea level, especially at the eastern side of the town where most mountain ranges lie.

Antipolo town lies approximately 22 km. east of Metro Manila. The municipality is bounded on the northwest by the municipalities of Marikina and San Mateo, on the north by the municipality of Montalban, on the east by Quezon Province, on the southeast by Tanay and Teresa and on the southwest by the municipalities of Angono, Cainta and Taytay. The municipality covers a total land area of 30,610 has. and occupies 23.5 percent of the total area of Rizal Province.

(4) Antipolo Study Area

The area under consideration, previously identified as Antipolo area and its urbanizable peripheral areas and parts of the municipalities of Taytay, Angono, Binangonan and Teresa, is about 51 square kilometers and covers the barangay of Antipolo and the contiguous municipalities (Figure 11.8.1).

The Antipolo area is characterized by a high-intensive residential development because of its strategic location -- contiguous to Metro

Manila; its relatively cheaper land values, its rapid transformation of forest/grassland and agricultural land to other land uses.

This area is envisioned to absorb a considerable amount of urban growth. The emphasis shall be as described earlier and focused on intensive residential development and urban concentration along major transport routes, projecting a linear-cellular pattern.

(5) Existing Condition of Land Use

Figure 11.8.2 (Land Use Map, Antipolo Area, 1991) and Table 11.8.2 shows the estimated area by land category.

The existing general land use pattern in Antipolo area shows the predominance of forest/grassland (land usually rolling and generally covered with second growth forest and grasses); mostly on the southern side of the study area. Forest/grassland occupies about 2,660 hectares or 52.3 percent of the total land area.

Agricultural land is planted to cash crop like rice and plantation (mango), but also covers farm areas mostly located at the east-south side of the study area. This land which is about 796 hectares is the second larger area.

The category open space consists of vacant area within the built-up areas. Unoccupied subdivisions which are mostly mixed with grassland constitute the third larger area. Examination of the field survey shows that the unoccupied subdivisions are larger than the total built-up area in Antipolo and surrounding municipalities.

Commercial areas are concentrated mostly in the main road (M.L. Quezon street) of Antipolo town, and in some precariously-sited commercial areas along the intersection of Marcos Highway and Sumulong Highway at the northern part of the study area.

Industrial areas are those where small industries are located.

The category built-up area consists of residential, institutional and facilities places.

Thirteen percent of the existing urban land is used for residential purposes while a larger number of lands are vacant lots owned by private individuals speculating on the ever increasing prices of real estate.

It can be seen that Antipolo urban area is a mixture of residential and commercial establishments.

The present trend of the study area indicates a continuous increase of the urban area involving the whole of the unoccupied subdivisions (mixed with the open area) and agricultural and grassland, especially in Antipolo, Taytay and Angono, at the western side of the Sumulong Highway M.L. Quezon Extension line.

(6) Land Use Projection

The future land use projection for the Antipolo area will determine the physical development of the study within the next twenty years.

The factors considered are: a) the goals and objectives of the sectoral components of the development plan; b) land capability of areas; and c) growing trend of the area.

Its high slopes are constraints for Antipolo's expansion of its agriculture and its urban area, thus limiting its expansion and urbanization. However, it can be used to work positively for the future development perspective which is directed towards the promotion of tourism and preservation of agro-forestry.

The eastern fringe of the study area in the next 10 to 20 years will not change drastically. However, urbanization in the western fringe covered by the Antipolo town and the impinged parts of Taytay and Angono may be changed drastically in the coming 20 years.

The predominance of forest/grassland will depend on the rate of reforestation and deforestation in the area affected by urban growth pressure.

Urbanization should be controlled due to development constraints brought about by steep slopes and poor soil conditions.