

11 SWM FINANCING AND COSTS

11.1 Evaluation of SWM Financing and Costs

11.1.1 Background

The financing of RASUB's recurrent and capital expenditures is greatly constrained. As a result the opportunity to improve the quality of SWM services provided by RASUB to the citizens of Bucharest is limited. A brief analysis of MB's financial position is provided below.

RASUB's operational expenditure (opex) is financed from its tariffs as required under Law 15, 1990, Art 6. However it is proposed that a new local waste fee which will be collected by MB, will replace the tariff in 1995. Both existing tariff arrangements and new fees are evaluated below.

RASUB's capital expenditure (capex) is financed from its own resources and by MB. In practice its own source funding is extremely small; the majority is financed by MB. These arrangements are also evaluated below, including investment planning and appraisal procedures.

11.1.2 Why is MB Financially Constrained ?

MB is financially constrained because it lacks financial autonomy to set its taxes and fees and to approve its expenditures. Under the current legal framework, Law 69, 1991, The Law on Public Administration, theoretically gives local government complete financial autonomy. But this is constrained by Law 10, 1991 the Law on Public Finances, which defines the fiscal responsibilities of local and central government for establishing taxes and expenditure budgets.

Although Law 27 1994, the Law on Local Taxes, has amended and set new local taxes, and permits local governments to set fees for waste services, it will have virtually no impact on increasing local governments' revenue base. The proposed Law to restructure Local Government Finance and to devolve financial autonomy to municipalities is now long overdue.

Currently local government cannot change their local taxes and fees without approval from the MoF, which is exercising strict fiscal control over local government spend. As a result fiscal and non fiscal tax revenues are declining in real terms because they are increased well below inflation.

In practice, therefore, the MoF maintains absolute control over local governments financing and expenditure by approving and modifying local councils' budgets, establishing local taxes and fees, collecting these taxes, and controlling the timing of disbursements to them.

Control is exercised through the Ministry of Finance's local representations or financial administrations, which are physically located in all local governments offices.

11.1.3 Municipal Expenditures

Local municipal spend is defined as including all public services provided by the Regies plus MB's own spend on its Administrations and Sector ADPs. Financing sources are a curious mixture of local source taxes, central government subventions and tariffs for public services.

MB's expenditures are financed from its local fiscal and non fiscal revenue base (including house sales) and also from a top up subsidy from central government which is financed from a share of salaries tax. MB's Roads Administration also receives capex subventions directly from central government.

The Regies finance opex from their tariffs. Opex costs for public transportation and heating (thermal energy) are additionally heavily subsidised by central government.

RATB, RADET, and RGA's capex is almost entirely financed by central government subventions. RASUB is an exception; its capex is funded almost entirely financed by MB.

All local revenues are collected by the MoF local administration.

An analysis of expenditures for 1993 and the 1994 budget is given in Appendix 3.5. The analysis for 1993 shows that financing is approximately 20% from own local source taxes and fees (very small amount) and 80% from central government. The analysis excludes the Regies own opex spend.

11.1.4 Financing of RASUB's opex

1) Current tariff setting procedures

The financing arrangements of Regies are governed by Law 15,1990 by which the Regies were established. Under Art 6, Regies are responsible to recover opex, capex and financing costs by raising revenues through tariffs. They are allowed to set a number of tariffs to cover different types of services and customer categories. A full list of tariffs is contained in Appendix 3.5. Art9 also allows Regies to borrow from banks to cover negative cashflows (deficits). Opex is not subsidised by MB.

The greater part of revenues are generated from tariffs for household collection and disposal. In practice revenues are not high enough to finance capex which MB picks up, but opex costs are fully recovered with small year end surpluses. This does not mean that operational costs are adequately funded. For instance maintenance is severely underfunded, which has a serious impact on vehicle utilization and service levels.

There are a number of reasons why tariffs are not set high enough to adequately finance RASUB's operations.

Firstly, the tariff setting method is not robust and is subject to significant error. Calculations are inexact and based on average costs. Marginal costing is not used and costing skills at RASUB are weak.

Secondly, costing data used in the calculation may be unreliable.

Thirdly, tariffs are subject to a very bureaucratic approval process involving the MoF & MB, in which they are likely to be amended for political and social reasons, e.g. affordability, rather than for RASUB's financial well being.

Lastly, the tariff setting procedure does not fully absorb the consequences of hyperinflation currently estimated at between 200% to 250% in Romania.

The tariff is most sensitive to increases energy costs which typically make up about 15% to 20% of total operating costs. Energy costs are set by central government without forewarning, so that, by the time tariffs get increased, energy prices have already fed through. There have been 4 price increases in 1994.

Current tariff setting procedures are therefore inadequate to finance RASUB's opex.

2) MB's proposed new waste and street cleansing fee for SWM

From 1/1/95 the proposed new SALUB (or RASUB if it still exists) will not levy its own household tariffs. Instead MB will levy a waste and street cleansing fee which it is permitted to do under the new Law 27 (The Law on Local Taxes and Fees), and pay the service provider a fee under a contract. Fees for RGR will be established on the same basis.

The MoF local administration will continue to collect the fee on MB's behalf. Households, will not be invoiced and contracts will be terminated.

It has not been decided whether commercial and industrial institutions will continue to have contracts or whether new fees will be levied on them also.

MB officials are currently negotiating with the MoF to establish the level of the fee and collection arrangements. The fee has to be approved by the MoF under the requirements of Law 10, The Law on Public Finances, 1991. It is also proposed that the MoF will also issue an Ordinance on the agreed fee arrangements, which will repeal the existing contractual arrangements between RASUB and customers.

The detailed methodology for setting the fees, the linkage with contract remuneration and the collection arrangements are still undecided. These need to be clearly thought through.

The benefits of this fee arrangement for MB are:

1. fosters financial discipline. MB will have to balance fee revenue with the contract price;
2. ensures a higher rate of revenue collection;
3. less costly to administer - no billing costs and collection is easier;
4. suitable for a management contract where the Provider is remunerated under a lump sum
5. less risk for the Provider who is guaranteed a steady cashflow; and
6. less risky. Easier to implement, feasible given institutional capabilities and keeps future options open.

The disadvantages of this arrangement are:

1. less commercial risk for the Provider, therefore less incentive for cost minimisation;
2. MB may be unable to set the fee at the appropriate level because of its lack of financial autonomy.

11.1.5 Financing of RASUB's Capex

a. Financial Resourcing

The financing of capex is severely constrained. In practice capex cannot be financed from RASUB's tariffs because they are too low. Nor does RASUB finance capex (independent equipment only) from bank credits because financing costs are too high.

Instead capex is primarily financed by MB from its own local budget i.e. from local tax sources. However, in 1994 MB was unable for the first time to finance any of RASUB's capex at all because its own revenue base was severely constrained.

MB is hoping to mobilise investment by encouraging foreign companies to set up joint ventures with MB like RGR and at the same time to improve the quality of the service, increase cost efficiencies and develop the private sector.

This seems to have worked successfully with RGR which provides a better service for about the same price, has financed its truck fleet itself without assistance from MB and is much more efficient than RASUB.

b. Investment Planning

The investment planning process is reasonably well defined but is very bureaucratic. Each year the Regies submit investment plans approved by their Councils of Administration, to MB. Investments are classified by:

A - capital/civil works in progress

B - new capital works

C1 - equipment procurement

C2 - investment studies and Feasibility

A and B are supported by Feasibility studies.

The PSD prioritises the investments based on the Regies requests, feasibility studies that it wishes to convert to projects and sometimes recommendations from research institutes.

After approval by the MB executive departments the investment budget is approved by the Council. The Budget is then passed to the MoF for approval.

c. Investment appraisal and selection

Feasibility studies are prepared for large civil works for which procedures, methodologies and selection criteria are defined and documented. The MB monitors and assesses the results of studies through its Economic and Technical Commission. The role of the Regies in the investment planning process is limited to assisting the consultants carry out the feasibility study.

There is also a process to select investments which do not require Feasibility Studies, i.e. equipment procurement (C1). The PSD and the Economic Department appraise RASUB's investment plan. In practice it appears that little economic analysis is carried out. Furthermore there doesn't appear to be any formalised method to prioritise investments with agreed selection criteria.

Instead it appears that MB relies on RASUB's information and prioritises according to pressing social needs.

It can be argued that this is sufficient since the selection of investments is largely determined by MB's financial constraints and obvious priorities. In practice this means that priority is given to completing ongoing civil works projects (A) before equipment procurement (C1) projects.

11.1.6 Expenditure analysis

Comparison of SWM costs with municipal expenditures are given in Appendix 3.5.

11.2 Proposals for SWM finance and costs

11.2.1 Proposed financial arrangements

Proposals and recommendations for new financing sources and mechanisms for both opex and capex will be addressed and incorporated in the Interim Report.

This will include a more detailed analysis of the financial framework, including an analysis of the local budgeting cycle (and its interaction with central government financing procedures), financial flows and proposals for improving opex and capex financing.

11.2.2 Cofinancing of project

The scope for possible cofinancing of a potential project with other international agencies will be addressed in the Interim Report.

12. OUTLINE OF BUCHAREST

12.1 Introduction

Bucharest is situated at about 60 km away from Danube river in the southern part of the country on the Romanian Plain. The area under the jurisdiction of Bucharest Municipality is 228 km². The province of Bucharest has a total area of 1,821 km².

It was in 1862 that Bucharest was declared as the capital city of Romania after the unification of Wallachia and Moldavia in 1859. Bucharest is the political, economic, scientific and cultural center of Romania.

The population of the city of Bucharest is about 2.06 million in 1992. There has been a slight decrease in population over the past few years.

Bucharest has good public transportation systems including street cars, buses, trolley and subway.

According to the document entitled BUCHAREST 1993, Bucharest's contribution to the Romanian economy is:

- Sales of goods: 16.6 %
- Jobs: 14.0 %
- Industrial production: 13.1 %
- Capital assets: 12.1 %
- Population: 10.6 %
- Territory: 0.8 %

12.2 Natural Conditions

12.2.1 Geomorphology

Bucharest lies at the average altitude of 80m in the Romanian plain, upstream from the confluence between Colentina and Dimbovita rivers. Morphology is dominated by an alternance of high (80 to 90m) and low (55 to 60m) topographic levels according to interfluves, alluvial terraces, and riverbeds, with a general orientation NW - SE. Northern part of the city belongs to the so-called Mostistei plain, while south of Dimbovitsa river is known as the Vlasiei plain. Altitudes are slowly decreasing from north-west towards south-east. Arges, Dimbovita, Colentina, Pásatea, and Mustistea rivers are discharging into the Danube river at 50km from Bucharest.

Geological materials are those of quaternary period, represented by superficial loesses deposits on interfluves, and alluvial accumulations on river terraces, with gravels, sands, marnes and gleys. Upper geological strata are thin and horizontal. Lower strata are thicker and have a declivity up from SE down to NW. The main strata belong to the so-called Fratesti strata, which are an important reservoir for deep groundwater.

12.2.2 Climate

Climate is continental with influences of east or south and west air currents. According to records of the Bucharest Afumlati gauging station (east of the city), annual average rainfall was 477mm between 1981 and 1990. Romania is characterized by a natural cycle of dry and wet decades. The actual period is regarded as belonging to a dry decade. Between 1961 and 1990, amounts of precipitations have been between a yearly maxima of 869mm and a yearly minima of 376mm. In 1989 and 1990, precipitations have been less than 400mm yearly. Precipitations are characterized by torrential rainfalls. Average yearly temperature (1981-1990) is about 10 to 11°C. Between 1961 and 1990, the monthly minimum temperature was -8.9°C in January, and the monthly maxima temperature was 24°C in August. Values of monthly and yearly precipitations and temperatures are shown in Table 12.2-1 and Table 12.2-2.

Dominant winds are from west and north-east, with the highest frequency between November and May. Speed average is generally between 5 and 7m/s for NE wind in period of high frequency, and between 4 and 5m/s for west wind in same period, according to records made between 1981 and 1991 at the Bucharest Afumlati gauging station.

12.2.3 Drainage

Bucharest district lies between 2 important rivers: The Arges river in south, and the Ialomita river in north. Between these main rivers, Dimbovita river and its main affluent, Colentina river, are crossing the city. Tributaries of Ialomita are oriented SW-NE, while tributaries of Dimbovita and Arges rivers are oriented NW-SE. Main characteristics of the natural drainage around Bucharest city are summarized below. Actual drainage features are the result of several hydraulic works for protection against flooding and for water supply:

1. Derivation of high waters of Dimbovita toward tributaries of Arges river;
2. Derivation of high waters of Ilfov river, which is a tributary of Dimbovita upstream the Bucharest city, toward Colentina;
3. Derivation of 8m³/s of water supply from Arges to Dimbovita (Arcuda water treatment station);
4. Building of 2 major sewer canals, Ao and Bo, for draining city wastewater and rain water (3 years frequency);
5. Establishment of a system of reservoirs, for the integrated control of flooding hazards. Reservoirs are those of Ilfov river (6), Dimbovita (3), and Colentina (15), with a total volume of 210 million m³.

Recent flooding hazards have been in 1975 (July), with a flood peak of 120 to 140m³/s in the city due to high waters of Dimbovita and urban borne flood. Northern and central zones of the city have been flooded. Areas located upstream from the canal Arges / Dimbovita are subject to a 160m³/s flood with a frequency of 1/1000 years. Areas located downstream Bucharest city are subject to a flood of 217m³/s with a frequency of 1%. This area is however limited to the zone of confluence of Colentina and Dimbovita rivers, outside the district of Bucharest. The limit of the actual flooding protection system is 70m³/s. This capacity may be exceeded when floods are simultaneously produced in the catchment area of Dimbovita, and in upstream and urban areas of Bucharest. During 1968-1993, 10 floods have exceeded this limit at the Catelu gauging station. Flooding hazards in Bucharest city are almost reduced to a frequency of 1/1000 years.

12.2.4 Groundwater

Deep aquifers are stocked within the Fratesti strata, which are at 300m deep in the north of Bucharest, and at only 80m deep in the south. This aquifer is the groundwater source of Bucharest municipal supply.

Superficial aquifers are stocked in horizontal geological strata. One is at about 40m deep (Mostistea stratum) and an other is near the topographic surface at 5 / 6m deep (Colentina strata). This phreatic water is directly recharged by rain in the catchment area of Bucharest, while it is discharging in local rivers like Colentina. Hydroisohypses and depth levels of these aquifers are shown in maps at 1/200,000 scale, according to the maps prepared by the National Institute of Meteorology and Hydrology (Fig. 12.2-1 and Fig. 12.2-2). Fig. 12.2-1 shows hydroisohypses together with indications on the direction of groundwater flow, hydraulic gradient in % (i), and Darcy velocity (vD) in m/day. Fig. 12.2-2 shows isolines of thickness of layer which cover phreatic aquifer (in m).

Shallow groundwater flows according to geomorphological structure from the north-west to the south-east, at a speed comprised between 0.3 and 0.7m/day (Darcy velocity). Permeability of layers covering phreatic aquifer is generally high. Permeability in loess has been evaluated between 5 to 10 m/day vertically, and is higher in alluvial sediments. Because of lithological characteristics and thickness of surface layers, vulnerability of phreatic aquifers to surface pollutants is generally critical in the area of Bucharest.

From the point of view of depth of water table, extremely vulnerable areas (less than 3m depth) are those of the Dimbovita riverbed, and highly vulnerable areas (less than 5m) correspond to large corridors along Dimbovita river in central part of Bucharest, and along Arges / Sabar rivers in southern part. Areas with reduced vulnerability are lying in north and north-east part of Bucharest (more than 20, and more than 30m depth). There are 2 corridors oriented NW-SE with moderate vulnerability (between 5 and 10m depth) within the context of Bucharest area: One is on northern side of Colentina river, the other is on northern side of Sabar river.

12.2.5 Natural Areas

In the Study Area, natural vegetal species have generally been replaced by cultivated species. Forested area covers about 25,700ha, which is more than 14% of the Ilfov area. Main tree species are oak trees, mixed with maple-trees and acacia species. Age of the forest is 40 to 60 years old on average. 96% of the forest is property of state. Within the total superficiality of forest, it is considered that about 40% is degraded or in phase of being degraded by air pollutants.

Main forests are located in the northern and eastern parts of Bucharest district, respectively at 40 and 15 km from the city. There are also smaller pieces of forest in the northern part of the city. Natural areas which are considered as having an important ecological and touristic value by the Environmental Protection Agency of Bucharest are those of north and east of the district. A map of land use at district level shows the location and extension of forest area (Fig. 12.6-1).

Table 12.2-1 Monthly and Yearly Precipitation (Bucharest Afmat)

1981 - 1990

YEARS	M												YEARLY
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1981	53.4	28.4	63.7	52.0	72.7	42.3	23.7	66.3	62.1	30.3	59.2	48.9	603.0
1982	1.9	17.2	26.0	41.0	33.9	42.6	103.1	109.7	15.6	12.0	15.7	25.9	444.6
1983	3.9	24.9	5.6	24.1	68.7	149.1	43.0	94.0	2.4	12.3	27.4	6.3	461.7
1984	57.4	79.2	77.9	84.7	65.6	107.5	51.1	41.5	11.8	5.1	61.4	22.1	665.3
1985	32.9	23.9	17.2	6.7	41.2	64.9	63.3	53.2	17.2	9.5	51.0	19.0	400.0
1986	35.1	61.9	9.3	15.9	10.0	107.7	33.8	5.8	33.4	61.2	0.4	35.8	410.3
1987	25.6	23.9	21.5	52.4	78.2	38.5	49.2	35.3	16.8	0.0	50.1	44.4	435.9
1988	27.1	27.6	55.1	123.1	49.2	86.0	28.1	17.4	69.8	39.6	42.2	24.0	589.2
1989	1.7	6.6	2.0	65.8	17.0	119.5	6.8	19.9	28.0	50.9	25.6	38.5	382.3
1990	26.0	20.6	0.0	23.4	72.2	54.6	15.2	14.2	13.9	28.1	11.7	96.8	376.7
							1961 - 1990						
Max. Monthly	123.8	80.2	96.9	123.1	247.6	202.9	173.5	127.2	142.9	130.4	224.3	179.2	869.0
Min. Monthly	1.7	6.6	5.6	0.0	5.7	13.3	6.8	5.8	2.4	0.0	0.4	2.3	376.7

INMH Table 12.2-2 Mean Monthly Temperature (Bucharest Afmeti)

1981 - 1990

YEARS	T												YEARLY
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1981	-1:9	-0:3	6:8	9:4	14:8	21:7	21:1	20:7	16:8	12:8	4:0	1:5	10:5
1982	-2:0	-2:1	4:0	9:1	17:6	20:7	20:6	21:1	18:9	11:8	3:4	3:5	10:6
1983	1:9	0:5	6:6	13:2	18:4	19:3	22:5	20:3	17:9	10:3	1:3	-1:0	10:9
1984	1:2	-0:5	3:5	13:2	17:2	19:0	20:6	19:8	18:7	13:6	4:2	-0:8	10:5
1985	-6:5	-8:1	0:9	12:8	19:1	20:0	21:7	21:9	16:3	9:4	4:0	1:8	9:5
1986	0:9	-3:2	3:7	13:2	17:8	20:5	21:0	23:3	17:6	10:1	4:1	-1:9	10:6
1987	-4:8	1:1	-0:4	9:0	14:9	21:1	23:8	20:2	18:9	9:5	6:0	-0:2	9:9
1988	0:8	0:4	5:0	8:9	15:4	19:8	24:1	22:0	16:6	8:4	-0:3	-0:4	10:1
1989	-0:4	3:1	8:0	13:3	15:8	19:2	21:8	22:9	16:4	11:1	3:8	0:4	11:3
1990	-4:6	3:5	9:0	10:7	16:2	20:1	22:6	21:9	16:4	11:0	6:9	1:3	11:3

1961 - 1990

	H												
Max. Monthly	1.9	4.4	9.0	13.8	19.8	22.1	23.8	24.0	19.1	14.8	8.5	3.5	11.6
Min. Monthly	-8.9	-8.1	-0.4	7.9	14.6	18.8	20.0	18.0	14.9	8.4	2.5	-2.9	9.1

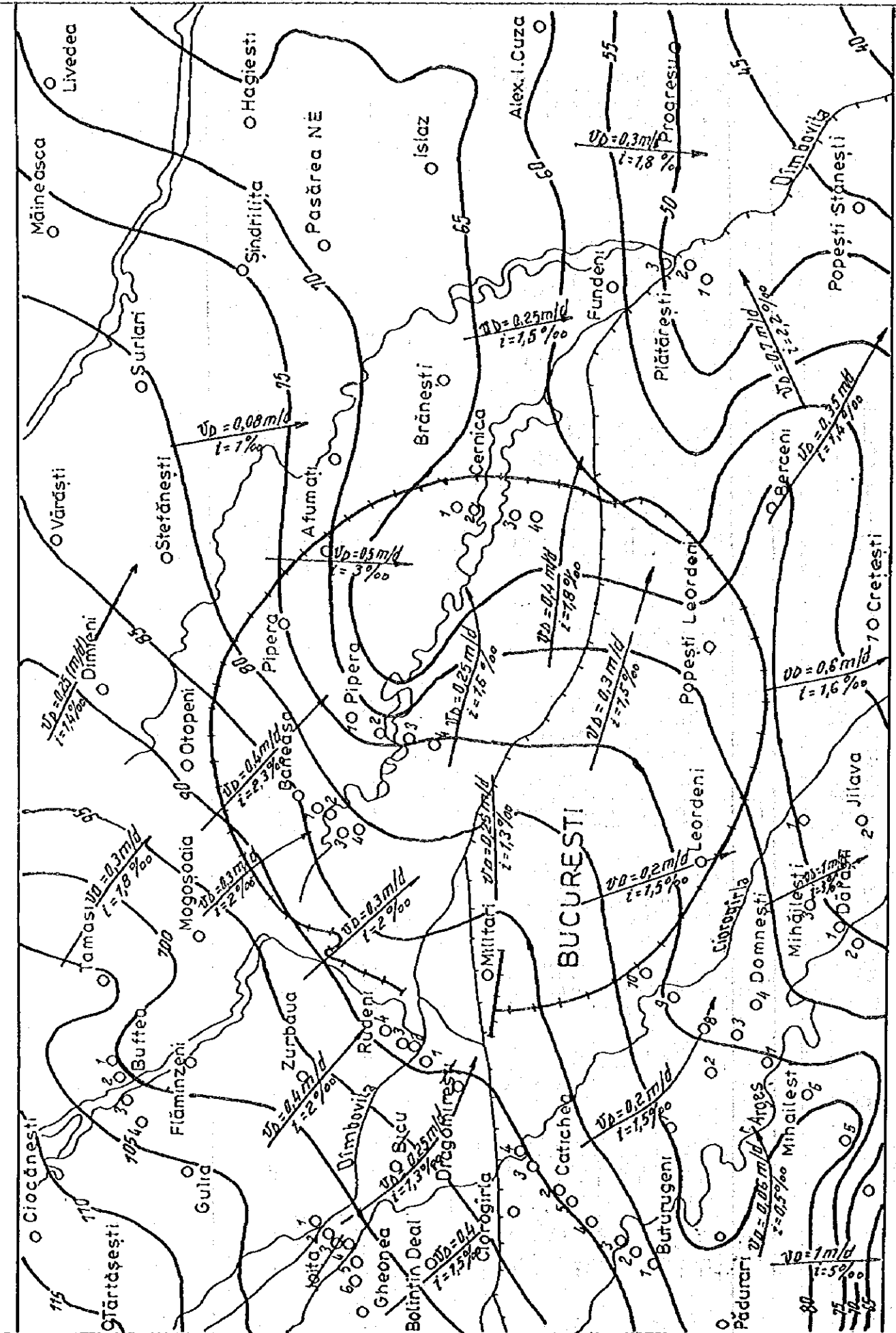


Fig. 12.2-1 Hydroisohypses in the Bucharest Area

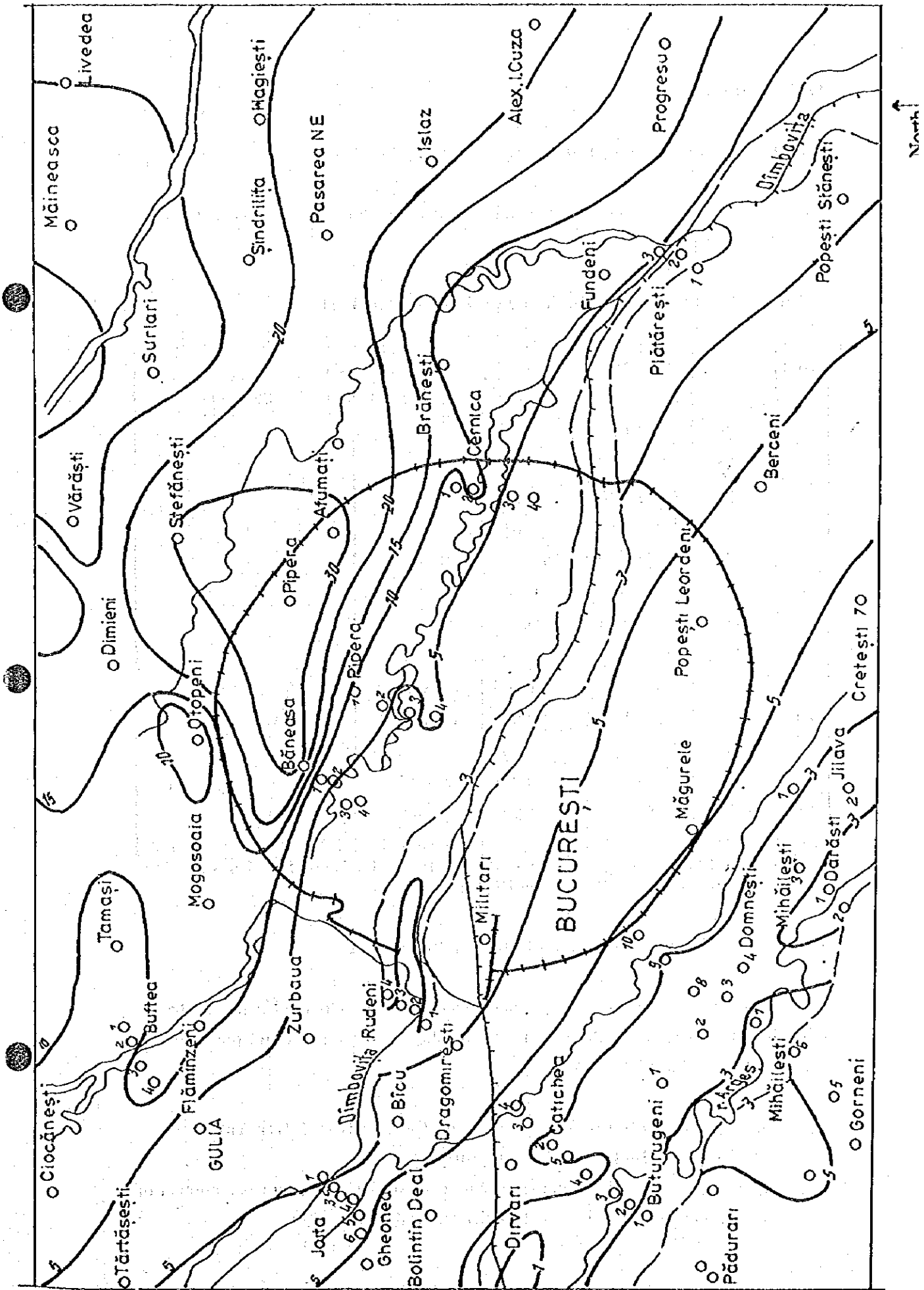


Fig. 12.2-2 Aquifers Depth Levels in the Bucharest Area

12.3 Population

12.3.1 Population and Growth Rate in the Past

The number of the annual population and its growth rate for the past 13 years is shown below in Table 12.3-1.

Table 12.3-1 Population and Growth Rate in the Past

No.	Year	Population	Growth Rate (%)		
			Annual	1980 ~1993	1989-1993
1.	1980	1,861,007	-	9.385% for 13 years	-
2.	1981	1,929,360	3.763		-
3.	1982	1,979,076	2.577		-
4.	1983	1,995,156	0.813		-
5.	1984	1,961,189	(-) 1.702		-
6.	1985	1,975,808	0.745		-
7.	1986	1,989,823	0.709		-
8.	1987	2,014,359	1.233	0.722%	-
9.	1988	2,038,543	1.201	per year in the period	(-) 0.061% for the recent 4 years
10.	1989	2,036,894	(-) 0.081		
11.	1990	2,127,194	4.433	174,653 persons increased	(-) 0.015% per year in the period 1,234 persons decreased
12.	1991	2,107,245	(-) 0.938		
13.	1992	2,065,651	(-) 1.974		
14.	1993	2,035,660	(-) 1.452		

Source: Hand-Writing Data from the Statistical General Division of Bucharest Municipality and Analysis by JICA Study Team.

12.3.2 Prediction of Population in the Future

In order to predict a number of future inhabitants in the six sectors of Bucharest, the following information and data are examined in addition to hearing from Romanians concerned and Table 12.3-1 as well.

- 1) **Discussion with the key persons of the Statistical General Division of Bucharest Municipality:**
2,300,000 written down in the questionnaire of the study team as a number of inhabitants in the six sectors of Bucharest for the year 2,000.

- 2) **Papers from the Ministry of Works and Regional Planning:**
 2,300,000 forecast as a population in 228 Km² (six sectors) in 2015, in the report concerning spare parts and 0.6% estimated as an annual growth rate of population.
- 3) **Statistical Yearbook 1994:**

1. **Table 12.3-2 Ratios per 1,000 Inhabitants in Bucharest**

Year	1980	1989	1990	1991	1992
Item					
Live Birth	13.9	11.2	10.2	8.6	7.9
Death	9.7	10.6	10.1	10.6	11.2
Natural Increase	4.1	0.5	0.1	(-)2.0	(-)3.3

2. **Female (over 15 years old) Population Ratio in Bucharest as of Jan 7, 1992**

By Number of Children :

Women who did not bear alive children	36 %
Women who born alive children	64 %
(83 % of the above 64 % has 1 or 2 children)	

By Fertility :

Year	1980	1989	1990	1991	1992
Total	55.9	45.1	39.2	31.3	29.8

(Live birth by 1000 women)

3. **Table 12.3-3 Average Duration of Life**

Year	Total	Male	Female
1979 / 1981	70.5	67.7	73.1
1984 / 1986	70.8	67.5	74.0
1986 / 1988	69.9	66.6	73.1
1988 / 1990	69.5	66.5	72.6
1990 / 1992	71.3	68.0	74.6

4. Table 12.3-4 Number of Newly Constructed Dwellings

Year	1980	1989	1990	1991	1992
Total Number	33,786	9,752	6,967	3,339	2,611

4) Forecast by 4 Kinds of Annual Growth Rates

1. Minimal Rate = 0.24 % calculated from the rates of the natural increase in light of the decrease for the recent 5 years as shown in Table 12.3-1.
2. Medium Rates = 0.60 % based on the above 2)
0.72% based on the Table 12.3-1
3. Maximal rate = 1.76 % calculated from the above 1)

Table 12.3-5 Population in the Future

Rate		Minimal			Maximal
%		0.240	0.600	0.722	1.760
No.	Year				
1	1995	2,045,443	2,060,161	2,065,161	2,107,946
2	2000	2,070,100	2,122,712	2,140,798	2,300,091
3	2005	2,095,067	2,187,162	2,219,206	2,509,750
4	2010	2,120,329	2,253,569	2,300,484	2,738,521
Total Increased Rate to the number of 1993		4 %	11 %	13 %	35 %
Increased number from 1993		84,669	217,569	264,824	702,861

Source: JICA Study Team

Population in the year 2010 shall be projected to be 2,300,000 (with the total growth rate of 13% for the period from 1994 to 2010) with eager anticipation of economic growth even if it is still unforeseeable in the transition period towards a free-market economy and based on the records of the past 13 years, although data indicating increase of population would hardly be found for the recent years.

12.3.3 Population by Sector

Three kinds of population data by sector for 1992 read as follows

Table 12.3-6 Population by Sector in 1992

Total	2,067,545	2,064,474	2,065,651
Sector	< A >	< B >	< C >
1	259,902	259,508	---- (259,664)
2	394,208	391,950	---- (393,847)
3	407,793	407,568	---- (407,419)
4	320,325	321,121	---- (320,032)
5	269,272	269,289	---- (269,025)
6	416,045	415,038	---- (415,664)
Source	Statistical Yearbook 1994 (Bucharest Municipality)	Bucharest Figures and Syntheses 1992 - 1993	Hand-writing Data from Statistical General Division of Bucharest Municipality

As no number by sector in <C> was written, the number in parentheses was figured out in the proportion of <A>

12.3.4 Prediction of Population by Sector in the Future

Since neither data of population by sector for past years are obtainable nor a large-scale urban development plan in Bucharest is scheduled to be set up for the time being, population growth rate shall be regarded as the same as that of the entire city elucidated before in 12.3.2. The undermentioned number of population by sector is computed pursuant to the yearly increase rate of 0.772 % in the medium size of population growth forecast.

Table 12.3-7 Prediction of Population Growth by Sector

Sector		1	2	3	4	5	6	Total
No	Year							
1.	1992	259,664	393,847	407,419	320,032	269,025	445,664	2,095,651
2.	1995	259,603	393,754	407,322	319,956	268,961	415,565	2,065,161
3.	2000	269,110	408,175	422,241	331,674	278,812	430,786	2,140,798
4.	2005	278,967	423,125	437,705	343,822	289,024	446,563	2,219,206
5.	2010	289,184	438,621	453,736	356,415	299,609	462,919	2,300,484

Source: JICA Study Team based on Hand-Writing Data from Statistical General Division of Bucharest Municipality

12.3.5 Population Density by Sector

The areas by sector have been unchanged since 1978 when eight sectors were adjusted in area and divided into the present six sectors and no rearrangement plan among the sectors exists at present.

Table 12.3-8 Population Density by Sector

(Unit: Persons)

Sector	1	2	3	4	5	6	Total
Km ²	65.0	31.0	35.6	29.6	30.1	36.7	228.0
1992	3,995	12,705	11,444	10,812	8,938	11,326	9,060
2000	4,140	13,167	11,861	11,205	9,263	11,738	9,389
2005	4,292	13,649	12,295	11,616	9,602	12,168	9,733
2010	4,449	14,149	12,745	12,041	9,954	12,614	10,090

Source: JICA Study Team

12.3.6 Population by Ethnic Groups

1) Bucharest (including Ilfov agriculture district)

The following table is self-explanatory about population growth by ethnic group for the period of 15 years. It is only gypsies that have increased in number of population except Romanians. The growth rate is 136 % for the 15 years.

Table 12.3-9 Population Growth by Ethnic Group

Year	1977		1992	
	Number	Population	Population	%
Total	2,094,977	100.00	2,354,510	100.00
Romanians	2,046,924	97.71	2,296,458	97.53
Gypsies	13,996	0.67	32,984	1.40
Hungarians	10,033	0.48	8,585	0.36
Germans	5,565	0.27	4,391	0.19
Jews	9,199	0.44	3,883	0.16
Russians	1,850	0.09	1,243	0.05
Greeks	1,256	0.06	943	0.04
Armenians	1,130	0.05	909	0.04
Turks	813	0.04	927	0.04
Others & not declared	4,211	0.20	4,187	0.18

Source: Bucharest Statistical Yearbooks 1994

2) Population in Six Sectors by Ethnic Group

Table 12.3-10 Population in Sectors by Ethnic Groups
(as of January 07.1992)

(Unit = 1,000 persons)

Sector	1	2	3	4	5	6	Total	%
Total	259.9	394.2	407.8	320.3	269.3	416.0	2,067.5	%
Romanian	251.8	381.1	396.6	314.2	261.4	409.5	2,014.6	97.44
Gypsies	2.8	5.9	5.8	2.6	5.5	2.4	25.0	1.21
Hungarian	1.6	1.7	1.6	1.2	0.7	1.4	8.2	0.40
Germans	0.9	0.9	0.8	0.5	0.3	0.7	4.1	0.20
Jews	1.1	1.0	0.8	0.4	0.2	0.4	3.9	0.19
Others	1.7	3.6	2.2	1.4	1.2	1.6	11.7	0.56

Source: JICA Study Team based on Bucharest Statistical Yearbook 1994

Attention shall be paid to the % of gypsies who are duply related to operation of Solid Waste Management in all the sectors.

12.3.7 Population by Educational Level

The following Table 12.3-11 shows the number of population classified by educational level and sector as of January 7, 1992.

Table 12.3-11 Population by Sector & Educational Level

Educational Levels		Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Total
Universities	-	54,483	56,740	41,218	30,517	21,090	48,817	252,865
Special Colleagues	-	6,541	11,290	11,658	9,204	5,621	12,236	56,550
High School	14-18	69,303	91,197	97,891	77,204	55,102	117,840	508,537
Vocational Schools	14-18 (16-18)	20,909	39,892	48,177	38,423	32,691	44,646	224,738
Elementary Schools	10-14	40,338	76,427	83,617	65,716	59,743	80,699	406,540
Primary Schools	6-10	30,476	51,570	53,120	42,493	39,109	46,707	263,475
Total (a)	-	222,050	327,116	335,681	263,557	213,356	350,945	1,712,705
Without school	-	1,801	3,266	3,014	1,898	3,569	2,258	15,806
Underdeclared Schools	-	2,630	3,633	3,401	1,903	1,904	2,136	15,607
Total (b)	-	4,431	6,899	6,415	3,801	5,473	4,394	31,413
Grand (Population 12 years old)	Total above	226,481	334,015	342,096	267,358	218,829	355,339	1,744,118

Source: JICA Study Team based on Statistical Yearbook 1994

Sector 1 is rather higher and Sector 5 lower in educational levels of the population as a whole than the other sectors which are more or less similar, which is observed in Table 12.3-11 above, for example, when the following comparison is made.

Table 12.3-12 Percentage of Population (%)

(Unit: %)

Sector	1	2	3	4	5	6
Universities	21	14	10	10	8	12
Total (a)	86	83	82	82	79	84

This shall be taken into account concerning citizen's awareness of solid waste management.

12.4 Land Use

12.4.1 Utilization of Land at Present

1) Classified-Present Land Use

Bucharest municipality has its administrative area of 228 km², composed of the six sectors, which are tabulated in Table 12.3-8, excluding the agricultural sector. The present land use of the 228 km² is classified into the eight categories by the urban planning department of the municipality as shown in Table 12.4-1.

Table 12.4-1 Classified Land Use

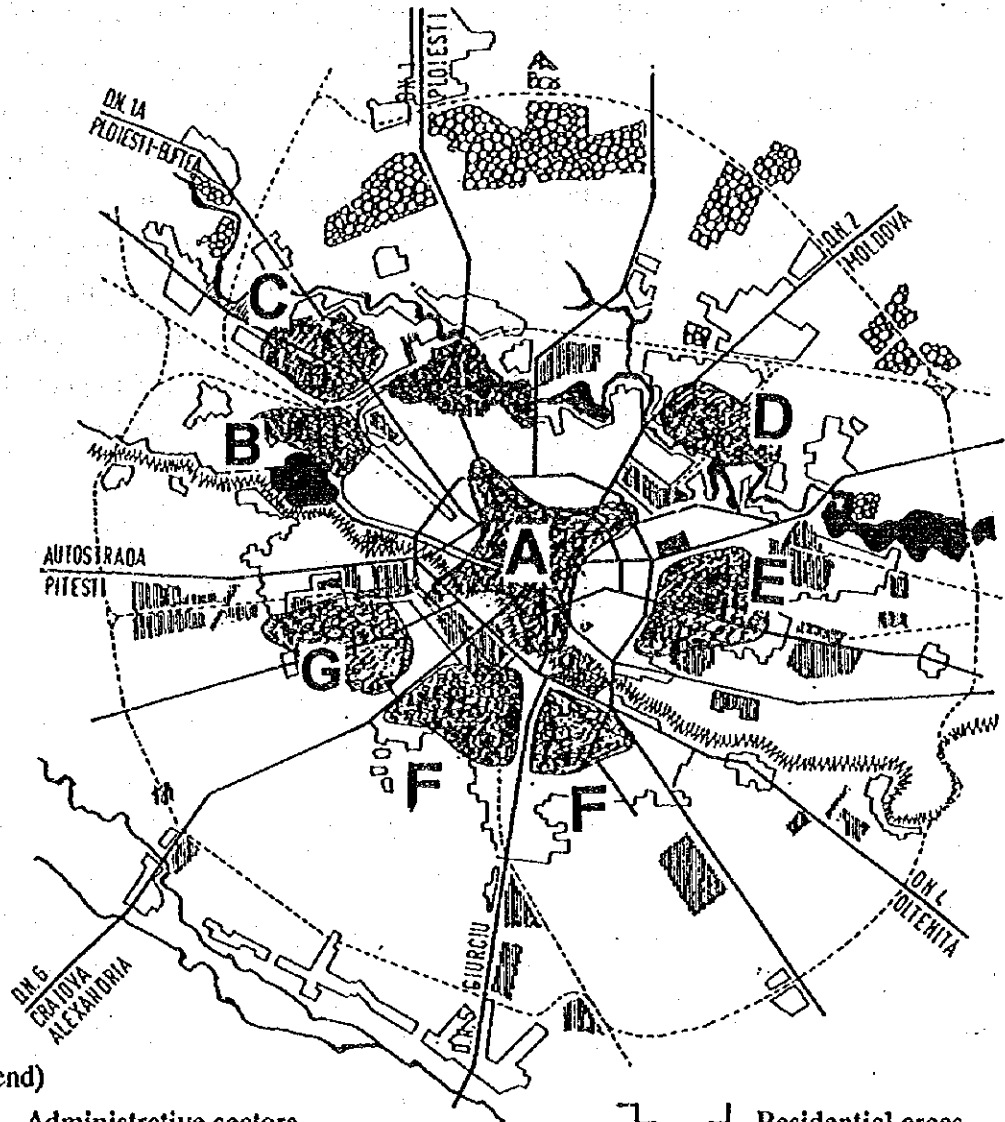
No.	Category	Km ²	%
1.	Residential zone	79	34.65
2.	Public institutions, social-cultural assets	10	4.39
3.	Industries, warehouses, village households	38	16.87
4.	Green spaces (parks, gardens, sports grounds, cemeteries etc.)	39	17.10
5.	Water (rivers, lakes, ponds etc.)	11	4.82
6.	Traffic zone (roads/streets, railways, airports etc.)	24	10.53
7.	Agricultural fields	21	9.21
8.	Other uses	6	2.63
	Total	228	100.00

Source: JICA Study Team based on one sheet list from the urban planning department of Bucharest municipality.

No elucidation is made further about the land use because response have seldom come to the department from the authorities concerned despite the fact that a request from the department has reached them. JICA Study Team succeeds in obtaining only one sheet of the list for a land use from the department.

2) Map of Present Land Use

Map 12.4-1 Land Use



(Legend)

- Administrative sectors
- Residential areas
- _____ Main streets/roads
- ||||| Industrial zones
- A Central-residential zone
- Forest
- Railways

B,C,D,E,F & G Blocks of flats with their respective centers & facilities

Source: Bucharest Figures and Syntheses 1992 - 1993 (Page 45)

12.4.2 Urban Development Plan

The urban planning department of Bucharest municipality has elliptically explained to the JICA Study Team how difficult it is to map out an urban development plan for the future without obtaining necessary information and data from the respective authorities concerned sufficient for mapping down on a map for the future. A comprehensive urban development map (scale: 1/10,000) has been in process with the target year of either 2000 or 2005 pursuant to the basic classification of the present land use at the department in charge which has still been waiting for necessary information and data as before mentioned. It is reported to the JICA Study Team in the department that neither a large-sized residential and industrial development will be planned nor a growth of population will also be expected in the future but economic structures will gradually be shifted from industrial and agricultural domains to fields of service industries.

12.5 Economic indicators

In order to understand the relative size and importance of Bucharest's economy, a number of economic data are presented.

It appears that data on the Gross Product for Bucharest is not officially prepared by any government or non government body, and generally good economic data is not easily available. However we were able to obtain the following:

1. Comparisons of annual production by industrial, agricultural and private sectors, etc for 1992 1993. Data on government output is not available;
2. General physical economic indicators e.g. numbers of schools and businesses; and
3. Comparison of Bucharest's municipal expenditures and revenues with national data.

12.5.1 Annual Production

Table 12.5-1 Annual production data for a number of sectors.

Economic indicators	Unit	MB	Romania	Ratio MB/Romania
Agricultural production / capita	0,000 lei/1993	64.40	323.9	19.88
	\$ / 1993 (1)	74.22	373.17	
Industrial production / capita	0,000 lei/1992	325.00	295.5	109.98
	\$ / 1992 (1)	1,000.17	909.41	
No. of private companies / 1,000 habitants	Total 90 - 93	32.60	13.57	-
No. of private persons / 1,000 habitants	Total 90 - 93	0.36	1.24	-

Note: 1) Exchange rate used is 1 \$ = 325 lei / 1992 and 868 lei / 1993 calculated on the basis on a mid year average rate & based on official National Bank of Romania rates.

12.5.2 Other Indicators

Table 12.5-2 gives other physical indicators. Comparisons show that compared to the national average Bucharest enjoys a higher level of physical infrastructure and services on almost any measure given.

Table 12.5-2 Table with physical indicators

Others economic indicator	Unit	MB	Romania	Ratio % MB/Romania
Area	km ²	1,821	238,391	0.76
Population	persons	2,343,824	22,755,260	10.30
Scholl population (not including highscholl)	persons	431,630	4,429,191	9.74
Numbers of appartments	unit	849,189	7,659,003	11.08
Numbers of beds in hospitals	unit	23,993	179,169	13.39
Roads and streets	km - 1992	2,472	29,611	8.34
Numbers unemployed	persons (02 1994)	72,551	1,262,937	5.74
Unemployment ratio	% (02 1994)	5.70	11.10	-
Agricultural area per capita	% (02 1994)	0.05	0.65	-
Drinking water for consumption per capita	m ³ (1992)	144.30	96.29	-

12.5.3 Municipal Revenues and Expenditures

Table 12.5-3 gives comparisons of municipal revenues and expenditures between Bucharest and the average for the Romania over the last 4 years.

As expected Bucharest's revenues are much higher than the country as a whole since the fiscal and non fiscal revenue base is stronger in Bucharest. This is because incomes and property values are disproportionally higher in the capital than in almost any other Romanian city.

**Table 12.5-3 Comparisons of municipal revenues and expenditure
between Bucharest and the Average for Romania**

Indicators	Years	BM 0,000 \$	Romania 0,000 \$	Ratio % BM/Romania
Revenues	1990	144	1,112	12.96
Expenditures of which / 1 habitant		144 0.06	1,107 0.05	13.01 -
Revenues	1991	101	469	21.44
Expenditures of which / 1 habitant		100 0.04	468 0.02	21.38 -
Revenues	1992	121	614	19.70
Expenditures of which / 1 habitant		120 0.05	614 0.03	19.62 -
Revenues	1993	188	821	22.88
Expenditures of which / 1 habitant		184 0.08	802 0.03	22.99 -

Note: 1) Exchange rate used is 1 \$ = 45 lei / 1990; 125 lei / 1991; 325 lei / 1992 and 868 lei / 1993 calculated on the basis on a mid year average rate & based on official National Bank of Romania rates.

12.6 Environmental Conditions

12.6.1 Natural Resources

1) Land Use

A map at the scale of 1/200,000 shows land use patterns in the district of Bucharest (Fig. 12.6-1). Land use in the district of Bucharest is as follows (in ha):

1. Residential / commercial: 32,522 (includes industrial)
2. Agriculture: 117,372
3. Forest (or gardens): 25,743
4. lakes / rivers: 6,478
5. Total superficies: 182,115

2) Water Resources

Main water resources are supplied by Dimbovita, Arges, and Ialomita rivers. Total consumption of water is about 17 to 18m³/s in Bucharest city, including municipal and industrial supplies (685 l/pers/day for municipal supply). Surface water represents 85 to 90% of the total municipal supply, against 10 to 15% for deep groundwater. In the Ilfov sector, water resources are almost exclusively phreatic aquifers. Deep groundwater is used for apartment complexes built up around Bucharest, which represents a negligible quantity. Quantitative data are not available for the Ilfov sector. The main problem of water resources management lies in the loss of 40 to 50% of quantities supplied within the distribution system.

12.6.2 Urban Sanitation

1) Water Supply

In Bucharest city, 90% of the population is served by a centralized water supply system. Among the 39 villages of the Ilfov sector, 11 have a centralized water supply system. However, this collective supply is limited to apartment buildings, and is negligible in terms of population served. The 11 villages are the following: Bragadiru, Branesti, Chitila, 30 Decembrie, Cornetu, Jilava, Magurele, Otopeni, Pantelimon, Popesti-Leordeni, and Voluntari. In the Ilfov sector, drinking water sources are in most cases shallow groundwater (supply by collective or individual wells and fountains). Water is generally removed by handpump or by bucket and chain method.

Water supply related problems are the following:

1. Possible shortage of resources in hot period;
2. Discontinuity of supply (lack of pressure);
3. Obsolescence of the distribution network;
4. Obsolescence of the Arcude water treatment plant.

The actual policy of the municipality in order to solve the water supply related problems is as follows:

1. Modernization of treatment technologies;
2. Increased capacity of treatment;
3. Increased capacity of water storage;
4. Modernization of the pumping system;
5. Development of groundwater resources.

2) Sewerage

The city sewerage system collects household used water, industrial water, and rain water toward Dimbovita river, downstream from the city. Length of the sewerage system is of 1600 km without connecting pipes to the households. 90% of the city area is covered. Remaining 10%, and the whole population of the Ilfov sector are using emptying septic tanks, sump holes, or latrines. Industrial wastewater is discharged into the sewerage system, generally after pre-treatment, and sometimes without treatment. As far as the new municipal wastewater treatment plant of OGREZENI does not operate, wastewater is directly discharged in the Dimbovita river. The OGREZENI treatment plant is designed with a capacity of 6m³/s for covering the whole quantity of waste water produced and collected in Bucharest. First stage operation is planned for December 1994, and for treatment of 3 m³/s of wastewater.

12.6.3 Major Fixed Pollution Sources

1) Industrial Plants

It seems that industrial solid waste is generally stocked on site without any further treatment. Regarding industrial wastewater treatment plants, problems are generally mentioned as follows:

1. Obsolescence of wastewater treatment installations;
2. Accidental leakage of contaminants from sewers;
3. Poor conditions of storage of sludge;

4. Problems of maintenance.

2) Municipal Facilities

Sewerage is one of the main source of water pollution in the Bucharest area since the wastewater treatment plant is not yet in operation before discharge into the Dimbovita river downstream. Solid waste disposal sites are other major sources of pollution.

3) Agricultural Activities

Given the high price of pesticides and fertilizers, agricultural activity is not an important source of environmental degradation. However, the existing zootechnical plants represent severe point sources of water contamination. According to old data (1981), there are several zootechnical plants in the Bucharest district, of which 1 for poultry which is included in the city (north), 7 for poultry which are very near the limits of the city in the north, and 4 for bovine or porcine production which are also on the northern side of the city. Other plants are in northern limits of the district. A map of the location of main zootechnical centers is attached in Fig. 12.6-2, based on data of 1981.

12.6.4 Health

1) Scope

This part will include informations on the following points:

1. General Data on Health Conditions
2. Vectors and Sources of Diseases

As regarding the vectors and sources of diseases, the following aspects are described below:

1. Drinking water quality
2. Insects and animals

2) Drinking Water

Most of the analyses made for drinking water (98%) by the Inspectorate of Sanitary Police are respecting the drinking water quality standards (chemical and microbiological analyses). Only chlore residue are high at the water treatment plants level. Drinking water quality may be a vector of diseases in the Ilfov area only. The Inspectorate of Sanitary Police monitors water quality at the following sites:

1. At the output of the Arcuda and Rosu water treatment plants (complete analysis 2 or 3 times a year);
2. At the level of the existing 5 pumping stations (weekly monitoring);
3. Inside the city at 36 different points.

3) Insects and Animals

Rats, insects, and abandoned dogs are certainly those vectors which are theoretically the most important sources of transmission of pathogens in Bucharest. According to an evaluation made in 1991, the number of rats is a ratio of 5 rats per person. Possible transmission of disease comes from direct contact with garbage, and food. The mosquito factor is also an important one. Mosquito grow up in winter in caves of buildings where humidity and temperature conditions are favorable. Humidity comes from groundwater, and heat comes from central heating systems.

12.6.5 Areas with Potential for Siting of New Landfill Site

1) Criteria of Selection

Criteria for the selection of areas with potential for siting of waste disposal sites are based here on environmental conditions. Selection of areas with priority ranking for new waste disposal sites must be made within a reasonable distance around Bucharest city, in priority within the Ilfov area. A general classification into priority areas, restricted areas, and avoided areas has been performed. These areas are presented on a map at 1/200,000 scale (Fig. 12.6-3). Elements considered for the selection and ranking of areas are the following:

1. Areas with environmental damages or technological hazards: These areas are mainly inside or at proximity of the ring road of Bucharest.
2. Areas with high environmental value: These areas are those with relictual forest, water landscape, and sometimes historical patrimony. They are essential quality spots for the urban development of Bucharest. Such areas are mainly distributed

in the north of the district, and in closer proximity to the city in the north and north-east parts of Bucharest.

3. Areas with high water resources value: These areas include surface water resources withdrawn for supplying water needs of Bucharest, and phreatic aquifers directly withdrawn by people in the Ilfov area. Areas directly supplied by deep aquifers or only belonging to the municipal system of water supply are not considered as areas with high water resources value.
4. Areas with high vulnerability of groundwater, as already mentioned.
5. Areas subject to flooding: The official standpoint (Apele Romane, National Institute of Meteorology and Hydrology) is that there is no possible major flooding hazard in Bucharest city and its close surroundings, due to the prevention system set up in this area. This criteria for siting of a new waste disposal site is then not considered.

2) Priority Areas

According to the above mentioned geographical criteria, areas which should have potential for development of new solid waste disposal site are the following:

1. North-east zone of Bucharest city, characterized by a reduced vulnerability of groundwater. This area can be considered as the first priority for siting. However, this zone presents difficulties for access from the city (Colentina river), and is drained by a small river.
2. North, West and SE parts of Bucharest city, where groundwater is deeper than 5m, which means a reasonable vulnerability within the context of Bucharest hydrogeological conditions. North zone is not easy for access at the difference of West and SE zones. Advantage is that they do not present any place with high environmental value.

3) Restricted Areas

Areas that can be selected with restrictive conditions are the following:

1. South and SW parts of Bucharest are characterized by high vulnerability of groundwater and potential for tourism development in SW. This area is drained by 2 rivers, of which the Sabar river which is already severely contaminated. Selection of a waste disposal site in such areas needs protection of phreatic groundwater and development of deep groundwater resources for the supply of local inhabitants.

4) Avoided Areas

Areas that should be avoided for siting of a new waste disposal site are:

- 1. East part of Bucharest, which can be further divided into 2 parts with the following characteristics: Upper part characterized by high environmental and touristical value, with artificial lake and forest of Cernica, and historical patrimony (churches, monasterium). Lower part characterized by high vulnerability of groundwater, and already existing environmental pressure due to the Glina waste disposal site, the wastewater treatment plant, and various industrial pollution sources.**
- 2. North-West part of Bucharest, which presents the same kind of conditions as precedently, namely an upper zone with environmental and touristic value (forest and historical patrimony) in the area of Mogosoia, and a lower zone with high vulnerability of groundwater. Furthermore, this zone corresponds to the upstream part of Bucharest city.**

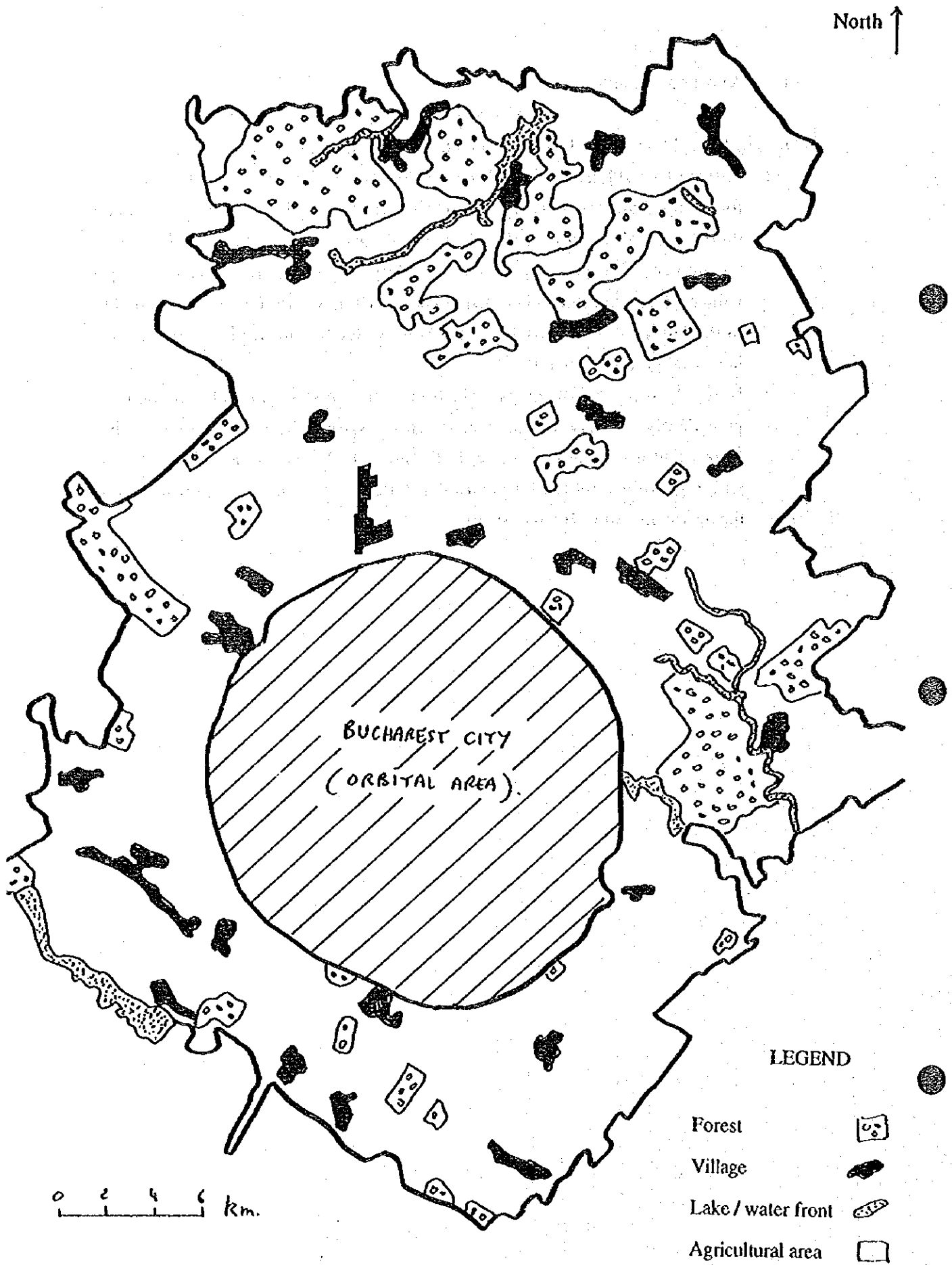
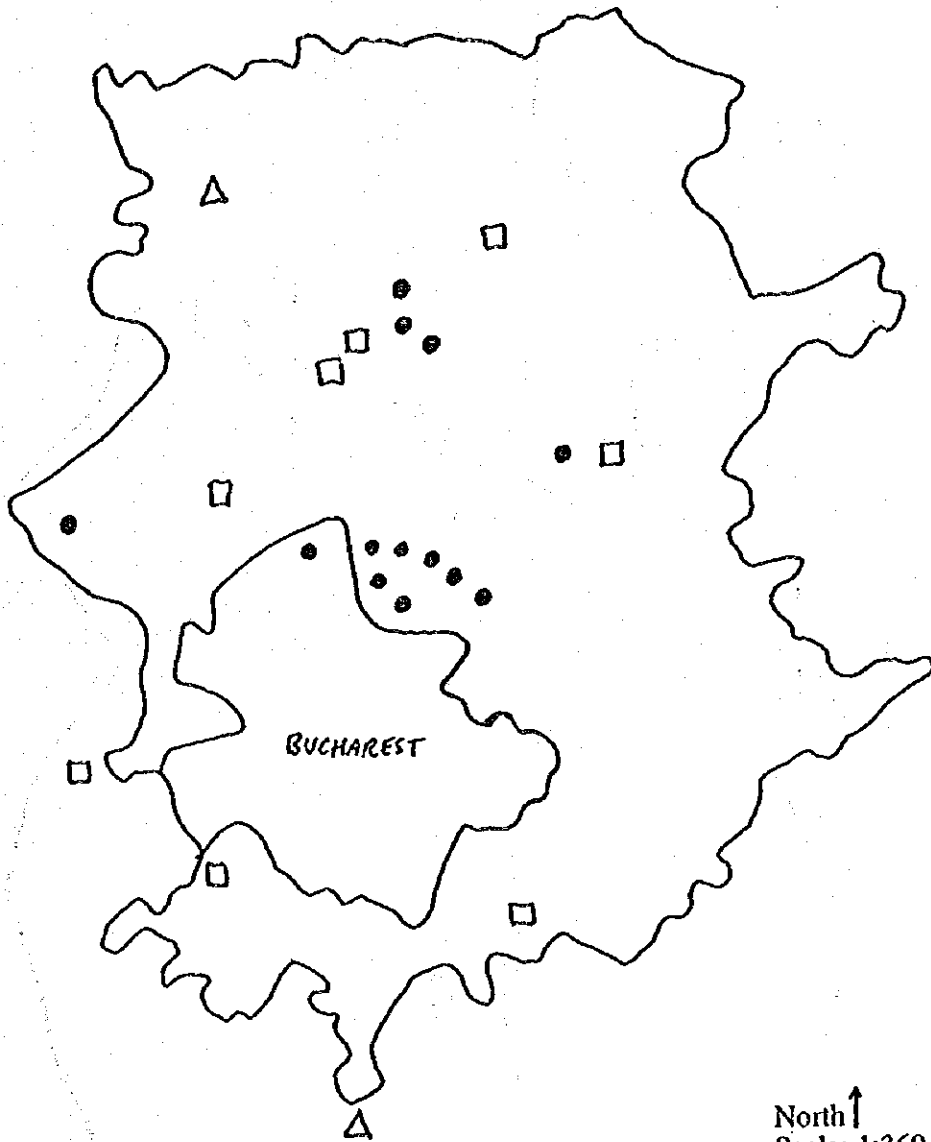


Fig. 12.6-1 Schematic Land Use Map of the District of Bucharest



LEGEND

Poultry



Porcine



Bovine or mixte (bovine and porcine)



North ↑
Scale: 1:360.000

Fig. 12.6-2 Location of Main Zootechnical Centers in the District of Bucharest

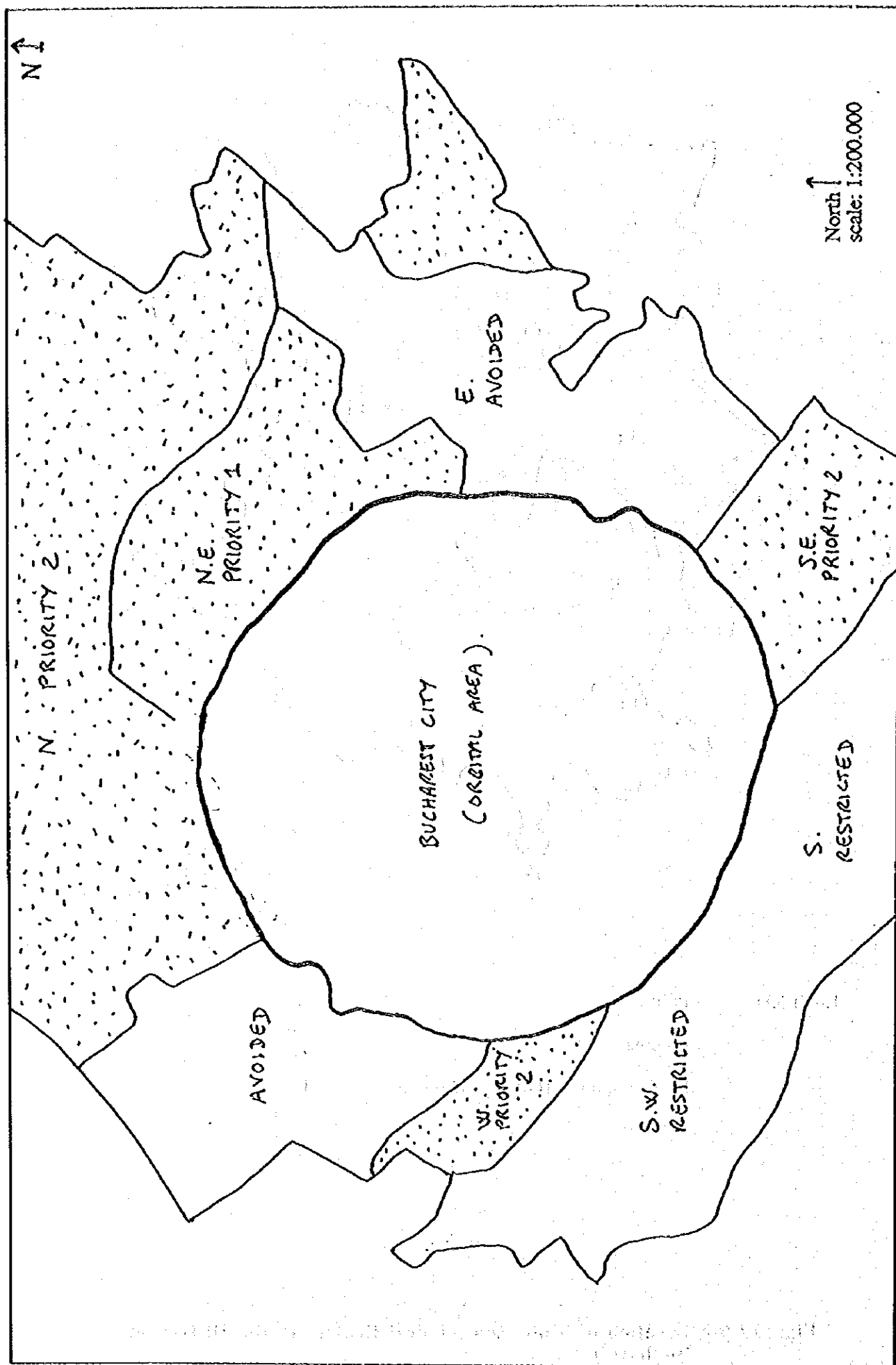


Fig. 12.6-3 Schematic Presentation of Areas with Potential for Siting of New Landfill Sites (Bucharest Area)

12.7 Other Urban Infrastructure Conditions and Development Plans

12.7.1 Housing

1) Present Conditions

Table 12.7-1 Dwelling Stock according to the Census of January 7, 1992, by Sector

Sector	1	2	3	4	5	6	Total
Number of Dwellings	103,315	149,124	153,010	115,403	96,144	144,160	761,156
Number of Rooms	251,187	360,966	348,108	277,362	236,455	345,394	1,819,472
Total floor in M ²	3,829,361	5,306,385	5,062,566	3,921,978	3,309,437	4,866,013	26,295,740
Occupied Dwellings	99,161	142,874	147,186	111,733	91,746	140,519	733,219
Number of Rooms	241,650	346,233	337,395	269,688	227,741	338,144	1,760,851
Total floor in M ²	3,680,561	5,079,796	4,899,750	3,812,165	3,194,960	4,761,775	25,429,007
Number of Households	101,388	144,790	148,517	112,569	92,764	141,906	741,934
Number of Persons in Households	250,674	387,525	404,169	317,621	266,131	395,126	2,021,246

Source: Statistical Yearbook 1994

2) Development Plan

A large-scale housing development will scarcely be expected for the near future years until the current stagflation ceases and economic situations turn good and brisk, because a majority of funds for new dwellings have been public funds from state enterprises, co-operative and public organizations, as shown for instance in the case of 1992, that is 2,242 (86%) out of 2,611 new dwellings were constructed with public while only 369 (14%) with population's funds in 1992. In addition, the number of constructed houses have decreased as shown in Table 12.3-4.

12.7.2 Infrastructure Facilities for Dwellings in Urban Area
(as of January 7, 1992)

1) Present Situation

The number of dwellings in urban areas is 766,778 which consists of 5,622 in Buftea city and 761,156 (referred to Table 12.7-1) in Bucharest. As no separation between the two cities is obtainable from the data, the following Table 12.7-2 indicates figures by kind of facilities for dwellings for the entire number of the dwellings in the urban areas as a whole.

Table 12.7-2 Infrastructure Facilities for Dwellings

No.	Name of Facility	Total Number of Dwellings:	766,788
		Number of Dwellings	% to the Total
1.	Water Supply Installation	717,382	94 %
	--- of which, connected to public networks	--- 705,038	92 %
2.	Hot Water Installation	662,503	86 %
	--- of which, connected to public networks	--- 602,879	79 %
3.	Sewerage Installation	706,973	92 %
	--- of which, connected to public networks	--- 697,869	91 %
4.	Electric Installation	765,518	99.834,4 %
	No Electric Installation	1,260	0.1643 %
5.	Kitchen Gas	726,977	95%
	--- of which, connected to public networks	--- 625,827	82 %
6.	Energy for Heating		
	--- Thermal heating	576,162	75 %
	--- Thermal station	62,438	8 %
	gas	55,529	(89 %)
	solid fuel	2,669	(4 %)
	liquid fuel	4,240	(7 %)
	--- Stoves	125,968	16 %
	gas	27,604	(22 %)
	solid fuel	85,895	(68 %)
	liquid fuel	12,469	(10 %)
	--- Other means	2,210	0.3 %

Source: Statistical Yearbook 1994 / Rearrangement by JICA Study Team

2) Development plan

a. Development in the Past

Table 12.7-3

No	Name of Facility	1980	1989	1990	1991	1992	Remarks
1.	Water Supply						
	--- Simple length of networks (km)	1,829	2,123	2,133	2,063	2,075	Few market fluctuations
	--- Drinking water supply (mill m.c.) (of which, for domestic use)	424 164	477 205	439 199	371 184	338 179	Decreasing Decreasing
2.	Natural Gas						
	--- Simple length of networks (km)	899.5	1,205.4	1,745.7	1,915.3	1,935.0	Creeping-up
	--- Gas distributed (-mill cu. m) (of which, for domestic use)	3,503 373	2,849 357	2,851 337	2,821 404	2,716 403	Decreasing Few fluctuations
3.	Commuting Heating						
	--- Length of heating networks (km)	374.0	462.4	533.4	541.0	565.0	Increasing
	--- Distributed thermal power (1,000 Gcal) (of which, for domestic use)	9,356.2 4,580.0	9,140.9 4,705.6	9,454.3 5,059.8	8,867.7 4,906.5	8,423.1 5,248.5	Decreasing Evenly fluctuated
4.	Sewerage						
	--- Total simple length of sewerage pipes (km)	1,464.5	1,730.8	1,748.3	1,702.8	1,737.0	Evenly fluctuated

Source: Statistical Yearbook 1994 and Rearrangement by JICA Study Team

b. Development Plan

Although the study does not extend to details of future plans in respective fields at the present stage of the study, a drastic increment of investment in those fields is hardly expected in light of the development in the past and the current-economic situation which is unforeseeable for the future.

12.7.3 Public Transportation

1) Roads

Table 12.7-4 Town Street (1)

(Unit: km)

Year	1980	1989	1990	1991	1992
Length of town streets (km)	2,009	1,874	1,874	1,874	1,874
--- of which modernized	866	851	851	851	851

Source: Statistical Yearbook 1994

Table 12.7-5 Town Street (2) by Sector & Material

(Unit: km)

No.	Sector	1	2	3	4	5	6	Total	%
	Material								
1.	Asphalt & Concrete	129.7	117.3	85.8	98.3	84.1	106.8	622.0	34
2.	Macadam (Stones)	71.2	34.1	30.2	17.6	37.1	2.9	193.1	10
3.	Cobble (Stones)	94.2	149.9	40.3	87.5	104.4	19.7	496.0	27
4.	Gravel sand bed	29.1	28.0	25.8	85.0	121.7	54.5	344.1	19
5.	Earth (Soil)	39.0	16.9	99.4	9.6	0.7	-	165.6	10
	Total	363.2	346.2	281.5	298.0	348.0	183.9	1,820.8	-
%	-	20	19	16	16	19	10	-	100

Source: Rearrangement by JICA Study Team from two sheets of data obtained from Street Administration, Local Consul of Bucharest Municipality

Although 19,499,900 m² as the total area of streets/roads is same in any data, the number and the length of the streets/roads are different in the data. Bucharest Figures and Syntheses 1992 - 1993 (March 1993) describes 6,678 streets/roads while 5,340 is typed as the number of the total streets/roads in the original data for Table 12.7-5. Compared 1,874 km in Table 12.7-4 with 1,820.8 km in Table 12.7-5, 53.2 km is figured out as a balance, while the above Bucharest 1992 - 1993 shows 2,121.4 km. Table 12.7-5 had better be used for the study regardless of the discrepancy among the data.

2) City Transport

The city transport is composed of Trams, Buses, Trally-buses, Mini-buses, Subways, Taxies and private cars. The following Table 12.7-5 shows changes of length of lines, number of vehicles and passengers by major means of public city transport according to the years.

Table 12.7-6 Town Passenger Transport

No.	Year	1980	1989	1990	1991	1992
1.	Length of Lines (km)					
	Trams	351	349	345	353	364
	Busses	959	760	760	809	--
	Trolley-buses	194	125	123	132	131
	Mini-buses	--	218	120	--	--
	Subways	16	115	120	120	120
2.	Number of Registered Vehicles					
	Trams	1,291	912	880	844	844
	Busses	3,378	1,135	1,022	1,200	1,223
	Trolley-buses	829	241	243	261	257
	Mini-buses	--	146	131	140	134
	Subways	24	396	438	468	486
	Taxies	750	1,088	1,339	1,245	1,071
3.	Passengers (1,000 persons)					
	Trams	557,197	367,528	236,112	267,241	345,750
	Busses	555,311	193,044	147,093	226,554	299,874
	Trolley-buses	137,593	76,295	53,373	73,731	99,592
	Mini-buses	--	18,372	11,324	7,621	5,187
	Subways	14,285	271,843	246,966	244,356	207,454
	Total	1,264,386	927,082	694,868	819,503	957,857

Source: Statistical Yearbook 1994

The Regia Autonoma de Transport Bucharest (RATB) is operating Trams, Buses and Trolley-buses under the jurisdiction of the municipality of Bucharest, while METROREX is subordinated to the Ministry of Transportation, in charge of subway operation.

The operation of RATB influences the Solid Waste Management particularly waste collection/haulage and street-sweeping activities because trams, buses and trolley-buses are in operation on the roads and in the streets where the raid activities are carried out, while that of METROREX is not related directly to these activities but merely to the waste generated by passengers. Thus, the study on RATB has been conducted with emphasis on its operation along the roads/streets. Table 12.7-7 is an answer from RATB to a questionnaire of the study team.

Table 12.7-6 R.A.T.B.

Mode of Public Transport		Tram Car	Trolley Bus	Bus	Remarks
Number of Vehicles in Present		672	225	1,217	
Number of Vehicles in Operation		455	209	862	
Operation Hours from a.m. to p.m.		04:08~24:40	04:20~24:45	04:05~24:15	
Number of Passengers a Year (million)		290.35	94.55	298.00	(persons) 1993
Max. Passengers in month (mil. April)		28.90	9.38	29.90	(persons) 1993
Min. Passengers in month (mil. August)		14.64	5.10	15.24	(persons) 1993
Total Length of Lines (networks)		153 km	60 km	333 km	
Length of Lines in Operation (routes)		398 km	125 km	1,134 km	
Average Distance among Stations		0.581 km	0.471 km	0.524 km	
Average Width of Roads/Streets		m	m	m	
1. 10.5 m in Width Overlapping Length	Tram	---	0.600 km	7.100 km	
	Trolley	0.600 km	---	1.350 km	
	Bus	7.100 km	1.350 km	---	
2. 14 m in Width Overlapping Length	Tram	---	2.100 km	10.100 km	
	Trolley	2.100 km	---	13.800 km	
	Bus	10.100 km	13.800 km	---	
3. 21 & Wider m in Width Overlapping Length	Tram	---	8.500 km	68.935 km	
	Trolley	8.500 km	---	28.650 km	
	Bus	68.935 km	28.650 km	---	
Total Length (Overlapping Length)	Tram	---	11.200 km	87.185 km	
	Trolley	11.200 km	---	42.750 km	
	Bus	87.185 km	42.750 km	---	
Future Plans	Year	1995 ~ 1999	1995 ~ 1999	1995 ~ 1999	Number of vehicles to annually be increased
	Increase of Vehicles	80	100	300	
	Mode	Moderniza- tion	Investment	Investment	

Source: Answer of RATB in the Format of JICA Study Team

Attention shall be paid first to the operation hours, overlapping length of roads/streets in operation of the three kinds of passenger transporting vehicles in connection with the width of roads/streets, etc. which will be utilized together with the operation route maps of RATB for setting up an efficient waste-collection system in this study. Private passenger cars have increasing in number and the number of cars per 1,000 persons is reported to be now 155. Reference is made to Table 12.3-1 in which 2,035,660 is shown as the number of population of Bucharest in 1993. The calculation results in 315,527 cars which exist now in Bucharest.

13. Municipal Government of Bucharest

13.1 History and Status

In 1991 a new Constitution was adopted in which the principle of decentralisation and returning autonomy to local government was established. Under it a two tier system of government at central and local level was established. Although the principle of local autonomy has been established, implementation remains slow, primarily because of a lack of legislation to devolve financial responsibilities to local government.

The local structure, which follows the French system, comprises 41 counties or judets. Each County has its own Council and contains municipalities with their own Councils. The exception is Bucharest county which has no County Council, but is split between Bucharest Municipal Council and the Ilfov agriculture sector lying outside the city limits.

The city is further subdivided into 6 sectors each with their own Councils and administrations (ADPs).

In 1991 the Law of Public Administration, Law 69, elaborated the Constitution's intentions and new Councils were established in early 1992. See legal section for a summary.

13.2 Organisation

MB is comprised of a legislature, the Council, and an executive, headed by the Mayor. Under Law 69, MB is assigned with the responsibility of providing all public services including solid waste management, to its citizens. But in practice most public services are provided independently of MB either by the Regii Autonome or by the 6 Sector

Councils through their local Administrations (ADPs). Although the ADPs are autonomous of MB they are financed by from Municipal tax revenues.

Bucharest has 5 Regiis, including RASUB. Their responsibilities are given in Table 4-2 below.

Table 4-2 Services provided by Regie Autonome in Bucharest

Bucharest's Regii Autonome	Service Function
RASUB	waste collection, haulage and disposal
RATB	public transportation
RADET	central/district heating
RGA	water and sewerage
DRUPO	roads and pavements

Each the 6 Sector Administrations (ADPs) provides street cleansing, road maintenance and green spaces maintenance. No street cleansing services are provided by MB.

MB does provide some public services but these are relatively small, examples are public gardens, the zoo, cemeteries, housing etc.

A great deal of the Municipality's activities are therefore spent in monitoring and general administration of the Regiis and the ADPs, rather than in hands on management of the services themselves. These administration responsibilities basically comprise:

1. informal policy and planning
2. setting standards and formulating norms
3. monitoring and enforcement of the norms

4. contract management where there is private sector involvement

5. approval and financing of Regii's investment plans

In general managerial capacity appears to be limited not only because of this, but also because of the lack of financial resources, poor systems and decision making processes (there is no Management Information System), and the way in which organisational functions and staff responsibilities are defined by bureaucratic regulations. This tends to create an administrative culture which stifles management capabilities.

The organisational structures also appear to reinforce this. They are characteristically well defined vertical structures with many levels and little horizontal coordination. This emphasises a style of management bound by procedures and rules, rather than one in which there is effective decision making, strong accountability and team work, and where performance is measured against agreed objectives.

We must emphasise that these findings have been made from a preliminary assessment only and will be developed as the study continues.

13.3 Financing and expenditure

13.3.1 MB's Financial Constraints

MB is financially constrained because it lacks financial autonomy to set its taxes and fees and to approve its expenditures. Under the current legal framework, Law 69, 1991 The Law on Public Administration, theoretically gives local government complete financial autonomy. But this is constrained by Law 10, 1991 the Law on Public Finances, which defines the fiscal responsibilities of local and central government for establishing taxes and expenditure budgets.

Although Law 27 1994, the Law on Local Taxes, has amended and set new local taxes, and permits local governments to set fees for waste services, it will have virtually no impact on increasing local governments' revenue base. The proposed Law to restructure Local Government Finance and to devolve financial autonomy to municipalities is now long overdue.

Currently local government cannot change their local taxes and fees without approval from the MoF, which is exercising strict fiscal control over local government spend. As a result fiscal and non fiscal tax revenues are declining in real terms because they are increased well below inflation.

In practice, therefore, the MoF maintains absolute control over local governments financing and expenditure by approving and modifying local councils' budgets, establishing local taxes and fees, collecting these taxes, and controlling the timing of disbursements to them.

Control is exercised through the Ministry of Finance's local representations or financial administrations, which are physically located in all local governments offices.

13.3.1 Municipal Expenditures

Local municipal spend is defined as including all public services provided by the Regies and MB's own spend on its Administrations and Sector ADPs. Financing sources are a mixture of local source taxes, central government subventions and tariffs for public services.

MB's expenditures are financed from its local fiscal and non fiscal revenue base (including house sales) and also from a top up subsidy from central government which is financed from a share of salaries tax. MB's Roads Administration also receives capex subventions directly from central government.

The Regies finance opex from their tariffs. Opex costs for public transportation and heating (thermal energy) are additionally heavily subsidised by central government.

RATB, RADET, and RGA's capex is almost entirely financed by central government subventions. RASUB is an exception; its capex is funded almost entirely financed by MB. All local revenues are collected by the MoF local administration.

An analysis of municipal expenditures for 1993, 1994 and the forecast 1994 is given in Tables 2_1 to 2_4 below.

Tables 2_1 Analysis of municipal expenditures (1993)

Major CostCategories	OPEX 0,000 Lei	CAPEX 0,000 Lei	Total Expenditures 0,000 Lei
RASUB	1,580,400	4,021,383	5,601,783
TOTAL MUNICIPALITY of which:			
2.1 BM	1,581,000	-	-
2.2 GARDENS	2,135,873	105,346	2,241,219
2.3 STREETS & ROADS	6,553,632	2,698,615	9,252,247
2.4 ZOO	317,964	16,884	334,848
2.5 CEMETERIES	360,150	26,925	387,075
2.6 OTHER			
TOTAL R.A.'s of which:			
3.1 RGAB	23,863,968	22,006,781	45,870,749
3.2 RATB ⁽¹⁾			
3.3 RADET ⁽¹⁾			
3.4 DRUPO			
TOTAL			

Note: 1) Opex for RATB and RADET including also the subsidies given by municipality.

Tables 2_2 Analysis of municipal expenditures (1993)

Major Cost Categories	OPEX 0,000 \$	CAPEX 0,000 \$	Total Expenditures 0,000 \$
RASUB	1,821 ?	4,633	6,454
TOTAL MUNICIPALITY of which:			
2.1 BM	1,821		
2.2 GARDENS	2,461	121	2,582
2.3 STREETS & ROADS	7,550	3,101	10,659
2.4 ZOO	366	20	386
2.5 CEMETERIES	415	31	446
2.6 OTHER	26,112		
TOTAL R.A.'s of which:			
3.1 RGAB	27,493	25,353	52,846
3.2 RATB ⁽²⁾			
3.3 RADET ⁽²⁾			
3.4 DRUPO			
TOTAL			

Note: 1) Exchange rate used is 1 \$ = 868 lei calculated on the basis on a mid year average rate & based on official National Bank of Romania rates.

2) Opex for RATB and RADET including also the subsidies given by municipality.

Tables 2_3 Analysis of municipal expenditures (1994)

Major Cost Categories	OPEX 0,000 Lei	CAPEX 0,000 Lei	Total Expenditures 0,000 Lei
RASUB			
TOTAL MUNICIPALITY			
of which:			
2.1 BM	3,712,000	24,150,000	27,862,000
2.2 GARDENS	3,725,595	-	3,725,595
2.3 STREETS & ROADS	13,566,382	8,221,388	21,787,770
2.4 ZOO	466,735	-	466,735
2.5 CEMETERIES	1,376,067	-	1,376,067
2.6 OTHER			
TOTAL R.A.'s			
of which:			
3.1 RGAB	43,189,334	32,073,839	75,263,173
3.2 RATB ⁽¹⁾			
3.3 RADET ⁽¹⁾			
3.4 DRUPO			
TOTAL			

Note: 1) Opex for RATB and RADET including also the subsidies given by municipality.

Tables 2_4 Analysis of municipal expenditures (1994)

Major CostCategories	OPEX 0,000 \$	CAPEX 0,000 \$	Total Expenditures 0,000 \$
RASUB			
TOTAL MUNICIPALITY of which:			
2.1 BM	2,448	15,930	18,378
2.2 GARDENS	2,457	-	2,457
2.3 STREETS & ROADS	8,949	5,423	14,372
2.4 ZOO	308	-	308
2.5 CEMETERIES	908	-	908
2.6 OTHER			
TOTAL R.A.'s of which:			
3.1 RGAB	28,489	21,157	49,646
3.2 RATB ⁽²⁾			
3.3 RADET ⁽²⁾			
3.4 DRUPO			
TOTAL			

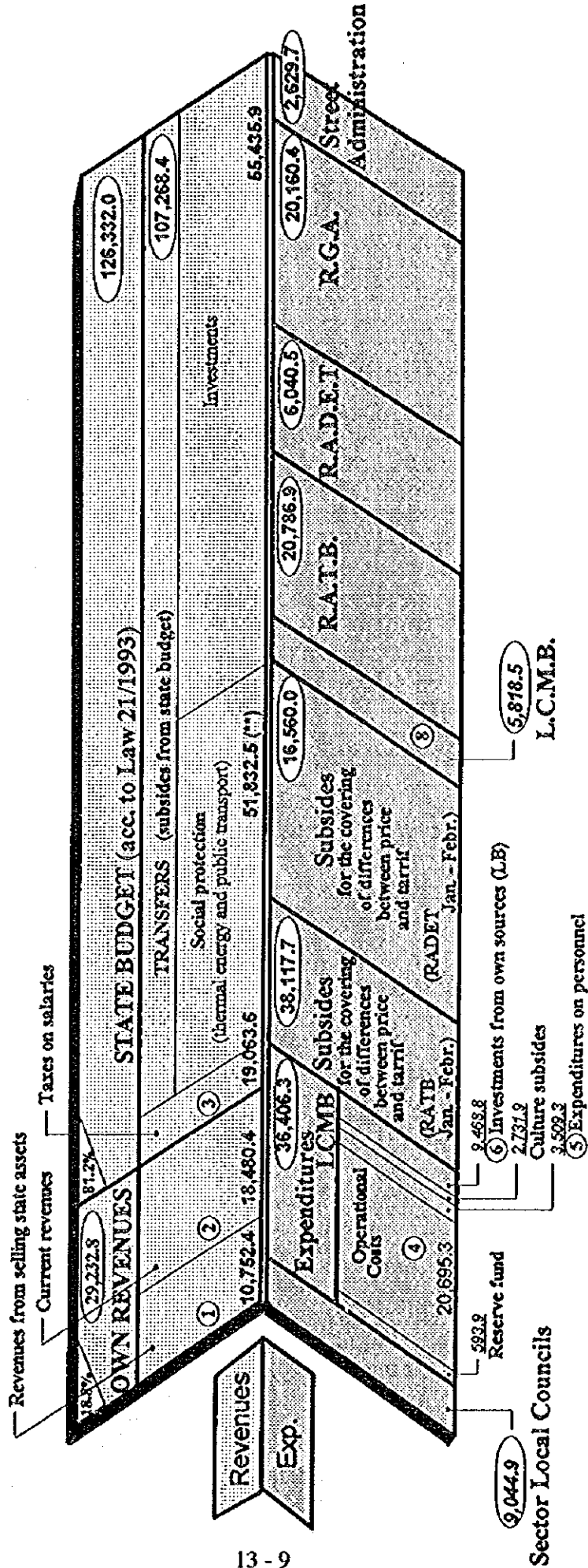
Note: 1) Exchange rate used is 1 \$ = 868 lei calculated on the basis on a mid year average rate & based on official National Bank of Romania rates.

2) Opex for RATB and RADET including also the subsidies given by municipality.

An analysis of municipal financing for 1993 and 1994 (budget) is given in Figures 2_1 and 2_2 below.

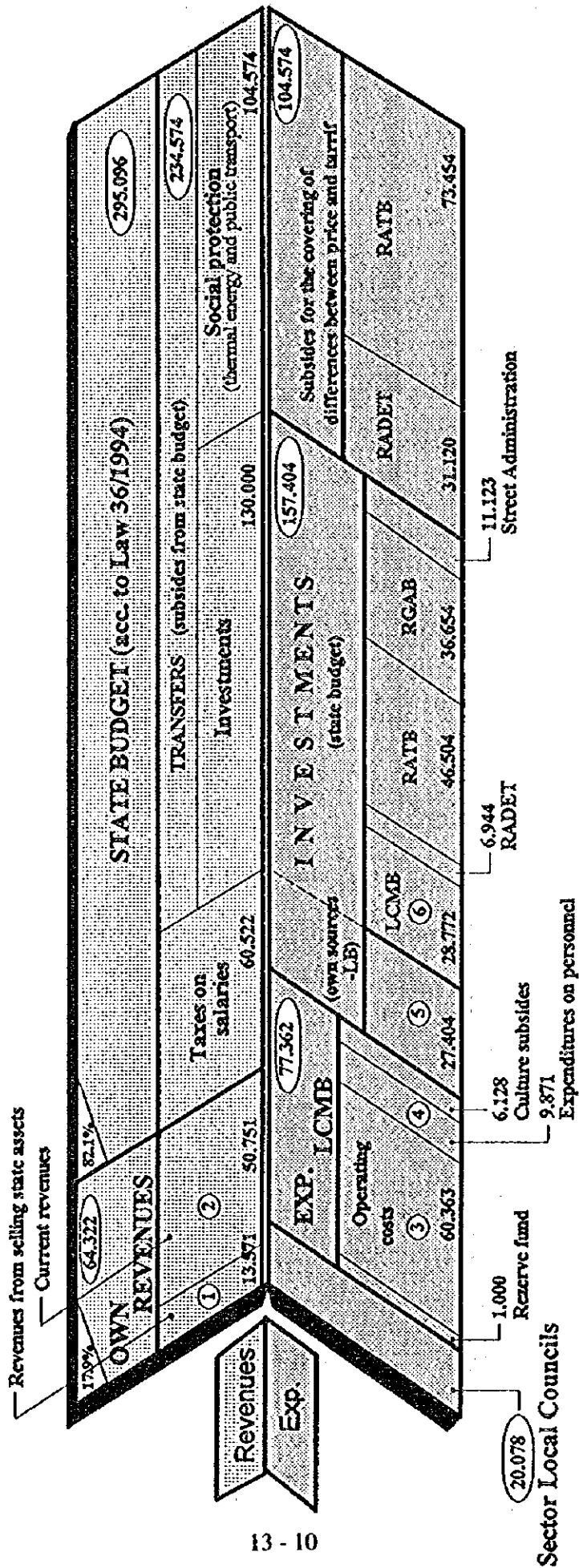
Local Budget - 1993

155,564.827 million lei



Local Budget - 1994

359,413 billion lei



13.3.3 Financial Profile and Performance

An analysis of the total municipal revenue and expenditure profile for 1991, 1992 and 1993, including the Regie Autonomes is given in Tables 2_1 to 2_4 below. Not all the information could be obtained at this stage but missing data will be included in the Interim Report.

The Tables shows the major cost categories split between opex and capex. The opex costs include MB's own spend on its own administration i.e. salaries, maintenance, utilities, consumables, reserve fund spend (discretionary) and culture and art. Opex subsidies for RATB and RADET are included in the total opex costs. Capex expenditure includes:

1. CLMB investments financed from their own local sources
2. CLMB investments financed from the state budget and invested at their discretion.
3. RATB financed from the state budget
4. RADET financed from the state budget
5. RGA financed from the state budget
6. Roads Administration financed from the state budget

Figure 2_1 (1993) and Figure 2_2 (1994) which were provided by the MB, show how municipal opex and capex is financed either from MB's own revenue base or from central government financing.

In 1993 approximately 20% is from own local source taxes and fees (very small amount) and 80% from central government. The analyses ignore the Regies own opex spend financed from their tariff revenue. In 1994 this ratio has shifted. Central government's subsidisation of MB's opex expenditures, sourced from income taxes, has increased sharply demonstrating how sharply MB's revenues decreasing in real terms.

13.4 Institutional Linkages with Central Government and the Regie Autonomes

There is none between MB and central government for SWM. At a much higher level MB is linked with central government, via the Prefect, who is central government's representative at the Judet or County level. The Prefect is appointed by the Department of Public Administration (DPA), which is part of the Prime Ministers Cabinet Secretariat.

The Prefect's role is concerned with issues of governance, i.e. that local government exercises its powers in accordance with the Constitution and the national laws. It has the right to challenge the legality of Local Council Decisions through judicial process.

Lastly there is almost no co-ordination between central government over SWM policy and legislation.

14. POLICY, INSTITUTIONAL AND LEGAL ASPECTS OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION

14.1 Policy and Institutional Aspects

14.1.1 Country Level

1) Environmental Policy

Within the Strategy for Economic and Social Reform (1993-97 program) as set up by the Government of Romania, environmental protection is regarded as a basic requirement. Some of the basic principles are the following:

1. Action to reduce impacts in highly polluted areas, and ecological reconstruction;
2. Modernization of existing environmental institutions;
3. Setting of standards that are similar with those of the European community;
4. Reinforcement of safety and health standards for the working population;
5. Minimization of health risks;
6. Setting of strategies for the protection and administration of ecologically sensitive areas of the Black Sea coastal zone and of the national territory;
7. Promotion of sustainable growth.

However, these commitments did not yet result into a national environmental strategy plan. Environmental Action Plan is now under elaboration by the ICIM research institute and in coordination with other ministries. Policy objectives have been defined in the National Report for the United Nations Conference on Environment and Development in Rio de Janeiro (1992), and then incorporated in the Draft Environmental Law. Main points are the following:

1. Environmental protection is a national priority;
2. Improvement of environmental quality, through taking into consideration environmental norms;
3. Improvement and updating of the environmental management system;
4. Ecological protection, conservation, and reconstruction, with the Danube delta as the top priority;
5. Integrated monitoring system for the environment;
6. Recycling of materials.

Major environmental plans actually developed in Romania belong to the following integrated programs:

1. Monitoring of the quality of environment, within the scope of the establishment of a National Integrated Monitoring System, and with priority actions in the so-called environmental disaster zones. Bucharest does not belong to the list of environmental disaster zones.
2. Conservation and protection of biodiversity, according to the Global Environmental Facility Fund, which is administered by the World Bank. Included are integrated programs like the Environmental Program for the Danube River Basin, and the Black Sea Environmental Program.

2) Institutional Organization of MoE

The Ministry of Waters, Forests and Environmental Protection (MoE) was first established as the Ministry of Environment in 1989, before including water resources and forests jurisdictions in 1990, and getting its actual denomination in 1992. A new concept of organization of the Ministry has been developed by Governmental Order in August 1994. The Ministry is actually composed of "activities" headed each by a secretary of state, and worked out by "experts" in cooperation with its research institutes. Each Directorate is managed by a director with experts under its responsibility. Activities and directorates directly involved in environmental protection tasks are the following:

1. Activity of Water Protection:

- Directorate of Strategy and Regulation of Water Resources
- Directorate of Registering and Flooding Prevention
- Inspection for Water

2. Activity of Forest Protection:

- Directorate of Strategy and Regulation of Forest
- Directorate of Forest Fund and Rehabilitation of Forest
- Inspection for Forest

3. Activity of Environmental Protection:

- Directorate of Strategy and Regulation for Environmental Protection
- Directorate of Monitoring
- Directorate of Projects and Ecological Reconstruction
- Inspection for Environmental Protection

The Directorate of Strategy and Regulation of Water Resources is composed of the following "activities":

1. Activity of Waste Management
2. Activity for Strategy and Legislation
3. Activity for Regulation and Permits
4. Activity for Legislation

General jurisdictions of the Ministry include the establishment of environmental criteria, preparation of draft laws and orders, setting of environmental guidelines, review of environmental assessment studies, and environmental policy setting.

14.1.2 Bucharest District Level

1) General Background

In Romania, local authorities (rural communes, municipalities, county councils) have limited obligations with regard to environmental protection and pollution control. The local councils are responsible for organizing public services and infrastructure such as water supply within their territorial district, waste water treatment, and the collection and disposal of solid waste from private households. Environmental protection is organized solely within the state administration and reaching the local level through the Environmental Protection Agencies (APM) established at county level. The equivalent of APM exists for health protection in each county. This is the Inspectorate of Sanitary Police and Preventive Medicine, under the jurisdiction of the Ministry of Health.

The main agencies dealing with the overall problem of environmental quality and health protection in Bucharest District are the Environmental Protection Agency of Bucharest (APM) and the Inspectorate of Sanitary Police and Preventive Medicine.

2) The Environmental Protection Agency of Bucharest

a. Assignments

The Environmental Protection Agency of Bucharest (APM Bucharest) represents the MoE at county level and is responsible for enforcement of environmental policy through issuing environmental permits, through inspections, monitoring and legal actions. The APM agencies are financed by funds from the MoE. Main activities are regulation, permitting, inspection, and control with application of penalties. Permitting

is one of the most important activities since the new environmental law will require that industrial activities actually operating without environmental license should provide, within a period of one year and after enactment of the law, an information to get environmental authorization.

b. Policy Objectives

APM receives policy objectives from the MoE. The most important objectives of APM Bucharest are now its contribution for establishing the integrated national monitoring system (PHARE program), and for defining restricted natural areas within the county. Establishment of the monitoring system and country wide data bank involves communication of data between various agencies. The APM Bucharest collects data from 12 APM agencies located around Bucharest. Investment in laboratory equipment is planned for 1995 for implementation of the data bank system.

c. Organization

Organization of each APM in Romania is as follows:

1. Department of Inspections, headed by the chief inspector: The task of the inspectors is to control whether the economic entities (industrial plants, agricultural farms) are complying with the environmental standards and regulations in permits and certificates, and to enforce these standards.
2. Department of Regulations: This department is responsible for issuing environmental permits in accordance with the environmental laws and regulations. According to the draft environmental law, new as well as ongoing activities will be required to have an environmental certificate.
3. Laboratory Department, which performs laboratory tests of surface and groundwater, waste water, soil, air and radioactivity.
4. Department for Integrated Monitoring, which is responsible for the reporting of monitoring data to the MoB and to the Environmental Research and Engineering Institute (ICIM).
5. Department for Administration.

d. Control and Inspection

APM receives reports of waste generation from main industrial plants of the County. About 100 reports are received from a total of 200 demands in Bucharest district. Reporting is not required by law. Inspectors go on sites to check the conditions of

treatment facilities. Enforcement tools are only penalties. Inspection covers the following aspects:

1. Review of documentation of the enterprise;
2. Environmental evaluation of the input / output system of the production process;
3. Inspection of environmental facilities;
4. Sampling and analysis of emissions.

e. Human Resources

Each APM is managed by a Director, a Committee of Direction and an Administrative Council. In average each agency employs about 50 persons. APM Bucharest has a total staff of about 80 persons, of which 70 in various departments, and 10 in the administrative departments. There are 20 inspectors (university grade), and about 25 employees in laboratory (only 5 with university grade).

3) The Inspectorate of Sanitary Police and Preventive Medicine

a. Assignments and Activities

The Inspectorate of Sanitary Police and Preventive Medicine represents the Ministry of Health (MoH) at county level, and focuses on control and inspection, besides an important activity for permission. Main duties are inspections on sites, sampling, analysis, and warning. Permitting consists in delivery of sanitary certificates for any new or on-going activity. Inspectors are controlling the hygienic conditions of hospitals, schools, and other public places, working conditions, quality of food, environmental conditions from the point of view of health incidences (air, drinking water), and use of toxic substances.

b. Organization

Organization of the Inspectorate is as follows:

1. Inspectorate of Sanitary Police, assisted by the Laboratory of Evaluation of Risks and Impacts;
2. Laboratory for Promotion of Sanitation and Education;
3. Laboratory of Analysis;
4. Other services with administrative functions.

The Inspectorate of Sanitary Police is composed of 7 different sections, of which the Environmental Hygiene section, which is dealing with vector related diseases and environmental diseases.

c. Human Resources

Total staff is about 460 persons, with 190 persons belonging to the Inspectorate of Sanitary Police, 210 to the Laboratory Analysis, and about 60 persons in the administrative field. The Environmental Hygiene section employs 26 inspectors (4 doctors and 22 medical assistants).

14.1.3 Bucharest City Level

1) Environmental Protection Office of the City Hall

The Environmental Protection Office belongs to the Division of Sanitary Engineering and Ecology Management. His jurisdictions include normating activity, permitting, control of quality of environmental media, and inspection of equipment for treatment of industrial emissions. Share of such activities with the Bucharest environmental agency is not clear. Staff is limited to one director assisted by 2 employed persons for administrative work. Accordingly, activities of the office are in practice very limited, and are totally excluding the inspection aspect. In order to start measurement of the quality of environmental media, the municipality has made acquisition of a mobile laboratory in 1994.

2) Role of the Municipality in Environmental Protection

In the field of environmental protection, jurisdictions of the municipality of Bucharest are not clearly coordinated with the Environmental Protection Agency of Bucharest. According to the APM Bucharest, relationship is now an exchange of information. However, this kind of coordination itself seems limited since the Environmental White Paper of Bucharest, which is prepared each year by the APM Bucharest, has never been communicated to the municipality.

With the coming enactment of the Environmental Protection Norms of Bucharest, the role of the municipality in environmental protection will be extended by an obligation to deliver the urbanism certificate after consultation of the environmental office. The

investor must include in his technical documentation submitted to the municipality for obtention of the urbanism certificate a document in which the environmental office presents its conclusions about the environmental effects of the project on the environment. The urbanism agency must take into account this document before delivery of its certificate.

14.1.4 Main Jurisdictions

A summary of main jurisdictions for protection of environment and health is given below in Table 14.1.1, according to country, county, and city levels.

Table 14.1-1 Distribution of Jurisdictions for Protection of Environment and Health

	national level	district level	city level
policy setting	MoE; MoH	APM applies MoE policy; Sanitary Police applies policy of MoH and MoE	Environmental program 1993
setting of regulation / criteria	Normative standards are established by MoE, MoH...	propositions towards line ministries	Draft norm for environmental protection salubrity norm
permitting	Delivery of permits by MoE for important projects only	APM delivers permits and authorization; Sanitary Police delivers sanitary certificate	as required by the salubrity norms
monitoring / sampling and analysis	Research institutes of MoE are responsible for monitoring environmental media;	Sanitary Police periodically analyses drinking water and air; sampling / analysis of water, air, soil by APM	Environmental office check air, water, soil, no vibrations, radioactivity; not made in practice
control / inspection	Only in particular cases	APM and Sanitary Police are responsible for control / inspection	Environmental office legal ability for inspection not made in practice

14.2 Legal / Regulatory Aspects of Waste Management in Romania

14.2.1 Permitting System

1) Legal Background

The environmental permitting system, or approval system, is composed of 3 kinds of administrative documents: Permit, authorization, and environmental impact assessment (EIA) study. The Ministry's Order 437 is regarded as the legal basis for authorization procedure, while Order 170 is considered to be the legal reference for environmental permit. Difference between permit and authorization is however not explicitly mentioned in these texts (translated versions). This distinction seems to be fundamental within the decision procedure of MoE. Legal documents that lay down the environmental approval system are the following:

1. Minister's Order 170 (1990) sets out the issuing procedure and competences for issuing environmental approval (MoE or Regional Branch Agencies of MoE).
2. Government Decision 113 / 1990 provides the contents standards for the technical documentation for obtaining the environmental approval. These standards are stipulations about the documentation necessary for an environmental approval, with regard to emissions into air, water and soil. The list of activities requiring an EIA is also given in this Decision.
3. Minister's Order 437 dated July 17, 1991 also provides rules for the contents standards about the documentation submitted for obtaining the environmental approval, and a list of activities, which must have an environmental approval.
4. Order 619 / 1992 provides the general methodology for carrying out the EIA study.

2) Environmental Permit

Environmental approval is the essential piece of the environmental administration for controlling the conformity of activities with regulations. Starting construction works of a project is submitted to the obtention of the environmental permit. Starting the operational phase of the project is submitted to obtention of the environmental authorization. EIA may be required for obtention of the environmental permit if the activity of concern belongs to the list of activities needing EIA. Environmental permit may be issued either by the Branch Agency or by MoE, according to the importance of the project. The permitting agency may impose conditions in the permit with additional or stricter limits than in the set environmental standards. Alterations and expansions of

ongoing activities may be considered as new activities and therefore require an environmental permit as a precondition for an authorization.

In the case of construction of a new waste disposal site as well as for any project aiming at environmental hygiene, the MoE has competency for delivering the permit when the project scale is more than 100,000 inhabitants (Order 170).

3) Sanitary Certificate

The sanitary certificate is delivered by the Inspectorate of Sanitary Police for any new and on-going activity. Checking points are working conditions, quality of products, and conditions of emissions of pollutants. In the case of waste disposal sites, there is no any ready guidelines for the information points which must be presented to the Inspectorate of Sanitary Police. Information submitted should include all the necessary information dealing with sanitary conditions of the activity. Criteria considered for delivery of the certificate are normative standards for protection of the environment and health.

4) Environmental Authorization

The environmental authorization is the official confirmation that the factory or installation is working in accordance with the established standards for emission or other limits, and/or in accordance with conditions set in the environmental permit. New as well as existing activities require an authorization. Environmental authorization gives conditions for respecting environment in the case of an existing activity. Environmental authorization is carried out by the Regional Branch Agency of MoE, on the basis of a technical documentation. In case of important works with expected impacts on the environment, EIA is needed.

5) Environmental Impact Assessment

Environmental Impact Assessment is required for certain kinds of activities before issuing of approval by the MoE or one of its regional branches. In general, the objective of an EIA study is more specifically related to obtention of the environmental permit in cases of new established activities. EIA is part of the technical documentation presented for requiring the environmental approval. Smaller plants may only require a limited impact analysis while larger projects will demand a more comprehensive study. The Environmental Impact Assessment must be performed by one of the authorized

research agencies registered by the MoE. In practice, none of the agencies registered in the list of MoE has ability to make a full impact assessment study. Involvement of the National Institute for Environmental Research (ICIM) in the EIA seems to be a precondition for obtention of the environmental approval by the MoE. The EIA study is financed by the investor of the project.

In the case of sanitary landfills, there is no any official guidelines for performance of the EIA study. Existing requirements are those of Decision 113 for human sites (waste and hygiene). These requirements are very general. Basically, the impact assessment is made on a case by case basis. Within the context of lack of environmental experience, there is no any strict rules for the EIA method. The output of the study is to present appropriate technical solutions for dealing with the possible impacts. The agency which is performing the EIA study is finally free to use its own methodology for the evaluation of the impacts. The standpoint of the MoE is that results of the EIA study are not evaluated according to guidelines, but according to the capacity of carrying out propositions for mitigating important impacts. In practice, the method of EIA that is required for approval of the project is the routine method adopted by ICIM.

14.2.2 Normative Requirements at City Level

Normative Requirements at City Level include the Salubrity Norms and the Draft Environmental Protection Norms. Salubrity norms deal with waste collection, transportation, and storage, and with cleanliness of the public domain. Environmental Protection Norms are in a draft stage. One of the main aspects of this draft norm is the introduction of environmental taxes, and involvement of the municipality into the decision process for attribution of urbanism certificate through notification.

14.2.3 Environmental Criteria for Final Disposal of Solid Waste

1) Legal Requirements

Legal requirements for the siting, construction, operation, monitoring and control, and post-closure management of landfills are all dispersed within the set of existing laws and decrees or decisions. These requirements will be reviewed in the feasibility study as criteria for the environmental impacts assessment.

2) Technical Guidelines

There is no any official technical guidelines set up for sanitary landfills in Romania. There are however studies with recommendations, particularly in the case of siting and construction. These recommendations are general. Several technical committees have been established at ministerial level for studying the possibility of proposing standards in the field of waste management.

At the Ministry of Public Works, the standardization work for urban salubrity is being planned as follows:

1. Terminology;
2. Classification of household waste;
3. Collection, transport, and separation of wastes;
4. Organization;
5. Qualitative parameters for final treatment.

Basically, sanitary landfill is designed in order to take into account the specificities of each site and the expected impacts. The case by case basis is the norm. Moreover, and as mentioned above, there is no guidelines for the conducting of an EIA study pertaining to landfill site project.

15. RESULTS OF THE CITIZENS' OPINION SURVEY

15.1 Interviewees

The Study Team conducted survey on citizens' opinion concerning solid waste management in order to understand their waste discharge manner and their opinion on waste collection service. The survey team visited and interviewed 220 households and 37 offices and commercial enterprises. Two kind of questionnaires were used in this survey; one for households and the other for offices and commercial enterprises. Composition of the interviewees are shown in Table 15.1-1 and 15.1-2. Questionnaire includes questions about current waste collection services, expected frequency, appropriate tariff and so on. Questions about recycling activity are also included in the questionnaire.

Table 15.1-1 Composition of Household Interviewees

Interviewee	number	percentage
Apartment with dust chute	75	34 %
Apartment without dust chute	85	39 %
Individual house	60	27 %
Total	220	100 %

Table 15.1-2 Composition of Offices and Commercial Enterprises Interviewees

Interviewee	number	percentage
Offices	13	35 %
Hotels	7	19 %
Restaurant	10	27 %
Market	7	19 %
Total	37	100 %

15.2 Results of Survey on Waste collection Service

15.2.1 Households

95 % of households interviewed have solid waste collection services, while 4 % does not. Frequency of services are shown in Table 15.2-1.

34 % of interviewees is satisfied with current waste collection service, while 66 % is not satisfied. Composition of answers is shown in Table 15.2-2. Major reasons for

dissatisfaction are low frequency, irregularity and high rates of tariff for collection services as shown in Table 15.2-3.

Table 15.2-1 Frequency of Waste Collection Services

Frequency	AWD	AOD	IH	Total	Percentage
2 times a week	41	33	2	76	34.5 %
Once a week	31	25	31	87	39.5 %
Once in 10 days	3	6	6	15	6.8 %
Once in 2 weeks	4	4	11	19	8.6 %
Once a month	2	4	5	11	5.0 %
Others	1	1	5	7	3.3 %
Don't know	3	2	-	5	2.3 %
Total	85	75	60	220	100 0 %

Note: AWD: Apartment with Dust Chute, AOD: Apartment without Dust Chute, IH: Individual House

Table 15.2-2 Degree of Satisfaction for Waste Collection Service

Answer	AWD	AND	IH	TOTAL	Percentage
YES	29	33	11	75	34 %
NO	56	42	49	147	66 %
Total	85	75	60	220	100 %

Note: AWD: Apartment with Dust Chute, AOD: Apartment without Dust Chute, IH: Individual House

Table 15.2-3 Reasons of Dissatisfaction for Waste Collection Service

Reasons of Dissatisfaction	AWD	AND	IH	TOTAL
Low frequency	20	15	31	66
Irregularity	28	18	28	74
High rates of tariff	4	8	22	34
Others	5	8	4	17
Total	57	49	85	191

Note: AWD: Apartment with Dust Chute, AOD: Apartment without Dust Chute, IH: Individual House
Multiple answer is presented.

15.2.2 Survey on Offices and Commercial Enterprises

Most of waste from offices, hotels restaurants and markets are collected by RASUB, and some waste from restaurants and markets are collected by ADP. Frequency of waste collection is summarized in Table 15.2-4.

Table 15.2-4 Frequency of waste collection for Offices and Commercial Enterprises

Office	2 times a week, once a week or once in 2 weeks
Hotel	2 or 3 times a week
Restaurant	2 times a week
Market	Everyday

Waste of some offices and restaurants is collected by private collectors.

In case of offices and commercial enterprises, 62 % of interviewees is satisfied with the current waste collection service, while 38 % is not satisfied. This rate is quite inverse of the results for household. Especially offices are not satisfied. Composition of answers is shown in Table 15.2-5. Major reasons for dissatisfaction are low frequency, irregularity and high rates of tariff for collection services as shown in Table 15.2-6. Many offices and commercial enterprises expect daily collection.

Table 15.2-5 Degree of Satisfaction for Waste Collection Service

Answer	Office	Hotel	Restaurant	Market	TOTAL	Percentage
YES	1	2	6	5	14	62 %
NO	12	5	4	2	23	38 %
Total	13	7	10	7	37	100 %

Table 15.2-6 Reasons of Dissatisfaction for Waste Collection Service

Reasons of Dissatisfaction	Office	Hotel	Restaurant	Market	TOTAL
Low frequency	3	-	2	-	5
Irregularity	8	4	1	1	14
High rates of tariff	4	2	1	1	8
Others	1	3	2	2	8
Total	16	9	6	4	35

Notes: Multiple answer is presented.

15.3 Results of Survey on Recycling

15.3.1 Households

Glass bottles and plastic bottles are major recycling items. 50 % of the interviewees answered that they reuse glass and plastic bottles. However, 85 % of the interviewees does not go to REMAT. This suggests that waste paper, ferrous and non-ferrous metal are not recycled well, while bottles are reused at fairly high rates.

Citizens are not familiar with private collectors. Only 8 % of the interviewees have contacted with private collectors, while 92 % of the interviewees have not.

15.3.2 Commercial Enterprises

Reuse and recycling activity of offices and commercial enterprises are not well developed. 68 % of them do not have any recycling activity, although some of hotels and restaurants reuse glass bottles at high rates. Some offices recycles waste paper.

16 % of the interviewees have contacted with private collectors, whereas only 5 % of the interviewees sell material to private collectors.

16. LAWS AND REGULATIONS

16.1 Introduction

MB's provision of SWM services to the citizens of Bucharest is constrained by a number of deficiencies in the legal framework. These may be summarised as:

1. an absence of a comprehensive law on solid waste;
2. a lack of financial legislation to devolve fiscal responsibility to local government;
and
3. an absence of clearly defined proprietorial laws that establish asset ownership and classification.

These issues are now separately considered below.

16.2 SWM Legislation

16.2.1 Central Government Role

There is no single body at central government which is assigned with the responsibility of formulating national SWM policy or passing a national SWM law.

Existing law on municipal waste is contained in a hotch potch of laws. These are Law 10, 1982, Ordinance No59, 1976, and Government Decision No127, 1994. These laws are not comprehensive enough. Nor are they supported by robust guidelines so that local government can prepare its own norms and regulations.

However, it is very encouraging that there are a number of new initiatives:

1. The MoE is taking the lead (supported by the MoI) in formulating a new waste law under a joint program with the Secretariat of the Basel Convention, who will be provide technical and financial support. It is anticipated by the Ministry that, as a result of its lead role, it might in future take the lead role in national SWM policy and planning. It is not clear whether this might extend to recycling which is currently the MoI's responsibility.
2. The MoE has recently drafted and sent to Parliament the new Law on Environmental Protection, under which it is proposed that the MoE will be solely responsible for all environmental protection.
3. The MoI's National Council for Material Recycling has recently drafted the proposed Law Concerning Material Recycling.

These indications are good and it is hoped that responsibility for SWM at national will be resolved.

16.2.2 Municipality of Bucharest

MB has prepared its Bucharest Sanitation Norm (BSN) based on Law 10, 1982 and on other municipal norm(s). A brief analysis of the BSN has identified the following points. A complete analysis of the BSN including suggested revisions and additions to will be proposed in the Interim Report.

a. Inclusion of Waste Generators' Reporting Requirement in Article 14

Article 14 "Obligation of Generators of Waste of Special Nature" should include a section which stipulates that producers of special waste should submit reports which include:

1. Types and quantity of waste generated;
2. Types and quantity of waste hauled to municipal landfill sites;
3. Methods of treatment, haulage and disposal applied; and
4. Details of contractors that manage the waste in case waste producers use them."

2. Prohibition of Waste Dumping at Former Dump Sites article 16

Article 16 "Keeping Clean the Public Domain" should include a provision which states that citizens are forbidden to illegally dump their waste at former dump sites. Former dump sites may be used for housing or commercial/industrial development if no more dumping is allowed.

3. Types of Salubrity Services to be Covered by the Salubrity Fees Article 15

It may be necessary to define types of salubrity services (waste collection, haulage and disposal as well as street sweeping) that the salubrity fees cover (in Article 15 Fees and Taxes).

16.3 Development of Fiscal and Proprietorial Responsibilities to Local Government

Although the Law of Public Administration, Law 69, established a general framework for reform, there is still a considerable amount of new law and adjustments to existing law that are required to support the reform process.

Financial, proprietorial and regulatory responsibilities have not been devolved to the local government.

This affects SWM in two ways.

Firstly, the lack of financial autonomy seriously constrains MB's ability to raise financial resources to invest in SWM facilities. This severely constrains the opportunity to improve the quality of SWM services to the citizens of Bucharest.

The proposed Local Government Finance Law, or the Law of Local Budgets, which will restructure local government finances and decentralise government control, is now long overdue. Under the current framework, Law 69 theoretically gives local government complete financial autonomy but this is constrained by Law 10, the Law on Public Finances, 1991 and other financial procedures. Practically speaking central government through the MoF maintains absolute control over local governments financing and expenditure by:

1. exercising the right to approve and modify their budgets;
2. establishing local taxes and fees; and
3. collecting their local taxes and duties, and therefore controlling the timing of disbursements to them.

This control is exercised by the Ministry of Finance's local representations or financial administrations which are physically located in all local governments offices.

Secondly, the lack of legislation that defines proprietorial rights to assets and asset classification, has caused a number of uncertainties. In particular it has made it difficult for MB to decide how it can assign assets under Ordinance 69 which transforms RASUB.

16.4 Summary of Existing Legislation relevant to Solid Waste Management

It has not been possible to make a thorough examination of all the laws relevant to the Study. However a summary of the related laws is given in Appendix 3.1, including where possible, short descriptions.

Laws have been grouped into the following categories: solid waste laws, municipal governance, laws governing the Regie Autonome, municipal financing, company law, property law, contracting, environmental protection and hazardous waste.

Laws are defined as including Parliamentary Laws, Government Ordinances, Decisions and Decrees, Local Government Decisions and Norms.

A more complete evaluation of the legal framework will be made at the Interim Report.

The scope of the evaluation will cover:

1. municipal governance;
2. financing;
3. solid waste law; and
4. contracting.

Laws on hazardous waste and environmental protection will be considered in the appropriate sections of the report.

JICA