B.2 Socioeconomic Conditions

B.2.1 Macro-economy of the Country

a. Economically Active Population (EAP)

The Census of 2000 indicated a total population of 2,839,177 in the country, of which 1,161,612 as economically active population (EAP). The corresponding figures for Panama District were a total population of 708,438 and an EAP of 326,561.

Population	Country	Panama District
Total	2,839,177	708,438
Over 10 years old	2,216,191	578,700
EAP	1,161,612	326,561
Employed	1,010,837	282,601
Unemployed	150,775	43,960
Unemployment rate	13.0%	13.5%

Table B-2: Economically Active Population (EAP)

Source: Censos Nacionales de Poblacion y Vivienda, 14 de mayo de 2000, Direccion de Estadistica y Censo, Panama

The economic slowdown of the past three years was reflected in the worsening unemployment, which was estimated at 11.5% in 1999, 13% in 2000 and 14% in 2001. Unofficial estimates place unemployment rate in 2002 at 17%. A decisive factor in rising unemployment was declining sales, sometimes followed by bankruptcy, a situation aggravated by the increase in minimum wage that took effect in 2000. Declining sales strongly affect the economy, as Commerce is the largest single component of GDP, with around 20%.

b. Gross Domestic Product (GDP)

During the 1995-1999 five-year period, total GDP of Panama measured in 1982 Balboa grew 2.92% per year from 6,198 Million Balboa in 1995 to 7,157.7 Million Balboa in 1999. During the same period, the Panamanian per capita GDP, also measured in 1982 Balboa, grew 1.58% per year, from B/2,356 in 1995 to B/2,548 in 1999, being unofficially estimated at B/2,571 in 2001. Total GDP grew fastest in 1997 at 4.5%, decreasing slightly to 4.1% in 1998, and 3.2% in 1999. The officially estimated preliminary growth rate was 2.9% in 2000, 1.8% in 2001 (recent reports indicate 0.3%), and the growth prospect for 2002 is 1.5%.

Over the 1995-1999 five-year period, the GDP composition remained roughly the same, comprising around 8% of primary sector, 18% of secondary sector, and 74% of tertiary sector, indicating a predominantly service society.

Economic Activity	1997	1998	1999
Primary sector	514.9	545.1	546.7
Secondary sector	1,230.4	1,263.6	1,326.5
Tertiary sector	4,912.2	5,124.2	5,284.5
GDP	6,657.5	6,932.9	7,157.7
GDP growth rate	4.5%	4.1%	3.2%
Per capita GDP	2,449.0	2,509.0	2,548.0
Per capita GDP growth rate	2.8%	2.4%	1.6%

Table B-3: Gross	Domestic	Product	(GDP)	Million	Balboa
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Source: Informe del Contralor General de la Republica, 1 marzo 2000; Cuentas Nacionales 1989-1999, Direccion de Estadistica y Censo, Setiembre 2001, Panama

c. Manufacturing Industry

Manufacturing industry in the country in 1999 was classified into 40 types, comprising 883 firms, 37,931 employees, B/286,411,000 paid as salary, B/2,635,499,000 production value, and B/568,338,000 added value. The relative importance was ascertained by choosing manufacturing types that accounted for more than 5% of the total in terms of the following criteria: number of firms, number of employees, amount of salary paid, the value of production, and the added value.

Table B-4: Manufacturing Industry in Panama, 1999

Criteria	Manufacturing Type
Number of firms	Bakery, apparel, printing, cement-lime-gypsum, metal works
Number of employees	Meat, dairy, bakery, apparel, plastics
Salary paid	Meat, dairy, bakery, oil refinery, plastics
Production value	Meat, dairy, milling, oil refinery
Added value	Meat, sugar, oil refinery, cement-lime-gypsum

Source: Industria Manufacturera, Direccion de Estadistica y Censo, Abril 2001, Panama

The above table indicates the importance of agriculture related industry (meat, dairy, bakery, milling, sugar), oil refinery, plastics, and construction (cement-lime-gypsum, metal works).

d. Construction

Total construction in the year 2000 amounted to B/332,662,506, of which 67% consisted of residential construction. Industrial construction amounted to less than 1%, but 93% of industrial construction took place in Panama District.

Construction Type	Country	Panama District
Total	332,662,506	184,271,352
Residential	222,611,773	132,048,680
Commercial	89,163,667	32,724,398
Industrial	1,398,659	1,297,920
Others	19,488,407	18,200,353

Table B-5: Value of Construction in 2000 (Balboa)

Source: Industria Ano 2000, Direccion de Estadistica y Censo, Nov. 2001, Panama

e. Consumer Price Index (CPI)

CPI grew less than 1.5% per year during the last half of the 1990s. Sectors where CPI grew faster than the average growth rate were health care (more than 5%), education and public utilities (more than 3%).

Goods and Services	1997	1998	1999
Total	1.2	0.6	1.4
Food & beverage	0.7	0.4	0.2
Clothing	-2.0	1.3	0.4
Housing & public utilities	2.1	1.6	3.5
Furniture & house care	2.4	0.2	1.3
Health care	2.3	3.0	5.6
Transport & communication	2.2	-1.8	0.8
Entertainment & education	1.2	2.9	3.1
Others	1.2	0.4	-0.1

Table B-6: Consumer Pri	ice Index (CPI) (%)
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Source: Informe del Contralor General de la Republica, 1 marzo 2000

f. Public Sector Debt

Public sector debt in 1999 amounted to B/7,770 Million, of which 70% foreign debt and 30% domestic debt. Of foreign debt, 70% were of private sources (mostly bonds), 20% from multilateral organizations, and 10% from bilateral organizations. On the other hand, most domestic debt originated in public sources, namely, National Bank and Social Security. In 2001, public debt increased to B/8,183 Million, the foreign debt increasing its share to about 75%, or B/6,087 Million. A heated political debate is going on concerning the use of special funds (Fondo Fiduciario) to reduce the public sector debt.

Sources	Total Public Sector	Central Government	Decentralized Sector
Total debt	7,770.9	7,566.6	204.3
Foreign debt	5,559.5	5,459.3	100.2
Multilateral organizations	1,157.0	1,097.6	59.4
Bilateral organizations	452.8	413.2	39.6
Private sources	3,949.7	3,948.5	1.2
Domestic debt	2,211.4	2,107.3	104.1
Private sources	653.9	651.7	2.2
Public sources	1,557.5	1,455.6	101.9

Table B-7: Public Sector Debt in 1999 (Million Balboa)

Source: Informe del Contralor General de la Republica, 1 marzo 2000

B.2.2 Regional Economy

a. Panama District EAP and Gross Regional Product (GRP)

As there are no officially published data on GRP, due consideration will be given to the little bit of existing data on regional economy, in an attempt to deduce the GRP of Panama District.

Of the EAP in the country, around 30% or 333,217 in 2001 were located in Panama District, according to the Household Survey of 2001. Further, employment data in Panama District in 2001 showed 2% in the primary sector, 20% in the secondary sector, and 78% in the tertiary sector. As expected, these data indicate employment in Panama District to be more skewed toward secondary and tertiary sectors.

Limited data available on regional economic activity confirm the above statement. Construction in Panama District in the year 2000 amounted to B/184,271,352, equivalent to 55% of the construction in the country. Although, 72% of construction in Panama District consisted of residential construction, 93% of the industrial construction of the country took place in Panama District.

Likewise, water consumption in Panama District in the year 2000 amounted to 42,969 million gallon, or 68% of the country. Further, a sector by sector comparison with water consumption of the country showed the predominance of Panama District, as it accounted for 68% of total consumption, 68% of residential consumption, 76% of commercial consumption, 77% of industrial consumption, and 63% of public sector consumption.

All the above data indicate the possibility of making assumptions on economic concentration in the Panama District.

Generally speaking, primary sector production around large urban areas is geared toward high valued perishables which should be produced near consumption centers, for example fresh vegetables. Accordingly, the assumption is that 10% of primary sector GDP is produced in Panama District.

The data on construction and water consumption suggest that secondary production is quite concentrated around the capital city. This might be especially true in the case of large scale production. However, small scale secondary sector production is likely to be scattered in the rest of the country. Therefore, the assumption is that 60% of secondary sector GDP is concentrated in Panama District.

The macroeconomic data indicate that Panama is a predominantly service economy. Commerce is the largest single component of GDP (around 20%), and Colon unquestionably plays the most important role in re-export activities. However, the other important components, financial intermediary (around 12% of GDP) and real estate rental (around 14% of GDP) are presumed to be centered in the capital city. Then, the assumption is that 70% of tertiary sector GDP is concentrated in Panama District.

The assumed economic concentration in Panama District results in a GRP amounting to B/4,538 Million, equivalent to 63.4% of GDP. The GRP sector distribution would be 1.3% in the primary sector, 17.0% in the secondary sector, and 81.7% in the tertiary sector. The per capita production value of the EAP would be around B/13,500 in Panama District and B/3,500 in the rest of the country.

b. Consumer Price Index (CPI) in Panama District

The latest CPI data available for Panama District refers to June 2000 and June 2001 (Situacion Economica: Indice de Precios al por Mayor y al Consumidor, Segundo Trimestre de 2001, Direccion de Estadistica y Censo, Panama, Diciembre 2001). During the said period, the overall CPI in Panama City declined by 0.4% as a result of price decrease in food (-0.5%), and in transport and communications (-4.8%), which offset the price rise in clothing (4.6%), and in entertainment and education (2.6%).

B.2.3 Administration

The Public Power is exercised by the State through its three branches: the Legislative, Executive and Judicial powers, which act separately and with limitations, yet in harmonic collaboration.

It also has six independent bodies with the following duties: The *Contraloría General de la República* [Comptrollership General's Office of the Republic; auditing of public funds], *Ministerio Público* [Prosecutor's Office; defense of the state's, municipalities and citizens' interests], *Ente Regulador de los Servicios Públicos* [Regulating Entity of Public Services; proper rendering of public services] and the *Tribunal Electoral* [Electoral Court] and the *Fiscalía Electoral* [Electoral Auditors' Office] (oversee the liberty, integrity and efficacy of the people's suffrage).

As of the 80's, after the exhaustion of the "interventionist-State" model – which prevailed during the previous decades-, a two-way movement to reduce the governmental public functions begin; being one in the direction of privatization and the other one towards de-concentration and decentralization of activities towards the municipalities.

Provinces are political divisions constituted by the territory assigned to them by the laws, and are the limitation areas for the governments. The governor is the representative from the Executive Power at his/her respective province, and has the responsibility of inspecting and coordinating the duties of public entities; likewise, he/she is the maximum authority within the province and head of police matters. The provincial Council, is the consultation body, and once its recommendations are approved by the Executive Body, their compliance will become compulsory.

The municipality is the community's autonomous and political organization within a district. Its main duty is to foster the development of the community and the achievement of social well-being. Each district has an assembly known as the Municipal Council, which is formed by all the *Corregimiento* representatives. The municipal council regulates the juridical life of municipalities by means of enforceable agreements and resolutions within the respective district.

In order to understand Panama's national life, it is worth mentioning that the municipalities had a preeminent role during the independence process. The *cabildos abiertos* (open city councils) were the ones that backed up and proclaimed the spinning-off from and the independence of Colombia. Nevertheless, at the time of constituting and national state, the role of these *cabildos* was significantly minimized, and Centralism dominated over the so-called Federalism. During almost 80 years, the municipalities have seen their functions being shortened and their municipal treasury funds restricted. This situation began to change

as a consequence of the 1983 constitutional reforms. As of 1984, it was decided that Mayors be chosen through direct elections. Until that year, the Mayor performed as a representative of the President of the Republic before the municipality, and as such he/she was appointed by the former.

Each *Corregimiento* has a Communal Board that fosters the community's organization and actions to promote their social, economic, political and cultural development. They are bodies that stand for the *Corregimiento* inhabitants, with juridical status conferred by the mayor by means of a resolution.

The *Corregimiento* representative acts as chairman, the *Corregidor* (police commissioner) and five representative citizens living within the *Corregimiento*, who will be assigned by the *Corregimiento* representative, are all members of the Communal Board.

B.2.4 Population

The last population census for Panama Republic was conducted in the year 2000. Table B-8 shows comparatively the results with census made in 1960, 1970, 1980, 1990, and 2000. Arraijan and San Miguelito District are also included because their collection systems also dispose in Cerro Patacon final disposal site

The results show that Arraijan district has the most important population growth since the 1990 census; as opposed to San Miguelito district which seems to have reached a stable growth condition. Panama district shows an intermediate growth compared to San Miguelito and Arraijan districts.

Within Panama district, the trend shows a stagnant and in some cases a negative growth in the southwestern and central Corregimientos. On the other hand, a robust growth is experienced by the northern and eastern Corregimientos.

			Years		
	1960 1970 1980 1990 2			2000	
	248 360	368 112	477 107	584 803	708 438
Southwestern Corregimientos	240,000	500,112	477,107	304,003	700,400
San Feline	12 466	14 145	11 696	10 282	6 928
El Chorrillo	28 577	27 834	25 145	20 488	22 632
Santa Ana	34 007	32 023	27,806	20,400	22,002
	51 305	44 875	28,602	27,007	10 720
	51,555	12 753	16 0/17	17 033	10,720
Ancon		12,700	6 401	11 518	11 160
Contral Corregimientos			0,401	11,510	11,109
Betania	15 615	37 271	13 081	46 611	11 100
Bella Vista	13 203	26 650	28 136	24 086	28 / 21
	16,290	10 376	20,130	24,900	18 161
San Francisco	24.069	35.005	21,103	21,209	25 751
Bargua Lafavra	19 440	21 165	24,902	20 162	27 126
	10,449	31,103	34,120	30,103	20 714
Rio Abajo	10,002	27,353	31,909	33,155	20,714
Northern and Eastern Corregimiento	<u>s</u> 7550	04 740	E1 044	72.000	00.405
Juan Diaz	7,553	24,719	51,944 20,724	73,809	88,105 45,004
Pedregal	7,162	14,536	32,731	40,896	45,801
Chilibre		40.000	18,168	27,135	40,475
Las Cumbres		13,238	31,495	56,547	92,519
Pacora			8,184	26,587	61,549
San Martin			1,925	2,479	3,575
locumen	40.007	6,170	21,762	47,032	83,187
SAN MIGUELITO DISTRICT	12,927	68,400	156,611	243,025	293,745
Amelia D. de Icaza					38,522
Belisario Porras					49,802
Jose Espinar					35,301
Mateo Iturralde					12,607
Victoriano Lorenzo					17,328
Arnulfo Arias (1)					30,502
Belisario Frias (1)					46,794
Omar Torrijos (1)					37,650
Rufina Alfaro (1)					25,239
ARRAIJAN DISTRICT		19,347	37,186	61,849	149,918
Arraijan (Cabecera)		8,432	16,272	24,665	64,772
Juan Demostenes Arosemena		3,440	8,525	13,418	24,792
Nuevo Emperador		1,688	1,926	2,319	2,765
Santa Clara		1,109	1,169	1,422	1,744
Veracruz		2,358	5,287	8,224	16,748
Vista Alegre		2,320	4,007	11,801	39,097

Table B-8: Comparative Population Results from 1960, 1970, 1980, 1990, and 2000 Census

Note: The results from census 60, 70, 80, and 90 are not broken down by corregimientos for San Miguelito because those corregimientos marked as (1) are corregimientos recently created by the Law 21 of June 27th, 2000.

B.2.5 Education

The education system in Panama comprises the pre-elementary school, primary school, secondary school, and college/university studies. At present, there are about 357,000 registered primary students from first to sixth years. The 6 years of the secondary education are divided into first cycle (junior high school, 3 years) and second cycle (high school, 3 years) with approximately 207,000 students. The 6 years period of the primary school and the 3 years of junior high school are compulsories.

Panama has achieved a high literacy level, creating therefore, an important base to promote economic development with justness, although there are deviancies in the indigenous population. In comparison with Central America countries, the literacy is quite high in Panama, even among the poor.

About 90% of the Panamanians are literate (urban 94%, rural 62% rural). The following table shows illiterate population figures of 10 years old and more in the country and in Panama District.

			Population of 10 years old and more			
No.	Corregimiento	Population Total	Population	With less than third level of primary school approved	Illiterate	Total (%)
	Country	2,839,177	2,216,191	230,938	168,140	7.6
1	San Felipe	6,928	5,878	228	127	2.2
2	El Chorrillo	22,632	18,207	512	271	1.5
3	Santa Ana	21,098	17,920	526	273	1.5
4	Calidonia	19,729	16,872	516	208	1.3
5	Curundú	19,019	14,408	1,031	539	3.8
6	Betania	44,409	39,887	572	242	0.6
7	Bella Vista	28,421	25,150	336	143	0.6
8	Pueblo Nuevo	18,161	15,794	353	143	0.9
9	San Francisco	35,751	30,981	579	177	0.6
10	Parque Lefevre	37,136	32,095	876	336	1.1
11	Río Abajo	28,714	24,638	903	543	2.2
12	Juan Díaz	88,165	74,458	1,678	581	0.8
13	Pedregal	45,801	36,369	1,658	660	1.8
14	Ancón	11,169	9,458	453	249	2.7
15	Chilibre	40,475	30,703	2,286	1,016	3.3
16	Las Cumbres	92,519	71,710	3,742	1,726	2.4
17	Pacora	61,549	47,138	3,611	1,758	3.7
18	San Martín	3,575	2,794	381	235	8.4
19	Tocumen	83,187	64,240	3,419	1,603	2.5
	Total	708,438	578,700	23,660	10,830	1.9

Table B-9: Illiterate Population of 10 Years Old and More in Panama District

Source: Statistical and Census Office, National Censuses of Population and Housing 2,000. Edition, December 2001.

In Panama District (Study Area) there are 215 primary schools with 80000 students and 2800 teachers. High school education is imparted in some 130 schools with about 75,000 students assisted by about 4,000 professors. More than 65,000 Panamanian students attended the University of Panama, the Technological University of Panama, (both state universities) and the Catholic University Santa María La Antigua, a private institution. Besides the aforementioned universities, there are several private universities such as Columbus University, University of Panama, Latin University of Panama, Nova Southeastern University, University of Louisville, among others.

The schooling levels of Panama District are the highest of the country. Their residents have an average of 9.2 approved years. The illiterates of the district hardly represent 1.9% of the inhabitants of more than 10 years old. The center area has the highest schooling level (11.4 years) and the Northeast has lowest schooling level (7.6 years). It is necessary to highlight that the east sector is the one that has high level of absolute illiteracy (3.5%). Refer to the following Table:

Area / Corregimiento	Approved average years (highest approved level)	With less than third level of primary approved (%)	Percentage of illiteracy (population of 10 years old and more
District	9.2	4.1	1.9
Casco Viejo	8.7	3.1	2.0
San Felipe	9.1	3.3	2.2
El Chorrillo	8.4	2.3	1.5
Santa Ana	9.2	2.5	1.5
Calidonia	9.9	2.6	1.3
Curundú	7.1	5.4	3.8
Centro	11.4	1.9	1.0
Betania	12.3	1.3	0.6
Bella Vista	12.8	1.2	0.6
Pueblo Nuevo	11.2	1.9	0.9
San Francisco	11.7	1.6	0.6
Parque Lefevre	10.6	2.4	1.1
Río Abajo	9.8	3.1	2.2
East	7.9	3.8	3.5
Juan Díaz	10.2	1.9	0.8
Pedregal	8.1	3.6	1.8
Tocumen	7.8	4.1	2.5
Pacora	6.9	5.9	3.7
San Martín	6.3	10.7	8.4
Northeast	7.6	4.5	2.9
Las Cumbres	8.0	5.6	2.4
Chilibre	7.2	4.0	3.3
Reverted Area	10.2	4.1	2.7
Ancón	10.2	4.1	2.7

Table B-10: Schooling Level and Illiteracy in Panama District, Year 2000

Source: General Auditor of the Republic, Statistical and Census Office, National Censuses of Population and Housing 2,000)

The corregimiento with highest schooling level is San Francisco with 11.7 years, while the highest functional and absolute illiteracy is San Martin, located in east sector.

Generally speaking, while more is the level of the population's education, more will be the environmental and sanitary conscience, and more ingrained their habits of personal hygiene and cleansing of their housings and public areas. It will also be more prepared to participate for the improvement SWM.

The plan and study programs for elementary school education, prepared by the Ministry of Education, and applied in the whole country starting from September 1993, has the purpose to provide the children "fundamental knowledge to understand the natural phenomena, in particular those that are related with the preservation of the health, environmental protection and the rational use of the natural resources.

The subjects of Natural Sciences mainly, and Civic Education in smaller measure, approach some topics related with the use of drinking water, air, water and soil pollution, origin and destination of waste produced at home and in the community, organic and inorganic waste; although the previous topics do not surpass 10% of the subjects tried in Natural Sciences.

B.2.6 Community Structure

Panama District is comprised by 19 corregimientos, which are mentioned next:

a. San Felipe

The corregimiento of San Felipe with an approximate population of 6,300 inhabitants (censuses of 2000) and an area of 0.5km², has characteristic of a colonial neighborhood with narrow and was declared World Heritage Area by the UNESCO, transforming the place into a special area. According to the Urban Development Plan of the Ministry of Housing, the corregimiento of San Felipe would not experience bigger changes in connection with its current population with little increase in the future. This would be achieved by means of a policy that maintains the effective norms of density and prevalent scale in "Casco Viejo", so that the rehabilitation works can be carried out inside a framework of restricted growth.

b. El Chorrillo

The rehabilitation of the area of El Chorrillo, after its partial destruction during the invasion of 1989, has reduced the high prevalent densities by means of the construction of low-rise buildings.

c. Santa Ana

This area of restricted growth with a population of about 20,000 people is replacing the old wooden houses gradually for small apartment buildings. The suburb area, in the surroundings of Plaza Santa Ana, will become protected area by regulations of Historical Patrimony, to conform the group of Casco Viejo to San Felipe's neighborhood.

d. Calidonia

The transformation that took place in Caledonia, mainly from residential use to commercial use, it contributed in their population's marked descent, modified by an intensive use of existing residential areas in the corregimiento that maintains the low occupation densities (between the Central Avenue and Balboa Avenue especially toward Bella Vista area.

e. Curundú

The situation of the corregimiento of Curundu is one of most difficult in the metropolitan area of Panama, for the fact that two of its main neighborhoods (Hollywood and Viejo Veranillo that represent 40% of its population), they are located in flooding areas and they require urgent sanitation measures. These conditions force to maintain a restricted growth.

f. Betania

Betania is the only corregimiento of the central area, which has expansion areas (in its northeast end, toward San Miguelito). On the other hand, it has an important group of residential areas: El Dorado, Villa de las Fuentes, La Gloria, Altos de Betania, El Ingenio, developed in relatively low densities that can be considered similar to Bella Vista, although with a smaller intensity. In the vacant lands on the road Tumba Muerto, in La Loceria and in Loma de la Playa, are projected multifamily towers that will allow accommodating projected population's increment.

g. Bella Vista

The corregimiento of Bella Vista, has a population of 42,046 inhabitants and an area of 5.1 km². With heterogeneous characteristics and a medium-high living standard is observed in this corregimiento the best well being levels and high employment concentration. The corregimiento has many trade establishments, banks, high educational establishments (University of Panama, Inter-American University, Columbus University), hotels and others, transforming the corregimiento into a great generator of solid waste.

According to the Urban Development Plan of the Ministry of Housing, the population of this corregimiento will duplicate in the next 15 years. This figure can be reached through an increase in the densities of barrios such as El Cangrejo, where densification process can be

observed at present; Obarrio, where the substitution of wide single story housings for apartment buildings has increased in recent years. High densities can be expected in Campo Alegre and Nuevo Campo Alegre, while in Marbella the urbanization will occupy the whole available area with high-density towers. Finally, the barrios of Herbruger and Nuevo Reparto El Carmen will experience increases of density by means of a mixture of single family housings and multifamily buildings.

h. Pueblo Nuevo

This corregimiento takes its name from an old suburban settlement, has also been one of slow development process. There is a housing deficit due to deterioration and to be one of the old areas of the city. This deterioration is shown at tenancy houses. At present vast areas of vacant lands can be observed which are equal to 7% of their land area.

i. San Francisco

In San Francisco, the creation of new profitable areas, with the use of the old Paitilla Airport lands and the gradual densification of San Francisco's neighborhood, will allow to absorb a growth that, as it is calculated, to double the current population toward the year 2020. This means that most of the residential area can remain with relatively low densities as shown at the moment.

j. Parque Lefevre

10% of Park Lefevre housings qualified as rent rooms are of masonry construction contrary to the rent rooms of other two corregimientos of Pueblo Nuevo and Rio Abajo where old wooden constructions prevails.

k. Rio Abajo

Rio Abajo houses one of most extensive barrio of the city, being one of the oldest, except Casco Viejo, presents the biggest housing proportion in deterioration. This situation has facilitated in the latest years the substitution, gradual and still slow, of the old wooden housings for small apartment buildings of more occupation density, tendency that will be accentuated in the future. The corregimiento also has an extensive area of vacant lands, along the Via Cincuentenario, between Via España and Domingo Díaz that will allow to build medium and high density residential complexes, which would facilitate to reach a projected population of 50,000 peoples by 2020 (according the Urban Development Plan).

l. Juan Díaz

Juan Diaz is one of the corregimientos with high potential growth, since it possesses abundant vacant lands and a road system, which is reinforced by the South Corridor that makes attractive its location in the city.

m. Pedregal

This corregimiento also has land in abundance, although it is gulch areas to the northeast of the city that have given place to semi-rural settlements of very low density. The growth of Pedregal is based in the development of new areas, with low densities, in the north sector. The second phase of the North Corridor link the buffer area of the corregimiento (San Martin, El Naranjal) with the rest of the city, what can give an additional incentive to the population of the area.

n. Ancón

Reverted area. This corregimiento that comprises the reverted area, has a population of 10,000 inhabitants.

o. Chilibre

This corregimiento, originally an articulate rural settlement to the old Canal Zone before the construction of the Transistmic Highway, still conserves rural characteristics (large land lots, low density) that goes disappearing because it is being absorbed by the City of Panama like one of its outlying neighborhoods. The fact that Chilibre is inside the hydrographic basin of the Canal makes that the future population should be limited, intensifying its use in the current area with low densities. This corregimiento is considered within the poor corregimientos of Panama District.

p. Las Cumbres

The area of Las Cumbres is characterized by its irregular topography, what explains the discontinuity of their urbanized areas and the current levels of low density. The corregimiento, however, still has expansion areas, particularly in its northeast sector, from Gonzalillo toward the area of Calzada Larga, where is projected a growth based mainly on the development of new areas and a bigger density of existing establishments. The corregimiento is qualified as semi-urban and rural with a strong pressure from the expansion of San Miguelito.

q. Pacora

The corregimiento of Pacora has an area of 479.4 km2 with rural area characteristics and a low socio-economic level. However, it is the corregimiento of high relative growth in the recent years. This phenomenon obeys the availability of abundant plane lands and of easy access. A tendency exists in this corregimiento to the dispersion. Consequently, the Development Plan plans to brake the limitless growth toward the periphery and it proposes a limited development of new areas to maintain the population of the corregimiento below the 60,000 inhabitants until the year 2020. However, this aspect could be difficult since the population reaches at the present time more than 57,000 inhabitants.

r. San Martín

This corregimiento like Chilibre and Pacora show high poverty level, and consists essentially of rural population and it is one of the corregimientos of slow growth in the Study Area. Do not present difficulty in connection to its future population, since the residential land use projection for the year 2020 are considered less than 5,000 people, and the abundance of available lands guarantees completely this provision.

s. Tocumen

The corregimiento of Tocumen dates of 1950 and it is a continuation of the establishments settled down in the vicinities of Tocumen airport.

Tocumen, in the East side of the city, it has been a scenario of a growing process based in the autoconstruccion, conforming extensive settlements for low income peoples. With the improvement of the communication roads (Via Domingo Diaz, Inter-American Highway), the sector has begun to attract urbanization investments for medium income peoples. This tendency is reinforced with operation of the South and North corridors. This way takes advantage of two existing hints of Tocumen airport for activity localization purposes as processing export areas.

B.2.7 Poverty Conditions

According to the survey carried out by Social Political Bureau of the Ministry of Economy and Finances there are in Panama two poverty lines: extreme poverty and general poverty.

Extreme poverty level is defined as consumption level or annual per capita food expenses to satisfy the necessary daily minimum calories estimated at an average of 2,280 calories. The cost of this requirement, according to the Life Standard Survey data of 1997, fix the extreme poverty line at B/519 per person/year. People's with a total expense in consumption below this value are classified in extreme poverty or indigent.

General poverty level is defined as per capita food expenses to satisfy the daily minimum calories requirements (extreme poverty level) including an additional amount to cover service consumption and essential non food goods such as: housing, transport, education, health, clothing and home daily goods. The general poverty value was estimated at a consumption level of B/905 per person/year, that is to say B/75 a month per person. The individuals with a consumption level below this value are considered poor.

According to the life standard survey, prepared by Social Political Bureau of the Ministry of Economy and Finances, the poor of Panama District reached 18.1% of the total population, while the residents of extreme poverty, correspond to 7.8%.

General poverty areas are concentrated around Casco Viejo, at the east sector, in reverted area and in the northeast sector. The corregimientos with more poverty incidence are Curundú (50%), Chorrillo (42%), Chilibre (38%), Pacora (32%) and Tocumen (31%).

Extreme poverty populations are located in the same general poverty areas, standing out the cases of Curundú (32%), Chilibre (17%), Tocumen (12%), and Pacora (10%).

Details of poverty areas by corregimientos of Panama District are shown in the following Table:

Corregimiento	General poverty	Extreme poverty
6	(%)	(%)
Distrito	18.10	7.81
Casco Viejo	28.05	14.48
San Felipe	11.76	5.88
El Chorrillo	41.76	20.00
Santa Ana	16.92	6.15
Calidonia o La Exposición	15.56	8.89
Curundú	50.00	32.35
Centro	5.57	2.30
Betania	0.00	0.00
Bella Vista	8.11	2,70
Pueblo Nuevo	2.86	0.00
San Francisco	5.00	1.67
Parque Lefevre	16.67	9.26
Río Abajo	1.67	0.00
Este	17.79	6.27
Juan Díaz	2.84	0.71
Pedregal	14.47	7.89
Tocumen	30.95	11.90
Pacora	31.82	7.95
San Martín	20.00	10.00
Noreste	26.49	11.89
Las Cumbres	21.97	9.85
Chilibre	37.74	16.98
Area Revertida	29.41	11.76
Ancón	29.41	11.76

			<i>.</i> –	
Table B-11: Povert	y Main	Indicators	of Panama	District

Source: Living Level Survey, 1997 and National Censuses of Population and Housing. Prepared by Social Policy Department of the Ministry of Economy and Finance, 1999.

B.2.8 Public Health

Executive Organ presents in Health Policies and Strategies document, 2000 - 2004, the purposes and commitments, as well as, the policies and strategies for the health sector.

The national government recognizes that the health should be a matter of high-priority interest, and it defines as: the enjoyment of complete physical, mental and social well-being, and considered as a basic component to achieve the coexistence, progress and justness, with good quality of life for a human being with provision of values and principles.

Among the main problems and health conditions of the Panamanians, sanitary problems are found which arise as the product of social and economic development process of the country. These are related with damages on health and with condition and decisive factors of the population's health level, such it is the case of the contamination of physical and social environment, food, water and air (plaguicidas, lead, waste and dangerous substances, among other). Among the policies, strategies and objectives/goals of the Ministry of Health can be mentioned the following policies I, III, IV and VI, which are related to solid waste management and described as follows:

Among the policies, strategies and objectives/goals, the related ones with solid waste management, are the followings:

a. Policy I

Promote a National Health Pact with a vision on health that all the Panamanians want in 2020

Strategies and Objectives / Goals

- i. Establishing a consensus on development policy priorities for the production of population's health, environment, and National Health System.
- Develop a consensus on policies and models of sustainable management and provision of water services, sanitation, and waste disposal.
- ii. Guiding health management according to a social agenda
- To incorporate the vision of the citizen's responsibility in their health and quality of life, of their family and their vicinity.

b. Policy II

Improve the regulatory framework on health, as mechanism that guarantees quality in the national health system and population's health protection levels and the environment.

Strategies and Objectives / Goals

- 1) Perfecting policies, laws, standards, and regulations in health field.
- Define policy and establish standards for water, sanitation, solid waste, air, and hazardous substances.

2) Coordinating sectors, intersector and others around high-priority topics

- Monitoring and coordination for water and sanitation subsector, housing sector, and others
- 3) Strengthening the capacity of MINSA as conductor of the health sector.
- Develop the capacity of MINSA in areas like environmental health, water, sanitation, food, medicines, investigation, technology, human resources and quality of services, among other aspects.

c. Policy III

To universalize and to improve access toward integral health programs and services with optimum levels, so that they reduce the breaches.

Improving the continuous access for population to ensure water, sanitation and appropriate waste management.

- To promote at national level decentralized environmental health programs, which include integral management of solid waste and wastewater, hazardous, and non hazardous waste.
- To reach intermunicipal agreements to achieve the development of sanitary landfills and water pipelines.
- To introduce new technology for the appropriate treatment of pollutant solid waste.

d. Policy IV

To guarantee a healthy environment improving surveillance system and risk factor control to the population's health

1) Perfecting the damages surveillance system and risk factors to the human health, labor, and social environment.

- Control infestation of transmitter vector of prioritized diseases
- To establish effective mechanisms for the control of urban plagues
- To develop environmental surveillance systems with emphasis in working environment, water, waste and residuals.
- 2) Implementing strategies and necessary coordination for the effective control of environmental risks that affects the population's health.
- To coordinate and implement policies and development strategies for drinking water services, sewerage system, collection and waste disposal, as well as those of environmental risk control for the population's health.
- To begin a Sanitation Plan of Panama Bay.

B.3 Urban Structure

B.3.1 Generalities

The former city of "Nuestra Señora de la Asunción de Panamá" was funded on the 15th of August of 1519 by Pedro Arias de Avila (Pedrarias) with the main objective to serve as a departure point for future expeditions along the new ocean (Pacific Ocean) which was discovered by Vazco Nuñez de Balboa.

On the 28th of January of 1671, Panama city was ransacked by the English pirate Henry Morgan. Subsequently, Fernández de Córdoba had to fund the new city to the southwest from the old one. Three consecutive fires (1737, 1756, and 1781) take place in the new city which affect its development.

Panama becomes independent from Spain on the 28th of November of 1821 and it is adhered to the New Granadian Republic (Colombia, Ecuador, and Venezuela). The development of Panama city reaches a new peak with the construction of the Transisthmic Railway in 1850 and the initiation of the French Canal in February of 1882 which was suspended in December of 1889.⁷

Panama is separated from Colombia on the 3rd of November of 1903, mainly as a result of the rejection by the Colombian Senate of the Herrán-Hay Treaty. Almost immediately the United States decided to reinitiate the construction of the canal; consequently, workforce from the Antilles is brought to Panama from 1904 to 1914 when the works are finalized. As a result from this immigration, Chorrillo, San Felipe, Santa Ana, and Calidonia barrios are created. Since its beginning, the development of the city has been defined by the physical existence of the canal itself and the presence of the North Americans in the area.

Bella Vista corregimiento is included within the new city limits in 1938. By 1953, Betania, San Francisco, Pueblo Nuevo, Parque Lefevre, Río Abajo, and Juan Díaz are included within the limits of the city.

Panama city is limited naturally to the south by the Pacific Ocean and to the west by the canal itself. Consequently, its natural expansion is toward the north and east, as a result, the city expands from east to west along Via España, Transisthmic highway, and Via Ricardo J. Alfaro; by 1960 Corregimiento Pedregal is adhered to the city. Similarly, along the same Transithsmic highway there is an expansion to the north and important urban centers emerge, such as, Las Cumbres and Alcalde Díaz.⁸

⁷ Panamá en cifras, November 2001

⁸ Plan Metropolitano, Dames & Moore

B.3.2 Urban Plan

The Study area has three development plans:

- Regional Plan for Land Use: it focuses on the environmental resources of the Panama Canal watershed which are critical for its development
- General Plan for Land Use: it guides the development and maintenance of reverted areas, including its equipment
- Metropolitan Plan (Dames & Moore): it guides the growth of urban areas in the Atlantic and Pacific with the purpose to reach a sustainable use of land through the integrated use of the resources and controls of Panama canal and its watershed

The Urban Development Plan for the Metropolitan Areas in the Pacific and Atlantic (Dames & Moore, Inc.) is the most recent study conducted for the study area (December, 1997). This study foresees the creation of four development nodes in the study area: Ancon west node would be defined by its potential as a center for air transportation (Howard Air Base); Ancon east node would be an educative and sport development center; Central node would be an international financial center which would include an insurance and reinsurance center; and the Tocumen node would be a center to promote enterprises in the Exportation Processing Zone which would serve as a counterbalance for the Central node.

The Housing Ministry (MIVI) should be the main executing body of the metropolitan plan, as it is shown in the following proposed administration scheme for the short term. However, the plan is not totally being executed, for example, the Advisory Committee is not currently working; this committee would be formed by middle ranking officers or professionals specialized in the technical units of the central government, decentralized sector, universities, municipalities, professional associations, and other organized members of the community. Consequently, the role of the municipality as a communication link between the residents and the executing body is not taking place.

As a result, the growth trend foreseen by Dames & Moore, for the case of a deficient execution of the plan, is taking place. The called Central node remains the most important and attracts strong and consolidated investments; this node becomes an attraction point for low income residential communities found in the periphery and their residents have to travel longer distances as they seek housing every time farther away from the employment area.



Figure B-1: Administration Scheme Proposed in the Urban Metropolitan Plan (Short term)

On the other side, the following table shows the investments foreseen in the Metropolitan Plan in the area of Solid Waste Management.

		Invoctmont	Estimated	Priority of Execution				
Area of Influence	Sector/ Sub-sector	Project	Project Justification (millions of Balboas) execution Time (years)			1995 -2000	2001 -2005	2006 -2020
Coregimiento José Domingo Espinar, Belisario Porras, Integrated zone 4	Infrastruc./ Solid Waste	Transfer Station Las Cumbres (TELC)	Low capacity of DIMA* to service the area; to prevent illegal disposal	14.7	1		A	В
Corregimiento Pacora, San Martín, and Tocumen	Infrastruc./ Solid Waste	Transfer Station Tocumen (ETT)	DIMA* can not service area appropriately; too much distance to Cerro Patacon	17.3	1	A	А	В
Corregimiento Veracruz, western part of Ancón	Infrastruc./ Solid Waste	Transfer Station Howard (ETH)	Current system is adapted to Veracruz generation. Development projections in Howard and Kobbe indicate that the system should be reinforced.	14.3	1		A	В
Corregimiento Arraiján Cabecera, Juan Demóstenes Arosemena, Nuevo Emperador	Infrastruc./ Solid Waste	Transfer Station Arraiján (ETA)	A significant growth is projected in the area which would deteriorate the current situation .	10.0	1	A	A	В
Integrated zone 1, 2, 4, 5, Pacora, San Martín, Tocumen	Infrastruc./ Solid Waste	Cerro Patacón (Expansion)	It is the only Final Disp. Site in the metropolitan area. The development in the area creates a strong pressure on the landfill capacity.	149.6	2	A	A	В
Corregimiento Juan Díaz, José Domingo Espinar, 30% of Las Cumbres, Pedregal, Pacora, San Martín and Tocumen	Infrastruc./ Solid Waste	Sanitary landfill José D. Espinar (RSJDE)	The projection for 2020 shows that this area will have a high SW generation which should be serviced with appropriate technology	20.8	2			В

Table B-12: Matrix of Key Projects for Solid Waste Management in the Study Areaforeseen in the Metropolitan Plan

					Estimated	Priority of Execution			
Area of Influence	Sector/ Sub-sector	Project	Justification	(millions of Balboas)	execution Time (years)	1995 -2000	2001 -2005	2006 -2020	
National level	Infrastruc./ Solid Waste	Sanitary education program	It is necessary to raise conciousness level of the residents regarding good cleansing habits	1.1	1	A	A	В	
Metropolitan area	Infrastruc./ Solid Waste	Facility for separation and recycling program	Large quantity of waste can be recycled; additionally, there is great potential for employment generation	7.0	1		A	В	

Source: Plan Metropolitano, Dames & Moore

* The service was provided by DIMA when the study was conducted

Note: The project priorities are shown as A, B, and C. Letter A represent essential projects which require to be executed in the corresponding execution phase. Priority B projects are important, but its execution in the proposed phase is not critical in the Plan. Priority C represents complementary projects to the Plan implementation. The investment amount is based on the assumption that there is an average generation of 0.7 kg./pers./day and proceeds mostly from residential areas.

B.3.3 Land Use

The categories established for land use and their representative Corregimientos are the following:

a. Urban Use

- Low density residential: San Francisco, Pueblo Nuevo, Betania, Parque Lefevre, Rio Abajo; and parts of Juan Diaz, Tocumen, Pedregal, Pacora, Chilibre, and Las Cumbres.
- High and medium density residential: Bella Vista, Curundú, San Felipe, Chorrillo, and Santa Ana
- Commercial/Services: Bella Vista, Betania, and mostly along corregimientos bordering Via Domingo Díaz, Jose Arango, and Via Simón Bolivar.
- Mixed: Calidonia, and Bella Vista.
- Institutional: parts of Parque Lefevre, Bella Vista, and Betania.
- Industrial: parts of Betania, Pedregal, and Chilibre
- Transport and communications: parts of Ancon and Tocumen; especially areas for national airport Marco A. Gelabert and Tocumen International airport
- Recreational and Green Areas: most of Ancon, parts of San Francisco and Juan Diaz.

b. Non-urban Use

Corregimientos Ancon, Chilibre, Las Cumbres, Pacora, Tocumen, Pedregal, and parts of Juan Diaz are included in this category.

c. Overlapping areas

Corregimientos Ancon (tourist and protected areas are found) and Parque Lefevre (mostly where Panama Viejo is found as a tourist attraction) are included in this category.

The urban area of Panama is made of approximately 57% residential areas, 18% commercial and residential areas, 10% commercial and industrial areas, and 15% public facilities.⁹

B.3.4 Population Density

The following table shows population density in the study area. San Miguelito and Arraijan districts are included because their collection services also dispose in Cerro Patacon final disposal site.

The most densely populated district is San Miguelito. In Panama district, the most densely populated corregimientos are found in the southwestern part of the district. The medium densely populated corregimientos are found in the central part of the district. The least densely populated corregimientos are found in the northern and eastern part of the district which are precisely the current expansion areas of the city.

⁹ Plan Metropolitano, Dames & Moore

Municipality, Corregimiento	Population	Surface	Density
PANAMA DISTRICT	708 438	2560.8	(Del 3./KIII.2) 276 6
Southwestern Corregimientos	700,400	2000.0	270.0
San Felipe	6,928	0.5	13.856.0
El Chorrillo	22,632	0.4	56,580.0
Santa Ana	21.098	1.3	16,229,2
La Exposicion o Calidonia	19.729	1.6	12.330.6
Curundu	19,019	1.1	17,290.0
Ancon	11,169	664.5	16.8
Central Corregimientos			
Betania	44,409	8.6	5,163.8
Bella Vista	28,421	5.1	5,572.7
Pueblo Nuevo	18,161	5.8	3,131.2
San Francisco	35,751	5.6	6,384.1
Parque Lefevre	37,136	6.2	5,989.7
Rio Abajo	28,714	6.3	4,557.8
Northern and Eastern Corregimiento	s		
Juan Diaz	88,165	35.6	2,476.5
Pedregal	45,801	28.4	1,612.7
Chilibre	40,475	978.0	41.4
Las Cumbres	92,519	106.0	872.8
Pacora	61,549	479.4	128.4
San Martin	3,575	134.0	26.7
Tocumen	83,187	92.4	900.3
SAN MIGUELITO DISTRICT	293,745	50.1	5,863.2
Amelia D. de Icaza	38,522	3.8	10,137.4
Belisario Porras	49,802	4.0	12,450.5
Jose Espinar	35,301	7.1	4,972.0
Mateo Iturralde	12,607	1.0	12,607.0
Victoriano Lorenzo	17,328	2.0	8,664.0
Arnulfo Arias (1)	30,502	7.4	4,121.9
Belisario Frias (1)	46,794	4.3	10,882.3
Omar Torrijos (1)	37,650	11.0	3,422.7
Rufina Alfaro (1)	25,239	9.5	2,656.7
ARRAIJAN DISTRICT	149,918	170.1	881.4
Arraijan (Cabecera)	64,772	53.4	1,213.0
Juan Demostenes Arosemena	24,792	48.3	513.3
Nuevo Emperador	2,765	24.4	113.3
Santa Clara	1,744	15.9	109.7
Veracruz	16,748	13.8	1,213.6
Vista Alegre	39,097	14.3	2,734.1

Table B-13: Population Density

Source: Panama en cifras, Noviembre 2001

(1) Corregimientos created by the Law 21 of June 27th, 2000

B.3.5 Transportation

The study area has structures for sea, air, and terrestrial transport. Among the sea transport facilities, there are the Canal itself, and Balboa port.

Regarding air transport, the study area has Tocumen international airport and the airport for local flights Marcos A. Gelabert (better known as Albrook). The following table shows the number of passengers and freight in both terminals.

Table B-14: Number of passengers and freight in Tocumen and Albrook airports

Airport		Years					
		1996	1997	1998	1999	2000	
Tocumen	Passengers	1,083,524	1,209,902	1,284,236	1,233,316	1,295,154	
	Freight (metric tons)	67,723.7	76,253.9	79,845.6	70,617.2	73,532.9	
Marcos A.	Passengers		340,756	343,473	331,513	272,921	
Gelabertt	Freight (metric tons)		684.58	842.303	805.307	693.917	

Source: Department of Transportation and Air Works

The terrestrial transport consists of a railway system which connects mainly Panama with Colón. On the other hand, Panama city is crossed by the following main roads:

From east to west:

- a) Ave. Balboa, Via Israel, Via Cincuentenario
- b) Ave. Central, Via España, Via José Arango;
- c) Vía Simón Bolívar (Transístmica);
- d) Vía Ricardo J. Alfaro (Tumba Muerto), Vía Domingo Díaz

From north to south:

- a) Calle Martín Sosa;
- b) Ave. Manuel Espinoza B., Ave. Frederico Boyd;
- c) Ave. Brazil; Ave. 12 de Octubre, Ave. Ernesto T. Lefevre y Ave. Cincuentenario

Additionally, two important roads (Corredor Norte and Corredor Sur) run from east to west. Those *Corredores* are the result of the implementation of the transportation master plan called ESTAMPA I and ESTAMPA II which were conducted by JICA.

In the following table, the evolution of vehicle type and number is shown, both at the national level and in the Panama District.

Type of vehicle	Number of vehicle A					
rype or venicle	1995	1996	1997	1998	1999 (P)	
NATIONAL LEVEL	249,571	263,073	277,142	296,843	312,959	
Passenger vehicles (up to 13 persons)B	178,255	188,268	198,718	212,650	222,433	
Buses (5 persons and more)C	14,830	15,492	16,181	16,072	16,415	
Heavy duty vehicle	56,328	59,145	62,057	67,948	73,916	
Others	158	168	186	173	195	
PANAMA DISTRICT	124,326	135,021	148,604	166,624	180,109	
Passenger vehicles (up to 13 persons)B	99,258	107,993	119,590	133,986	143,569	
Buses (5 persons and more)C	6,784	7,020	7,464	7,498	7,645	
Heavy duty vehicle	18,196	19,905	21,436	25,007	28,754	
Others	88	103	114	133	141	

Table B-15: Number of Vehicles

(A) Excludes vehicle with official plate

(B) Include pick ups, jeeps, sedan

(C) Include "chivas" (small typical buses)

Source: Records of plate sales in the Municipalities' Treasury

B.4 Financial Conditions

B.4.1 Public Finance

a. Public Sector Budget

The Panamanian Public Sector encompasses General Government and Decentralized Institutions. General Government, in turn, is divided into Central Government and Local Government. On the other hand, Decentralized Institutions are classified into Financial Intermediaries, Autonomous Institutions and Non-Financial Government Corporations.

The budget of the Central Government amounted to some B/2,500 Million in 1999, with a surplus of some B/60 Million. Income of the Central Government originated 75% as current income and 25% as capital income. On the expenditure side, 86% was current expenses and 12% investment, as shown below.

Income and Expenditures	Million Balboa	Composition (%)
Income		
Current Income	1,925.7	74.9
Tax Income	1,211.2	
Non-tax income	538.2	
Other current income	176.3	
Capital Income	644.5	25.1
Equity	32.3	
Domestic credit	220.4	
Foreign credit	384.8	
International organizations	70.0	
Bilateral agreements	14.2	
Foreign bonds	300.6	
Other capital income	7.0	
Total Current and Capital Income	2,570.2	100.0
Expenditures		
Working expenses	2,173.4	86.6
Operating expenses	821.7	
Personnel expenses	631.4	
Non-personnel expenses	113.6	
Materials & supplies	59.8	
Machinery & equipment	4.0	
Other expenses	12.8	
Transfer & subsidy	416.2	
Debt service	935.5	
Investment	303.6	12.1
Education insurance	32.4	1.3
Total Current and Capital Expenditures	2,509.4	100.0
Surplus	60.9	

Table B-16: Executed 1999 Budget of the Central Government

Source: Informe del Contralor General de la Republica, 1 marzo 2000

Of total income, tax income comprised around 47%, the most important taxes being income tax (20%) and import tax (14%). Of total expenditures, debt service comprised 37%, personnel 25% and subsidy 17%. Within the Central Government, expenditures by the Executive Branch accounted for 96%, as Legislative-Judiciary-Electoral Tribunal, all together, comprised less than 4%. Social spending is high, Ministry of Education accounting for 16% of expenditures of the Central Government, and Ministry of Health for 12%, both however being shadowed by the 37% debt service.

The 1999 budget of the decentralized sector showed income of B/2,635.9 Million and expenditures of B/2,483.9 Million, with a surplus of B/152.0 Million. Within the Decentralized Sector, Social Security accounted for around 40% of the sector budget, and National Bank of Panama for about 20%. Regulatory Entity of Public Services (ERPS) and National Environmental Authority (ANAM), each accounted for less than 1%, while National Institute for Water and Sewerage (IDAAN) accounted for a little over 2%.

The payroll of the Public Sector in December 1999 numbered 131,300 employees (65% in the Central Government) who were paid B/76,637,000 (60% in the Central Government), resulting in an average monthly salary of B/584.

b. Budget of Municipal Government

The budget of all 68 municipalities in the country in 1999 amounted to B/69.9 Million, the municipalities in Panama Province comprising B/45.8 Million (65.5% of total). The municipal budget seems small when compared to the budget of the country, possibly due to the large number of decentralized institutions included in the general budget. Within Panama Province, the municipal budget of Panama City was the biggest with B/34.6 Million, while that of San Miguelito was second with B/4.8Million, and that of Arraijan was B/1.6Million.

Municipality	Authorized Budget
All Municipalities	69.9
Municipalities in Panama Province	45.8
Municipality of Panama	34.6
Municipality of San Miguelito	4.8
Municipality of Arraijan	1.6

Table B-17: Municipal Budget of 1999 (Million Balboa)

Source: Informe del Contralor General de la Republica, 1 marzo 2000

c. Municipal Budget in Panama District

The 1999 authorized budget of Panama City was B/34.6Million, equivalent to 75.5% of the budget of municipalities in Panama Province, and 49.5% of the budget of all municipalities in the country.

Executed budget of 1999 in Panama City showed an income of B/38.1 Million and expenditures of B/26.4 Million. In Panama municipal budget, income from tax and fees amounted to 79% of total income, while personnel expenses accounted for 69% of total expenditures, as shown below.

Income and Expenditures	1999
Income	
Tax income	30,183,000
Non-tax income	7,915,000
Total Income	38,098,000
Expenditures	
Personnel	18,106,000
Operating expenses	3,654,000
Service by third party	2,339,000
Reserves	2,275,000
Total Expenditures	26,374,000
Other Income and Expenditures	-148,000
Operation Result before Contribution	11,576,000
Income from Previous Years	14,000
Contribution	-5,276,000
Surplus or Deficit	6,314,000

Table B-18: Income Statement 1999 of Panama City

Source: Informe del Contralor General de la Republica, 1 marzo 2000

B.4.2 Panama District Municipal Finance

a. Balance Sheet

The Balance Sheet of Panama Municipality for the past four years is summarized below.

Balance Sheet	2001	2000	1999	1998
CURRENT ASSETS	23,523	18,270	7,739	8,075
Cash & Banks	2,936	3,078	1,451	2,217
Tax receivable	4,881	4,413	3,922	0
Accounts receivable	10,187	5,626	0	0
Other receivables	3,280	2,949	2,314	5,614
Inventory	2,239	2,204	52	244
FIXED ASSETS	137,281	124,377	107,117	97,215
Long-term receivables	87,777	87,719	78,382	69,807
Property, machin. & equip.	38,190	36,643	28,724	27,401
Other assets	11,314	15	11	7
TOTAL ASSETS	160,804	142,647	114,856	105,290
CURRENT LIABILITIES	12,970	7,878	6,257	7,280
Accounts payable	11,848	6,822	5,416	5,595
Other payables	1,122	1,056	841	1,685
LONG-TERM DEBT	0	0	0	0
TOTAL LIABILITIES	12,970	7,878	6,257	7,280
EQUITY	147,834	134,769	108,599	98,010
Public assets	43,148	31,853	16,549	16,549
Additional public assets	3,485	3,478	3,461	695
Revaluation surplus	3,003	0	0	0
Reserves	144	144	10,063	69,951
Accumulated results	98,054	99,294	78,526	10,815
LIABILITIES & EQUITY	160,804	142,647	114,856	105,290

Table B-19: Balance	Sheet of Panama	Municipality	v	(\$1000))
			, ,	(,	/

Sources: Informe del Contralor General de la Republica, Marzo 2000

Estados Financieros, Municipio de Panama, 2001-2000, 2000-1999

The Balance Sheet of the last two years, 2000 and 2001, shows the consolidation of Panama Municipality and DIMAUD, as a result of the transfer of DIMA to three municipalities in 1999.

"Public Assets" refer to Capital or Equity of each government entity, while "Additional Public Assets" refer to donation of capital goods received during the year.

On the positive side, the Municipality has no long-term debt, and Current Liabilities comprise no more than around 20% of the yearly income.

However, quite noticeable is the large size of Long-term Receivables (\$87.8 million) which reportedly is due to continued billing, over many years, to businesses that ceased to operate. Reportedly, long-term receivables consist mostly of tax receivables. Further, most of the Long-term Receivables were recognized as bad accounts, whereby only about 5% was included as current tax receivables.

On the other hand, Accounts Receivable refers to non-tax receivables. Among these, parking tickets comprised \$6.2 million out of \$32.8 million accounts receivable from the private sector in 2001. Still, around \$3.9 million worth of parking ticket receivables were included as long-term receivables.

Yet, as the Municipal Treasury has no right to clean up these arrears without the prior approval of the Comptroller of the Republic, a committee was set up in July 2000 with the task of determining the recoverable amount and the recovery mechanism. Conclusions and recommendations made by the committee should be presented to the Municipal Council, and then to the Comptroller of the Republic. The administrative procedure to clear the bad accounts has been activated for more than one year, and a quick decision should contribute to improve the financial standing of the municipality.

Current Assets in 2001 were \$23.5 million, of which receivables comprised \$18.3 million. Likewise, Fixed Assets in 2001 were \$137.3 million, of which long-term receivables comprised \$87.8 million. On the other hand, Total Liabilities were only \$12.9 million, leaving Total Equity at \$147.8 million.

b. Income and Expenditures

The Income Statement of the Municipality of Panama showed that Income exceeded Expenditures in the four years between 1998 and 2001, as detailed below.

Income & Expenditures	2001	2000	1999	1998
INCOME	61,613	57,504	38,098	35,958
Tax income	31,387	32,665	30,183	28,514
Non-tax income	30,226	24,839	7,915	7,444
EXPENDITURES	50,063	44,156	26,522	23,195
Personnel	30,501	28,930	18,106	16,166
Operating expenses	5,942	4,858	3,654	3,301
Service by third-party	9,094	6,096	2,339	2,373
Unspecified expenses	719	660	148	0
Reserves	3,087	3,612	2,275	1,355
OTHER INCOME & EXPENDITURES	479	500	0	-202
Unspecified oper. income	479	500	0	0
Unspecified oper. expense	0	0	0	-202
RESULTS BEFORE FUND TRANSFER	12,029	13,848	11,576	12,561
EXTRAORDINARY	-72	352	14	21
Extraordinary income	23	402	14	21
Extraordinary expense	-95	-52	0	0
FUND TRANSFER	-4,623	-4,021	-5,276	-4,923
Fund transfer received	2,001	2,283	0	0
Fund transfer given	-6,624	-6,304	-5,276	-4,923
FINAL RESULTS	7,334	10,179	6,314	7,659

Table I	R_20·	Income	Statement	of	Panama	Munici	nality	, (\$1	იიი	יי
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Sources: Informe del Contralor General de la Republica, Marzo 2000

Estados Financieros, Municipio de Panama, 2001-2000, 2000-1999

Panama City income and expenditures in 2001 can be summarized as follows: total income of \$61.6 million, direct expenditures of \$50.1 million, and a surplus of \$7.3 million.

It can be seen that Non-tax Income increased from around one-fourth of Tax Income in 1998 to about the same as the Tax Income in 2001. This can possibly be attributed largely to DIMAUD service charges.

The composition of Income and Expenditures was available only for the year 2000. The largest component of Tax Income was the tax on license plate (circulation permit) accounting for 27% of Tax Income, followed by tax on retailer business (14%) and liquor shop tax (10%). As for Non-tax Income, fees for regularly provided services comprised 13%, specific services 9% and duties 8%. On the expenditure side, the largest component in the year 2000 was Personnel with 59%, fund transfers comprising 17%, non-personnel expenditures 7%,

materials and supplies 5%, machinery and equipment 2%. In the year 2000, executed income comprised 57% of budget, while executed expenditures comprised 54% of budget.

B.4.3 Taxation System and Public Utilities

a. Taxation System

Taxes are divided into direct tax and indirect tax. In Panama, the most important direct tax is income tax, comprising around 40% of tax revenues, and the most important indirect tax is import tax, comprising around 30% of tax revenues.

Components of direct tax and indirect tax in Panama are as follows.

a.1 Direct Tax: Income tax, Property and equity tax

Personal Income Tax

Personal Income Tax is regulated by Article 700 of the Tax Code, modified by Article 9 of Law 31 of December 30, 1991. It is a progressive tax, but instead of percentage levied by income levels, it comes as a table specifying the amount to be deducted from monthly salary.

For the same monthly salary, there are Groups A, B, C and E, according to the number of exemptions claimed. Further, Group C and Group E are divided into 8 sub-groups identified with numbers ranging from 0 to 7. Groups A, B and C, specify monthly income from B/296 to B/6,000, every one Balboa up to B/2,000, and every 5 Balboas between B/2,000 and B/6,000. Group E, on the other hand, starts at a monthly salary of B/358, changing every one Balboa up to B/2,000 and B/2,000 and B/6,000.

The highest income tax rate on a monthly salary of B/6,000 is around 25%.

Corporate Income Tax

Since its inception in 1934 and up to 1994, income tax in Panama was a progressive tax for both persons and corporate tax subjects. From fiscal 1995, a tax reform phased out the progressive nature of corporate income tax, using it with the purpose of increasing tax income, rather than as a tool for income redistribution. Personal income tax remains a progressive tax up to the present day.

More specifically, Law 28 of 1995 modified Article 699 of the Tax Code, establishing a single rate of 30% as corporate income tax starting in 1995. Excluded from this tax rate were the companies registered in National Industry Official Registry, and those having contracts with the country's government. Such companies were applied a single rate of 34% on taxable net income exceeding B/.500,000.00. Also excluded from the single income tax rate of 30%

were companies defined as "micro, small and medium size companies" by Article 699-A of the Tax Code, which were characterized by gross yearly income of less than B/.200,000.00.

a.2 Indirect Tax:

Transfer tax, Import tax, Export tax, Production-sales-consumption tax, Commercial tax, Juridic act tax

Import Tax

The import tax of Panama is structured in 21 Sections as shown below.

		Impor	t Tax	ITE	BM
Section	Product	From (%)	To (%)	From (%)	To (%)
I	Live animals, animal products	0	300	0	5
II	Plant products	0	130	0	5
III	Oil & fat, animal or plant origin	0	30	0	5
IV	Food products	0	154	0	10
V	Mineral products	0	87	0	5
VI	Chemical products	0	15	0	5
VII	Plastics & rubber	0	15	5	5
VIII	Leather & hide	2	15	5	5
IX	Wood, charcoal	2	15	5	5
Х	Pulp, cellulose, paper, cardboard	0	15	0	5
XI	Textiles	0	15	5	5
XII	Shoes, hats	0	15	5	5
XIII	Processed stone, cement, gypsum	0	15	5	5
XIV	Pearl, valuable stone & metal	0	15	0	5
XV	Metal	0	15	0	5
XVI	Machinery & appliances	0	15	5	5
XVII	Transportation material	0	20	5	5
XVIII	Optical & photography instruments	0	15	5	5
XIX	Firearms & ammunition	15	15	5	5
XX	Merchandise & products	3	15	5	5
XXI	Art objects, antiques	0	15	5	5

Table B-21: Import Tax Structure of Panama

Source: Arancel de Importacion de la Republica de Panama, Decreto de Gabinete No. 61, 10 Octubre 1997, actualizado Setiembre 2000 As can be seen in the above table, the prevailing top end of import duty is 15%, while the prevailing low end is usually 0%, or scheduled to become 0% some time in the near future. Import duty is always shown combined with the Tax on Transfer of Mobile Goods (ITBM). Tariff protection is observed on some foodstuff and important products for the national economy, like cane sugar, as the following higher import tariffs indicate.

Section	Tax Rate (%)	Product
I	300	Chicken meat, fresh or refrigerated
	130	Rice
	30	Different types of oil and fat
IV	154	Unrefined cane sugar
V	87	Salt
XVII	20	Large, luxury SUV type vehicles

Table B-22: Higher Import Tariff

Panama is an open economy, and recently was ranked among the most globalized economies.

b. Public Utilities

The Census of 2000 indicates that there were 681,799 dwellings in the country, out of which 63,002 (9.2%) without water supply and 126,805 (18.6%) without electricity. The corresponding figures for Panama District were 187,729 dwellings, of which 2,558 (1.4%) without water supply and 4,343 (2.3%) without electricity.

Table D 00. Houses	with out Electricit		Water Cumply	
Table B-23. Houses	without Electricit	y and without	water Supply	

Dwollings	Coun	try	Panama District		
Dweinings	Number	%	Number	%	
Total dwellings	681,799	100.0	187,729	100.0	
Dwellings without electricity	126,805	18.6	4,343	2.3	
Dwellings without water supply	63,002	9.2	2,558	1.4	

Source: Censos Nacionales de Poblacion y Vivienda, 14 de mayo de 2000, Volumen I, Tomo I, Direccion de Estadistica y Censo, Diciembre 2001

b.1 Electricity

Three stages are clearly defined in electricity: generation, transmission, and distribution. There can be any number of electricity generators, as long as they are licensed by the Regulatory Entity of Public Services (ERSP). Transmission is monopolized by ETESA, a government corporation. Distribution is provided by regulated private companies: EDEMET and ELEKTRA in Panama District, and EDECHI.

- Empresa de Distribución Eléctrica Metro Oeste, S.A. (EDEMET), with concession area comprising western Panama City, western Panama Province, and the provinces of Coclé, Herrera, Los Santos and Veraguas.
- Elektra Noreste, S.A., (ELEKTRA), with concession area comprising eastern Panama city and Panama Province, Panama Gulf, Colon Province, as well as the isolated Darién and Kuna Yala.
- Empresa de Distribución Eléctrica Chiriquí S.A: (EDECHI), with concession areas in the Provinces of Chiriquí and Bocas del Toro. In addition, Bocas Fruit Company, generates electricity and sells it to the people of Changuinola, Guabito, Almirante and Las Tablas in the Bocas del Toro Province, by virtue of a legal contract which authorizes the company to sell electricity without having a concession area for distribution.

In the year 2000, the number of clients was 513,638, of which 504,025 were served by the companies with concession for distribution. The remaining 9,613 were served by Bocas Fruit Company. The number of clients in 1999 was 485,051, which implied a growth of 5.9% in 2000, while the growth of 1999 over 1998 was 5.3%.

In the year 2000, EDEMET served 48% of clients, with 241,384, or 5.5% more than in 1999. ELEKTRA served 187,092 clients, or 37%, equivalent to a 7% growth in a year. EDECHI served 15% or 75,549 clients, 4.6% more than the previous year. Bocas Fruit served 2% of clients.

Panama Province concentrated 289,523 clients, or 57% of total. Chiriquí was second with 73,858 clients (14% of total). Coclé, Colón and Veraguas, each comprised around 6% of clients. Herrera and Los Santos accounted for 5% and 3% of clients, respectively. Provinces with low electrification were Bocas del Toro, Darién and Comarca San Blás, adding up to around 3% of clients.

Sales by the three distribution companies in the year 2000 reached 3,796,770 MWh, equivalent to a 7.8 % growth over the previous year sale of 3,521,370 MWh. This growth rate was higher than the historical cumulative yearly growth rate of 5.7%.

EDEMET with 1,926,873 MWh accounted for 50% of total, followed by ELEKTRA with 1,553,950 MWh, or 41%, while EDECHI with 315,950 MWh accounted for 8% of total. Bocas Fruit Company accounted for 1%, or 40,000 MWh.

Electricity consumption in the country is concentrated in the cities of Panamá and Colón, and surrounding areas, which account for around 56% of the total population of the country. In addition, these are the areas with main commercial and industrial activities. Approximately 73% of electricity, or 2,761,644 MWh, is consumed in Panama, while Colón accounts for 310,229 MWh, or 8% of total electricity consumption of the country.

The Provinces of Coclé, Los Santos, Herrera and Veraguas consume 355,208 MWh, (approximately 9%), and the Provinces of Chiriquí and Bocas del Toro together consume 324,649 MWh, or 8% of total.

Electricity consumption in the country in the year 2000 showed the following distribution: 42% commercial, 29% residential, 16% public sector, and 13% industrial. Electricity consumption in the industrial sector grew 3.2% in 1998 and 7.0% in 1999, but declined 3.2% in 2000, resulting in an overall yearly growth rate of 1.5% between 1996 and 2000. During the said period, the growth of electricity consumption by sector, as compared with the yearly growth rate of total electricity consumption (5.2%), was lower in the industrial sector (1.5%), while higher in the commercial sector (8.6%) and residential sector (5.3%).

Around 38% of residential clients consume up to 100 kwh/month; 32% consume between 101 and 200 kwh/month, 23% between 201 and 500 kwh/month. This leaves only 6% as consumers of more than 500kwh/month. A monthly consumption of 100 kwh is considered as barely enough for basic needs like lighting in the house.

Most EDEMET and EDECHI clients are low consumers of electricity, while 24.8% of ELEKTRA clients consume between 0 and 100 kWh/month, 68% between 101 and 500 kWh, and 7.6% consume more than 500 kWh/month.

In EDEMET, 41% of low consumption residential clients (less than 100 kWh/month) consume only 8.17% of electricity sold, while 7.64% of high consumption residential clients (more than 501 kWh/month) consume 45.9% of electricity sold. In EDECHI, around 50% of residential clients are consumers of 0 to 100 kWh/month and account for 17% of sales; while 2.1% of consumers of more than500 kWh/month account for 15.8% of sales. In ELEKTRA, consumers of less than 200 kWh/month represent 25% of sales, 46% of clients consume

between 201 and 500 kWh/month, and approximately 29% of clients consume more than 500 kWh/month.

Large consumers, defined as those consuming more than 500KW per site (Law 6 of February 3, 1997), have the option of bypassing the distribution companies to buy electricity directly from generating companies. Distribution companies try to keep large consumers by setting prices low, while generating companies try to entice large consumers with even lower prices. The goal of this policy is to stimulate competition and efficient operation.

A new tariff will take effect in July 2002. The procedure for introducing a new tariff is "public consultation" in which any interested party (consumer) can send in opinions through any means (letter, fax, e-mail) during a given period, say 30 days. A more formal procedure is called "public audience" in which interested parties are required to register in advance, so as to be allowed to attend a meeting on a set date when they can present their arguments. These consumer opinions are taken into consideration and a corrected tariff is formulated and proposed to the consumers.

The cut-off of electricity service is contemplated in Law 6 of February 3, 1997, as a measure that can be applied when a customer is 60 days late in payment. In addition, electricity distribution companies had to resort to special wires that are difficult to tamper with, in order to avoid illegal connections.

Electricity tariff

The tariff structure of electricity distribution companies used to be classified as residential, commercial, industrial, and government. However, starting in 1998, electricity tariff is classified by consumption levels and voltage, as follows.

i. Tariff for Clients Connected to Low Voltage

These tariffs correspond to voltage of up to 600 volts, and are classified by consumption levels.

Simple Tariff (BTS): for clients whose demand is up to 10kW per month.

Tariff with Maximum Demand (BTD): for clients whose demand exceed 10kW per month.

Tariff per Hourly Block (BTH): for clients who request different prices depending on time of supply, peak or off-peak.

ii. Tariff for Clients Connected to Medium Voltage

These tariffs correspond to voltage of more than 600 volts and less than 115 kilovolts, and are classified as follows.

Tariff with Maximum Demand (MTD): for clients who request it.

Tariff per Hourly Block (MTH): for clients who request different prices depending on time of supply, peak or off-peak.

iii. Tariff for Clients Connected to High Voltage

These tariffs correspond to voltage of more than 115 kilovolts, and are classified as follows.

Tariff with Maximum Demand (ATD): for clients who request it.

Tariff per Hourly Block (ATH): for clients who request different prices depending on time of supply, peak or off-peak.

Voltage	Unit	EDEMET	ELEKTRA	EDECHI
Tariff for Low Voltage				
SimpleTariff (BTS1): = o < 100 kWh				
Fixed charges for first 10kWh	B/client/mo.	1.66	1.65	1.66
Additional charges: 11 to 100 kWh	B/kWh	0.10823	0.10712	0.10623
Simple Tariff (BTS2): > 100 kWh				
Fixed charges for first 10kWh	B/client/mo.	1.66	1.65	1.66
Additional charges: 11 to 100 kWh	B/kWh	0.12492	0.11619	0.10623
Tariff with Maximum Demand (BTD)				
Fixed charges for first 10kWh	B/client/mo.	3.04	3.02	3.04
Additional charges: 11 to 100 kWh	B/kWh	0.08669	0.07784	0.07794
Charges for maximum demand	B/kW/mo.	8.00	8.57	6.82
Tariff per Hourly Block (BTH)				
Fixed charges for first 10kWh	B/client/mo.	4.06	4.03	4.05
Additional charges: 11 to 100 kWh	B/kWh	0.08436	0.07784	0.07793
Charges for maximum demand peak	B/kW/mo.	16.58	12.00	0.85
Charges for maximum demand off-peak	B/kW/mo.	3.06	2.33	11.67
Tariff for Medium Voltage				
Tariff with Maximum Demand (MTD)				
Fixed charges	B/client/mo.	6.09	5.04	5.07
Additional charges	B/kWh	0.08105	0.07136	0.06189
Charges for maximum demand	B/kW/mo.	9.99	9.07	1.27
Tariff per Hourly Block (MTH)				
Fixed charges	B/client/mo.	6.34	5.54	5.57
Additional charges	B/kWh	0.08105	0.07136	0.06189
Charges for maximum demand peak	B/kW/mo.	14.01	12.93	0.33
Charges for maximum demand off peak	B/kW/mo.	1.21	1.11	2.31
Tariff for High Voltage				
Tariff with Maximum Demand (ATD)				
Fixed charges	B/client/mo.	6.09	5.04	5.07
Additional charges	B/kWh	0.06586	0.05528	0.04612
Charges for maximum demand	B/kW/mo.	10.08	9.42	-0.30
Tariff per Hourly Block (ATH)				
Fixed charges	B/client/mo.	6.34	5.54	5.57
Additional charges	B/kWh	0.06586	0.05528	0.04612
Charges for maximum demand peak	B/kW/mo.	12.39	11.55	-0.76
Charges for maximum demand off peak	B/kW/mo.	0.64	0.46	0.12

Source: Ente Regulador de los Servicios Públicos

The following table shows income by distribution company and type of tariff for the year 2000.

Tariff Type	EDEMET	ELEKTRA	EDECHI	TOTAL
BTS	98,217,621	72,775,379	16,495,216	187,488,216
BTD	112,153,924	66,169,862	10,887,174	189,210,960
BTH	17,503	344	0	17,847
MTD	19,218,435	27,640,047	3,529,050	50,387,532
ATD	0	2,328,089	0	2,328,089
TOTAL	229,607,483	168,913,721	30,911,440	429,432,644

Table B-25: Income by Company and Tariff in 2000 (Balboa)

Source: Ente Regulador de los Servicios Públicos

It can be seen that EDEMET accounted for 53.5% of income in 2000, ELEKTRA for 39.3%, and EDECHI for 7.2%. On the other hand, low voltage consumers comprised 87.7%, medium voltage consumers 11.7%, and high voltage consumers only 0.5%.

b.2 Water

Water consumption in the country in the year 2000 amounted to 62,807 million gallon, distributed in 73% residential, 15% commercial, 10% public sector and 2% industrial. Panama District accounted for nearly 70% of water consumption of the country.

The cut-off of water supply service as a coercion measure is contemplated in Decree Law 2 of January 7, 1997.

ERSP has in its registry 9 providers of water supply and sewerage services, including Bocas Fruit Company, Municipality of Boquete, Water Committee of Gualaca, and a few urbanization and resort companies (Urbagona, Altos de Vistamares, Costa Esmeralda, Punta Chame Turistica). User charges vary from fixed monthly rates, regardless of water consumed, to charges that vary in relation to water quantity consumed.

IDAAN Water Charges

IDAAN water charges have not varied for about 20 years. The following definitions apply to IDAAN.

- Minimum Consumption: fixed charges applied when consumption is lower than the minimum.
- Basic Consumption: charges applied to consumption restricted to 10,000 gallon/month.
- Additional Charges: charges applied to every 1,000 gal in excess of basic consumption.
- Tariff 20: charges applied to residential customers in Panama, Colon and Arraijan.
- Tariff 21: charges applied to residential, special and marginal areas in the country.
- Tariff 22: charges applied to residential customers in urban areas other than Panama, Colon, Arraijan.
- Tariff 23-24: charges applied to Commercial-Industrial customers.
- Tariff 25-26: charges applied to the government.

User Type	Charges	Monthly Water Consumption	Monthly Tariff
Residential Panama-Colon	Minimum	8,000 gal	B/ 6.40
–Arraijan Tariff 20	Basic	10,000 gal	B/ 8.00
Residential other urban areas	Minimum	8,000 gal	B/ 5.68
Tariff 22	Basic	10,000 gal	B/ 7.10
Special residential at national level	Minimum	6,000 gal	B/ 4.26
Tariff 21	Basic	10,000 gal	B/ 7.10
Commercial-Industrial	Basic	10,000 gal	B/11.50
Tariff 23-24			
Government	Basic	10,000 gal	B/ 8.00
Tariff 25-26			

Table B-26: IDAAN Fixed Charges by Customer Type

Source: Ente Regulador de los Servicios Publicos

Differential Tariff: additional charges applied when consumption exceeds 10,000 gal

(JD-1506 of Regulatory Entity, August 18, 1999)

Table B-27. IDAAN Diff	erential Tariff	Applicable to	Tariff 20
TADIE D-21. IDAAN DIII		Applicable it	7 Tanin 20

User Type	Monthly Consumption	Charges
Residential Panama, Colon,	First 10,000 gal	B/ 8.00/month
Arraijan	10,001 - 15,000 gal	B/ 1.36 per 1,000 gal
Tariff 20	15,001 - 20,000 gal	B/ 1.51 per 1,000 gal
	20,001 - 30,000 gal	B/ 1.62 per 1,000 gal
	30,001 - 50,000 gal	B/ 1.67 per 1,000 gal

Source: Ente Regulador de los Servicios Publicos

Table B-28 [.]	ΙΠΑΑΝ Γ	Differential	Tariff Ap	plicable to	Tariff 21
			runn / ip		

User Type		Monthly Consumption	Charges
Special housing (marginal		First 10,000 gal	B/ 7.10/month
areas)		10,001 - 15,000 gal	B/ 1.36 per 1,000 gal
Tariff 21		15,001 - 20,000 gal	B/ 1.51 per 1,000 gal
	20,001 - 30,	20,001 - 30,000 gal	B/ 1.62 per 1,000 gal
		30,001 - 50,000 gal	B/ 1.67 per 1,000 gal

Source: Ente Regulador de los Servicios Publicos

Table B-29: IDAAN Differential	Tariff Applicable to	Tariff 22
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User Type	Monthly Consumption Charges	
Other urban areas	First 10,000 gal	B/ 7.10/month
Tariff 22	10,001 - 15,000 gal	B/ 1.36 per 1,000 gal
	15,001 - 20,000 gal	B/ 1.51 per 1,000 gal
	20,001 - 30,000 gal	B/ 1.62 per 1,000 gal
	30,001 - 50,000 gal	B/ 1.67 per 1,000 gal

Source: Ente Regulador de los Servicios Publicos

User Type	Monthly Consumption	Charges
Commercial-Industrial and	First 10,000 gal	B/11.50/month
High Consumption	10,001 - 100,000 gal	B/ 1.51 per 1,000 gal
Residential and Government	100,001 - 150,000 gal	B/ 1.70 per 1,000 gal
Tariff 23-24	150,001 - 200,000 gal	B/ 1.81 per 1,000 gal
	Over 200,000 gal	B/ 1.6225 per 1,000 gal

Table D 201	IDAAN Difforon	tial Tariff An	nligghla ta	Tariff 22 21
I ADIE D-SU.	IDAAN DIIIEIEII	liai Tahin Ad		1 al III 23-24

Source: Ente Regulador de los Servicios Publicos

User Type	Monthly Consumption	Charges
Government	First 10,000 gal	B/ 8.00/month
Tariff 25-26	10,001 - 15,000 gal	B/ 1.36 per 1,000 gal
	15,001 - 20,000 gal	B/ 1.51 per 1,000 gal
	20,001 - 30,000 gal	B/ 1.62 per 1,000 gal
	30,001 - 100,000 gal	B/ 1.67 per 1,000 gal
	100,001 - 150,000 gal	B/ 1.70 per 1,000 gal
	Over 150,000 gal	Same as Tariff 23-24

Table B-31: IDAAN Differential Tariff Applicable to Tariff 25-26

Source: Ente Regulador de los Servicios Publicos

The above tables show that even though the IDAAN tariff structure has not changed for about 20 years, the introduction of "differential tariff" in August 1999 made it a progressive tariff. This means that high consumers pay more, which is a mechanism to encourage rational resource use and conservation.

B.5 Environmental Policy

B.5.1 General Review

a. The Constitution

The basis for environmental legislation and policies in the Republic of Panama is the country's Constitution, which was modified in 1972 and again in 1983. Articles 114 to 117 of this main statute relate to the quality of the environment, establishing that environmental protection is a responsibility of the State. Article 114 states that it "is a fundamental duty of the State to guarantee that the population lives in a healthy environment, free of contamination, where the air, water and food satisfy the requirements for the adequate development of human life." Similarly, Article 115 establishes that the "State and all inhabitants of the national territory have the duty of promoting social and economic development that prevents environmental contamination, maintains ecological equilibrium and avoids the destruction of ecosystems".

b. Earlier environmental legislation

Earlier environmental laws, dating from the 1960's, dealt primarily with the rational use and protection of natural resources, such as forests, fisheries and wildlife. Thus, in 1966 the first National Park was created in Altos de Campana, a National Water Commission was established to regulate the use of the waters and the Renewable Natural Resources Institutes was designated as responsible for the administration of forested lands.

c. Law 41 of July 1998

As concerns the environment and resources increased in the 1990's, and public demand for the application of impact statement tools augmented, a new major framework of General Environmental Law passed in July 1998.

Redefinition of the environmental management system

Law 41 of July 1998, the General Environmental Law of the Republic of Panama establishes the principles and norms for the protection of the environment and redefines environmental management programs. It assigns specific responsibilities to the different government entities with environmental protection and renewable natural resources management functions.

Specific designation of responsibilities

Title III of the Law delineates the State's administrative organizations for environmental management.

- 1. The National Authority on the Environment (ANAM), described below in detail.
- 2. The National Council on the Environment, which consists of three Ministers designated by the President. Its functions include recommending the national environmental policy, providing support to the National Authority on the Environment in the coordination of the Interstitutional System for the Environment.
- 3. The Interinstitutional System for the Environment, which includes all public institutions with environmental responsibilities
- 4. The National Consultative Commission on the Environment, of no more than 15 technical members from the private and public sector
- 5. Provincial and Municipal Consultative Commissions on the Environment, with technical representatives of local private and public representatives

Definition of environmental protection tools

Law 41 refers to the tools for the environmental management process, which include land use plans, environmental impact evaluation, environmental quality standards and environmental education.

Title IV of Law 41 assigns ANAM the duty of directing and coordinating the process for elaborating environmental quality standards with the participation of pertinent entities and the community. These standards are to be established by executive decrees, which shall include attainment schedules.

d. Current Environmental Policy and Major Issues

Title II of Law 41 defines environmental policy as 'the set of measures, strategies and actions established by the State that guide and modify and determine public and private sector behavior in the conservation, use and management of natural resources and of the environment.' That same title establishes that the Executive Branch shall approve, promote and oversee national environmental policy.

d.1 National Environmental Strategy

Formulation of the strategy

National Environmental Strategy addressed in Law 41 was developed through a National Consultation process, which consisted of numerous workshops at regional and country levels. Scientists, professionals and representatives from the private and government sectors participated in these consultation workshops. The process included a diagnosis of the environmental situation in Panama and the identification of future action plans. The National Council on the Environment recommended the adoption of the Strategy and the Cabinet signed a resolution approving the Strategy in May 1999.

National Environmental Strategy

The Strategy consists of seven volumes that discuss in detail the country's environmental situation as well as social, economic and other conditions that affect resource usage. Chapter IV of the Strategy, titled Environmental Policy, presents specific strategic actions that must be adopted by the State, and fundamental public environmental policies.

Strategic actions include: completing the program to modernize the economy through the globalization process, improving quality of life by fomenting social equity and strengthening the democratic system.

Fundamental public environmental policies are based on sustainable development principles as follows: valuation and conservation of the environmental patrimony, restoration of environmental resources, promotion of environmental education and development and strengthening of institutional environment management capacity.

d.2 Areas of particular concern

Panama Canal Watershed

The operation of the Panama Canal depends on the water captured and stored within its 330,000 ha watershed. The locks that lift and lower vessels to permit the transit from ocean to ocean require approximately 55 million gallons (208,175 cubic meters) of water per ship. The hydrological system of six major rivers and tributaries that drain the basin and three artificial storage reservoirs also provides water to supply the cities and communities of Panama, Colon and Arraijan. Thus, conservation of the natural resources of the Canal Watershed is critical for the long-term operation of the Canal and to adequately maintain water supplies for the metropolitan population. Law 19, which organized the Panama Canal Authority, established an Inter-institutional Commission on the Watershed to assist in the coordination for the management and conservation of the natural resources within the basin. This

Inter-institutional Commission on the Watershed is integrated by seven public and private entities in addition to the ACP.

Water requirements for both the Canal and the urban population have been increasing through the years. But the amounts that can be generated and stored by the current system are limited; thus, the ACP is in the process of evaluating projects that could be implemented to augment water supplies over the short and long term. Given that potential projects that could be developed were identified in rivers in the West of the Canal drainage basin, an area of 254,000 hectares was annexed to the existing Watershed in 1999. This additional area, known as the Western Region of the Watershed, is considered a hydrological reserve and is subject to the same management and resource protection policies as the Eastern or traditional region.

Panama Bay

Panama Bay is located on the south of Panama City, in the Gulf of Panama of the Pacific Ocean, which receives the raw wastewater from the most of the city and suffers from a serious contamination problem. It is estimated that approximately 40 million metric tons per year of untreated wastewater from households and industries are discharged into the Bay. In addition, solid wastes, often handled improperly, are dumped into creeks and rivers that flow into the Bay and contribute to the poor conditions. Consequences of this contamination lead degradation of fishery, biodiversity and tourist resources.

Since 1975, a series of studies have been conducted to define possible solutions and actions to be taken. The most recent recommendations call for the construction of a large wastewater treatment plant at the Juan Diaz River to the East of Panama City, and two smaller ones near the Canal area.

B.5.2 Organizations Concerned

a. Institutions with major environmental responsibilities

This part presents institutions concerned with environmental issues briefly. Further descriptions of organizations related with SWM are presented in *4.5.1 Institutional System for SWM*.

a.1 ANAM

National Authority on the Environment (ANAM) was created by Law 41 of 1998, under Title III, which deals with the administrative organization of the State to manage the environment. Functions assigned to ANAM include:

- Direct, supervise and execute the implementation of the government's environmental policy, strategies and programs, along with the Interinstitutional Environmental System and private organizations
- Issue resolutions and technical standards for the execution of the national environmental and renewable natural resources policy
- Evaluate environmental impact statements
- Cooperate in the preparation and execution of formal and informal environmental education programs in coordination with the Ministry of Education and specialized agencies.
- Promote public participation and the implementation of Law 41 and its regulations
- Promote technical and scientific research in coordination with the National Secretariat on Science and Technology
- Prepare the annual report on the environment and present it to the Executive Branch
- Impose sanctions and fines according to regulations issued under Law 41

a.2 ACP

The Panama Canal Authority (ACP) initiated its operations on December 31, 1999, when the Panama Canal was transferred to the Republic of Panama and the United States Federal Agency that managed the Canal, the Panama Canal Commission ceased to exist. The ACP was established by a 1994 amendment to the Constitution and was organized under Law 19, of June 1997. Its main function is to operate, manage and improve the Canal. The ACP is also responsible for managing and safeguarding the water resources of the Canal watershed. Specifically, the Agency must coordinate with other private and public entities with natural resources responsibilities in the Watershed, and must approve public and private strategies, policies, programs and projects that could affect the Watershed.

a.3 ARI

The Interoceanic Region Authority was established by Law No. 5 of February 1993 to oversee and administer properties transferred to the Republic of Panama under the 1977 Treaties according to specific objectives. To achieve delineated objectives, ARI was instructed to prepare a land use plan, which establishes the zonification of the Canal Area and its watershed. Through a series of studies, ARI developed land use and regional development plans for the canal area and Watershed, which were adopted by Law 21 of July 1997.

b. Other Organizations with Environmental Issues

b.1 Panama Municipality

The City of Panama has the legal authority to dictate measures to protect the environment throughout its 19 Corregimientos. In addition to its waste disposal responsibilities, it is charged with maintaining public parks and other green areas in the City. It also grants tree cutting permits on a case-by-case basis, following guidelines from ANAM.

b.2 Ministry of Education

Law number 10 of 24 June 1992 declares environmental education as a national strategy to preserve natural resources and the environment. Specifically the law states that the State must include environmental education in study programs at all levels of education. The law creates a National Environmental Education Commission to be coordinated by the Ministry of Education.

c. Non-Government Organizations

Non-government organizations (NGOs) with environmental concerns can be divided into two types, conservation groups and social interest societies. The major active ones are described below.

NAME	SINOPSIS
Asociación Nacional para la Protección de la Naturaleza	Founded in 1985. Conducts environmental education, agro-forestry projects, and park protection. It has several demonstration farms and education centers.
Sociedad Audubon de Panamá	Established in 1963 as a naturalist society in the former Canal Zone. Holds regular meetings and field trips, promoting environmental education.
Fundación Natura	Established in 1990 to administer an ecological trust fund created by the Government of Panama, the USAID and The Nature Conservancy. It finances and oversees conservation projects, both public and private.

Table B-32: Environmental Conservation Grou	ıр
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NAME	SINOPSIS
Centro de Estudios y Acción Social CEASPA	Conducts rural environmental social studies, with emphasis on women's participation in community projects.
Fundación para el Desarrollo de la Libertad Ciudadana	Created in 1995 to promote public participation in development projects. Main areas of interest include the Bay of Panama and the Canal Watershed.
Centro de Estudios de Acción Social	Mainly a social research organization, actively participates in the review of proposed projects and legislation.
SONDEAR	Formerly Technoserve, provides technical assistance to rural communities, primarily in the Canal Watershed.

B.5.3 Environmental Impact Evaluation Process in the Country

a. Initial applications of environmental impact tools

The first environmental impact studies conducted in the Republic of Panama were prepared in connection with major development projects that affected large areas and attracted international attention, such as the hydropower dams at Bayano in 1973 and Fortuna in 1976. The impact study for the Bayano Dam consisted primarily of a socioeconomic assessment and an evaluation of insect vector conditions, while the Fortuna impact studies included fauna and flora inventories as well as socioeconomic reviews of the relatively small human population affected.

Since the mid 1980s the World Bank, the Inter- American Development Bank and other multilateral lending institutions began requiring environmental impact evaluations of all projects financed by them. Thus it was established that impact studies would be conducted

for roads, bridges, and other infrastructure improvements projects constructed with loans from international assistance agencies.

However there were no specific requirements as to how such studies should be prepared or as to how the follow-up of implementation of mitigation measures should be conducted.

a.1 First general guidelines

First regulatory guidelines were issued in 1995, under a requirement established by the Forestry Law of 1994. These guidelines contained a list of aspects that had to be contemplated in the impact study, criteria to determine if a study was necessary and a list of projects that required impact studies. The requirement that persons or firms that prepare impact studies had to be registered in the Institute of Renewable Natural Resources was also established.

a.2 Major deficiencies

One of the major problems associated with the application of environmental impact tools is that such studies have been conducted to comply with requirements and not as elements of the planning process. In addition, project stakeholders have taken advantage of deficiencies in impact studies to delay execution of projects they do not favor.

Perhaps the major fault with the impact review process has been the lack of follow-up in the application of mitigation measures. Projects that sometimes were approved on the basis of mitigation measures sometimes never apply them and the identified impacts occur as would be expected. The Inter-American Development Bank and other lending institutions now require that environmental inspections be conducted in financed project. The new regulations issued by ANAM also provide specifications aiming at closing this loophole.

b. Current Environmental Evaluation Process

Title IV of the General Environmental Law, establishes that public or private activities, works or projects that could generate a risk to the environment will require an environmental impact study (EIS) before initiating their execution, in accordance with regulations to be issued by ANAM. Such regulations were published on March 2000 under Executive Decree 59 and completely modify the environmental impact evaluation process.

These regulations define the process as "an early detection system that operates in a continuous manner to protect the environment against unjustified or unforeseen damages through administrative procedures, analytical methods and mitigation and corrective measures carried out in a series of stages".

b.1 Screening and Scoping

Screening is the initial analysis to determine if a project requires the preparation of an environmental impact study and scoping is the identification of the most critical impacts that could be expected of a given project. These processes are common practice in many countries and are also contemplated in the Japan International Cooperation Agency (JICA) Environmental Guidelines. However, ANAM regulations do not describe screening and scoping as regulatory requirements. The guidelines detail methodologies based on a list of projects that require environmental impact studies and five criteria to consider in the determination of categories a given project might fall into.

b.2 Criteria to determine if an environmental impact study is required, as detailed in Executive Decree 59:

- 1. When the project generates or presents a risk to the health of the population, flora and fauna and on the environment in general
- 2. When the project generates alterations to the quantity and quality of natural resources (soil, water, flora, fauna)
- 3. When a project presents significant alterations to the qualities of an area that had justified its protection
- 4. When the project causes resettlements and alterations to human groups
- 5. When the project affects monuments, archaeological, or historic sites

b.3 Projects that require EIS

Projects that must enter the environmental impact process are listed under Title II of the regulations and this list also identifies the government agency that must receive the EIS. Projects oriented on the disposal of wastes, including landfills and waste treatment facilities, fall under the jurisdiction of the Ministry of Health (MINSA). Projects listed include:

Mining Sector and Hydrocarbon exploration and production

- Metallic and non-metallic mineral exploration
- Oil refining plants

Forestry Sector

- Forest harvesting in natural forests of more than 50 hectares
- Forest plantations of more than 10 hectares
- Forest industries
- Furniture industries

Agriculture Sector

- Sugar factories
- Alcoholic beverages production industries
- Industrial animal processing activities
- Pig raising plants
- Food processing plants
- Cattle raising facilities with more than 100 heads
- Industrial sea food processing plants

Fisheries and aquaculture Sector

- Industrial harvest of fisheries
- Shrimp farms larger than 1 hectare
- Fish farms larger than 1 hectare
- Frog farms larger 1 hectare
- Other aquatic animal (turtles, crabs, snails) farms larger than 1 hectare

Energy and Industry Sector

- Electrical energy generating plants larger than 1.0 MW
- Hydroelectric generating plants larger than 1.5
- Nuclear plants
- Iron and steel industries
- Cement plants
- Transmission lines
- Battery factories
- Cement block factories
- Industrial coffee processing

Transport Sector

- Road construction projects
- Railroad line construction projects
- Commercial ports
- Bridge construction projects
- Bus and train terminals

Waste Disposal Projects

- Construction and operation of solid waste management, treatment and final disposal systems
- Sanitary Landfills
- Installations for the final treatment of common wastes
- Safe disposal of hazardous wastes

- Sewage systems
- Depuration plants and systems
- Sludge treatment plants
- Septic tanks and treatment lagoons

Development of infrastructure

- Urban development projects
- Tourist development projects in protected areas
- Telecommunication cables
- Construction of buildings, galleys and shopping centers
- Oil pipes
- Flood prevention or irrigation reservoirs
- Marine, fluvial or coastal filling for construction

Development Plans

- Urban renewal development programs
- Forestry development plans
- Tourist development plans
- Agricultural development plans
- Industrial development plans
- Fishery development plans
- Electrical energy plans

b.4 Description of EIS categories

Projects in the list that do not generate significant environmental impacts and do not pose environmental risks can be considered as Category I types. Projects in the list that can generate negative impacts that can be easily mitigated to comply with standards fall under Category II. These projects imply partial effects on the environment, with no indirect, cumulative or synergistic impacts. Projects in the list that require a more thorough analysis because of the potential negative impacts fall under Category III.

According to the guidelines issued by ANAM on the Environmental Impact Evaluation Process, for the three Categories of projects, EIS must include the following discussions:

Required information and activities for Category I

- Description of project area, landscape, geographic location
- Project description through different stages
- Identification of impacts, risks
- A sworn statement that project does not pose significant environmental impacts and does not generate environmental risks according to the 5 environmental protection criteria.

Required information and activities for Category II

- Summary of results and findings with description of area and citizen participation plan
- Project description objectives, location, justification, stages, operation, closure, costs
- Description of negative and positive impacts
- Citizen participation plan
- Environmental Management Plan measures to mitigate impacts, surveillance and control program, risk prevention plan, contingency plan
- Citizen Participation Plan -- observations made by affected communities during information exchange
- Staff professionals in the EIS team
- Annexes

Required information and activities for Category III

- Summary of results and findings
- Project Description objectives, justification, location, design, stages, construction, operation, closure, costs,
- Description of Area of Influence land use, value, property rights, potential uses, protected areas, fauna, flora, quality of the environment, scenery, climate, geology, geomorphology, hydrology, population, demography and sociology
- Identification of Impacts positive and negative consequences of all project activities and stages, transformations of the environment, impacts (direct, indirect, cumulative, synergistic), duration of occurrence, extent
- Environmental Management Plan measures to mitigate impacts, surveillance and control program, risk prevention plan, contingency plan
- Citizen Participation Plan -- observations made by affected communities during information exchange
- Staff professionals in the EIS team
- Annexes cartography and other related information

Project promoters are made responsible for the contents of EIS and must guarantee citizen participation in the environmental evaluation process. Thus, members of the civil society can request information on the EIS and can provide observations through the public consultation process.

B.6 Other Infrastructure

B.6.1 Water Supply

Water in Panama District is served by National Waterworks and Sewerage Institute (IDAAN). 97.2% of the housings in the urban areas has drinking water and 85.5% in the rural areas. The rest of the district receives water from cistern trucks.

Almost all the urban communities of the country receive water from IDDAN, while in the rural, half of the population receive the service through the community pipeline.

The quality of the water is considered as good by most of the communities (72.2%), as average quality by 18.6% and as poor by 9%.

B.6.2 Sewage and Drainage

The sanitary system for drinking water and sewerage system are in charge of IDAAN for population of more than 1,500 people and in charge of MINSA in smaller settlements. The covering indexes are high, in relation to the Central American countries. There is insufficient treatment for sewer waters, causing serious pollution problems in the receiving bodies, especially in Panama Bay.

The natural basins that drain in the metropolitan area of Panama that is the primary receiving body of those waters and wastewater, they constitute elements of high impact in the bay.

60% of drainage system of the Panama City is connected to the system.

B.6.3 Roads and Traffic System

Panama City grew physically lengthening in extension, for the narrowness caused by the old Canal Area and Panama Bay, which has generated an extensive road infrastructure toward the northeast. The traffic problems have intensified the sustained growth of vehicles that represents 57% of the country vehicular fleet. To improve the vehicular circulation a series of road works have been built, as the two corridors bounding the city, bridges in main roads and secondary roads in big urbanization's.

The road system of the Pacific Sector of Panama District consists of primary and secondary roads supplemented by local roads. The corridors forming the main axes which work as primary roads of the urban areas, allow a great vehicular flow between the two main development poles of the multinodal system formed by Tocumen and Ancon Center and East.

The primary road network formed by North Corridor, South Corridor, Via Domingo Diaz, the new route between the North corridor and Via Domingo Diaz, José Domingo Arango and a

road parallel to the South Corridor, is supplemented with traverse roads which connect between them conforming the cross-linked system.

Panama has important ports that offer modern services to the users. The main ports are Balboa (in Panama City) in the Pacific Ocean and Cristobal (in Colon) in the Caribbean Sea. Also, in 1994 a modern port of Manzanillo was inaugurated in the coastal area of the Caribbean Sea,

Regarding airport facilities, the main air terminal is Tocumen International Airport located at 20 km of Panama City; there is also an international airport in Colon.

B.6.4 Power Supply

The electric power service is one of the services that were privatized together with telephone service. 95% of Panama District is connected to the electricity services provided by Unión FENOSA-EDEMET EDECHI (Metro-Oeste Electrical Distribution Company).

B.6.5 Telephone, Internet and others

In Panama City there is a transnational company of telephone communication and 2 cellular telephone companies, several Internet service offices, 6 newspapers, 5 television stations and several radio stations.

B.6.6 Priority Ranking of Infrastructure Investment

Within the priorities of infrastructure investments of DIMAUD, the following can be mentioned:

- Transfer of the DIMAUD offices from current place in Carrasquilla to Cerro Patacon sanitary landfill site. It is expected that the project (about 7 million dollars) is financed through the National Bank. It is considered to begin the transfer in October 2003.
- The installation of transfer stations in Tocumen, Pedregal and Chilibre (under study).
- The exploitation of solid waste for energy recovery. At present, this project is under study, and three private companies from Holland, United States and Canada are interested in this project.
- Construction of an oxidation lagoon for leachate in Cerro Patacon sanitary landfill.
- Construction of fencing and internal roads inside Cerro Patacon sanitary landfill (the construction is foreseen to begin this year).

The Municipality of Panama has as priority the following work:

• Construction or purchase of a building to replace the Municipality offices from current place in EDEM building to a place between Colon and Avenue B.

Annex C

Field Survey

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C Field Survey

C.1 Waste Amount and Composition Survey

Waste Amount and Composition Survey (WACS) is actually divided into two parts, i.e.,

- Waste Amount Survey, and
- Waste Composition Survey.

Objectives, methodologies and results are separately described in each part and findings are discussed together in the subsequent section.

C.1.1 Waste Amount Survey

a. Objectives

The objectives of Waste Amount Survey is to know current waste generation rates of households, commercial entities, institutions, markets and street sweeping in the Study Area. Knowledge of the waste generation rate is essential for the development and design of integrated solid waste management systems.

The data of waste generation rates obtained in this survey is then applied to elaborate the waste stream that is used to comprehend the current flow of waste and to make future projections in the Study Area.

b. Methodology

b.1 Wastes Targeted

The survey covers household, commercial, institutional, market and street sweeping wastes. Waste generation sources were selected through consultation with a local contractor in order to reflect the present situation of the Study Area to the survey.

b.2 Questionnaire Survey

Questionnaire survey was also conducted to know the number of residents in houses, the number of employees in commercial and institutional entities, the number of stalls in markets, and conditions of recycle of these waste generation sources.

b.3 Survey Schedule

The survey was conducted in two seasons (from January 2002 to February in the dry season, July 2002 in the rain season). The first day of the survey was used as a trial run. Then, the sources had a chance to discharge waste accumulated before the survey started, and the sources and surveyors could get used to the survey.

b.4 Waste Generation Sources

Table C-1 shows the categories, the number of waste generation sources, the survey days and the number of samples in each category. The categories were 8, the waste generation sources were 80, and the total number of samples was 560 in respective seasons.

Category		Number of sources	Survey days	Number of samples
	High	20	7	140
Residential	Middle	20	7	140
	Low	20	7	140
Commorcial	Restaurant	5	7	35
Commerciai	Others	5	7	35
Institutional		5	7	35
Market		3	7	21
Street sweeping		2	7	14
Total		80	_	560

Table C-1: Number of Sources and Samples

Households were categorized into 3 groups according to income level, i.e., high, middle, and low income, in order to reflect living conditions in the Study Area, and the sources were distributed in 12 Corregmientos. Classification of income level was not based on actual income. It was based on observation on houses and areas where sources are located.

Income level	Name of Corregmiento
High Income	Paitilla, EL Cangrejo, Marbella, Curundu Altos
Middle Income	L. Cresta, Bethania, L.Radial, P.Lefevre
Low Income	Tocumen, Curundu, Chorrillo, Alc Diaz

Table C-2: Distribution of Sources (Households)

Commercial entities were divided into two groups, i.e., restaurant and other, due to the difference of amount and character of waste generated from them. Schools, public institutions were chosen as waste generation sources of the institutional waste. Municipal markets (Mercado Municipal de San Felipe, Mercado Municipal de Abastos) were selected to obtain the market waste.

Manually swept streets were chosen as sources of street sweeping waste because the manual sweeping method dominates street sweeping in the Panama municipality.

c. Results

c.1 Household Waste Generation Rate

140 samples for each income level, 420 samples in total, were obtained for the 7days in dry and rain season respectively (total number of samples are 840). Results of survey are shown in the table below.

		Dry season	Rain season	Overall
	Number of samples	140	140	280
ne	Effective number of samples	140	137	277
	Maximum value (g/person/day)	5,000.0	10,995.0	10,995.0
h ir	Average value (g/person/day)	566.1	972.2	766.9
Hig	Minimum value (g/person/day)	20.3	20.3	20.3
	Standard deviation (g/person/day)	677.6	1,404.8	1,115.8
4)	Number of samples	140	140	280
ш	Effective number of samples	140	130	270
inco	Maximum value (g/person/day)	2,897.7	7,301.0	7,301.0
alle	Average value (g/person/day)	586.2	575.1	580.8
۸id	Minimum value (g/person/day)	16.5	31.3	16.5
4	Standard deviation (g/person/day)	499.5	746.0	629.1
	Number of samples	140	140	280
ne	Effective number of samples	140	139	279
Low incor	Maximum value (g/person/day)	5,256.0	1,517.0	5,256.0
	Average value (g/person/day)	429.4	344.4	387.1
	Minimum value (g/person/day)	24.3	37.8	24.3
	Standard deviation (g/person/day)	569.8	287.3	452.9

Table C 2.	Deculte of	Concretion	Data (C	of Llouis a hald	\//ooto
1 able C-3	Results of	Generation	Rales	Shirvey	OF HOUSEDOID	vvasie
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Those were statistically analyzed as below. Consequently, generation rate for each income level was estimated as shown in Table C-4.

Waste generation rate of 95% reliable value calculated by the following formula.

$$R_{95} = \overline{x} \pm 1.96 \left(\frac{\sigma}{\sqrt{n}}\right)$$

where R_{95} : 95% reliable value

x : average value

 σ : standard deviation

	High income	Middle income	Low income
Standard deviation (g/person/day)	1,115.8	629.1	452.9
Total number of samples (nos.)	280	280	280
Effective number of samples (nos.)	277	270	279
95 % reliable value (g/person/day)	±131.4	±75	± 53.1
Maximum value (g/person/day)	898.3	655.8	440.2
Average value (g/person/day)	766.9	580.8	387.1
Minimum value (g/person/day)	635.5	505.8	334.0

Table C-4: E	Estimation o	f Generation	Rate of	f Household	Waste
		Conoration	1 (010 0)	11000011010	110000

c.2 Commercial, Institutional, Market and Street Sweeping Wastes

The following table shows the waste generation rates of commercial, institutional, market and street sweeping wastes.

		Number of samples (nos.)	Effective number of samples (nos.)	Standard deviation (g/employee /day)	95 % reliable value (g/employee /day)	Maximum value (g/employee /day)	Average value (g/employee /day)	Minimum value (g/employee /day)
ant	Dry season	35	34	5,927.0	1992.3	10,588.8	8,596.5	6,604.2
staur	Rain season	35	33	2,513.3	857.5	4,938.6	4,081.1	3,223.6
Re	Overall	70	67	5,079.4	1216.3	7,588.8	6,372.5	5,156.2
cial	Dry season	35	35	1,915.1	634.5	2,644.6	2,010.1	1,375.6
nmer	Rain season	35	35	2,131.4	706.1	2,532.4	1,826.3	1,120.2
Col	Overall	70	70	2,013.6	471.7	2,389.9	1,918.2	1,446.5
uo	Dry season	35	35	163.0	54.0	239.0	185.0	131.0
stituti	Rain season	35	35	165.6	54.9	271.1	216.2	161.3
sul	Overall	70	70	163.8	38.4	239.0	200.6	162.2
÷	Dry season	21	21	2,133.8	912.6	4,123.1	3,210.5	2,297.9
larkeı	Rain season	21	21	2,178.0	931.6	6,077.6	5,146.0	4,214.4
2	Overall	42	42	2,344.0	708.9	4,887.2	4,178.3	3,469.4

Table C-5: Generation Rate of Commercial, Institutional and Market Wastes