COUNTRY PROFILE ON ENVIRONMENT

PANAMA

FINAL REPORT

November 1998

JAPAN INTERNATIONAL COOPERATION AGENCY

USERS GUIDE: Contents of the Report

This report consisted of the following Chapters on environmental information of the country.

1. Keywords of the Environment

Various features and principal environmental issues and their related matters of the country are schematized within 1 page to easily understand the country's natural and social environmental issues on the whole.

2. Fact Sheet

Principal indices and natural and social environmental characteristics of the country such as economy, demographic statistics, socio-economic conditions, various important resources available in the country are described.

3. Institutional Context

3.1 Environmental Agency

Matrix table on governmental agencies related to the environmental issues in the Chapter 4 is described to grasp the role of the agencies easily. Responsibilities and organizational structure of the principal responsible agency for the environment, and responsibilities of related agencies are explained. Main activities of the various environmental non-governmental organizations are described in the table.

3.2 National Environmental Policy

Environmental policy of the country such as national environmental action plan is explained.

3.3 Environmental Laws and Regulations

Environmental laws and regulations of the country including their status of applications are described.

4. State of the Environment

In this Chapter, status of the various environmental issues as follows are covered with information on related agencies, related standards, laws and regulations, examples of the issue are explained. In the section 4.3, other kind of considerable environmental issues in the country are described based on the report which local consultant prepared.

4.1 Air Pollution	4.7 Waste Water Management
4.2 Water Pollution	4.8 Forest Conservation/Desertification
4.3 Other Pollution	4.9 Biodiversity
4.4 Waste Management	4.10 Natural Resource Management
4.5 Energy Conservation and Alternative Energy	4.11 Natural Disaster
4.6 Water Supply	4.12 Environmental Education

5. International Relationship

Status of the implementation of the economic and technical assistance projects in the country are outlined. International conventions and agreements on environment which the country agreed and ratified are listed up in section 5.1, and environmental projects which are funded and/or implemented in the country by donor countries and international organization in the section 5.2. In addition, location map of the project funded and implemented by using the Official Development Assistance (ODA) of Japanese government are showed.

6. Sources of Information

Governmental environmental agencies related institutions and NGOs are listed with the some information such as contact address and e-mail address.

7. References

References used in the report are listed.

Table of Contents

1. KEYWORDS OF THE ENVIRONMENT

1.1 Features of the Country

Related pages

①Gross Domestic Production(GDP)

US$2,587 per capita (Japan : US$33,857, China : US$361) => 2. Fact Sheet p.3
Total: US$6.6 billion

②High-concentrated Urban Population

Urban population rate: 53% (Panama province: 48%) => 2. Fact Sheet p.3
Total population: 35 million, Urban population: 26 million => 4.1, 4.2, 4.4

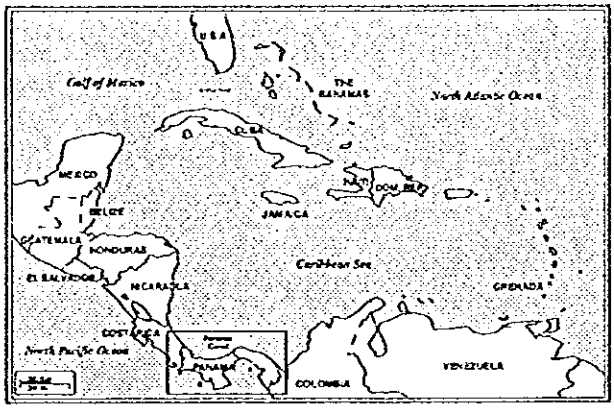
③Reversion of Panama Canal

Reversion from U.S. in the end of 1999 => 2. Fact Sheet p.3
=> Panama manages any pollution in the Canal after the reversion.

1.2 Keyword of Environmental Issues

	Related page
① Urban pollution	
· Air pollution and noise by automobiles	4.1 p. 11, 4.3 p. 15
· Sanitary condition for illegal settlement	4.2 p. 13
· Industrial effluent and wastes	4.2 p. 13, 4.4 p.17
② Water pollution	
· Industrial effluent	4.2 Water pollution p. 13
· Cyanide contamination of rivers (mining activity)	4.2 Water pollution p. 13
· Contamination in Panama bay (domestic, industrial), navigation sources)	4.2 Water pollution p. 13
· Sedimentation by soil erosion and deforestation	4.3 p. 15, 4.8 p. 20
③ Soil degradation	
· Inappropriate agricultural methods	4.3 Soil degradation p. 15
· Deforestation	4.8 Forest conservation p. 20
④ Loss of biodiversity	
· Proected areas	4.9 Biodiversity p. 21
· Deforestation	4.8 Forest conservation p. 20

Republic of Panama



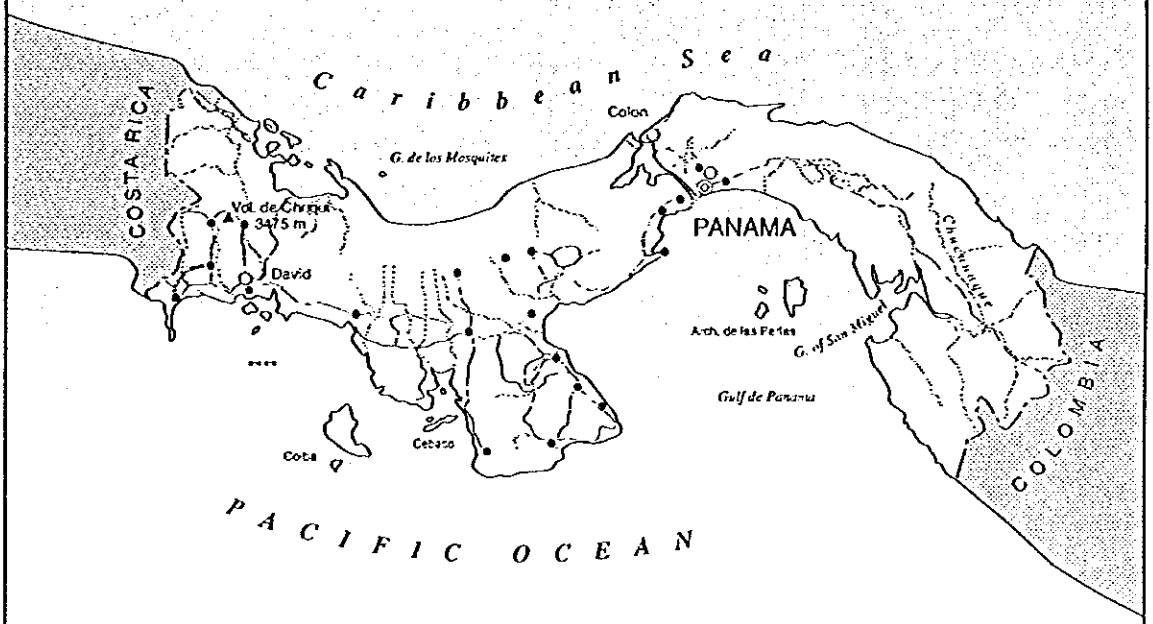


Figure 1 Location of Panama

Source: Data Atlas 1994 - 1997

2. FACT SHEET

2.1 Socio-economic Index

Index	Data	Data year	Reference
Population	2.63 million (annual average incremental rate : 1.9% (1990~95))	1995	b)
Race	Mixed blood with black and Caucasians 95%、black person 13%、Caucasians 11%、aborigines10%	no information	d)
Religion	Catholicism	no information	d)
Literacy rate	Adult female : 88%　Adult male : 89%	1990	b)
Urban Population rate	53% (1.4 million)	1995	b)
Life expectancy	73 (1990~1995 average)	1990-95	b)
Under-5 mortality rate	20 (per 1,000)	1993	b)
GNP*1	$6,599 million ($2,600/person)	1993	b)
GDP*1	$6,565 million ($2,587/person)	1993	b)
GDP structure	Agriculture : 10%　Industry : 18%　Service industry & others : 72%	1993	b)
Prime industry	Tobacco, garments, food processing	1996	d)
Prime resource	Mahogany, copper, rice, banana, cacao, corn, coconut, sugar cane, fish	1996	d)
Safe water (% of population with access) *2	Urban : 100%　Rural : 100%	1980-1995	b)
% of sewered population *3	Urban : 100%　Rural : 73%	1980-1995	b)
Human Development Index (HDI)	0.864 (World rank 45, GDP per capita rank 59 in same year)	1994	c)

*1 : The estimated value of the GNP was exchanged and adjusted from local currency into US$ by means of 3-year average of exchange rates. The estimated value of the GDP was presented in US$ of 1993 based on the exchange rate.

*2 : "Safe water" includes treated surface water, and untreated water which is pumped up from protected spring / excavated well and sanitary well.

*3 : "Sewered population" should be met conditions that the population in urban area can use public sewerage and indoor facility such as dug hole outdoor toilet, pouring water toilet, private sewerage system, public community toilet, and similar facilities, and that the population in rural area can use dug hole outdoor toilet, pouring water toilet, or other proper treatment methods.

2.2 Geographical Characteristics

Area : 75,517 km2 (almost same as Hokkaido in Japan)
Geographical features : 1) 70% of land is lowland and hill less than 70 m high, 2) width of the country: 50 km at the narrowest point, 190 km at the widest point
Highest place : Volcan Baru(Vol. De Chriqui, 3,475 m, dead volcano)

Source: a), f)

2.3 Meteorological Characteristics

Climate : marine tropical (constant, moderately high temperature all year round, abundant rainfall, high humidity)
Season: Dry season (mid-December – April), Rainy Season (May – December)
Average temperature : 27.7°C(minimum: 21.2°C, maximum 34.3°C)
Average annual rainfall : (see the next column), 90% rainfall during rainy seaon
Climatic classification : 1) Very humid tropical: western section of the Caribbean versant and Valiente Peninsula of the Bocas del Toro province, rainfall: 6,000 mm/year, 2) Humid tropical: most widespread in the country, rainfall: 5,000 mm/year, 3) Dry tropical: coastal regions of the eastern part of the Gulf of Panama, rainfall: below 1,500mm/year, 4) Very humid temperature: highland of the Bocas del Toro and Chiriqui province, rainfall: 7,000 mm, 5) Humid temperature: regions of Veraguas, Panama, Colon, San Blas and Darien province

Source: a)

2.4 Ecological Characteristics

Biogeographical feature: (see Section 4.9)
Identified animals and plants(no. of species) : mammal(225), bat(120), rodent(54), bird(929), amphibians and reptile(400), plant(8,000-10,000)　(see Section 4.9 in detail)
Protected area(no. of places) : total 22,000 km2(see Section 4.9 in detail) 1) National park(14), 2) Forest reserve(9), 3) Wildlife refuge(9), 4) Protective forest(2), 5) Moist soil of International significance(4), 6) Natural monument, 7) Natural area(1), 8) Recreation area(2), 9) Hydrological reserve(1), 10) Wild area(1), 12) Biological corridor(1)

Source: a)

2.5 Hydrological Characteristics

Main river: Chucunaque Lakes: (no information)

Source: a)

2.6 Land Use

Activity	Area (km^2)	%
Forest	33,916	44.0
National parks and reserves	9,250	12.0
Stubble fields	11,177	14.5
Mangrove swamps	3,006	3.9
Agriculture	2,313	3.0
Pasture for cattle-raising	15,417	20.0
Agroindustries	1,156	1.5
Villages and cities	231	0.3
Lakes	385	0.5
Roads (concrete, asphalt, earth)	85	0.11
Canal Area	146	0.19
TOTAL	77,082 *	100.0

* Total land area of the Panamanian territory was revised, and it is now 75,517 km^2.
Source: MINSALUD, 1995, page 197.

3. INSTITUTIONAL CONTEXT

National Environment Authority (ANAM) was created in July, 1998. However, environmental management in Panama is carried out at the multi-sectoral level, and its responsibility is shared by various ministries, autonomous and semi-autonomous institutions, municipalities, civil society, and organized groups.

The lack of adequate coordination among them, has made it difficult to enforce existing legislation, as well as its revision and updating, and also it has had a negative impact on resource allocation, because they sometimes perform the same tasks since they do not have enough information about the activities conducted by others.

Up to present, environment-related legislation in Panama has been made up by a large number of scattered, mostly-outdated laws, which are barely observed, because of the lack of a well-defined administrative body to monitor their compliance. Another reason why environment laws and regulations have not been fully respected, is the lack of a clear definition of fines imposed on environmental damages.

Source: a)

3.1 Environmental Agency

3.1.1 Governmental Agency

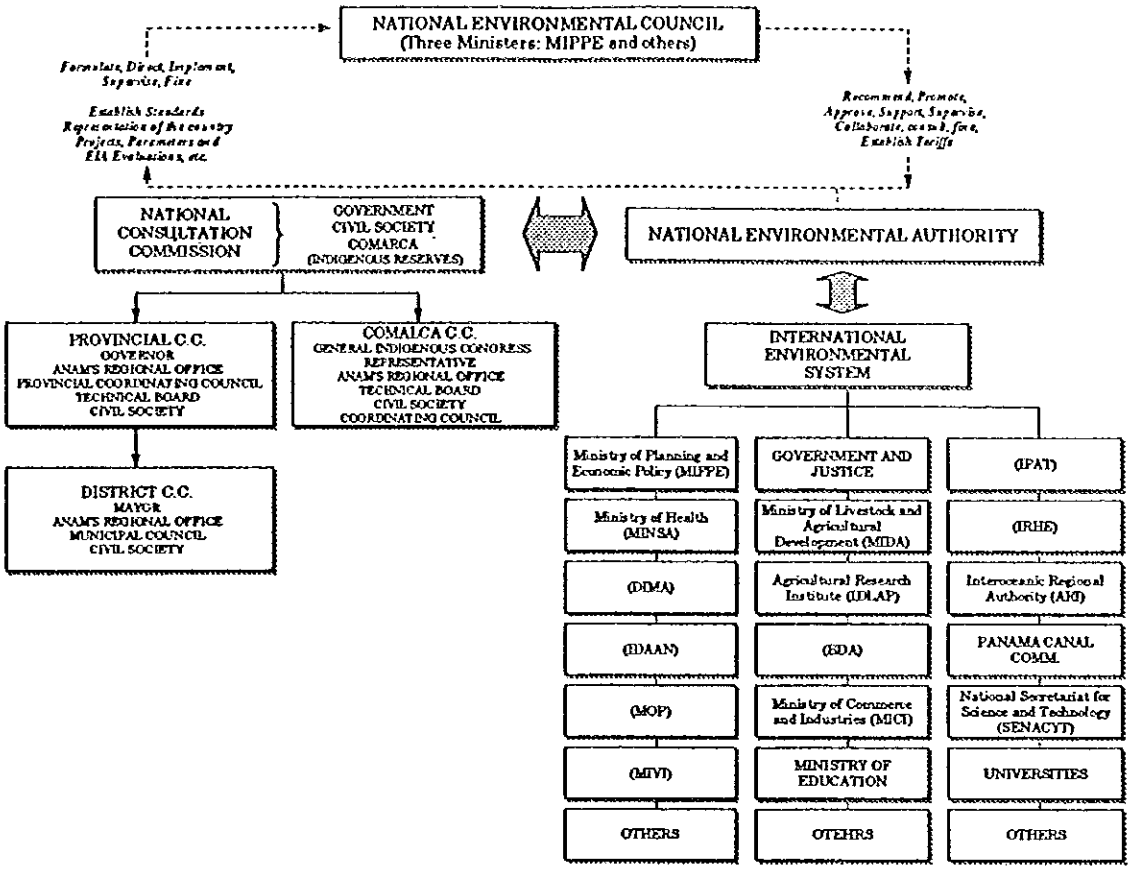
(see "6. SOURCES OF INFORMATION" on each agencies and its contact address.)

Governmental Agency \ Environmental Issues (Each No. consist with Section No.)	4.1	4.2	4.3		4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12
	Air pollution	Water pollution	(1) Noise	(2) Land	Waste	Energy	Water Supply	Waste Water	Forest	Biodiversity	Resources	Disaster	Education
National Environmental Authority (ANAM)	○	—	—	na	—	—	—	—	—	○	—	—	○
Ministry of Health (MINSA)	○	○	—	na	○	—	○	○	—	○	○	○	—
Ministry of Public Works (MOP)	—	○	○	na	○	—	—	○	—	○	○	○	—
Ministry of Commerce and Industries (MICI)	○	—	—	na	—	—	—	—	—	○	○	—	—
National Water and Sewage Institute (IDAAN)	—	○	—	na	○	—	○	○	—	○	○	○	—
Ministry of Livestock and Agricultural Development (MIDA)	—	—	—	na	—	○	—	—	—	○	○	—	—
Ministry of Housing (MIVI)	—	—	○	na	—	—	—	—	—	—	—	—	—
Metropolitan Cleaning Department (DIMA)	—	—	—	na	○	—	—	—	—	—	○	—	—
Electric and Hydraulic Resources Institute (IRHE)	—	—	—	na	—	○	—	—	○	○	○	—	—
Ministry of Education (ME)	○	—	○	na	—	—	—	—	—	—	○	—	○
SINAPROC National Civil Protection System	—	—	—	na	—	—	—	—	—	—	—	○	—
Others	○	○	—	na	○	○	○	—	—	○	○	○	—

Note:1) : ○ → related — → No relation na → no information

2) : 4.3(1) Noise, 4.3(2) Land degradation, 4.4 Waste management,
4.5 Energy conservation and alternative energy, 4.7 Waste water management,
4.8 Forest conservation / desertification, 4.10 Natural resource management,
4.11 Natural disasters, 4.12 Environmental education

3) : Refer to each section related to other agencies when column of "Others" is filled by ○.



Source: a)

Organization Chart for environmental Management

(1) National Environmental Authority (ANAM) (established in July 1988)

Functions of ANAM
• Formulate the national policy for environment conservation and natural resources use, in agreement with the State's development plans.
• Direct, supervise, and carry out the implementation of the government's environmental policies, strategies and programs, jointly with the Interinstitutional Environmental System and private organizations.
• Formulate bills, and issue environmental resolutions and regulations.
• Represent the country before national and international organizations, in matters related to environment.
• Promote and facilitate the implementation of environmental projects.
• Regulate, evaluate and approve Environmental Impact Assessment Studies.
• Encourage people's participation in environmental issues
• Promote decentralization of its functions toward local authorities, and technically support municipalities in their local environmental management
• Encourage technical and scientific environmental investigation
• Collaborate in the elaboration and implementation of environmental educational programs
• Create and make accessible the databases related to environment and sustainable use of natural resources.
• Elaborate the Annual Report on Environmental Management and submit it to the Executive Branch.
• Collect fees for services rendered for the development of profit-making activities.
• Impose sanctions and fines, in agreement with the General Environmental Law.

Source: a)

(2) Other governmental organization concerning environmental issues

Institution and particular department	Sector
Ministry of Health (MINSA) - National Directorate of Health Planning = Environmental Planning Department = Environmental Epidemiological Vigilance Department - Directorate General of Health = Deputy Directorate General of Environmental Health • Environmental Health Division • Water Division • Vectors Control Division • Food Control Division • Veterinary Vigilance Division	Environmental Health
- CIASMA Interinstitutional Commission on Water, Sanitation and Environment	Water and Sanitation
Ministry of Livestock and Agricultural Development (MIDA) - National Directorate of Agroforestry = Sanitation and Environment Unit	Livestock and Agricultural Development
- National Directorate of Aquaculture = Lakes and Rivers Department	Fishing in continental waters
Panama Agricultural Research Institute (IDIAP)	Agricultural Development Soils
Ministry of Education (ME) - Environmental Education Office	Education
Ministry of Commerce and Industries (MICI) - Directorate General of Marine Resources	Fishing in coastal marine waters
- Directorate General of Hydrocarbons - Directorate General of Mineral Resources	Hydrocarbons
Ministry of Housing (MIVI) - National Directorate of Social Development, = Environmental Unit	Housing
- Technical Council of Urbanism	
Ministry of Public Works (MOP) - General Secretariat, Environmental Section	Transport
Ministry of Government and Justice (MGyJ) - SINAPROC National Civil-Protection System (Does not have environmental unit)	Natural Disasters Prevention
- DAC: Civil Aeronautics Directorate Does not have environmental unit)	Airports (noise)
Ministry of the President's Office - SENACYT: National Secretariat for Science and Technology.	Biodiversity
Panama Canal Authority (ACP)	Canal Area (Canal Watershed)
Interoceanic Regional Authority (ARI)	Canal Area (land use)
Panama Maritime Authority (AMP) - Directorate General de Marine and Coastal Resources	Marine and Coastal Resources
National Water and Sewage Institute (IDAAN)	Water resources
- Environmental Protection and Control Department	Basic Sanitation and Sewerage
Metropolitan Cleaning Department (DIMA)	Solid Waste Collection in Panama and San Miguelito Districts
Electric and Hydraulic Resources Institute (IRHE) - National Environmental Manager's Office - Engineering Directorate, = Watershed Management Department = Hydrometeorology Department = Project Monitoring Department	Water resources
= Watershed Management Department	Soils
- National Environmental Manager's Office = Project Monitoring Department	Energy
- CONADE National Commission of Energy	
Panama Tourist Institute (IPAT)	Tourist Development (EIA)

Institution and particular department	Sector
National Cultural Institute (Does not have environmental unit) (INAC)	Culture (Preservation of Historical Heritage)
Municipal governments	Solid waste collection in their respective district
University of Panama (UP) -Environmental Sciences and Biodiversity Institute (ICAB)	Research and studies on environment
-Center for Sea Sciences and Limnology(CCML)	
-Geoscience Institute(ICG)	
-National Studies Institute (IDEN)	

★ Formerly, its name was INRENARE: National Institute of Renewable Natural Resources, but then it only dealt with water resources, soils, forest development, protected natural areas, wild flora and fauna.

Source: a)

3.1.2 Non-governmental Organization (NGO)

Name of NGO	Established year	Main activities
National Association for the Conservation of Nature (ANCON)	no information	• Raise people's awareness about the necessity of preserving natural environment. Recently this organization has been criticized by a local newspaper for its involvement in profit-making activities.
National Resource Conservation Foundation (NATURA)	no information	• Presently managing a USAID funds in trusteeship for US$25 million which used to finance environment al projects.
Paramanian Center for Social Action and Studies (CEASPA)	no information	• Conduct various environmental studies
Smithsonian Institute	no information	• Research on the environment issues

Source: a)

3.2 National Environmental Policy

Policy/Project Name and Contents	Funding or Implementing Agency
Plan de Acción Nacional de Salud Ambiental en el Desarrollo Humano Sostenible, 1998-2002 (National Action Plan of Environmental Health in Sustainable Human Development, 1998-2002), / Main objectives: • reduce or eliminate environmental risk factors affecting population's health, through the participation of both governmental and non-governmental organizations, • strengthening of the interinstitutional coordination, formal and informal education • strengthening of the environmental information system	Ministry of Health (July 1997)

Source: a)

3.3 Environmental Laws & Regulations

Present legislation	Status	Comments/ Recommendations	Related sections
1) Constitutional provisions and responsibilities			
a) Political Constitution of 1972, Title III, Chapter IV, on the Ecological Regime.	It had not been enforced because of the lack of a national environment policy.	General Law of Environment has recently been enacted. (Law No. 41 of 1998).	
b) Law No. 41 of 1998 (General Law of Environment)	Its regulations are in process. Also all environment related laws will be revised.	This law creates the National Environmental Authority, with a greater power to enforce environmental legislation. In general terms, this Law covers nearly every environmental aspect.	
2) Environmental Impact Assessment (EIA)			
a) Law No. 8 of 1994, on Tourism, whereby EIA is mandatory for carrying out a tourist project.	EIA are carried out, but their evaluation are not so strict.	Monitoring is necessary after the beginning of the project.	
b) Law No. 30 of 1994, whereby EIA is mandatory for every project or human activity, which might deteriorate or affect environment.	It is not been fully enforced because of deficient interinstitutional coordination	After the enactment of Law No. 41of 1998, ANAM is expected to enforce this law more strictly.	
c) Resolution No. 91-36 (MICI, 1991) requires an Environmental Report with every mining concession request.	Submission of the Environmental Report was established by Regulations DGRM-90-1 and DGRM-90-2 of 1990.	General Directorate of Mineral Resources, Ministry of Commerce (MICI), does not have well-trained technical staff to assess environmental damages.	
d) Law No. 10 of 1997, which creates Ngobe Bugle Indian Reserve, requires a previous EIA, including social impact, prior to the implementation of a mining project.	Ministry of Commerce through its General Directorate of Mineral Resources, is responsible for this, but it does not conduct studies on mining contamination.	They do not have well-trained technical staff to assess environmental damages.	
3) Environmental Education			
a) Law No. 10 of 1992 establishes environmental education as a strategy for natural resources and environment conservation.	It has not formally been enforced because of the lack of interinstitutional coordination.	After the enactment of Law No. 41 of 1998, ANAM is expected to enforce this law more strictly.	4.12
4) Land			
a) Law No. 8 of 1991, bans importation of toxic wastes	A coordination and monitoring system for toxic wastes is lacking.	There has been some progress in the detection of imported toxic wastes.	
b) Law No. 66 of 1947, Health Code, provides for agro-chemical contamination.	There is a high level of contamination from pesticides.	Law must be enforced.	
c) Law No. 51 of 1975, includes rules for protecting soil against erosion.	Cultivation practices have not changed, and still contribute to erosion.	Consciousness-raising is needed for rural population to change their cultivation practices.	
5) Reforestation			
a) Law No. 24 of 1994, on incentives to reforestation, whereby private sector is given participation in reforestation and forestry modernization.	It is partially enforced, because no monitoring is done.	Monitoring and a national land-use study are needed.	4.8
6) Water resources			
a) Law No. 16 of 1973, whereby water pollution countermeasures are mandatory.	It is not enforced.	Greater control has to be exerted in order to refrain growing water pollution by industrial and domestic wastes.	4.2
7) Air pollution control			
a) Law No. 66 of 1947, which prohibits air pollution.	Environmental quality standards are not yet been defined.	Panama Technological University, Ministry of Health and ANAM are working on these standards.	4.1

Present legislation	Status	Comments/ Recommendations	Related sections
8) Noise pollution control			
a) Decree 75 of 1973, whereby the use of noise-reducing filters is mandatory and the use of loudspeakers to promote products is limited.	Municipality of Panama has enforced this law in the case of public transportation by bus only.	The use of speakers by businessmen to promote their products must be banned.	4.3
a) Decree 150 of 1971, establishes maximum level standards for noise pollution	The Ministry of Health does not have necessary laboratory equipment to enforce this law.	Law should be revised, and special equipment must be acquired.	4.3
9) Canal Area			
a) Law No. 21 of 1997, whereby the Interoceanic Regional Development Plan and Canal Area Land-Use, Conservation and Development Plan are approved.	The Interoceanic Regional Authority uses these Plans for development of the reverted areas	The major problem in this area is deforestation by landless invaders, and contamination in former U.S. military bases.	
b) Law No. 19 of 1997, whereby Panama Canal Authority (APC) is organized.	Its implementation is on-going.	Article 6 of this Law establishes that APC is responsible for the management, maintenance, use, and conservation of the water resources of the Canal Watershed.	4.10
10) Biodiversity			
a) Law No. 24 of 1995 (Wildlife Law) which establishes that wildlife is a natural endowment of Panama, and is a public property	The only place where this law is been enforced is the Canal Area. In the rest of the country, illegal hunting problems still persists.	It must be enforced more forcefully.	4.9
b) Law No. 1 of 1994 (Forest Law) Its objective is to protect, preserve, improve, manage and use natural resources.	In spite of this law, traditional agricultural methods of slash-and- burn are being practiced.	It must be enforced more forcefully.	4.8

Source: a)

4. STATE OF THE ENVIRONMENT

4.1 Atmospheric Pollution

Air pollution in many places is above limit values by international standards. In fact, a study conducted by the University of Panama showed that the quantity of suspended particulate matters reached an average of 390 ug/m3, and a maximum of 1,403 ug/m3, exceeding the standard values limit of 260 ug/m^3. In urban areas, most of pollution is produced by motor vehicles exhaust gases, having detected an average carbon monoxide level of 17.3 ppm, with a maximum of 35 ppm, when acceptable standard value is 9 ppm, (MINSA, 1997, p.14).

Sulfur dioxide constitutes the greatest charge of air pollution and fixed sources are the main contributors to this charge. On the other side, the main sources of airborne particles are industrial activities, which are responsible for 71% of polluting charge. In addition, moving sources generate 78% of hydrocarbon and 95% of carbon present in the air. (MINSA, 1995b, p.20).

It is important to point out that due the large number of automobiles in the country, Panama has the highest lead-caused pollution ratio in Central America. (MINSA, 1997, p.15) In a recent study conducted by the University of Panama (Escudero, 1996), it was determined that present levels of carbon monoxide (CO), Sulfur Dioxide (SO_2), and Nitrogen Dioxide (NO_2) significantly exceed acceptable levels according to WHO standards.

Source: a)

Related Agency
① National Level
• National Environmental Authority (ANAM)
• National Environmental Council
• National Environmental Consultation Commission
② Local Level
• Provincial governments
• Comarca (Indigenous reserves) governments
• Municipal governments
• Respective Environmental Consultation Commission at the province, comarca and district levels.
③ Sectoral Level
• Ministry of Health (MINSA)
• Ministry of Commerce and Industries (MICI)
• Ministry of Education (ME)
• MITRADEL
• Universities (University of Panama(UP) and UTP)
• Private Enterprise
• Environmental NGOs

Source: a)

Contaminants concentration at San Miguelito intersection (in ppm) Wednesday, March 18, 1996

Time	CO	SO^2	NO^2
6. a.m.	46.32	1.00	1.0
7.a.m.	68.00	--	1.0
12. p.m.	19.84	2.00	--
5. p.m.	37.00	1.00	1.0
WHO STD.	9.00	.14	0.5

WHO STD: Acceptable levels by the World Health Organization.
Source: Escudero, 1996 a)

Main causes of air pollution
• Excessive number of motor vehicle generating great quantities of carbon monoxide, sulfur oxide, and nitrogen. Only in Panama City, the number of automobiles rose from 107,968 in 1990 to 184,100 in 1996, that is, a 70.5% increase (Ministerio de la Presidencia, 1997, p.3). • Industrial residues from chemical plants, metallurgical plants, and refinery plants, and the organic values rising to the air, during the process of storing and transvasing solvents, gasoline and similar products. (MINSA, 1995a, p.163). • Burning of pasture, forest and plantations during the dry season • Lack of quality standards to regulate polluting emission from moving or stationary sources.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on air pollution	○	· Law No. 66 of 1947
② Ambient air quality standard	×	·
③ Emission standard (stationary and/or mobile sources)	×	·
④ Environmental monitoring results	?	·

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.2 Water pollution

Domestic waste

Sewage treatment or purification plants are scarce throughout the country. Existing treatment systems, such as septic tanks, imhoff tanks, and others, serving a great part of Panama City and some communities are working deficiently (MINSA, 1995a, p.81). On the other hand, rivers near urban centers show a significant pollution level because of the discharge of semi-treated or non-treated wastewater. Situation is worse in the case of Panama City, where the six rivers running through it (Curundú, Matías Hernández, Juan Díaz, Matasnillo, Río Abajo and Tapia), reached high pollution levels at their mouth in Panama Bay. (MINSA, 1997, p.12).

One of the most critical problems concerning water pollution is precisely Panama Bay. This bay receives numerous polluting discharges from domestic, industrial, transportation and navigation sources.

On the hand, bacteriological tests revealed the concentration of colonies of fecal coliform bacteria and fecal streptococcus per 100 ml. In Panama, there are no quality standards for natural waters; however, by international standards, bacteria concentration of recreational waters is defined at a maximum level of about 1,000 total coliforms and 500 fecal coliforms 100 ml. (See MIPPE, 1996d, p.5).

Agricultural chemicals

Panama holds the first place in terms of the quantity of pesticide per inhabitant and per cultivated hectare. During 1980-1989 period, an average yearly amount of 7,500 tons of pesticide were consumed. Current consumption is estimated at 7,000 tons, with a cost of about U.S.$ 30 million. Some studies have found pesticide residues inside fish and crustacean. In 1992, the death of fish, crabs, turtles, and shrimp from environmental pollution caused by pesticide, was reported. Also, there have occurred accidental spill of pesticide into rivers, on which there is little information and no monitoring has been made. (See Jenkins, 1995, p.14).

Industrial waste

Most polluting industries in the country are estimated to be refinery, cement plans, sugar mills, chemical plants, tanneries, marine motors, and mining. A quick assessment of air, water and soil pollution from industrial revealed that major problems are found in cement, synthetic rubber, paint, and aluminium plants. (For more details see MINSA, 1995b, p.18). Some causes are:

a. There is no treatment system for wastewater poured into Panama Bay.
b. The implementation of developmental infrastructure works involving some changes in coastlines.
c. Destruction of mangrove forest areas.
d. Over exploitation of some fishing resources

Source: a)

Related Agency
① Ministry of Health (MINSA)
② Ministry of Public Works (MOP)
③ National Water and Sewage Institute (IDAAN)
④ Municipalities
⑤ Universities
⑥ Private Enterprise and NGOs

Source: a)

Polluting discharges into Panama Bay

Detail	Quantity
Wastewater (million gallons per day)	110
Solid waste (metric tons per year)	800
Navigation (oil barrels per year)	2000

Source: MINSA, 1997, p.12

Contamination in Panama Bay

- Pollution in Panama Bay is one of the most critical problems regarding sanitation in Panama Metropolitan Area. This pollution is mainly caused by the numerous pollutant discharges from domestic, industrial, transport and navigation sources. It is important to point out that the contamination of Panama Bay is not an isolated problem, and it is related to overall pollution of existing water resources in the surrounding areas, mainly from direct discharge of non-treated domestic and industrial wastewater into rivers.
- The government of Panama has obtained a loan from IDB to finance a study on the decontamination of Panama Bay. At present, with the administrative support of UNDP, MIPPE is at the final stage of a process for contracting a private enterprise to conduct this study at a cost of US$ 2.1 million. A partial solution to this problem is expected to be obtained through the privatization of IDAAN, since those companies responsible for the operation of private water supply and sewerage facilities, will be requested to invest US$500 million within a 10-year span, and most of it (70 percent) will be for the improvement of the sewerage system.

Source: a)

Bacteriological results in Panama Bay: 1991 and 1996

Station	Total coliforms x 100ml		Coliformes fecales x 100ml		Fecal strepto-coccus x 100ml	
	1996	1991	1996	1991	1996	1991
Matasnillo River	6,000,000	470,000	2,000,000	248,800	7,000	21,400
Club Union	200,000	1,248	100,000	976	0	50
Club Yates (outside dock)	10,000	4,990	7,000	715	0	355
C. Yates (inside dock)	100,000	★	100,000	★	40,000	★

★: This station was not working this year.
Source: a-33), p.5.

Cyanide contamination of rivers

- Cyanide is used for gold mining in Panama in its extraction process. Most mines are located in Panama's central provinces.
- Since they employ an opencast working system and rainfall is high during 9 months of the year, there is a great concern about cyanide and dust contamination of soil and rivers in the surrounding areas.
- A local newspaper has recently denounced the poisoning of fish by cyanide poured into the river passing by the Santa Rosa mine, in the province of Veraguas ("La Prensa" newspaper, Wednesday, June 17, 1998, p.12A).
- According to the Ministry of Health, there is not sufficient, appropriate epidemiological information for assessing labor risk factors in these mines and for decision-making in this regard. The Directorate General of Mineral Resources of MICI has neither specialist staff nor appropriate equipment to conduct a scientific study on this matter.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on water pollution	△	· Law No. 16 of 1973
② Water quality standard	?	
③ Effluent standard	?	
④ Drinking water standard	?	
⑤ Water quality monitoring	?	
⑥ Guidelines on water quality	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.3 Other Pollution

(1) Noise

In Panama, there has been a rise in noise from transportation. Panama Metropolitan Region has 68% of all automobiles circulating throughout the country, causing a tremendous increase in transportation costs for both vehicle operators and users in terms of commuting time, as well as producing an environment deterioration through noise, gas exhaust, etc. (Ministerio de la Presidencia, 1997, p.2). Transportation noise problems are worsened by the fact that the high volume of radios and cassette-players in some automobiles and buses. Some stores and other business use high-volume musical equipment to attract customers. Although the use of musical equipment and noise-reducing filters are regulated by law, in practice this law is ineffective, except for measures taken by Panama municipal authorities in the case of public transportation only. This rapid growth of the number of circulating automobiles is caused basically by the deficient public transportation system. This trend in the number of motor vehicles is shown in Table 4-3 below.

It is worth noting that the Occupational Health Directorate of the Social Security Agency is measuring the number of people exposed to noise in the industrial sector, beyond the permissible level of 85 decibels, according to World Health Organization. They determined that in 1996. 19.32 percent of employees working in different types of industries, that is 165,384 people, were affected by noise. The most critical cases were found in clothing, footwear, and basic metal manufacturing, and in construction sites, where the number of affected workers exceeded 40 percent.

Main causes of this problem are:

a. Lack of an urban transportation policy
b. Low institutional capacity in transportation sector organizations
c. Lack of planning and development of an efficient road network.
d. Lack of regulation on noise produced by construction.

Related Agency
① Ministry of Public Works (MOP)
② Ministry of Education (ME)
③ Ministry of Housing (MIVI)
④ Panama Tourist Institute (IPAT)
⑤ Occupational Health Directorate, Solid Security Agency
⑥ Municipalities
⑦ Universities
⑧ Private Enterprise

Source: a)

Automobiles circulating in Panama City: 1990-1996

Year	Number of Automobiles	Increase	
		Quantity	Percentage
1990	107.968		
1991	119.819	11.851	11.0
1992	125.768	5.949	5.0
1993	138.227	12.459	9.9
1994	153.450	15.223	11.0
1995	162.928	9.478	6.2
1996	184.100	21.172	13.0
Average		12.689	9.4

Source: Ministerio de la Presidencia, 1997, p.3 a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on noise	○	· Decree 75 of 1973
② Standard on noise level	○	· Decree 150 of 1971

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

(2) Land Degradation

According to studies conducted by MIPPE (1988), two thirds of the population living in rural areas, cannot meet their basic needs and are concentrated in the most fragile, degraded ecological areas. This poverty level together with an itinerant, subsistence agriculture has greatly contributed to forest degradation, resulting in the deterioration of soil and watersheds, and in the continuing reduction in the productive potential of rural areas.

Source: a)

Related Agency
① (no information)

Main Issues of Land/Agriculture
• Lack of a national land use policy and regulations, which has facilitated the expansion of the agricultural border (that is, the land used for agricultural purposes), in response to farmers' needs, and facing weak opposition on the part of the corresponding government institutions. • Inadequate agricultural practices based on the felling of trees and burning of grass, which increase deforestation. • Undiscriminating use of chemical fertilizers and pesticides, causing pollution and adverse effects on land fertility, and even affecting human health • Intensive livestock raising based on the use of large extension of pasture, encouraging the felling of trees.

Source: a)

Contamination in U.S. military bases
• In view of the reversion of Panama Canal and adjacent areas, including U.S. military bases, to the Republic of Panama by the end of 1999, the Government of Panama has established a Land-Use Plan of the Reverted Areas, including the conversion of former military installations into industrial, educational, and tourist centers. However, the Panamanian government has not yet received from the U.S. government, full, reliable information about the contamination produced by military practice and trial of conventional, chemical, and biological weapons in the Canal Area, and neither does it have the technical capacity to get it at this moment. • Preliminary soil tests and research conducted by the Interoceanic Regional Authority (ARI), have shown the existence of arsenic contamination in certain unspecified spots within the Reverted Areas. • On the other hand, in July, 1998, Fellowship of Reconciliation (FoR), an American environmentalist group, denounced the United States chemical weapons testing, storage and dumping in Panama, particularly in the Canal Zone, over the 40-year span from 1920 to 1960. Also, American military authorities have confirmed that it is possible that some ammunition still remain unexploded in the military training sites. The government of Panama has acknowledged that in the little time remaining for the conclusion of the reversion process, from now to the end of 1999, it will be very hard for them to eliminate all existing hazardous residues in this zone. (See "El Panama America" newspaper, Wednesday, July 29, 1998, p.6A)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on land management	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.4 Waste Management

In most part of the country, solid waste disposal is inadequate. Many cities lack appropriate waste landfill, and necessary collection and transportation vehicles. Particularly, in rural and suburban areas disposal is made near very fragile environments (such as, riversides, mangrove swamps, seaside, etc.). Continental and marine waters, soil and air quality is being affected by growing volumes of garbage and its by-products (leachate, smoke, offensive odors, etc.), and also by sludge, septic tank and wastewater. Estimations indicate that by 1999, in Panama City only, solid waste production will be about 1,000 tons a day. In addition, it has been estimated that in the Metropolitan Area only, 12 hospitals produce 4,764 kg/day of ordinary waste and 4,782 kg/day of hazardous waste. The remainder 20 medical centers produce 4,631 kg/day and 1,385 kg/day, respectively. (MINSA, 199, p.13).

Source: a)

Related Agency
① Ministry of Health (MINSA)
② Ministry of Public Works (MOP)
③ Ministry of Education (ME)
④ National Water and Sewage Institute (IDAAN)
⑤ Metropolitan Cleaning Department (DIMA)
⑥ Municipalities
⑦ Private Enterprise

Source: a)

Main Issues of Waste Management
• Inadequate industrial waste management
• Uncontrolled pouring of polluting waste into environment.
• Shortage of treatment and disposal systems for industrial waste and hazardous substances
• Poor coverage in environmental assessment
• Deficient control mechanisms in industries

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on waste	?	
② Laws on hazardous waste	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.5 Energy Conservation and Alternative Energy

The energy sector in Panama is composed by two sub-sectors: hydrocarbon and thermal or hydroelectric power. Even if hydrocarbon is less used in electric power generation, Hydrocarbon Sub-sector has tended to grow because of the increase in motor vehicles and other development areas. The share of primary energy sources in useful energy consumption is as follows: (See MINSA, 1995a)

- Petroleum 65.4%
- Hydro-electric power 25.5%
- Firewood 4.0%
- Bagasse 5.0%

The use of petroleum represents a major source of environmental pollution. A study conducted by the Union for International Conservation of Nature, in 1996, determined that 60% of people use firewood and coal for cooking. Most of the firewood come from natural forests. It was also estimated that it is necessary to plant 30,994 hectares with trees. (See UICN, 1996, p.18)

It is worth mentioning that although not yet developed, other energy sources are being used, such as: biomass is used by micro-industry; wind power is used for water extraction by some communities; charcoal is used by craftsmen. There are studies on coal and solar energy, but they have not been put into practice. Neither has the tide power potential as an energy source, been studied, although this source is being used in other countries

One of the main problems in this sector is energy wasting due to incipient saving habits and rural poverty leading peasants to cut trees as an energy source for cooking. Another problem is energy scarcity during the dry season, because of the decrease in water level of reservoirs used for hydropower generation, as a result of the mention in 4.8 deforestation problems. (MINSA, 1995a, p.178).

Source: a)

Related Agency
① Ministry of Livestock and Agricultural Development (MIDA)
② Ministry for the Youth, Women, Children, and Family
③ Electric and Hydraulic Resources Institute (IRHE)
④ Private Enterprise

Source: a)

Main Issues of Energy
• Lack of utilization of clean technologies, leading to a greater emission of pollutants.
• Poor institutional infrastructure and organization
• Incipient or weak habit of energy-consumption saving, thus producing wasting
• Lack of energy-source alternatives to the use of firewood in the rural areas, leading to the felling of trees and deforestation.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on energy use and conservation	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.6 Water Supply

In 1995, drinking water supply covers 93% of urban population and 73% of rural people. One of the main problems is sedimentation in reservoirs. Also, deforestation, over exploitation of forest resources, changes in land use, and the increasing need for basic food are some of the factors affecting water supply capacity. The main cause of this problem can be found in the lack of planned, integral national policy on water resources. (MINSA, 1997, p.11)

Source: a)

Related Agency
① Ministry of Health (MINSA)
② National Water and Sewage Institute (IDAAN)
③ Social Emergency Fund (FES)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on water resources and supply	?	
② Laws on use of water resources	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.7 Waste Water Management

There is no nationwide inventory of domestic and industrial waste sources and the volume of sewage discharged into different rivers has not been quantified either. On the other hand, MINSA does not have water quality control system to check installed treatment systems for efficiency and compliance with approved construction plans. In addition, during recent years, IDAAN has not made major investments in new sewerage systems and maintenance works in those already existing. (MINSA, 1995a, p.82).

Source: a)

Related Agency
① National Water and Sewage Institute (IDAAN)
② Ministry of Health (MINSA)
③ Ministry of Public Works (MOP)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on sewerage system	?	
② Laws and regulations on industrial effluent	?	
③ Effluent standard	?	
④ Results of monitoring	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.8 Forest Conservation / Desertification

In Panama, it is estimated that lands suitable for the growth of trees represent 72.72% (5.6 million hectares) of the country's total area; however, forests only cover 33.583 km2 (44.47% of total area), of which 3.3 millions (16.89%) are classified as commercial forest. National parks and reserves cover 25.000 km2, mangrove forest cover an area of 1,760 km², which support national fishing industry. The lands suitable for reforestation exceed two million hectares, of which about ten hectares only have been planted with trees. (See UICN, 1996, p.9). One of the major problems is that forest reserves have been intervened by itinerant agriculture. It is also estimated that annual deforestation rate of natural forests is 510 km².

Source: a)

Related Agency
① Electric and Hydraulic Resources Institute (IRHE)

Source: a)

Ecological Zones in Panama

Ecological Zones		Characteristics
Tropical moist forest	Coverage	24.530 km² (32.5% of total land area).
	Resources	It has timber-yielding species with high economic value.
Tropical dry forest	Coverage	5.630 km² (7.5% of total land area)
	Resources	Life zone suitable for agriculture.
Pre-montane dry forest	Coverage	2.070 km² (2.7% of total land area)
	Resources	It is the driest area in the country. Land is suitable for dry-season crops. Soil is fertile.
Pre-montane moist forest	Coverage	2.400 km² (3.2% of total land area)
	Resources	This zone has been destroyed by soil erosion, due to its use without a break.
Pre-montane wet forest	Coverage	15.200 km² (20.1% of total land area)
	Resources	Arid soils, with low nutrients, and poor area unsuitable for agriculture because of excess rain.
Tropical wet forest	Coverage	10.900 km² (14,4% of total land area)
	Resources	Poor soils, unsuitable for agriculture or cattle-raising. They should be dedicated to orderly reforestation.
Pre-montane rain forest	Coverage	9.975 km² (13.2% of total land area)
	Resources	These are humid and inaccessible areas, not very populated.
Lower montane rain forest	Coverage	2.370 km² (3.1% of total land area)
	Resources	Zone dominated by steep slopes and high mountains, generally very abrupt.
Montane wet and rain forest	Coverage	1.185 km² (1.6% of total land area)
	Resources	Excessively humid zones, with very steep places, too poor for agriculture..
Lower montane, moist and wet forest	Coverage	9 km² (.0001% of total land area)
	Resources	Areas with volcanic ash deposits, which make them particularly fertile, with good drain and easy to till.

Source: a-15)

Main Issues of Forest Degradation
• Over exploitation and insufficient forestry. • Inadequate demarcation of protected areas. • Inadequate management and improper, uncontrolled use of lands • Deficient land-use planning • Insufficient surveillance of the resource and weak enforcement of regulations due to the lack of personnel and institutional commitment • Spreading-out of human settlements without any planning or pre-determined land-use criteria • Expansion of the agricultural border toward the most fragile ecosystems • Lack of knowledge among farmers and rural population in general, about the impact of deforestation. • Surface denudation, through the indiscriminate felling of trees, wood extraction, slash-burn agricultural method, and cattle-raising activities.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on forest conservation	○	· Law No. 24 of 1994 · Law No. 1 of 1994 (Forest Law)
② Laws and regulation on protection area	?	
③ Laws on desertification	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.9 Biological Diversity

Panama is endowed with an impressive biological diversity, including 225 mammal species, of which 30 are endangered, 120 species of bats, 54 species of rodents, and an undetermined number of marine mammal species. In addition, there are 929 bird species, of which 122 are migratory and not well-known in Panama. With regards to amphibians and reptiles, there exist about 400 species, and most of them are frogs and toads. Snakes are the most important reptiles. Concerning insects, there is not an accurate calculation of the number of species, but there are plenty of them. Panama's flora is one the richest in the region. There are about 8,000 to 10,000 plants. (See INRENARE 1997).

There also exist a variety of aquacultural and marine environments, coastal zones, and the best and largest coral reefs in the Pacific side.

Main problems in this field are:

a. Lack of information about existing biological resources in the country.
b. Irrational use of natural resources
c. Loss of biological diversity
d. Economic value of biological diversity is not calculated in Panama's National Accounting.
e. Little coordination among entities responsible for the management of biodiversity.

Related Agency
① National Environmental Authority (ANAM)
② Interoceanic Regional Authority (ARI)
③ Ministry of Planning and Economic Policy (MIPPE)
④ Ministry of Livestock and Agricultural Development (MIDA)
⑤ Ministry of Commerce and Industries (MICI)
⑥ Ministry of Health (MINSA)
⑦ MINEDUC
⑧ Ministry of Public Works (MOP)
⑨ Panama Tourist Institute (IPAT)
⑩ Electric and Hydraulic Resources Institute (IRHE)
⑪ National Water and Sewage Institute (IDAAN)
⑫ Agricultural Research Institute (IDIAP)
⑬ Ministry of the President's Office (SENACYT)

Source: a)

Protected Wild Areas in the Republic of Panama

Management Category	Number	Area (ha.)
National parks	14	1,359,647.0
Forest reserves	9	346,494.0
Wildlife refuges	9	40,348.5
Protective forest	2	326,000.0
Moist soil of international significance	4	119,524.5
Natural Monument	2	5,403.5
Natural areas	1	265.0
Recreation area	2	348.0
Hydrological reserve	1	2,520.0
Wild areas	1	23,831.2
Biological Corridor	1	7,443.3
TOTAL		2,231,825.0

Source: a-38)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on protection for fauna and flora	○	· Law No. 24 of 1995 (Wildlife Law)
② Laws and regulations for protection for specific species	?	
③ Laws and regulations on hunting	○	· Law No. 24 of 1995 (Wildlife Law)
④ Laws and regulations on protection area	?	
⑤ Listed species in the Red Data Book	?	

Note: ○ : Issued、 × : None、 △ : Under planning、 ? : Unknown

4.10 Natural Resource Management

Panama has not yet defined a natural resource management policy. As a result, these resources are being depleted to meet people's present needs. Those institutions responsible for the conservation of these resources, do not have financial resources or well-trained personnel to enforce existing legal provisions.

Related Agency
① Ministry of Livestock and Agricultural Development (MIDA)
② Ministry of Commerce and Industries (MICI)
③ Electric and Hydraulic Resources Institute (IRHE)
④ National Water and Sewage Institute (IDAAN)
⑤ Ministry of Health (MINSA)
⑥ Ministry of Planning and Economic Policy (MIPPE)
⑦ Ministry of Education (ME)
⑧ Ministry of Public Works (MOP)
⑨ Metropolitan Cleaning Department (DIMA)
⑩ Universities

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on conservation of natural resources	○	· Law No. 19 of 1997, which organizes Panama Canal Authority (APC)
② Laws on use and conservation of mining resources	?	
③ Laws on underground resources	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.11 Natural Disaster

In Panama, natural disasters of great magnitude are rare. Major disasters are those related to fire, hurricane winds, and flood, causing loss of human lives and injuries, property damages and water pollution every year. Some causes of these disasters are: waste dumping into rivers and drainage systems, deforestation, inappropriate land use, destruction of mangrove forests, inefficient sewerage system, and lack of disaster-prevention contingency plans. (SINAPROC, report as of July, 1998)

Human activities causing these problems are itinerant agriculture, extensive cattle-raising, timber extraction, and waste dumping by people in general into rivers and areas near their banks.

Related Agency
① SINAPROC National Civil Protection System
② Ministry of Health (MINSA)
③ Ministry of Public Works (MOP)
④ National Water and Sewage Institute (IDAAN)
⑤ Fire Brigade
⑥ Red Cross

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on natural disaster	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

4.12 Environmental Education

Law No. 10 of 1992 adopts environmental education as a national strategy for natural resources development and environment conservation, and obliges to include the environmental issue in primary and high school curricula. Although this law has not been fully enforced yet, the Ministry of Education has given summer courses on this issue to 5% of teachers.

ANAM has an Environmental Education Department and also a Training Center on forest and environmental issues, in Rio Hato, province of Cocle. In this Center called "Center for Sustainable Development" (CEDESO - Centro para el Desarrollo Sostenible), a training program is conducted each year with the participation of government, NGOs and occupational groups officials, students, teachers, peasants and indigenous people. The government of Japan has contributed to the construction and operation of this Center through the "Forest Conservation Technical Development Project", carried out by ANAM with the support of JICA. ANAM also conducts training actions for communities on forest techniques, agroforestry, and organic agriculture. It is worth noting that at the community level, the coverage is very low (though no estimates on coverage percentage is available). Particularly in the provinces of Darien and Bocas del Toro, training actions have been scarce.

At the University of Panama, ICASE created a three-year graduate program on Environmental Education. Also, USMA, a private university, established a graduate program on Environmental Sciences in the province of Los Santos. Recently, the Smithsonian Tropical Research Institute established in Panama, the Center for Tropical Forest Sciences, which will serve as an information exchange network on tropical forest.

According to the present director of ICASE, one of the main difficulties for enforcing Law No. 10, is the lack of institutional commitment, and the lack of training personnel in this topic, since the career has just been established in Panama. Support has been received from JICA (through the JOCV program) and OAS, to begin this training. Another difficulty is that Panamanian environmental specialists have studied abroad, and most of them are not familiar with the environment where they will work. More research and information centers are also needed.

Related Agency
① Ministry of Education (ME)
② Environmental Education Department, ANAM
③ Training Center on forest and environment issues, ANAM

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on education	△	· Law No. 10, 1992
② Guidelines on environmental education	?	

Note: ○ : Issued、× : None、△ : Under planning、? : Unknown

5. INTERNATIONAL RELATIONSHIP

In Panama a border cooperation agreement between Costa Rica and Panama is in force since 1994. The purpose of said agreement is to attain a sustainable development of the population living near their common border.

At present, with the support of the Organization of American States (OAS), they are implementing a program aiming at improving income level in the communities located near the Costa Rica- Panama border. It is intended to involve people in non-traditional profit-making activities such as ecotourism and other; and also to raise their awareness on the necessity to protect natural resources.

The program has made little progress, since they have only designed four project profiles, for which financing sources are being sought.

5.1 International Convention

Name of international Convention	Year
no information	

Source:

5.2 International Cooperation Project

On-going Environmental Projects, by International Donors: 1991- 2020

Project	Implementation Period	Amount (US $)	Donor
Natural Resource Management (MARENA) • the integrated management of natural resources in the Canal Watershed and other wild areas, through the training of agricultural and cattle farmers • the conservation of the biological diversity in Panama, through the protection and administration of a system of national parks and reserves	Jun 91-Jun 99	41,000,000	USAID
Trusteeship Fund (FIDECO) • Through the NGO named NATURA, USAID finances actions in support of the conservation of natural resources and the protection and maintenance of infrastructure and equipment, existing or to be built, in protected areas	1996-2020	25,000,000	USAID, NATURA, TNC
Volunteer Program USA/JAPAN	Jan 95-Jan 99	295,300	PEACE CORPS, JOCV
Forest Conservation Technical Development Project (CEMARE Project)	April 94-march 99	9,000,000	JICA
Cerro Hoya National Park	Jan 95-Jan 98	1,540,916	GTZ
Agroforestry Cooperation in Bocas del Toro	1996-1998	47,086	CATIE, GTZ
Agroforestry in Ngobe Indigenous Region	1996-1999	488,810	GTZ
Project for Agrofoestal Development in the buffer area of "Cerro Hoya" National Park	1995-1998	N. A.	GTZ
Conservation of Biodiversity in Darien (BIODARIEN)	Jan 95- Dec. 99	2,500,000	GEF, UNDP
Sustainable Rural Development in Darien • funded by IFAD and UNDP • improve the management and use of natural resources to attain food and nutritional self-sufficiency of the population living near the rivers in the province of Darien • includes components of training, monitoring and evaluation of natural resources, institutional strengthening, and management and evaluation of resources	Oct. 1997-2002	14,300,000	IFAD, UNDP
Rural Development of Ngobe Bugle Indigenous Community	1995-2000	200,000	IFAD

Project	Implementation Period	Amount (US $)	Donor
Management of Cativo Trees and Non-Timber-yielding products • funded by ITTO and UNDP • improve the management of Cativo-trees forests and non-timber yielding products in the province of Darien, producing information to develop programs for improving living conditions of peasant and indigenous communities • It includes research, management and experimental plantations of "tawas" trees	Sep. 96 Sep.2000	1,585,667	ITTO, PNUD
Implementation of a Forest Statistical Information System	Nov. 97-Nov.99	371,100	ITTO
Strategy Plan for the Modernization of Forestry Infrastructure in Panama	1998-1999	98,200	ITTO
Management of Native Forests in East Panama (MACBEP)	Mar 97-Nov 98	622,300	UICN, EEC
Sustainable Development of Agricultural Border Zone in Central America • stop the process of uncontrolled colonization and its resulting destructive impact on the natural resources of the region • to find alternatives to allow local communities to benefit from the conservation and rational use of natural resources	Jan 96- Jan 99	2,378,833	CCAD, EEC
Forest Action Plan	1999-2000	556,400	FAO
Darien National Park	1980-Continued	879,000	UNESCO
La Amistad International Park	1988-Continued	570,700	UNESCO, NATURA
Portobelo National Park	1996-2001	1,100,200	AECI
Coiba National Park • Portobelo and Coiba National Parks projects consist of a technical assistance to collect information on their historical and cultural values, their social environment; field verification and analysis of data, as well as the evaluation of the tourist potential of the area	1996-2001	1,495,700	AECI
Ecotourism and Health	N. A.	N. A.	AECI
National Strategy on Biodiversity	Jul. 97-Jul 98	265,000	GEF
Rural Poverty and Natural Resources • reduce rural poverty in areas with high population concentration and to strengthen the national system of protected areas • include training and organization of communities to increase their self-management capacity, and provision of technical and financial assistance to communities to formulate and execute projects which solve their economic problems	1997-2002	12,800,000	GEF
Climatic Changes, Climatic Variability and Health	N. A.	N. A.	PAHO
National Forum on Health, Environmental Risk and Development in Panama	N. A.	N. A.	PAHO
Forest Seeds Program (PROSEFOR)	1998-2003	101,400	CATIE
Central American Forest Program	1999-2002	254,655	CATIE
Management and Conservation of Bayano River Watershed and Maje Sub-watershed	Jul. 97-Sep. 99	1,100,000	IDB

N. A. Not available
Source: ANAM, International Technical Cooperation Directorate (a))

6 INFORMATION SOURCE

6.1 Governmental Agency

Name of Organization	Contact Address
1) Policy / Institutions	
a) National Environmental Authority (ANAM)	• Curundu, Bldg. 1, Tel: 232-5940, Fax: 232-6612 • Curundu, Bldg. 2 Tel: 232-6770, Fax: 232-6449 E-mail: Darcia@ns.irenare.STRI.SI.EDU.
2) Toxic waste in Reverted Areas	
a) Interoceanic Regional Authority (ARI)	• Balboa Ave., Building 726 Tel: 232-5517, Fax: 232-5854 • Balboa Ave., Building 726 Tel: 232-6475, Fax: 232-5287.
3) Environmental Education	
a) National Environmental Authority (ANAM) b) Ministry of Education (ME)	• Ancon, Building 0599, Telefax: 262-1955 • Justo Arosemena Ave, Poli Bldg., 3rd. floor Tel: 262-3632, Fax: 262-1576
4) Forests	
a) National Environmental Authority (ANAM)	• Curundu. Building 501. Tel: 232-663, Fax: 232-5751. E-mail: UPSF@ns.irenare.stri.si.edu.
5) Technical cooperation	
a) Ministry of Planning and Economic Policy (MIPPE)	• Via España Ave. Ogawa Bldg., 2nd floor Tel: 269-4239, or 269-4133
b) National Environmental Authority (ANAM)	• Curundu, Building No. 503, 1st floor Tel: 232-6884, Fax: 232-5814, E-mail
6) Environmental Strategies	
a) National Environmental Authority (ANAM)	• Curundú, Building 502 Telefax: 232-7229 E-mail:
7) Protected areas	
a) National Environmental Authority (ANAM)	• Curundu. Building 501 Tel: 232-7228, Fax: 232-7221.
8) Environmental impact assessment	
a) National Environmental Authority (ANAM)	• Curundu. Building 501 Tel: 232-7228, Fax: 232-7221. Telefax: 232-1511.
9) Watersheds	
a) National Environmental Authority (ANAM) b) Ministry of Health	• Paraiso, telefax: 232-4317 Tel: 232-7228, Fax: 232-7221 • Tel: 264-4206, Fax: 264-4227
10) Energy	
a) IRHE	• Cuba Ave. and 26 St., Calidonia Tel: 227-2638 Fax: 227-2324 E-mail:. phoenic.net
11) Natural resources	
a) Ministry of Government and Justice, SINAPROC.	• Curundú, Building 1025 Tel: 232-6700, Fax: 232-6903 E-mail:
12) Petroleum contamination	
a) Ministry of Commerce and Industries (MICI)	• La Lotería Bldg. 31 & 32 St., Cuba & Perú Ave., Telefax: 227-5674
13) Mining contamination	
a) Ministry of Commerce and Industries.(MICI)	• Transistimica Ave. Next to Tommy Guardia Geographical Institute Tel: 236-1823
14) Border agreements	
a) Ministry of Planning and Economic Policy (MIPPE)	• Via España Ave., Ogawa Bldg. Tel: 264-4551, Fax: 664-1884 E-mail:
15) Environmental health	

Name of Organization	Contact Address
a) Ministry of Health (MINSA)	• 5th Ave. and 35 St. East, Ministry of Health Bldg Tel: 225-3785, Fax: 225-0041 • Ancón, Building 265 Tel: 262-2492, Fax: 262-6995
16) Water	
a) Ministry of Health (MINSA)	• Peru Ave., Las Camelias Bldg. Tel: 264-4206, Fax: 264-4227
17) Environmental research	
a) Smithsonian Tropical Research Institute (STRI)	• Balboa Ave Tel: 227-6022, ext. 2356,, Fax: 232-6274 E-mail:
b) Ministry of Health (MINSA)	• Justo Arosemena Ave., next to Hatillo Bldg. Tel: 227-4111, Fax: 225-4366 E-mail:
18) Pesticide Contamination	
a) Agricultural Research Institute (IDIAP)	• Vía Tocumen Ave. Tel: 266-0187 ext. 246, Fax: 225-5015.
19) Noise Pollution	
a) Social Security Agency (CSS)	• 17Street, Panama City Tel: 262-2555, Fax: 262-2849
20) Air Pollution	
a) University of Panama, Extension Vice-rector's Office	• Urbanización El Cangrejo Tel: 264-2985, Fax: 223-6166 Email:. ac.pa
b) University of Panama, Institute for Special Analysis	• Urbanización El Cangrejo. Tel: 223-6451, Fax: 269-8880.
c) University of Panama, Institute for Special Analysis	• Urbanización El Cangrejo. Tel: 223-6451, Fax: 269-888 E-mail:
21) Library	
a) Smithsonian Tropical Research Institute	• Balboa Ave. Tel: 227-6022, ext. 2220
b) University of Panama. Simón Bolívar Library	• El Cangrejo Tel: 223-8786
c) Ministry of Planning and Economic Policy (MIPPE)	• Vía España Ave., Prosperidad Bldg., 3rd floor Tel: 269-4133, Fax: 264-3373. • Vía España Ave,Ogawa Bldg., Ground floor Tel: 269-4133

Source: a)

6.2 Embassy

Name of Organization	Person in Charge	Contact Address
Embajada del Japón	• no information	• Calle 50 y 60E, Obarrio, Apartado No.1411, Panama 1, República de Panamá
Embassy of Panama	• no information	• Room 904 Kowa 38 Bld., 4-12-24 Nishiazabu, Minato-ku, Tokyo 106-0031 Tel: 03-3499-3741

Source: d)

List of Abbreviation

AECI	Spanish Agency for International Cooperation
ANAM ★	National Environmental Authority
ARI	Interoceanic Regional Authority
ASDI	Swedish International Development Agency
BID	Spanish abbreviation for IDB
CATIE	Tropical Agronomical Center for Research and Education
CCAD	Central American Commission of Environment and Development
CEASPA	Panamanian Center for Social Action and Studies
CEPREDENAC	Coordination Center for the prevention of Natural Disasters in Central America
CIASMA	Interinstitutional Commission on Water, Sanitation and Environment
ECOSAL	Central American Conference on Ecology and Health
EEC	European Economic Community
FAO	Food and Agriculture Organization of the United Nations
FES	Social Emergency Fund
FIDA	Spanish abbreviation for IFAD
GEF	Global Environmental Development Fund
GTZ	German Agency for Technical Cooperation
IDB	Inter-American Development Bank
IDIAP	Agricultural Research Institute
IFAD	International Fund for Agricultural Development
INRENARE ★	National Institute of Renewable Natural Resources
ITTO	International Tropical Timber Organization
JICA	Japan International Cooperation Agency
MIDA	Ministry of Livestock and Agricultural Development
MIPPE	Ministry of Planning and Economic Policy
MINSA	Ministry of Health
NATURA	Natural Resource Conservation Foundation
OIMT	Spanish abbreviation for ITTO
OPREMID	Panamanian Organization for the Prevention and Mitigation of Natural Disasters
OPS	Spanish abbreviation for PAHO
PAHO	Pan-American Health Organization
PC	U. S. Peace Corps
SENACYT	National Secretariat for Science and Technology
TNC	Tourist National Corporation
UICN	International Union for Nature Conservancy
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

★ INRENARE became ANAM, by Law No. 41 of July 1, 1998.

Source: a)

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