

COUNTRY PROFILE  
ON  
ENVIRONMENT

PAPUA NEW GUINEA

**February 2002**

PLANNING AND EVALUATION DEPARTMENT  
JAPAN INTERNATIONAL COOPERATION AGENCY

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## **FOREWORD**

### Composition and the Contents of this Report

This report presents information on the Environment of the Country in the following arrangement

#### **1. KEYWORDS**

Keywords to understand features of the country and major environmental issues are presented briefly on a page, which helps to overview the whole figures.

#### **2. FACT SHEET**

Major significant index of economy, demography, society and natural resources of the country as well as the characteristics of the natural and social environment are presented.

#### **3. ORGANIZATION AND LEGISLATION**

##### 3.1 Organization

Organizations in charge of each environmental issue stated in Chapter 4 and their duties are shown in the matrix. Responsibility, organization and duties of the relevant organizations are also described. For NGO, name and their main activities are shown.

##### 3.2 National Policy on Environment

National policy on the environment such as national environmental action plan is stated.

##### 3.3 Legislation

Laws and regulations on the environment and their coverage are presented.

##### 3.4 Environmental Impact Assessment

EIA system in the country including history and procedure etc. are presented.

#### **4. CURRENT ENVIRONMENTAL ISSUES**

This chapter summarizes the current status of the following environmental sectors and presents the organization in charge, applicable standards, past cases and relevant laws and regulations are presented. In the Chapter 4.3, current environmental issues to be considered are described based on the Local Consultant's report.

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

#### **5. INTERNATIONAL RELATIONS**

Economic and technical assistance by the foreign donors in the country are reviewed. Chapter 5.2, "Conventions Ratified or Signed concerning Environment" list the conventions ratified or signed by the country. Chapter 5.2, "International Donor's Project on the Environment" lists the assistance project on the environment by the bi- or multilateral donors with the information on the project. Japan's assistance projects are mapped.

#### **6. INFORMATION SOURCES**

Contact persons of the organizations in the country concerning the environment are listed.

#### **7. REFERENCES**

References quoted in this report are listed.

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## 1. Keywords

### 1.1 Keywords to understand the Environment

<p>Gross Domestic Product or Gross National Product</p> <p>GNP per capita: US\$890 (1998)                      GDP per capita : US\$2, 500 (2000 est.)</p> <p>Total GNP: US\$4.1 billion (1998)                Total GDP: US\$12.2 billion (2000 est.)</p>
<p>Indigenous Customary Land Ownership</p> <p>Ninety-five percent of the territory is customarily owned by over 600 tribes (5% owned by the government). Either clans or individuals usually own customary land. Land is usually inherited along paternal or maternal lines.</p>
<p>Many Undeveloped Areas</p> <p>The country is thinly populated (9 persons/km<sup>2</sup>) and undeveloped.</p> <p>The natural environment is relatively little affected by development.</p> <p>The rugged terrain of the country makes it extremely difficult to establish transportation and communication links. This also makes it difficult for infrastructure developments.</p>
<p>Diverse Natural Environment</p> <p>The country is characterized by steep and variable topography and high rainfall (annual average over 2,500 mm).</p> <p>High biodiversity (animals, plants and fungi: Estimated at about 4 million species).</p> <p>Treasury of marine resources, including coral reefs (greater than 700 species), over 1,000 reef building species, over 198 species of marine and fresh water decapods crustaceans and over 3,000 species of fish.</p>
<p>Economy Dependent on Natural Resources</p> <p>GNP by Sector: Agriculture, forestry and fisheries 26%, Mining 29%</p> <p>Main Exported Items: Gold, copper, crude oil, silver and timber accounting for 84% of all exports and rubber, palm oil, tea, coffee, copra, cocoa and marine resources account for the rest of the exports.</p>

Source: Ref. 25), 26)

### 1.2 Keywords to understand the Environment

- Forest Destruction
  - Commercial logging
  - Arson, bush fires.
  - Clearing of land for agricultural purposes, firewood collection, and conversion into pastures
  - Hunting and poaching.
  - Infrastructure developments, for example, roads, schools, bridges, etc.
  - Mining activities/operations
- Water Pollution from Mining Activities
  - Wastes from mining sites, such as the mine tailings, and other harmful chemicals.
  - Water pollution by heavy metals from the mines
  - Sedimentation accumulation on the riverbed
  - Inability on the side of the PNG Government to closely monitor the operations of mining companies.
- The Poor Capacity of the Government to conduct Environmental Surveys
  - The government faces difficulty in coordinating and monitoring mining activities because both its work force and financial resources are very scarce.
  - Local level governments cannot monitor the activities of mining activities since the government has no monitoring policy. For example, the government lacks qualified personnel for monitoring activities.
  - Often economic developments take precedents over sustainable environment developments. For example, issues relating to mining activities have little emphasis placed on the sustainability of the environment or the welfare of the people. For example, OK Tedi has destroyed the ecology of PNG and disrupted the lives of over 100,000 people.
  - Difficult interference in mining as a major sector
  - Difficult local administration      Many aboriginal tribes, difficult access to undeveloped areas

Source: Ref. 27)

## 2. Fact Sheet

### 2.1 Socio-Economic Indicators

Indicators	Data	Year of data	Ref.
Population	5.1 million (Average annual growth rate : 2.43 % in (2001 est.))	2000	2)
Ethnic Groups	Papua and Melanesia tribes falling under Melanesia		26)
Religion	Christianity is predominant, as and traditional religions		26)
Literacy	Total Pop. 72.2 %; adult female: 62.7 %; adult male: 81 %		26)
Urban Population	16 %	2000	2)
Life Expectancy	63.1 years; females: 65.3 years; males: 61.1 years	2000	28)
Child Mortality	58.21 (Mortality of children under five years old against 1,000 birth)	2001 est.	26)
GNP	4.1 billion US\$ (US\$ 890 per capita)	1998	3)
GDP	12.2 billion US\$ (US\$2,500 per capita)	2001 est.	26)
GDP Composition	Agriculture:25% Industry: 35% Services: 40 %	1999 est.	28)
Industry	Food processing, timber, plywood production, wood chip production, mining of gold, silver and cooper, oil palm processing, crude oil production, construction, tourism, copra crushing	2000	28)
Natural Resources	Gold, copper, silver, petroleum, timber, coffee, cocoa, copra, raw rubber, tuna, palm oil, marine resources	2000	28)
Access to the Safe Water *1	Urban areas: 84 % Rural areas: 17 %	1980-1995	
Access to the Sanitation *2	Urban areas: 95 % Rural areas: 12 %	1980-1995	
Human Development Indicators (HDI)	0.542 (133 <sup>rd</sup> in the world, GNP was 108 <sup>th</sup> in the same year)	1998	3)

Note: \*1: Access to Safe Water is the percentage of the population with reasonable access to an adequate amount of safe water including treated surface water and untreated but uncontaminated water, such as from springs, sanitary wells and protected boreholes.

\*2: Access to Sanitation is the percentage of the population with reasonable access the pit latrine, flush toilet with sewage, septic tanks and other suitable facilities to dispose and prevent human from contact with excreta.

### 2.2 Geological and Geographical Features

Area: Total: 460,000 km <sup>2</sup> (1.2 times that of Japan)
The land is geologically classified into:
(1) Southern Region: Hot and humid and rainfall is usually low. Distinct rain and dry seasons. A few dormant volcanoes are found in this region
(2) Islands Region: Hot and humid. Made up of islands off the mainland. Some of these islands have active volcanoes. The significant features of these islands are the coral reefs, beaches and rich volcanic soil and marine resources.
(3) Momase Region: Ranges from open beaches to coastal swamps with dry savannah. Rainfall ranges from 3,000mm to 3,500mm. There are few active volcanoes in this region.
(4) Highlands Region: Has several large open valleys. The region is quite cold at night although the days are warm. Experiences cloud cover and fogs and afternoon rain is common Rainfalls are usually between 3,000mm to 4,000mm.
Highest point: At the summit of Mt. Wilhelm (4,000 m)
Source: Ref. 4), 28)

## 2.3 Meteorological Features

Climate:	Tropical monsoon: northwest monsoon (Dec to Mar); southeast monsoon (May to Oct); slightly seasonal temperature variations.
Season:	Dry from May to October; rainy from December to March
Average Temperature:	23 ~ 32 °C Highland 11 ~ 25 °C, Rabaul 23 °C, Lae 22.9, Port Moresby 23°C
Annual Rainfall:	Over 2,500-3,000 mm ( Some district have annual more than 9,000 mm, Port Moresby: less than 1,000mm, Lae has over 4,500 and Highlands 4,000mm)
Winds:	Winds are changeable. May to August – Trade Winds, January to April – Northwesterly Winds
Climate Area :	Highlands-cooler; Coastal areas humid and hot

Source: Ref. 25)

## 2.4 Ecological Features

Bio-geographical classification : (1) Coastal and oceanic areas (2) Deltaic plains (3) Lowland forest areas (4) Lower mountain forest areas (5) Upper mountain forest areas (6) Grasslands
Known species : Vascular plants 20,000 species, Fish 3,000 species and more, Amphibians (frogs 197 species), Reptiles 300 species and more, Birds 762 species, Mammals (Marsupials 71 species)
Characteristics of fauna and flora species : 3,000 orchid species, over 35 mangrove species
Other features: Extensive mineral deposits and hydrocarbons, abundant water and mixed tropical woods.

Source: Ref. 25)

## 2.5 Hydrological Features

Main Rivers (Total length of river): Fly (1, 200km), Purari (233km), Markham (170km), Leron (76km), Sepik (500km)
<u>Lakes</u> : 5383 (22 lakes with surface area more than 1,000 ha)
Main Lakes (surface area): Murray (64, 700ha), Chambri (21, 600ha), Wisdom (8, 590ha), Dakataua (?)

Source: Ref. 1), 25)

### 3. Organization and Legislation

#### 3.1 Organization

##### 3.1.1 Governmental Organizations

##### (1) Environmental Issues and the Relevant Governmental Organizations

Governmental Organization	Environmental Issues (No. Indicates the relevant chapter)												
	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	Urban Environment	Noise	Solid Waste	Energy	Water Supply	Waste Water Treat	Forest Conservation	Bio-diversity	Natural Resources	Natural Disaster	Env. Education
Department of Environment and Conservation (DEC)	na					-					-	-	na
Department of Health, Ministry of Health		na	na	-		-			-	-	-	-	-
Energy Division, Department of Petroleum and Energy Resources(DPER)	-	-	-	-	-		-	-	-	-		-	-
National Forest Authority (NFA)	-	-	-	-	-	-	-	-				-	-
Department of Lands and Physical Planning (DLPP), Ministry of Lands	-	-	-	-	-	-	-	-		-		-	-
Department of Agriculture and Livestock (DAL), Ministry of Agriculture	-	-	-	-	-	-	-	-				-	-
PNG National Fisheries Authority (NFishA)	-	-	-	-	-	-	-	-	-	-		-	-
University of Papua New Guinea, UPNG	-	-	-	-	-		-	-	-	-	-	-	
University of Technology, UNITECH	-	-	-	-	-	-	-	-	-	-	-	-	
National Disaster and Emergency Service, Prime Minister's Department	-	-	-	-	-	-	-	-	-	-	-		-
Maritime Division, Department of Transport	-	-	-	-	-	-	-	-	-	-	-		-
Civil Aviation and the Landing Craft Base, Defense Department	-	-	-	-	-	-	-	-	-	-	-		-
Provincial Disaster Agencies	-	-	-	-	-	-	-	-	-	-	-		-
Schools (primary, secondary, tertiary)	-	-	-	-	-	-	-	-	-	-	-		-

Note) : Relevant Organization - : No responsible na: No Information  
Source: Ref. 29)

##### (2) Environmental Organizations relations

The Department of Environment and Conservation (DEC) is responsible for environmental assessments, monitoring and enforcement, while the Department of Mining and Petroleum is responsible for monitoring the mining operations and environmental safeguards. The Department of Foreign Affairs and Trade and the DEC are responsible for the implementation and discussion of international treaties. The National Fisheries Authority (NFishA) is responsible for the management and conservation of fish stocks and stock assessment. The NFA cooperates with the DEC to enforce related environmental legislations such as the Dumping of Wastes at Sea Act. The National Forest Authority (NFA) and the Department of Agriculture and Livestock (DAL) are responsible for forest management and commercial/subsistence agriculture, respectively. The Ministry of Law and Order is responsible for formulating environmental legislation, and the arrest, prosecution and detention of offenders.

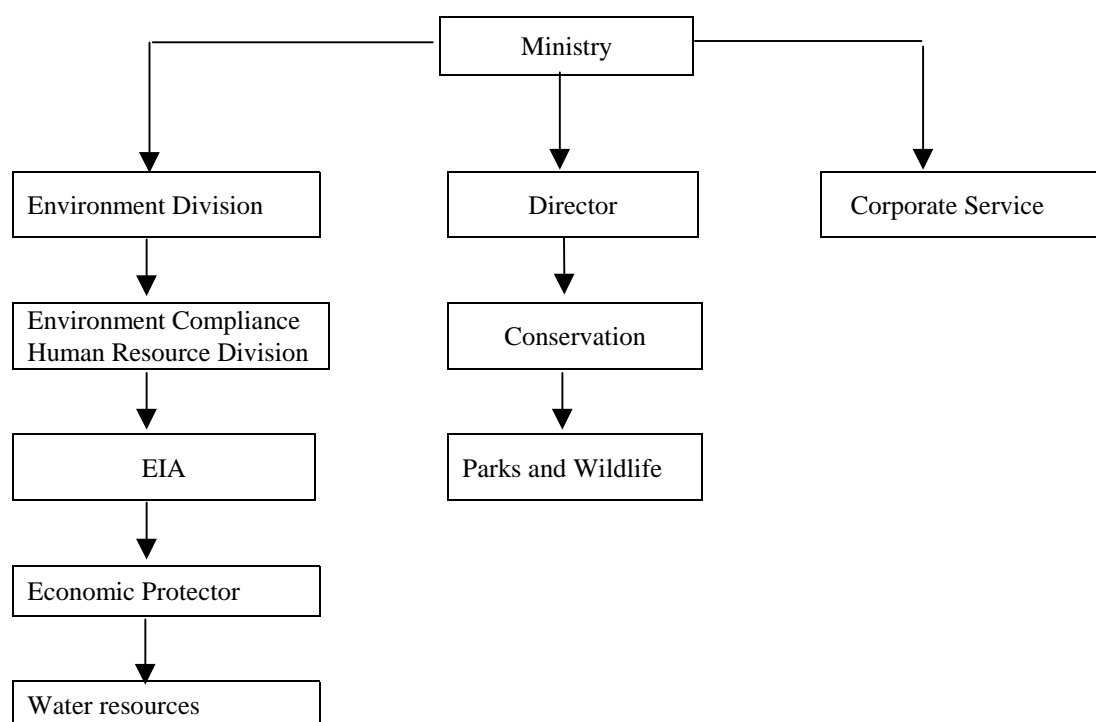
Tertiary Educational Institutions offer environmental science courses; conduct environmental assessment and monitoring and research. Other public institutions such as the National Museum as well as NGOs such as the Melanesian Environmental Protection play roles in environmental management and conduct environmental awareness campaigns.

Source: Ref. 29)

### (3) Department of Environment and Conservation (DEC)

The DEC was established in 1974 to implement and fulfill the Fourth National goal and Directive Principles. The Fourth National Goal and Directive principle has provided the foundation upon which the policies, legislations and regulations have been formulated for the operations of the DEC. Government directives, landowner demands, private sector interests and pressures exerted by various stakeholders have contributed to and shaped the manner in which the organization has performed. The DEC is generally responsible to ensure that natural and physical resources are managed to sustain environmental quality and human well-being. This is the DEC's current *mission statement*.

The Department of Environment and Conservation's Primary Responsibility is to ensure the protection of the environment and conservation of the nation's rich biodiversity. Cooperate planning is considered by DEC as an essential tool for the existence. The DEC is a public service organization that is entirely funded by the national government. Inserted below is a brief presentation of the DEC's structure.



Structure of the DEC

### (4) Example of a related organization to the DEC: *The PNG Forest Authority (PNGFA)*

The Forestry Act 1991, under section 5 enabled the establishment of the Papua New Guinea Forestry Authority (PNGFA). In carrying out its functions as specified by the Act, the Authority is to pursue the following objectives.

1. Manage, develop and protect the nation's forest resource and environment
2. Utilize the nation's resource to achieve economic growth, employment creation and industrial and increase down-stream processing
3. Encourage scientific study and research into forest resources
4. Increase acquisition and dissemination of skills, knowledge information in forestry through education and training
5. Pursue effective strategies to manage forest resources and the management of national, provincial and local interests.

The main functions of the PNGFA include:



1. Providing advice to the Minister on forest policies and legislation
2. Preparing and reviewing the National Forest Plan
3. Directing and supervising the National Forest Plan
4. Negotiating Forest Management Agreements
5. Selecting operators and negotiating conditions on which timber permits, timber authorities and licenses may be granted
6. Controlling and regulating the export of forest produce
7. Overseeing and administration and enforcing of the forestry act and any other legislation pertaining to forestry matters

#### (5) Other Organizations relevant to the Environment

Organization	Relevant Department	Activities
Ministry of Agriculture	Agriculture & Livestock Dept.	<ul style="list-style-type: none"> <li>• PNG resource data system</li> <li>• Planning and monitoring large-scale agricultural projects</li> <li>• Planning land use for local self-sufficient farming</li> <li>• Laboratory</li> </ul>
National Tourist Corporation, National Theatre Co., National Museum National Culture Council. Ministry of Culture & Tourism	Natural History Section National Museum National Cultural Commission	<ul style="list-style-type: none"> <li>• Conserving and developing the cultural heritage and art</li> </ul>
University of PNG, University of Technology. Ministry of Education	Environmental Science Department, University of Papua New Guinea University of Technology Schools	<ul style="list-style-type: none"> <li>• Environmental education</li> <li>• Environmental planning, assessment and monitoring</li> <li>• Environmental science programs</li> <li>• Natural resources research and collection</li> </ul>
Ministry of Finance	Finance Dept.	<ul style="list-style-type: none"> <li>• Budgeting for environmental publicity</li> </ul>
Ministry of National Planning and Implementation	National Planning and Implementation Dept.	<ul style="list-style-type: none"> <li>• Socioeconomic planning</li> </ul>
National Research Institute (NRI)		<ul style="list-style-type: none"> <li>• Conserving traditional culture</li> <li>• Socioeconomic impact assessment</li> </ul>
Ministry of Fisheries & Marine Resources	National Fisheries Authority	<ul style="list-style-type: none"> <li>• Fishery resource management, conservation</li> <li>• Stock assessment</li> </ul>
Ministry of Foreign Affairs	Foreign Affairs Dept.	<ul style="list-style-type: none"> <li>• International treaties and agreements</li> </ul>
PNG National Forest Service. Ministry of Forests	National Forest Authority	<ul style="list-style-type: none"> <li>• Forest management and assessment</li> <li>• Reforestation</li> <li>• National forest activity planning</li> <li>• Nationwide plant sampling</li> </ul>
Ministry of Health	Health Dept.	<ul style="list-style-type: none"> <li>• Environmental pollution assessment and monitoring</li> </ul>
Ministry of Industrial Relations	Labour Dept.	<ul style="list-style-type: none"> <li>• Working environment</li> </ul>
Ministry of Lands	Department of Lands & Physical Planning	<ul style="list-style-type: none"> <li>• Land expropriation and distribution</li> <li>• Government-owned land use planning</li> </ul>
Ministry of Mineral Resources	Mineral Resources Dept.	<ul style="list-style-type: none"> <li>• Environmental conservation and monitoring in mine management</li> <li>• Development forum</li> <li>• Research institute</li> </ul>
Ministry of Petroleum and Energy Resources	Petroleum and Energy Resources Dept.	<ul style="list-style-type: none"> <li>• Petroleum and energy development</li> </ul>
PNG Constabulary	Human Resource Division	<ul style="list-style-type: none"> <li>• Environment-related law enforcement</li> </ul>
Prime Minister	Human Resource Division	<ul style="list-style-type: none"> <li>• Information and land use survey programs</li> </ul>
Ministry of Village Services and Provincial Affairs	Village Services and Provincial Affairs Dept.	<ul style="list-style-type: none"> <li>• Environment-related law enforcement</li> </ul>

Organization	Relevant Department	Activities
Ministry of Transport and Civil Aviation	Transport and Civil Aviation Dept.	• Ocean pollution management

Source: Ref. 5), 29)

### (6) Local Administrator

Local governments have an important role in Papua New Guinea. Some of them have launched their own plans for environmental management. For instance, the New Ireland Province set up the Council for Environment, Tourism and Culture for the purpose of environmental management. Local governments are major participants in the Development Forum held in order to promote sound mine development. Since the basic law concerning provinces and local governments was enacted in 1995, the role of local governments has become increasingly important in environmental management. Many environmental functions have been decentralized for local level governments. Taking the Milne Bay Provincial Government as an example, the Milne Bay Provincial Government is now responsible for coordinating policy development in conservation by providing technical assistance. This project is a Community-based Coastal and Marine Conservation Project. The Milne Bay Provincial Government, the DEC and other stakeholders will work closely with UNDP and Conservation International for this project. This should establish a Wild Life Management Area (WMAs). Budget allocation to these various government agencies depends on the Department of Finance and Planning.

Source: Ref. 5)

### 3.1.2 Non-Governmental Organizations (NGOs)

The level of involvement of NGOs in environmental policy making in Papua New Guinea has been minimal. However, NGOs have been very effective in expanding environmental awareness and education. They have also been successful in mobilizing and galvanizing public support for many environmental causes. NGOs such as the Melanesian Environment Foundation and the Wau Ecology Institute provide classic examples of some of the active NGOs in PNG in terms of their active participation in environmental awareness and education campaigns in PNG.

Organization	Established	Major activities
Foundation of Peoples of South Pacific (FSP)	Na	The group is involved in promoting developments projects for example fisheries and agriculture. The projects must consider the environmental protection and conservation.
Milne Bay Eco-forestry Association (MBEA)	Na	Na
Village Development Trust (VDT)	Na	Na
Pacific Heritage Foundation (PHF)	Na	Na
Conservation Melanesia	1993	To provide research into conservation and sustainable development in relation to socio-economic issues for the protection of the natural resources of PNG.
Forest Industry Association (FIA)	Na	Na
Kavaua Consultants	Na	Na
EU Islands Regional Environment Program	Na	Na
East New Britain Sosek Action Komiti	Na	Na
South Pacific Forest Products	Na	Na
Business Enterprise Support Team (BEST)	Na	Na
Local Environment Foundation (LEF)	Na	Na
Wau Ecology Institute (WEI)	Na	The WEI major activities are centered around environmental monitoring and advocacy, planning and land awareness programme
Melanesian Environmental Foundation Inc (MEF)	Na	The group concentrates on environmental awareness programmes through tours, educating the community, for example schools, youth groups, women's groups and churches through video shows
Conservation International (PNG)	Na	Na
Christensen Research Institute	Na	Na

Organization	Established	Major activities
Melanesian Institute for Pastoral and Socio-Economic Service	Na	Na
Nature Conservancy	1996	Emphasis lies in protecting and conserving the environment
World Wildlife Fund for Nature (WWF)	Na	Na
Melanesian Solidarity Group Inc. (others)	Na	Na
Friends of the Earth	1981	The group is active in environmental awareness programmes through radio talk shows.
PNG ECO-Forestry Forum	1999	Promotes the sustainable use of resources and eco-forestry industry. Also supports the activities of its members.
Goroka Environmental Awareness Group	Na	Provides petitions against corruption in relation to the timber industry.
Environmental Law Center	1999	Deal with legal issues relating to the environment/ awareness, working with communities/ also providing legal assistance eg. Forestry/ Litigation and training based on the law/ Advise.

Na: Not available/located

Source: Ref. 29)

### 3.2 National Policy on the Environment

Policy	Formulated	Purpose	Authority
Managing Papua New Guinea's Unique Environment Strategic Directions 1996-1998	1996	<ul style="list-style-type: none"> <li>A short-term plan for three years from 1996 to 1998 and a ten-year plan until 2005.</li> <li>Comprising the four programs of natural resource strategies, environmental conservation regulations, strategic management and support, and general watershed management.</li> </ul>	DEC
National Environmental Acton Plan	Na	There is no National Environmental Action Plan however, the DEC has Environment and Conservation work plans.	DEC
Local Agenda 21 for Papua New Guinea	1992	Commitment to ecologically sustainable developments, or the creation of a progress for an ecologically, sustainable, socially equitable society economically	DNP&M
Proposed project called the National Biodiversity Strategy and Action Plan in 2002.	Na	The purpose is to emphasize on the Biodiversity Convention and the Climate Change Convention	World Bank and GEF

Source: Ref. 5), 9), 11)

### 3.3 Environmental Law

Laws and relevant Regulation	Description	Authority
Environmental Planning Act /1978	<ul style="list-style-type: none"> <li>The DEC requires resource developers to act in accordance with environmental standards.</li> <li>Developers shall carry out environmental and social impact assessment of their development projects and undertake countermeasures in advance.</li> <li>The DEC is obligated to confirm the observation of this act.</li> </ul>	DEC
Environmental Contaminants Act /1978	<ul style="list-style-type: none"> <li>This act regulates environmental pollution.</li> <li>It stipulates procedures for approving the emission of pollutants into the water, air and soil.</li> <li>It requires toxic materials to be registered before their importation, manufacturing and distribution.</li> </ul>	DEC
National Park Act /1984	<ul style="list-style-type: none"> <li>This stipulates the protection of the fauna and flora, scenic beauty, historic remains, and the cultural, educational and scientific values of nature.</li> <li>It stipulates land leasing and trust management for possessing government-controlled land and environmental conservation.</li> <li>It designates protected areas, including national parks and reserves.</li> <li>It is a basic law concerning the management of national parks along with the Conservation Areas Act.</li> </ul>	DEC
Conservation Areas Act /1980,1992	<ul style="list-style-type: none"> <li>This provides for setting up the National Conservation Council for the purpose of recognizing protected areas and giving management guidance as well as establishing the Management Committee for protected areas, the latter of which is responsible for making and implementing management plans.</li> <li>It stipulates the establishment of a system for terrestrial and marine conservation areas and the protection of lands owned by the government and individuals.</li> <li>It provides for the survey of customary land possession, negotiation and acquisition</li> </ul>	DEC
Crocodile Trade (Protection) Act /1982	<ul style="list-style-type: none"> <li>This provides for all activities related to crocodile farming, including catches, approved sizes for capture, feeding and export licenses.</li> </ul>	DEC
Fauna (Protection and Control) Act /1974	<ul style="list-style-type: none"> <li>This regulates the capture, possession and sale/purchase of wild animals regardless of the areas designated by the Minister of Environment and Conservation and land title.</li> <li>It designates fauna protection areas called Wildlife Management Areas, Nature Preserves and protected areas.</li> <li>In the designated areas, customary landowners are prohibited from excessive harvesting of biological resources, biological diversity is protected, the rights to land and resources are formerly approved, opportunities to gain profits are made available, cultural values are protected, and opportunities for scientific study and education are provided.</li> </ul>	DEC
The International Trade (Fauna and Flora) Act /1983	<ul style="list-style-type: none"> <li>This regulates the export and import of wildlife and related commodities.</li> <li>It fulfills the Convention on International Trade in Endangered Species of Fauna and Flora (CITES).</li> </ul>	DEC
Water Resources Act /1982	<ul style="list-style-type: none"> <li>It provides for control over water use.</li> </ul>	DEC

Laws and relevant Regulation	Description	Authority
Forestry Act /1991	<ul style="list-style-type: none"> <li>• This stipulates the protection and management of forest resources.</li> <li>• The government purchases the rights to felling from customary landowners and then licenses private companies to cut the trees (royalties shall be paid to local governments and landowners. An agreement on environmental protection shall be made between the government and the licensees. )</li> <li>• Felling and yarning shall be banned within 20 m from rivers (In the case of large rivers, within 50 m).</li> <li>• Felling and yarning shall be banned in any area with an inclination of over 25 to 30 degrees.</li> <li>• As for reforestation, licensees should obtain prior approval from the landowners.</li> </ul>	National Forest Authority (NFA)
Land Groups Incorporation Act /1994	<ul style="list-style-type: none"> <li>• This provides for the survey of groups of customary landowners, the confirmation and organization of social units to manage the major title to land, and their observation of PNG laws.</li> <li>• Incorporated Land Groups (ILGs) are groups of customary landowners, who manage their own lands in accordance with customs and laws.</li> <li>• The group as a customary community is entitled to possess, manage and trade land.</li> </ul>	IPA and Land Court/ Land Administration
Environment Act/2000*	This Act embraces the Environmental Planning Act/1978, Environmental Contaminant Act/1978 and the National Park Act/1984	DEC
Oil and Gas Act/1998	This Act embraces the Petroleum Act/1996. The emphasis is on resource participation.	Department of Mining
Fisheries Act/1992	This Act allows the government to prosecute any illegal boats entering the country's waters. The Act also allows the government to sell these illegal boats	National Fisheries Authority
Mining Act/1992	Basis for the regulation of mining and petroleum industries in PNG	Department of Mining
Dumping of Wastes at Sea Act	Regulates the dumping of chemicals in the sea	DEC

\*Note: The Environment Act has not been implemented yet

Source: Ref. 6), 29)

### 3.4 Environmental Impact Assessment (EIA)

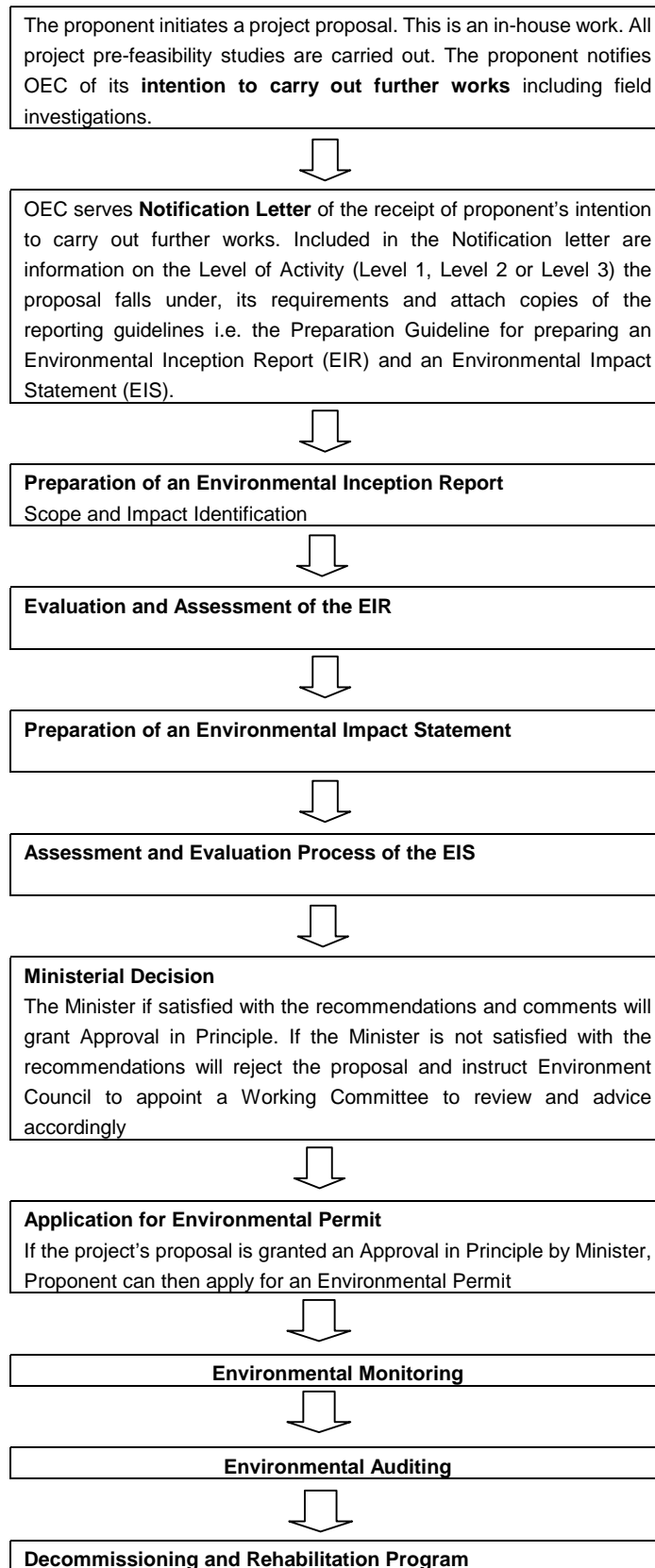
The Environmental Impact Assessment (EIA) Procedure in Papua New Guinea has been developed primarily as an aid to the environmental planning of new development projects or to the expansion of existing development projects. It can be compared with similar techniques that have been devised for the technical and economic planning of projects such as financial feasibility studies. The procedure and guidelines have been tailored specifically to the assessment of development project proposals.

EIA is essentially a preventive process. It seeks to avoid costly mistakes in project planning and development; mistakes which can be costly either because of environmental losses that result or costly because of modification that might be required subsequently to make the project environmentally acceptable to the Government and to the community. EIA and resource planning are together a total approach to environmental management. The procedures and guidelines for EIA in Papua New Guinea have been developed in line with the Government policy statements contained in Fourth National Goal and Directive Principles of the Papua New Guinea Constitution

#### **AIMS AND OBJECTIVES OF EIA**

The aim of environmental impact assessment in Papua New Guinea is to assess the overall impact on the environment of development projects proposed by the public and private sectors. The objectives of environmental impact assessment are:

- a. To examine and select the best from the project options available,
- b. To identify and incorporate into the project plan appropriate abatement and mitigating measures;
- c. To predict significant residual environmental impacts;
- d. To determine the significant residual environmental impacts predicted, and
- e. To identify the environmental costs and benefits of the project to the community.



Brief Procedural Chart of the EIA Process

Source: Ref. 7), 8), 29)

## 4. Current Environmental Issues

### 4.1 Air Pollution

The problem of air pollution has not yet arisen in Papua New Guinea. There are no laws or standards for air pollution, which is not, monitored either. Some possible ways pollutants can be emitted to the air include:

- exhaust fumes from automobiles,
- burning of bushes/rubbish and chemicals.
- industrial waste from factories, mines etc
- pesticides, such as arsenic trioxide and sodium arsenate

Even though, air pollution is not a concern area in PNG now, it is wise to have in place measures and regulations to avoid the danger of it in future.

Source: Ref. 9)

Relevant Organization
1) Road and Traffic Management Safety Division, Department of Transport
2) National Institute of Standards and Industrial Technology
3) Workers Labour Administrative Division, Department of Industrial Relations
4) Environmental Health Section, Department of Health

Laws and Regulations	Existence	Title or References
• Law on air pollution		Summary Offences Act
• Ambient air standards	×	
• Emission std. (Fixed or mobile)		Environment Contaminant Act/1994
• Result of air monitoring	×	
• Guidelines	×	
Environment Act/2000		Environment Act/2000
Motor traffic Act		Motor traffic Act
Public Health Act		Public Health Act

Notes)    : Exist    × : No exist    : under development    ? : Not identified



## 4.2 Water Pollution

The main factors in water pollution include mining and felling. Specifically, goaves waste rocks (wastes and residues of ore dressing) are dumped in rivers, heavy metals including such as cyanides and mercury are used in the refining process of minerals, and earth and sand accumulate in the lower reaches of rivers and coastal areas following soil erosion due to unplanned thoughtless and uncontrolled felling.

Water quality is monitored by each mining industry but not the government or a third party. No Any survey has not been conducted on the impact of water pollution caused by the above-mentioned factors on the natural environment and the human body.

As a problem of sea pollution, coral reefs are destroyed by the use of cyanide and dynamiting as a fishing method. Water pollution is also caused by sewage, agro-industrial and animal wastes. The increases in the number of industries, especially around the urban towns, have also given rise to the amount of industrial waste that is dumped into the sea.

Source: Ref. 10)

Relevant Organization
1) Water Conservation, Department of Environment and Conservation
2) Eda Ranu Pty Ltd. (means Our Water)
3) PNG Waterboard
4) Local Town Authorities

Items	Example of water quality survey ( Ok Tedi Mine(Fly River) )				PNG's water quality std. (rivers))
	(Unit: mg/l)				
	1995				
	4/25	8/30	10/16	12/5	
Copper (Cu)	0.0097	0.0102	0.0048	0.0099	1.0 and less
Lead (Pb)	<0.0003	<0.0003	<0.0003	0.0004	0.005 and less
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	0.01 and less
Zinc (Zn)	-	0.0015	0.001	0.001	5.0 and less
Suspended solids (SS)	2,380	3,600	3,915	4,980	3,500 and less *

**Note:** These results were obtained from the survey conducted by Ok Tedi Mining Limited (the largest mining company in PNG) on its own. A large quantity of earth and sand flow out from the mine into the river, especially during rainfall. It is reported that the flow into the Fly River is at the rate of about 80,000 tons per day. The results of surveys like these are reported to the government every week. The company spends more than 5 million Kina on such surveys every year.

\*The standard set by Ok Tedi Mining Limited on its own.

Source: Ref. 12)

Current State of Water Quality Monitoring at Major Mines	
• Porgera Mine:	Water quality is monitored monthly by the Porgera Joint Venture with regard to the impact of heavy metals on the river basin in which the mine is located. As for the first four days of the month, a survey is conducted every six hours, and the results are reported to the government every three months.
• Misima Mine:	Water quality is monitored monthly by the Misima Project with regard to the impact of heavy metals on the Solomon Sea into which wastewater is drained from the mine, and the results are reported to the government one month after the survey. Survey Items: Cadmium, cobalt, copper, zinc, iron, lead, arsenic, mercury, chrome, manganese, molybdenum, silver
• Ok Tedi Mine:	In September 1994, the Government established an Acceptable Particulate Level (APL) for sediment in Fly River System. Ok Tedi Mining Limited (OTML) reports to the PNG Government on environmental compliance on weekly, monthly, quarterly and annual basis. The company has always at all times met the statutory limits the PNG Government imposes.

Source: Ref. 30)

Laws and Regulation	Existence	Title or References
• Law on water pollution		Water Resource Act
• Water quality standard		PNG Water board Act
• Effluent standard	×	
• Drinking water quality standard		Eda Ranu Act (Our Water)
• Result of water monitoring		National Water and Sewerage Act
• Guideline for water quality control	×	
		Public Health Act

Notes) : Exist    × : No exist    : under development    ? : Not identified

### 4.3 Other Pollution

#### (1) Urban environment

The proportion of the urban population (16%) is relatively low compared with other developing countries. As the number of people who move to the capital Port Moresby is increasing year by year, there is concern that environmental problems will arise from shortages of water supplies and sewerage systems and waste disposal facilities.

#### (2) Noise in urban areas

Currently, there are no laws pertaining to the regulation of noise in PNG. Noise, especially in the city is usually caused by the heavy traffic on road, industries, air traffic and infrastructure construction such as roads and buildings.

Laws and Regulation	Existence	Title or References
• Law relevant to noise	×	

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 4.4 Solid Waste Management

In urban and rural areas, general and industrial wastes are dumped without treatment at uncontrolled reclamation sites. In Port Moresby, households put general garbage in the bins and drums specified by the municipality, and private companies are entrusted by the National Capital Committee to collect and transport them. Empty bottles of soft drinks and beer, and copper and aluminum scraps are recycled, though in very small quantities. There is concern that goaves (wastes and residues of ore dressing) from mining may accumulate in the lower reaches of rivers and have some impact on the natural environment and humans. There is also concern that cyanogen and mercury produced in the refining process may contaminate water and have some effect on the natural environment and humans.

Waste Management is a problem on the rise, especially in the urban centres such as Port Moresby and Lae. This problem is quickly turning into a very big issue. For example, unregulated domestic wastes dumped carelessly by the people, sewage disposals etc have evolved to become real concerns of late.

For Port Moresby, the National Capital District Commission (NCDC) is responsible for the collection and disposal of solid waste management in the city. Currently the NCDC has put forward certain goals/objectives to address the issues of the management, collection and disposal of municipal, health, industrial and solid wastes in the city.

Specifically, the NCDC's objectives include:

- The development of a waste management policy and strategy for control provisions of wastes generation and disposal systems;
- To develop and manage a data base of data collected and pollution monitoring in Port Moresby
- To develop and enforce a regular monitoring strategy
- Attending to and carrying out assessment and analysis of all kinds and types of contamination and pollution in the city.

Source: Ref. 27), 31)

Percentage Composition of Port Moresby's domestic wastes

Wastes	% of waste
Vegetable/Putrescible materials	52.8%
Paper	13.9%
Metal-iron	11.2%
Metal-nonferrous e.g. Aluminum	2.2%
Glass-colored	3.6%
Glass-clear	6.8%
Textiles	1.6%
Plastics	6.9%
Wood	0.1%
Ceramic	0.9%

Source: Ref. 14)

*Note:* The household waste composition survey was actually done in 1993. The figures have not been updated by the DEC since then.

Relevant Organization
The Capital Port Moresby
1) Health Division, National Capital District Commission
Other district
2) Environmental Waste and Pollution Control, Environment and Conservation Regulation Service Division, Department of Environment and Conservation
3) Environmental Health Division, Department of Health

Garbage disposal volume in Port Moresby (daily average in 1995)

Item	Volume (tons/day)
Household garbage	46
Market trash	25
Commercial trash	52
Industrial wastes	18
Public facilities' trash	6
Construction site wastes	22
Agricultural wastes	4
Total	173

Source: Ref. 15)

Goaves volume and measure of disposal in major mines

Mine	Available years to mine (years)	Laborer	Goaves (tons/day)	Measure of disposal
Bougainville	30	4,000	135,000	Dumping of goaves in the river.
OK Tedi	30	2,500	80,000	Dumping them in the river. Mining dust is also dumped in the river at over 10,000 tons a day.
Misima	10	350	15,000	Dumping them in deep-sea areas through submarine pipes. Pumping soft goaves of 10,000 tons a day directly into the sea.
Hidden Valley	10	300	10,000	Storing goaves in storage dams.
Porgera	18	900	9,000	Dumping them in the river.
Mt. Kara	3	200	3,000	Dumping them in the river.
Wau	9	280	1,400	Dumping them in the river.
Mt. Victor	2	100	400	Storing them in sealed holes in limestone.
Lake Kamu	15	160	???	Dumping them on the premises of the mine.

Source: Ref. 1)

Laws and Regulation	Existence	Title or References
Solid Waste Management Law	×	
Hazardous Waste Management Law		Environment Contaminant Act
Guideline for Solid Waste Management		Environment Planning Act
Others		OK Tedi Mining Agreement National Sewerage Act

Notes) : Exist × : No exist : under development ? : Not identified

## 4.5 Energy Conservation and Alternative Energy

Papua New Guinea has abundant fossil fuel deposits and is blessed with regenerative energy such as substantial water resources, solar energy, biomass energy and geothermal power. Currently, over 85% of the population uses firewood as a household fuel. In urban areas, about 35% of the population use firewood, about 35% kerosene, and about 30% gas or electricity. However, the low cost of funds as well as the limited knowledge in these issues pose to this development. It is estimated that 62.5 % of the population use traditional fuel and the government and the people do not recognize the necessity for introducing low-pollution alternatives, as they are not much aware of financial problems

Source: Ref. 32)

Relevant Organization
1) Energy Division, Department of Petroleum and Energy Resources(DPER)
2) Science and Technology Branch, Transport and Works Department
3) Applied Science and Appropriate Technology Development Institute, University of Technology
4) Physics Department, University of Papua New Guinea

The data for the total consumption and production of energy for 1999 for the respective energy items is listed here.

The energy production and consumption for 1999 was as follows:

- Electricity production: 1.82 billion kWh
  - Electricity production by fossil fuel: 54.95%
  - Source: hydro 45.0%
  - Nuclear: 0%
  - Other: 0%
- Electricity consumption: 1.693 billion kWh
- Electricity-exports: 0 kWh
- Electricity-imports: 0 kWh

Source: Ref. 32)

Laws and Regulation	Existence	Title or References
Law on Energy Conservation and Energy Use	×	
Law on Nuclear Energy Usage	×	
Others		PNG Electrical Commission Act

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 4.6 Water Supply

Although Papua New Guinea is rich in water resources, safe drinking water is available to just 32% of the population. Papua New Guinea ranks at the bottom of the world when it comes to access to clean water. By 1998, it was estimated that only 31% of the population had access to safe water. In this respect, the country is one of the worst ten in the world. Sanitary facilities are provided at a rate of no more than 56%. Besides a shortage of safe water, this deficiency causes infectious diseases to spread, including gastroenteritis, typhoid and hepatitis. These are a serious problem especially in densely populated urban areas.

The National Water Supply and Sewage Act/1986 were established to regulate all water supply and sanitation systems, the sector remains fragmented. The bulk of the population does not have access to safe water or better sanitation. This is a significant problem in PNG, especially when more people move into the cities.

The Asian Development Bank has invested as much as 10 million Kina in urban water supply and sanitary improvements since 1982. The EU has also made a similar investment since 1989. The DEC has outlined in its Corporate Plan 1998-2001 a programme for Water Resources Management. The programme aims to maintain water quality standards in future.

Source: Ref. 16)

Supply Sources	Water Supply	Purpose of usage	Water Demand
From Sirinumu Dam River	51,100	Drinking	51,100
From Bomana Lake	51,100	Drinking	51,100
Groundwater	Na	-	-
Total	51,100	Total	51,100

*Note:* Sirinumu and Bomana combined together have supply about 51,100ML/year. Eda Ranu does not recycle sewerage water or domestic wastewater, but this may occur in the near future.

Source: Ref. 17)

Relevant Organization
National level
1) Field Services Division, Department of Environment and Conservation )
2) Environmental Health Division, Department of Health )
3) Health, Population and Social Infrastructure, Department of Finance )
Port Moresby
4) Eda Ranu Pty Ltd (Our Water)
Local district
5) Provincial health offices
6) Provincial Water Boards

The means of access to fresh water in local districts

Year	Well		Rainfall		Simple Filtration of Surface Water		Others		Total	
	facilities	ratio	facilities	ratio	facilities	ratio	facilities	ratio	facilities	ratio
1990	64	32%	91	45%	33	16%	14	7%	202	100%
1992	115	50%	84	37%	31	13%	0	0%	230	100%
1993	84	21%	256	65%	34	9%	22	5%	396	100%
1994	128	45%	117	41%	38	14%	0	0%	283	100%

Source: Ref. 18)

Laws and Regulation	Existence	Title or References
• Law on Water Resources Management		Law on Water
• Law on Water Resources Usage		Law on Fees for Use of Water and Mineral Water

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 4.7 Wastewater Management

Sewage Wastewater is currently drained into areas of the sea or rivers without treatment under the Water Resources Act. There are no drainage effluent standards or regulations.

In Port Moresby, there are two ways of draining sewage, namely direct drainage without treatment and through the lagoon into the Papua Bay.

JICA signed an agreement concerning a study on planning for the provision of sewerage systems in Port Moresby in December 1996.

Source: Ref.1)

Relevant Organization
1) Department of Environment and Conservation
2) Department of Health
3) EDA RANU

Laws and Regulation	Existence	Title or References
Law on Sewerage		National Sewerage Act
Laws and Regulation on Industrial Wastewater Control	×	
Effluent Standards	×	
Monitoring Results	×	
Others		Environment Planning Act
		OK Tedi Mining Agreement

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 4.8 Forest Conservation and Desertification

Felling licenses have been granted for about 87,000 km<sup>2</sup> of a total of about 0.36million km<sup>2</sup> of forests. The cutover is not reforested because the selective cutting system is employed. Only 3 of 93 licensees carry out afforesting. The area planted by the end of 1994 accounts for no more than 600 km<sup>2</sup> across the country, of which an area of 26 km<sup>2</sup> was planted in 1994 alone, mostly by Japanese companies.

It is estimated that 2% of the country or an area of 1 million ha, has been felled up to now. On the periphery of densely populated towns, forestlands have been converted into grassland because of firewood collection, hunting, grazing and fire. In the suburbs, the selective cutover is converted into farmland, thus forestland is on the decrease.

At the present time, JICA is implementing a Forest Research Project (Phase II) in cooperation with the National Forestry Research Institute. This project is intended to provide technological cooperation for research into the species of natural forests, silvicultural techniques and forest soils so that forest resources will be managed in a sustainable manner.

The NFA and the DEC have developed a Tropical Forest Action Plan (TFAP) and the National Forests Conservation Action Plan (NFCAP) with the support of AUSAID, the UNDP, the WB and the ITTO.

At this moment, desertification has not yet become an actual problem but measures must be taken for future planning. Less than 2.8% of the Papua New Guinea has protected formal area status. Of this area, about 1% is set aside for state owned National Parks. The locals under the Fauna Act customarily own the rest of the protected land. The problem lies in the area of management. Often clans have conflicting views over the ownership of land.

Source: Ref.1), 19)

Relevant Organization
Forest conservation
1) National Forest Authority (NFA)
2) Department of Environment and Conservation (DEC)
3) Forest Research Institute, (NFA)
4) Organization of local government related to forest resource
Desertification
5) Department of Lands and Physical Planning (DLPP), Ministry of Lands
6) Department of Agriculture and Livestock (DAL), Ministry of Agriculture
7) Department of Environment and Conservation (DEC)
8) Organization of local government related to land resource and environment

Forest Area by Type (Unit : million ha)

Forest Type	Forest Area	
	Year	
	1975	1996- current period
Protection forest	6,141,625	10,284,393
Natural reserves	Na	Na
Productive forest	29,241,136	26,280,554
Convertible forest	1,019,499	26,280,554
Other types	Na	Na
Logged Forest	394,636	Na

**Note:** These figures still need further elaboration and confirmations.

Source: Ref. 20)



## Forest Classification by Use in PNG (by Province)

(Unit: 1,000 ha)

Province	Total area	Productive forest			Protected Forest	Preserves		Others
		Licensed		Unlicensed		Suitable for Felling	Unsuitable for Felling	
		Suitable for Felling	Unsuitable for Felling					
Western	9,786	800	603	553	744	3,793	2,089	1,745
Gulf	3,385	384	472	552	200	118	1,640	80
Central	2,995	240	359	137	11	418	1,244	477
Milne Bay	1,421	171	159	155	0	289	553	40
Oro	2,251	67	274	139	0	426	951	292
South Highland	2,569		371	50	0	558	1,286	180
Enga	1,184		195	13	1	80	677	167
West Highland	850		73	66	7	22	255	409
Simbu	602		84	55	0	92	293	50
East Highland	1,101		168	0	566	108	583	186
Morobe	3,353	227	484	51	4	233	1,680	406
Madang	2,873	215	329	327	56	270	1,143	479
East Sepik	4,372	80	617	278	5	219	2,143	827
Sandaun	3,601	336	345	275	17	1,117	1,197	215
Manus	210	52	4	114	6	25	14	113
New Ireland	962	375	52	73	0	183	182	79
East New Britain	1,511	442	113	303	0	139	391	85
West New Britain	2,075	336	227	97	19	127	788	423
North Solomon	933	99		0	0	0	344	457
Total	46,026	3,824	4,929	3,219	1,666	8,226	17,452	6,710

Source: Ref. 1)

Laws and Regulation	Existence	Title or References
Forest Conservation Law		Forestry Act
Laws and Regulation on Felling and Use of Forest	×	
Laws and Regulation on Protected Area		Forest Management Act
Laws on Prevention of Desertification	×	
Others		Environment Planning Act
		Environment Contaminant Act

Notes) : Exist × : No exist : under development ? : Not identified

## 4.9 Biodiversity

A great percentage of PNG's landmass is covered in blankets of rainforest- an exotic tangle of vines, creepers and trees. Wild Orchids blaze against a verdant green background canopy. PNG has more orchid species than the world. In addition, PNG also houses some 15-21,000 higher plants, 3,000 species of orchids, 800 species of coral, 600 species of fish, 250 species of mammals and 760 species of birds. The species are protected by the following legislation: Fauna Act/1982, Conservation areas Act/1980, 1992, the Crocodile Trade Act/1982 and the International Trade Act/1982. There are certain cases of smuggling of certain endangered species, for example the Alexandra Bird Wing butterfly. Certain species of orchids have also been smuggled out of PNG.

Source: Ref. 4), 33)

Organization
1) Conservation Resource Centre, Department of Environment and Conservation
2) National Forest Authority
3) Quarantine Office, Department of Agriculture and Livestock (DAL), Ministry of Agriculture
4) Bureau of Customs, Department of Finance
5) Tourism Promotion Authority

### Known, Protected and Endangered Species (as of 1995)

Category	Known Species	Protected Species	Indigenous Species	Endangered Species
Higher Plants	Vascular plants (ferns, micro flora, etc.) 15,000~20,000 (Include orchids: more than 3,000)	*	*	*
Fish	More than 3,000 (freshwater fish: 300)	2*	(Fresh water more than 200)	na
Birds	855	52	855	More than 23
Mammals	Marsupials 71	11	More than 60	8
Reptiles	Lizards:195 Snakes:95 turtles:13	1 turtle and 1snake	-	More than 4
Amphibians	Frogs 197	none	128	None
Insects	More than 23 species (Bird Wing Butterfly 958)	7 Bird Wing Butterfly	479	More than 20
Mollusks	More than 400 species	na	na	na
Coral reefs	More than 700	na	na	na

*Note\** Yet to be confirmed

Source: Ref. 4), 34)

### List of Reserve Area in Papua New Guinea

Name	Reserve Type
Varirata	National Park
Zoimaga	Terrestrial
Moro	Wildlife Management Area
Tonda	Marine
Maza	Wild life Management Area
Lake Kaumu	Wild life Management Area
Mt Gahausukan	National Park
Bismak-Ramu	Wildlife Management Area
Mt Crater	Wild life Management Area

*Note:* There are more than 100 reserve areas.

Source: Ref. 21)

## Classification of reserves

<p><b>Wildlife Management Areas (WMAs)</b></p> <ul style="list-style-type: none"> <li>• Landowners may utilize certain species in accordance with use regulations under the control of the government.</li> <li>• There are more than 20 wildlife protection areas occupying a total area of about 10,000 km<sup>2</sup> (about 2% of the country).</li> <li>• Tonda and Maza are the largest, accounting for about 75% of the total of all the areas or about 7,500 km<sup>2</sup></li> </ul> <p><b>Sanctuaries</b></p> <ul style="list-style-type: none"> <li>• It is prohibited to survey and feed wild animals originating in the area concerned.</li> <li>• Landowners are allowed to catch or harvest certain animals/plants for their individual livelihood in specified areas.</li> </ul> <p><b>National Parks</b></p> <ul style="list-style-type: none"> <li>• Untouched nature and habitats are protected and used for public and educational purposes.</li> <li>• There are four national parks occupying no more than 127 km<sup>2</sup> of the country.</li> <li>• Besides these, 21 areas have been proposed for national parks.</li> </ul> <p><b>Provincial Parks</b></p> <ul style="list-style-type: none"> <li>• These are established in the suburbs and enable people to enjoy excellent landscapes and recreation.</li> <li>• Currently, there are three provincial parks.</li> </ul>
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Source: Ref. 21)

Laws and Regulation	Existence	Title or References
General Law for Conservation of Fauna and Flora		Fauna(Protection and Control) Act * There is no legislation for flora.
Laws and Regulation on the Conservation of Species		Conservation Areas
Laws and Regulation on Hunting	×	
Laws and Regulation on Protected Area		National Parks Act
Definition in the Red Data Book		Fauna Act

Notes) : Exist × : No exist : under development ? : Not identified

## 4.10 Natural Resources

As stated in 4.5, 4.9 and other sections, Papua New Guinea is rich in natural resources including minerals, which are, however, not systematically managed well.

At the workshop on environment and natural resources management held by the UNDP in June 1996, the following six priorities were proposed.

- a) Implementation of national strategies for sustainable development
- b) Conservation of the sea, the coast and relevant ecosystems
- c) Conservation of land and freshwater ecosystems
- d) Establishment of the Environment and Resources Management Center
- e) Implementation of the National Forest Conservation Action Plan (NFCAP)
- f) Reinforcement of the capacity and finances of the government, educational institutions and the people involved in the mining industry

Because of the nature of the environment in terms of biodiversity and natural resources like minerals, forestry and fishery, it is significant that certain measures be taken for the management of the environment. The DEC has developed a legislation that will support the new Environment Act/2000. This new legislation will aim to monitor the environment regulation with regard to permit transition, fees and charges. The objective of the legislation is to protect and manage the environment adequately. Penalties range from K20, 000 for individuals and K250, 000 for large companies/co-operations.

Source: Ref. 23)

### (1) Land Use

Area and shares by land use category is shown in the table below.

Area and Shares by Land Use Category (year 1993)

Category	Area (km <sup>2</sup> )	Share (%)
Cropland	4, 528.6	1
Forest	420, 706.94	92.9
Arable land	452.86	0.1
Others	27, 171.6	6
Total	452 860	100

Source: Ref. 26)

### (2) Minerals

Production of major mineral resources

Minerals	1985	1990	1995	2000
Gold (kg)	30,000	35,000	40, 000	2,396,470
Copper (ton)	152,000	160,000	210,000	203,061
Silver (kg)	49,000	110,000	60, 000	2 ,546, 196

Source: Ref. 22)

Relevant Organization
1) PNG National Forest Authority (NFA)
2) PNG National Fisheries Authority (NFishA)
3) Department of Agriculture and Livestock (DAL), Ministry of Agriculture
4) Department of Lands and Physical Planning, Ministry of Lands
5) Mineral Resources Department and Petroleum & Energy Department

Laws and Regulation	Existence	Title or References
General Law on Natural Resources Management	×	
Laws on Mineral Resources Management		Mining Act
Laws on Underground Resources Management		Oil and Gas Act
Laws on Fishery Resources		Fish Management Act

Notes)    : Exist    × : No exist    : under development    ? : Not identified

## 4.11 Natural Disaster

The territory of Papua New Guinea, being located at the center of the Australian Plate clashing with the Pacific Plate, is geologically active. Because PNG is in the Pacific Rim of Fire, it is vulnerable to volcanoes, flooding, drought, frost, tsunamis and cyclones. Its geological location; sharing the Australian plate and colliding with the Pacific plate expose it to natural disasters.

The recent El Nino event caused a drought and a shortage of water for production at two mines, which have been forced to close.

Source: Ref. 30)

Relevant Organization
1) National Disaster and Emergency Service, Prime Minister's Department
2) Maritime Division, Department of Transport
3) Civil Aviation and the Landing Craft Base, Defense Department
4) Provincial Disaster Agencies

Laws and Regulation	Existence	Title or References
Laws on Natural Disaster Control	×	

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 4.12 Environmental Education

In Papua New Guinea, educational reforms are now being promoted and efforts are being made to bring children into the new educational system. The government and the World Bank have invested 27 million Kina in the reforms, and JICA supports the construction of the National Port Moresby Senior High School. At schools, students may learn music, plays and traditional dancing which have some relationship with the environment, but there are no special programs for environmental education. With over 800 languages spoken in PNG, it is significant that environmental awareness programmes are taught effectively at an early stage. The new education system allows more children to enter into to schools and blends well with the local dialects because it gives teachers the opportunity to teach students at an early stage the importance of environment in their own dialects.

As for universities, the University of Papua New Guinea has an environmental science program under which students can take the course of environmental sciences. The University of Technology has only a short-term seminar on the environment. The University of Papua New Guinea is considering starting a postgraduate degree course combined with the environmental science program.

Relevant Organization
1) Curriculum Unit, Department of Education
2) Environmental Science Programme, University of Papua New Guinea
3) Environmental Management and Resource Centre, University of Technology
4) Ministry of Education

Environmental Public Awareness Programme
• The DEC has developed some environmental Awareness programmes, but they are yet to be implemented.

Source: Ref. 24)

Laws and Regulation	Existence	Title or References
Education Law		Education Act
Guidelines for the Environmental Education	×	

Notes) : Exist    × : No exist    : under development    ? : Not identified

## 5. International Relations

### 5.1 Global or Trans-boundary Issues

In 1989, the Office of International Development Assistance (OIDA) was set up to receive foreign aid in the Department of Financial Planning. Australia is the largest donor of development assistance (\$235 million in 1994 accounting for 72% of the total). In the area of environment, Australia, Germany and the UNDP give significant cooperation, in the decreasing order.

#### (1) Drift net fishing and smuggling of endangered species

PNG is a signatory to a number of global environment protocols and ranks as 16<sup>th</sup> in the world. It shares the borders with Australia, Indonesia and Solomon Island. Drift net fishing by foreign vessels, smuggling of endangered species and border issues between PNG and Indonesia are current issues. Because these are international conventions, international law can take precedents over these issues. PNG's membership of global environment protocols prevents and protects it from the above issues. They include:

Source: Ref. 32)

### 5.2 Conventions Ratified or Signed concerning Environment

Convention	Ratified
1. General environment	
• Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques	1976
• South Pacific Nuclear Free Zone Treaty	1989
2. Waste Management and Hazardous waste	
• Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter	1972
3. International resources	
• The Antarctic Treaty	1959
• Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water	1963
• Convention on Conservation of Nature in the South Pacific	1976
• Convention for the Protection and Development of the Natural Resources and Environment of the South Pacific Region	1988
4. Global climate	
• The Convention to Combat Desertification	1995
• The Convention on Protection of the Ozone Layer	1963
5. Marine pollution	
• Law of the Sea Convention	1982
• International Convention for the Prevention of Pollution of the Sea by Oil (amended 1962 and 1969 )	1954
• International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties	1969
• International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage	1971
7. Wildlife	
• Convention on International Trade in Endangered Species of Wild Flora and Fauna	1973
• International Plant Protection Convention	1951
• Plant Protection Agreement for the South East Asia and Pacific Region (as amended 1956)	1956

## 5.3 International Donor's Project on Environment

Donor Country	Duration	Projects and related Institution
General Environment Issues		
AUSAID	1994-1999	North Simbu Rural Development Project
ACIAR	?	Economic Policy Choices for Rural Development in PNG
UNDP/UNEP/GEF	?	NSDS (National Sustainable Development Strategy)
EU	?	Island Regional Environmental Program
ADB,AIDAB,IRDB	?	Population and Family Planning
UNFPA	?	Population and Development Planning
Global climate		
GEF	?	Climatic Change (Inventory of Energy Index)
AUSAID	?	Sea Level Monitoring
Land use		
AUSAID	1991-1998	Australian Contribution to Land Mobilization
GTZ	?	NFCAP Landowner Awareness Project
Marine conservation		
AUSAID	1990-1994	Western and Gulf Coastal Zone Management Plan
GEF	?	Funds projects on marine conservation and protection of marine species
Biodiversity		
AUSAID	1994-1999	Queen Alexandra Birdwing Butterfly Conservation Project
GEF	?	GEF Biological
UNEP	?	Biodiversity Country Study
UNEP	?	Biodiversity Conservation Data Base Management Project
WB,AIDAB	?	Oro Butterfly Conservation
EU	?	Orchid Research and Extension
Forest conservation		
AUSAID	1992-1998	Rapid Forest Resource Appraisal (NFCAP)
AUSAID	1993-1998	National Forestry and Conservation Action Programme (NFCAP)
AUSAID	1993-1994	Forest Sector Human Resource Development (NFCAP)
AUSAID	1990-1994	AIDAB National Forestry and Conservation Action Program (NFCAP) Trust Fund
ACIAR	?	Requirements for Tropical Trees for Plantations and Agro forestry Systems
UNDP/UNEP/GEF	?	Tropical Forest Action Plan/National Forest Conservation Action Plan (TFAP/NFCAP)
WB,JAPAN,NFCAP,NORWAY	?	Forest Management and Planning Project
ADB	?	Forestry for Rural Development
ITTO	?	Ecological and Economic Sustainable Tropical Forest Use
ITTO,JAPAN	?	Plantation Establishment and Management
EU	1994-2000	Log Export Monitoring and Surveillance
Natural resources / conservation		
AUSAID	1992-1996	On Scene Oil Spill Model
AUSAID	1992-1994	PNG Resource Information System
ACIAR	?	Coconut improvement in PNG
ACIAR	?	Fisheries Management Economics in the South Pacific
ACIAR	?	National Disorders of Taro
ADB	?	Marine and Coastal Resources Management
Technical and institutional assistance		
AUSAID	1992-1994	DEC Strengthening (NFCAP)
JICA	?	Fish Farming in
Water pollution		
AUSAID	1993-1994	Validation of the Ok Tedi Mining Limited Pollution Monitoring
Water resource and sewerage system		
ADB	?	Development of Urban Water Supply and Sewerage Works
Human health		
ACIAR	?	Control of Mites and other diseases

Source: Ref. 1), 24)



## 6. Information Sources

## 6.1 Governmental Offices

Sector	Institution	Contact Person	Address
General Environment	National Weather Service	Mr. Kevin Luana, Acting Director	P.O. Box 1240 BOROKO Tel: (675) 3252788 Fax: (675) 3252740
	National Weather Service.	Sam Maia Weather Service.	PO Box 1240 Boroko Tel: 325 2788
	Department of Environment and Conservation	Mr. Lucas Tanigrey Executive Officer to the Director	P.O. Box 6601, BOROKO Tel: (675) 325 0196
	University of Papua New Guinea	Dr Budai Tapari Geography Department	PO Box 320, University Tel: 326 201
		Mr. Duguman Science Department	PO Box 320, University
	National Statistic Office	Christine Head of Publication	PO Box 337 Waigani Tel: 301 1226
	NSO Library	Francisca (publications)	PO Box 337 Waigani. Tel : 301 1226
DEC	For Environment, see Mr. Joku, Tel: 325 0196	Tel: 325 0196	
Forestry and Biodiversity	PNGFA	Mr. Dambis Kaip, Acting Director for PNGFA	PO Box 5055 Boroko Tel: 327 7800
	DEC	For Conservation, see John Lagani.	Tel: 325 1095
Land Use	Department of Land and Physical Planning	Mr. Kimas Deputy Secretary of Land Management	PO Box 6601 Boroko Tel:301 3110
	National Mapping Bureau	Robert Rosa	Tel:327 6213
	DAL	Mr. Henry Godfrid Acting Policy Planning Advisor	PO Box 417 Konedobu Tel:3235186; Fax:3235190
Water Supply/ Sanitation	EDA RANU ("OUR WATER")	Michael Yagro Environment Chemist	PO Box Tel:312 2176
	PNG Water Board	Sibona Vivia	Fax:
	DOH	Willie Porau, Central Public Health Laboratory	Tel: 324 8370
	DOH	Luke Tindilo, Manager in Charge for Waste Management, Health Division.	PO Box 7270, Boroko Tel: 323 3259

Sector	Institution	Contact Person	Address
Natural resource	Department of Mining	Patricia Pepena Senior Resource Scientist	Private Mail Bag Port Moresby Tel: 321 4011 Fax: 321 4637
	Department of Petroleum and Energy Resources	Nelson Tai Research Officer	P.O. Box 494, Waigani, NCD Tel: (675) 3253233
	National Fisheries Authority (NFA)	Mr. Buraik, Corporate Manager, NFA	PO Box 2016 Port Moresby Tel: 321 2643.
Energy Conservation / Alternative Energy	Department of Environment and Conservation	Kay Kalim	Tel: 325 0196

## 6.2 Environmental Non-Governmental Organizations ( NGO ) and Others

Organizations	Contact Person	Address
Nature and Conservancy	Mr. Wep Kanawi PNG Country Programme Director	PO Box 2750 Boroko Tel:323 0699 Fax: 323 0397
Porgera Joint Venture (PJV)	Tim Ombudsmen, Environmental Manager, Porgera.	Tel: 547 9500



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- 2) the National Statistical Office
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- 6) Regan.et.al Twenty Years of PNG Constitution.2000
- 7) UNDP Preparatory Assistance Document: PDF B
- 8) Environmental Impact Assessment Procedures and Guidelines, Department of Environment and Conservation
- 9) PNG National Profile of Chemical Management, pp.50-51, 1997-2000, Mowbary.D, Wagi. S, September 2000
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- 13) OK Tedi Mining Limited APL Compliance Addition. Environmental Monitoring Programme, Annual Report 1998/99
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- 16) Proposed Provincial Town Water Supply and Sanitation Project 2000; ADB Publications
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- 18) Papua New Guinea Department of Health National Health Plan VOLUME TWO 1996~2000
- 19) Colin Filner, The Thin Green Line: World Bank Leverage and Forest Policy Reform in Papua New Guinea. Iko-Foretri Nius, September, 2001
- 20) PNGFA Mapping Branch
- 21) Department of Environment and Conservation, Conservation Division
- 22) Independent State of Papua New Guinea: Department of Mining Quarterly Bulletin. July-December 2000
- 23) Nature and Conservancy
- 24) Department of Environment and Conservation Godfrey Angap. Pers.comm. November 2001
- 25) <http://www.niugini.com/~pngcom/profile1.htm>
- 26) <http://www.ordci.gov/cia/publication/factbook/geos/pp.html>
- 27) <http://www.countrywatch.com/files>
- 28) <http://www.edu.com/pp.html>
- 29) <http://www.unescap.org/drpad/publication/integra/volume3/png/3pg01c03.htm>
- 30) <http://www.oktedi.com/environment/monitoring.htm>
- 31) <http://www.ncdc.gov.pg/services/wastemanagement/index.htm>
- 32) <http://www.odci.gov/cia/publications/factbook/geos/pp.html>
- 33) <http://www.paradiselive.org.pg/nature.html>, 2000
- 34) <http://valhalla.unep-wcmc.org/isdb/country.cfm?Country=PG>

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## Abbreviations

ACIAR	Australian Centre for International Agriculture Research
ADB	Asian Development Bank
AIDAB	Australian International Development Assistance Bureau
AUSAID	Australian Agency for International Development (formerly AIDAB)
CI	Conservation International
CRC	Conservation Resource Centre
CRI	Christensen Research Institute
DAL	Department of Agriculture and Livestock
DFMR	Department of Fisheries and Marine Resources (now NFishA)
DOLPP	Department of Lands and Physical Planning
DMP	Department of Mining and Petroleum
DMR	Department of Mineral Resources
DNP&M	Department of National Planning and Monitoring
DPER	Department of Petroleum and Energy Resources
DOE	Department of Education
DOF	Department of Finance
DOH	Department of Health
DTCA	Department of Transport and Civil Aviation
EU	European Union (formerly EEC)
GEF	Global Environment Facility
GOPNG	Government of Papua New Guinea
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (Federal Republic of Germany Technical Assistance Organization)
IBRD	International Bank for Reconstruction and Development (World Bank)
ITTO	International Tropical Timber Organization
JICA	Japan International Cooperation Agency
MEF	Melanesian Environment Foundation
MICAD	Marine Integrated Conservation and Development
NEC	National Executive Council
NFA	National Forest Authority (formerly Department of Forests)
NFCAP	National Forestry and Conservation Action Programme
NFA	National Fisheries Authority (formerly DFMR)
NGO	Non-Government Organization )
NPO	National Planning Office
NSDS	National Sustainable Development Strategy
OEC	Office of Environment and Conservation
PNG	Papua New Guinea
PNGRIS	PNG Resource Information System
SPREP	South Pacific Regional Environment Programme
TECM	Total Environment Catchments Management
TNC	The Nature Conservancy
TPA	Tourism Promotion Authority
UNDP	United National Development Programme
UPNG	University of Papua New Guinea