

**COUNTRY PROFILE
ON
ENVIRONMENT**

FIJI

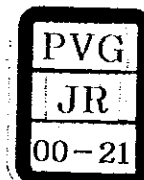
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JAPAN INTERNATIONAL COOPERATION AGENCY



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.



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1. KEYWORDS OF THE ENVIRONMENT

1.1 Features of the Country

Related pages

① Gross Domestic Production (GDP)

US\$2,210 per capita (Japan : US\$33,857, China : US\$361)
Total : US\$1.7 billion

=> 2. Fact Sheet p.3

② High Urban Population along Coast Line

Urban population rate: 41%
Total population: 0.78 million, Urban population: 0.32 million

=> 2. Fact Sheet p.3

=> 4.9 Biodiversity p.18

③ Land Tenure "mataqali" (native land)

82% of total area (15,000 km²)
(can not be leased and used by non-Fijians in theory, but used in practice)

=> 2. Fact Sheet p.3

④ Tourism

Fijians \$470 million in 1997 (16% of GDP)
(provides 18,000 jobs)

=> 2. Fact Sheet p.3

1.2 Keyword of Environmental Issues

Related page

① Loss of biodiversity

- Loss of terrestrial and marine biodiversity
- Lack of protective activities

=> 4.9 Biological diversity p. 18

=> 4.8 Forest conservation & 4.9 p. 16, 18

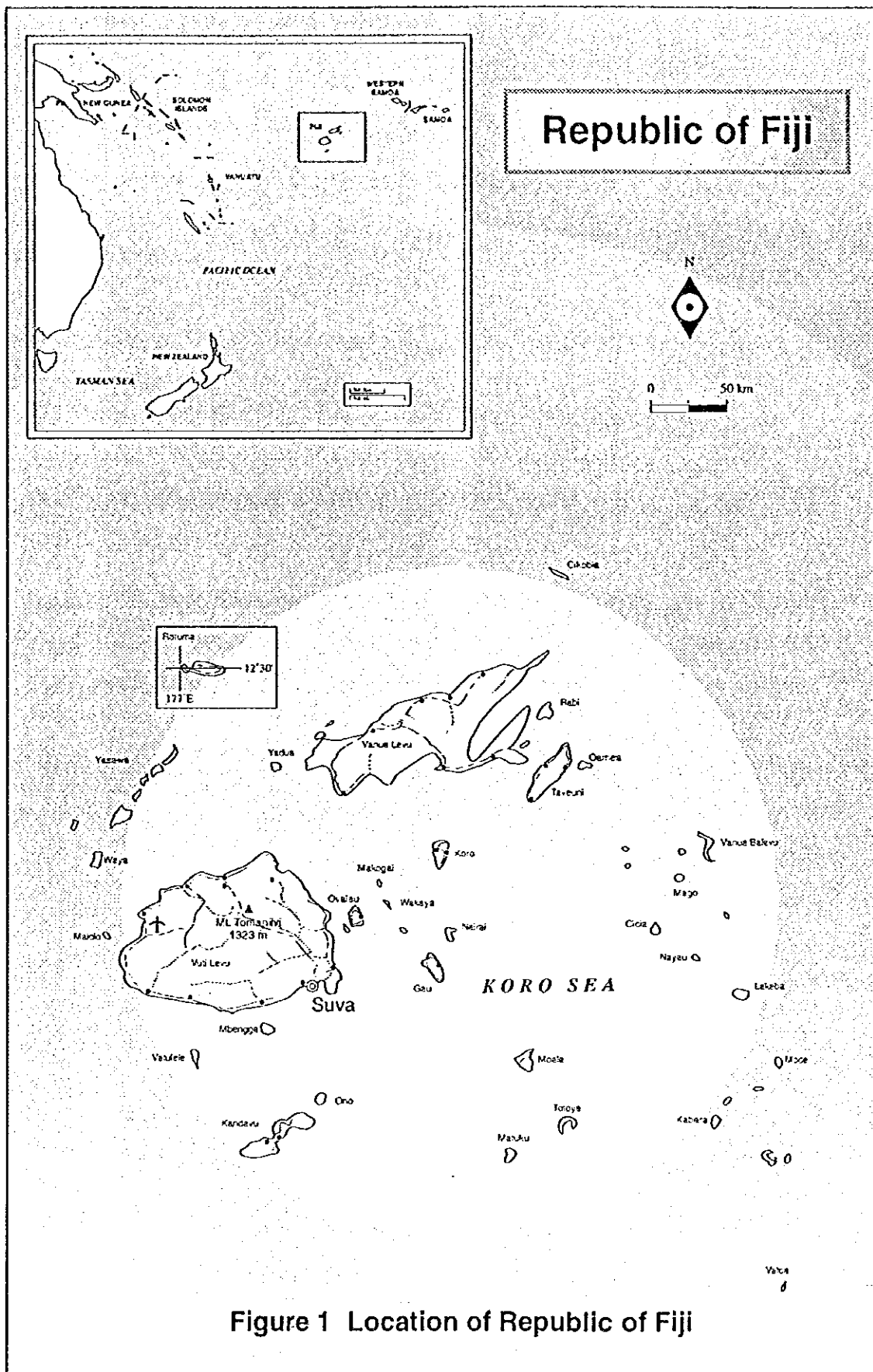
② Waste management

- Dumping management at mangrove sites
- Chemical contamination from disposal site
- Inappropriate of litter by people

=> 4.4 Waste management p. 12

=> 4.4 Waste management p. 12

=> 4.4 Waste management p. 12



Source: Data Atlas 1994 - 1997

2. FACT SHEET

2.1 Socio-economic Index

Index	Data	Data year	Reference
Population	0.78 million (annual average incremental rate : 1.5% (1990~95))	1995	b)
Race	Fijian family 47%, Indian family 47.4%, others 4.8%	no information	c)
Religion	Christianity (100% in Fijian family), Hinduism (Indian Family), etc.	no information	e)
Literacy rate	Adult female : 86% Adult male : 92%	1990	b)
Urban Population rate	41% (0.32 million)	1995	b)
Life expectancy	72 (1990~1995 average)	1990-95	b)
Under-5 mortality rate	25 infants per 1,000 born	1995	f)
GNP ^{*1}	\$1,623 million (\$2,130/person)	1993	b)
GDP ^{*1}	\$1,684 million (\$2,210/person)	1993	b)
GDP structure	Agriculture : 18% Industry : 20% Service industry & others : 62%	1993	b)
Prime industry	Sugar manufacture, light industry, tourism	1996	e)
Prime resource	Gold, timber, sugar cane, copra, rice, ginger	1996	e)
Safe water (% of population with access) ^{*2}	Urban : 100% Rural : 100%	1980-1995	b)
% of sewerage population ^{*3}	Urban : 99% Rural : 99%	1980-1995	b)
Human Development Index (HDI)	0.863 (World rank 46, GDP per capita rank 62 in same year)	1994	d)

*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 : 18,272 km ² (almost same as Shikoku in Japan), Viti Levu Is.(10,388 km ²), Vanua Levu Is.(5,532 km ²)
Geographical features: total 300 Islands(97 of the total are inhabited), steep mountainous country(67% of Viti Levu and 72% of Vanua Levu are classified as steep land (slopes greater than 18°)
Highest place : Mt. Victoria(1,424m)

Source: a)

2.3 Meteorological Characteristics

Climate : tropical maritime
Average annual rainfall: 3,000-4,000 mm/year(windward side of Viti Levu), less than 2,000 mm/year(leeward dry side)
Average temperature: daytime July(winter): at least 23°C, January(summer): above 27°C, leeward side of highland rise 1-2°C

Source: a)

2.4 Ecological Characteristics

Biogeographical feature: (no information)
Identified animals and plants: (no information)
Protected area: 1 National Park(Sigatoka Sand: 240ha), 6 Nature Reserves(total 5,719ha), 1 Protected Forest(at Batiwai), 24 Reserve Forests(total: 33,200ha), 1 Wildlife Sanctuary(Yadua Taba Island Crested Iguana Reserve), National Archaeological Monument

Source: a-51)

2.5 Hydrological Characteristics

Main river: Rewa(260 km), Sigatoka(255 km)
Lakes: (no information)

Source: a)

3. INSTITUTIONAL CONTEXT

3.1 Environmental Agency

3.1.1 Governmental Agency

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

Governmental Agency	Environmental Issues (Each No. consist with Section No.)											
	4.1 Air pollution	4.2 Water pollution	4.3 (1) Hazardous	4.4 Waste	4.5 Energy	4.6 Water Supply	4.7 Waste Water	4.8 Forest	4.9 Biodiversity	4.10 Resources	4.11 Disaster	4.12 Education
Department of Environment (DOE)	○	—	—	—	○	—	—	—	○	○	—	○
University of the South Pacific (USP)	○	—	○	—	—	—	○	—	○	—	—	○
Institute of Applied Sciences (IAS), University of the South Pacific (USP)	—	○	○	○	—	—	—	—	—	—	—	—
USP's Environmental Center	—	—	—	—	—	—	—	—	—	—	—	○
National Fire Authority	—	○	—	—	—	—	—	—	—	—	—	—
Permanent Secretary for Housing and Urban Development	—	—	—	○	—	—	—	—	—	—	—	—
Department of Energy	—	—	—	—	○	—	—	—	—	—	—	—
South Pacific Applied Geoscience Commission (SOPAC)	—	—	—	—	○	○	○	—	—	—	○	—
Public Works Department (PWD)	—	—	—	—	—	○	—	—	—	—	—	—
Forestry Department	—	—	—	—	—	—	—	○	—	—	—	—
Native Land Trust Board (NLTB)	—	—	—	—	—	—	—	○	—	—	—	—
National Disaster Management Centre (DISMAC)	—	—	—	—	—	—	—	—	—	—	○	—
Department of Education	—	—	—	—	—	—	—	—	—	—	—	○
Others	—	—	—	—	—	—	—	○	○	○	○	—

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

- 2) : 4.3(1) Hazardous waste, 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 ○.

(1) Department of Environment (DOE)

The role of the Department of Environment (DOE) is more in the policy and coordinating fields than directly in environmental activities as such. DOE has five professional staff and a technical officer funded by Government. They also have two externally funded project officers (PICCAP and Biodiversity Strategy Action Plan).

Source: a)

Organizational chart of DOE is not available.

(2) Other governmental organization concerning environmental issues

Organization / Outline of activities	Annual budget	Number of staff
University of the South Pacific (USP) / (no Information)	no information	no information
Institute of Applied Sciences (IAS), University of the South Pacific (USP) / (no Information)	no information	no information
USP's Environmental Center / (no Information)	no information	no information
National Fire Authority / (no Information)	no information	no information
Permanent Secretary for Housing and Urban Development / (no Information)	no information	no information
Department of Energy / (no Information)	no information	no information
South Pacific Applied Geoscience Commission (SOPAC) / (no Information)	no information	no information
Public Works Department (PWD) / (no Information)	no information	no information
Forestry Department / (no Information)	no information	no information
Native Land Trust Board (NLTB) / (no Information)	no information	no information
National Disaster Management Centre (DISMAC) / (no Information)	no information	no information
Department of Education / (no Information)	no information	no information

Source: a)

3.1.2 Non-governmental Agency (NGO)

Name of NGO	Established year	Main activities
World Wide Fund for Nature (WWF)	no information	no information
South Pacific Action Committee for Human Ecology & Environment (SPACHEE)	no information	no information

Source: a)

Government committees Concerned with Environmental Management

Committees/Activity	Established year
Land Conservation Board (MPI) • For many years inactive, this Board has recently been revived. The Board has wide powers to prevent poor agricultural practices.	1953
Environmental Management Committee (MHUD) • Provides an advisory and coordinating role on the environmental implications of development proposals	1980
Mangrove Management Committee (ML & MR) • Advises Director of Lands on development proposals which affect mangroves	1983
Nation Oil Pollution Committee (Marine Department) • Formed in June 1991 as a merging of the Ports Authority spills Steering Committee and the Oil Pollution committee. Its purpose is to coordinate the preparations and implementation of a national pollution response plan. Private and public sector representation.	
Rubbish Dump Committee (MHUD) • In operation on an ad hoc basis since 1989. Its purpose is to locate an alternative solid waste disposal site so that the existing Lami dump can be closed. Government and local authority representation.	
NLTB Steering Committee • The development of the land owner tourism forest parks at Waikatakata and Bouma necessitated formation of committees to oversee the successful implementation of the projects. Government and landowner representation.	
National environment Steering Committee (MHUD) • This committee was established to oversee the National Environment Management Project, as well as coordinating Fiji's involvement in the UN Conference on Environment and Development in 1992 and participation in the World Heritage Convention. High level (Permanent Secretary/Director) Government and statutory authority representation.	
Consultative Committee on Ozone Depleting Substances (MHUD) • This committee has been established to oversee implementation of the Government's commitment under the Montreal Protocol to phase out the use of CFCs (chlorofluorocarbons) in Fiji. Public and private sector representation.	

Source: a-51)

3.2 National Environmental Policy

Policy/Project Name and Contents	Funding or Implementing Agency
no information Source: a)	no information

3.3 Environmental Laws & Regulations

Laws & Regulations	Status	Related Pages
Land and Resource Use		
Mining Act 1966 (Cap 146) <ul style="list-style-type: none"> • Compensation for damage; • Restoration of land <ul style="list-style-type: none"> - Max fine \$200 and/or 6 months imprisonment • Responsible Agency: <ul style="list-style-type: none"> - Director of Mines & Ministry of Land & Mineral Resources 	no information	
Forest Act 1953 (Cap 150) <ul style="list-style-type: none"> • Minister may declare Nature Reserves and sylviculture areas in reserved forests and declare native land to be Protected Forest <ul style="list-style-type: none"> - Max fine \$300 and/or 6 months imprisonment • Responsible Agency, <ul style="list-style-type: none"> - Conservator of Forests & ministry of Forestry 		
Town Planning Act 1946 (Cap 139) <ul style="list-style-type: none"> • Minister may order area to be a town planning area; • Permission of local authority and Director of DTCP required for development. Preservation of historic buildings and objects of historic or scientific interest. <ul style="list-style-type: none"> - Max fine \$100 or 3 months imprisonment \$20 per day infringement • Responsible Agency, <ul style="list-style-type: none"> - Director of Town & Country Planning & Ministry of Housing & Urban Development 		
Native Land Trust 1940 (Cap 134) <ul style="list-style-type: none"> • Can lease Native Land (which is not native Reserve land) with restrictions regarding land use <ul style="list-style-type: none"> - Civil Remedies • Responsible Agency, <ul style="list-style-type: none"> - Native Land Trust Act Board 		
Land Development Act 1961 (Cap 142) <ul style="list-style-type: none"> • Land Development Authority Promotes and assists the investigation, formation and carrying out of projects for the development, improvement and settlement of the land • Responsible Agency, <ul style="list-style-type: none"> - Land Development Authority 		
Land Conservation and Improvement Act 1953 (Act 141) <ul style="list-style-type: none"> • Land Conservation Board may make 'Conservation Orders' Contravention of such an order is an offence <ul style="list-style-type: none"> - Max fine \$200 and/or 6 months imprisonment • Responsible Agency, <ul style="list-style-type: none"> - Land Conservation Board, Ministry of Primary Industries 		
Agricultural Landlord Tenant Act 1966 <ul style="list-style-type: none"> • Stipulates 'good husbandry practices' by tenants 		
Conservation and Quarantine Birds and Game Protection Act 1923 (Cap 170) <ul style="list-style-type: none"> • Wounding, killing, selling, holding in captivity or exporting protected birds is an offence <ul style="list-style-type: none"> - Max fine \$50 or imprisonment max 3 months • Responsible Agency, <ul style="list-style-type: none"> - Ministry of Primary Industries 		
National Trust for Fiji Act 1970 (Cap 265) <ul style="list-style-type: none"> • Power to purchase land. May enter into voluntary agreements to protect the land • Responsible Agency, <ul style="list-style-type: none"> - Ministry of Housing & Urban Development 		
Preservation of objects of Archaeological and Palaeontological interest Act 1978 (Cap 264) <ul style="list-style-type: none"> • Power to declare and acquire National Monuments <ul style="list-style-type: none"> - Max fine \$200 or 6 months imprisonment • Preservation of Monuments • Responsible Agency, <ul style="list-style-type: none"> - Board of Trustees of Fiji Museum and Ministry of Women and Culture 		

Laws & Regulations	Status	Related Pages
Plant quarantine Act 1982; Noxious Weeds, Pests and Disease of plants Act 1964 (Cap 133) <ul style="list-style-type: none"> Quarantine powers including declaration of noxious pests, infested places, removal of pests; prohibited imports Responsible Agency; <ul style="list-style-type: none"> Ministry of Primary Industries 		
Animal Importations Act (1970) <ul style="list-style-type: none"> Responsible Agency; <ul style="list-style-type: none"> Ministry of Primary Industries 		
Marine and pollution/Conservation		
Marine Spaces Act 1977 (Cap 158A) <ul style="list-style-type: none"> Management and conservation of fisheries within Fiji's economic zone (200 mile limit). Licensing of foreign fishing vessels <ul style="list-style-type: none"> Maximum fine \$100,000 Responsible Agency; <ul style="list-style-type: none"> Office of the Prime Minister 		
Fisheries Act 1941 (Cap 158) <ul style="list-style-type: none"> License to fish required <ul style="list-style-type: none"> Max fine \$50 and/or 3 months imprisonment Non Fiji registered fishing vessel without Licence <ul style="list-style-type: none"> Max fine \$100 Use of dynamite <ul style="list-style-type: none"> Max fine 12 months and/or \$200 fine Responsible Agency; <ul style="list-style-type: none"> Ministry of Primary Industries 		
Fisheries Regulations 1965 <ul style="list-style-type: none"> Prohibited methods and areas e.g. poison <ul style="list-style-type: none"> 3 months imprisonment and/or \$50 fine Production of turtles, etc. 		
Continental Shelf Act 1970 (Cap 149) <ul style="list-style-type: none"> Oil pollution of 'designated areas' resulting from escape from pipeline or as a result of exploration <ul style="list-style-type: none"> Max fine \$3,000 Responsible Agency; <ul style="list-style-type: none"> Ministry of Lands and Mineral Resources 		
Ports Authority of Fiji Regulations 1990 <ul style="list-style-type: none"> Various offences relating to pollution of port areas <ul style="list-style-type: none"> Max fine \$400 Responsible Agency; <ul style="list-style-type: none"> Ports Authority of Fiji 		
Water Pollution		
Rivers and Streams Act 1882 (Cap 136) <ul style="list-style-type: none"> Rivers belong to the Crown and are for enjoyment of public 		
Irrigation Act 1973 (Cap 144A) <ul style="list-style-type: none"> Offence to pollute water in Irrigation Works <ul style="list-style-type: none"> Max fine \$200 or 6 months imprisonment Responsible Agency; <ul style="list-style-type: none"> Commissioner for Irrigation and Ministry Primary Industries 		
Drainage Act 1961 <ul style="list-style-type: none"> Offence to interfere with public drainage work i.e. work for the purpose of draining land or mitigating flooding or erosion <ul style="list-style-type: none"> Max fine \$200 or 6 months imprisonment Responsible Agency; <ul style="list-style-type: none"> Appropriate Drainage Board and Ministry of Primary Industries 		
Water Supply Act 1955 (Cap 144) <ul style="list-style-type: none"> Offence to pollute water if: - in waterworks i.e., sluice pipe, pump etc. used for water supply or in declared catchment area <ul style="list-style-type: none"> Max fine \$100 Responsible Agency; <ul style="list-style-type: none"> Commissioner of Water; PS – Ministry of Primary Industries 		

Laws & Regulations	Status	Related Pages
Mining Regulations (Cap 146 S – 3) <ul style="list-style-type: none"> • Offence to pollute Water in race pipe dam or reservoir in respect to which a special site light has been granted to holder of mining lease <ul style="list-style-type: none"> - Max fine \$100 • Responsible Agency, <ul style="list-style-type: none"> - Director of Mines & Ministry of Lands and Mineral Resources 		
Pollution Generally		
Pesticides Act 1971 (Cap 157) <ul style="list-style-type: none"> • Registration of pesticides <ul style="list-style-type: none"> - Fine \$200 and \$10 per day for infringement • Responsible Agency, <ul style="list-style-type: none"> - Registrar of Pesticides & Ministry of Primary Industries 		
Traffic Regulations 1974 (Cap 176 – S-50) <ul style="list-style-type: none"> • Offence to drive vehicle from which smoke etc. is emitted likely to cause injury, nuisance or annoyance to any person <ul style="list-style-type: none"> - Max fine \$100 or imprisonment max 3 months • Responsible Agency, <ul style="list-style-type: none"> - Ministry of Infrastructure and Public Utilities 		
Public Health Act 1955 (Cap 111) <ul style="list-style-type: none"> • Board may cause inquiries to be made. Person authorised in writing may enter premises Power to inspect water and sewerage works. • Various powers to abate nuisances:- Inspection of district to ascertain nuisances • Section 56 (e): any accumulation Fine \$20 or \$4 per day in default or deposit of any material situated which is offensive to the public or injurious to health may be summarily abated • Responsible Agency, <ul style="list-style-type: none"> - Local authorities or Central Board of Health (Ministry of Health) 		
Penal Code 1945 (Cap 17) <ul style="list-style-type: none"> • Various: e.g. common nuisance:- Imprisonment 1 year i.e. causing common injury, danger or annoyance so as to interfere with the public (must be substantial and unreasonable) • Dealing with poisonous substances in negligent manner <ul style="list-style-type: none"> - 6 months imprisonment or \$200 fine • Responsible Agency, <ul style="list-style-type: none"> - Director of Public Prosecutions (Ministry of Justice) 		

Source: Manuel (1990; unpublished. mss) with additions by NEMP (a-15))

4. STATE OF THE ENVIRONMENT

4.1 Atmospheric Pollution

The high level of smoky emissions from poorly adjusted diesel motors in busses, lorries, and taxis has long been an issue in Fiji. Attempts at control have been hampered by lack of staff and fear of economic suffering by the transport industry. Consequently, the pollution still increases as vehicles numbers increase more rapidly than the ability to control emissions. Recently, during a two-day inspection at Nadi Airport, road transport officials did test vehicles and removed 25 from the road because of excessive emissions. This effort was, however, only in a short term and was done for the benefit of the tourist industry. Longer-term solutions in the form of more stringent controls and regular monitoring await the passage of the pollution section in the Sustainable Development Bill and the provision of funding for staff and equipment (*Fiji Times* 1998b).

Another long-term air-pollution issue has been the white powdery smoke emitted by the Fiji Industries Cement Factory at Lami. Only in June 1998 was a dust filtration system installed, but local residents still complain about dusty emissions from the plant (Hildebrand 1998). As is often the case with such a situation in Fiji, exact data are lacking as facilities for regular monitoring are lacking. Another industrial source of air pollution is the Tropik Wood saw mill at Drasa near Lautoka, where sawdust waste is burned to produce electricity. In smaller islands outside of Viti Levu, where power is generated from water turbines at Monasavu Dam, diesel-powered electricity-generating plants produce air pollution. Widespread air pollution occurs seasonally in the sugar cane areas because of the prevalence of burning cane in the fields at harvest time (Davies 1998).

Source: a)

Related Agency
① Department of Environment (DOE)
② University of the South Pacific (USP)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on air pollution	?	
② Ambient air quality standard	?	
③ Emission standard (stationary and/or mobile sources)	?	
④ Air quality monitoring	?	

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

4.2 Water Pollution

Water pollution is present in both freshwater (creeks and river) and marine coastal areas. The sources of pollution are many, including inadequate sewage systems, dumping and discharge by industry, and outflow from coastal and riverside rubbish tips, as at Lami or along the Rewa River north of the town of Nausori.

Recent issues of water pollution raised in the press have included:

- Contamination of Fiji's coastal waterways with heavy metals wastes (*Fiji Times*, 4 October 1995).
- Complaints that the Penang sugar mill contaminates nearby waterways — a situation denied by the mill's manager (*Fiji Times*, 18 July and 24 July 1998).
- Complaints that Wailada Creek in Lami, near Suva, is so contaminated with industrial waste that the fish and prawns that were once available from the Creek are now gone; nor is swimming any long possible (*Fiji Times*, 24 May 1996).

The most dramatic recent pollution events have been widely reported oil spills in Walu Bay, Suva, in March and June 1998 (*Fiji Times*, 27 June 1998; 28 June 1998; 30 June 1998; 10 July 1998; 20 July 1998). These events have added to the long-recognized industrial dumping and sewage pollution of Walu Bay from many sources. The events illustrate a variety of issues: health concerns as local people continue to fish in Walu Bay; the urgent need for the comprehensive legislation that will be available in the Sustainable Development Bill section of pollution, which will clearly define what authorities should act over such events and will provide for making the industries responsible for the spills also responsible for the costs of the clean-up.

Source: a)

Related Agency	
①	Institute of Applied Sciences (IAS), University of the South Pacific (USP)
②	National Fire Authority

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on water pollution	?	
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) Hazardous Waste

Other pollutants and hazardous waste in Fiji include pesticides (some of them obsolete), chemicals used in timber processing such as copper-chrome-arsenate compounds, petroleum wastes, hospital wastes, PCBs, asbestos materials, and a wide variety of chemicals used in industrial processing.

Although awareness of the dangers inherent in these substances has risen in recent years because of NGO educational activities and a variety of pollution-monitoring-and-control projects (particularly on the part of SPREP), unsafe disposal of hazardous waste remains common. Again, adequate legislation to enforce proper control and disposal awaits the passage of the relevant sections of the Sustainable Development Bill; and the actuality of actual control awaits an adequate enforcement facility.

The sugar industry, the fish-processing industry, and the municipal dumps at Lami and Nausori create offensive or noxious smells that have been the cause of major complaints. The fish-processing plants in Suva and Levuka produce large amounts of organic-rich effluent, which although not toxic has a high biological oxygen demand (BOD) that can affect reef life or overtax sewage systems.

Source: a)

Related Agency
① University of the South Pacific (USP)
② Institute of Applied Sciences (IAS), University of the South Pacific (USP)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on noise	?	
② Standard on noise level	?	

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

4.4 Waste Management

None of any municipal dump in Fiji are managed to acceptable international standards. Further, most of the dumps are sited in former mangrove areas because mangroves are State land and so negotiations over land and the payment for lease of the land are not necessary. Consequently, not only have the mangroves been removed, they have been replaced by a coastal facility that seeps organic effluent and toxic materials into heavily used coastal waters and reefs.

After more than a decade of search, an acceptable location has been found for a new landfill/dump site at Naboro to the east of Suva to replace the dumps currently operating at Nausori, Suva, and Navua. The new dump is to be of a higher standard technically than the existing ones and has an expected life span of at least 25 years. The new dump and the sealing of the old dump at Lami are to be funded by the EU (*Fiji Times* 1997b).

Some recycling or re-use of paper and bottles is currently carried out by private entrepreneurs. Separation and recycling are intended to be a part of the new regional dump, which will also have leachate control facilities.

Fiji has a serious litter problems in that some city people still bring their garbage to the seafront and throw it across the seawall despite an efficient and frequent garbage-collection facility. The debris from this means of disposal creates pollution and lowers amenity. After sports events, the grounds are covered with discarded paper and containers. DOE has estimated the cost of cleaning up at the National Stadium after a two-day sports event at \$2,000 (Premila Kumar, *pers. comm.*). To try to counter the lack of public attention to litter, a revised Litter Decree imposing a fixed penalty of \$F40.00 was gazetted in January 1997. It is to be enforced by city council, as an "add-on" duty.

Source: a)

Related Agency
① Permanent Secretary for Housing and Urban Development
② Institute of Applied Sciences (IAS), University of the South Pacific (USP)

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

Electricity supply in Fiji comes either from the Fiji Electricity Authority (FEA) — by far the largest part — or from that supplied to rural consumers by Public Works Department (PWD) or private operators. By far the largest single energy project in Fiji is the hydroelectric scheme at Monasavu in central Viti Levu, which came into operation in 1982 and 1983 and supplies power to most of Viti Levu at no pollution cost. About 57 per cent of Fiji's population is estimated to have access to power from FEA, and the Department of Energy and Rural Electrification has an active rural-electrification policy, with 14 stand-alone diesel systems being built in 1997. On outer islands and in areas remote from the grid on the larger islands, electrification depends on stand-alone systems, either diesel or photovoltaic (Ministry of National Planning 1997, 123-125; *Fiji Times* 1998c).

A current issue in power generation is that, although the total capacity on Viti Levu is still well in excess of maximum demand, if the hydro supply is curtailed for any reason, then the diesel standby power is insufficient — so that in 1997, when the hydro system was under maintenance, Viti Levu consumers experienced "brownouts" or power failures (*Fiji Times* 1997c).

The Department of Energy has a strong policy of seeking alternative energy sources (micro hydro schemes, photovoltaic systems, wind, geothermal, and OTEC) while also encouraging conservation. With the cooperation of the Education Department, the Department of Energy put energy conservation in the school curriculum.

The transport sector is a major user of power (all imported) wherein the demand is anticipated to increase as the number of vehicles increase, and more efficient alternatives such as converting to gas are not yet popular (*Fiji Times* 1997d).

The use of biomass for energy is extensive in rural Fiji, with wood and wood waste (including coconut husks) burned in open fires being the common method of cooking. Where open cooking fires are prevalent, the per capita consumption per year has been estimated to be about 350 kg. In peri-urban and urban areas, the amount drops considerably but is still significant. The other source of biomass is a by-product of the sugar industry in the form of bagasse, almost all of which is burned to generate steam for the sugar mills.

Source: a)

Related Agency
① Department of Environment (DOE)
② Department of Energy
③ South Pacific Applied Geoscience Commission (SOPAC)

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

The wetter parts of Fiji's larger islands have an ample surface water supply. On the drier part of Viti Levu, where river or stream flow is periodically insufficient, the construction of Vaturu Dam in the early 1980s has provided an adequate supply for Nadi and Lautoka. Labasa and Sigatoka towns use water from boreholes. Whatever its source, all twelve major urban centres of Fiji and much of the peri-urban area have piped water with satisfactory physical and chemical treatment to meet health standards, even though some of the water-treatment plants are now aged. Supplies are monitored regularly, and currently some 70 % of the total population has access to clean piped water (Ministry of National Planning 1997, 119-121).

The problem with formal water supplies in Fiji lies more on the side of demand and waste. The public generally still does not regard water as a scarce resource, and waste is commonplace. Leakage is very heavy from the Suva system so that a large amount of water is unaccounted for, that is, there is a large percentage difference between net production of water and paid consumption. In cooperation with the Water Resources Unit of SOPAC, the Water and Sewerage Department of PWD has initiated a program to reduce leakages. The distribution system from Vaturu Dam to Lautoka and Nadi is also faulty so that supplies are at times restricted. The policy in water-supply planning is in the process of shifting from the concept of needing ever larger supplies towards how best to save and conserve water supplies already available (Ministry of National Planning 1997; Burke, *pers. comm.*).

Rural water supplies come from a variety of sources and are of varying quality. Normally, rural water is not treated, and some sources are contaminated. In some areas, water collection is a matter for individual families taking water from surface sources. In others, communities have cooperated and collected funding to build boreholes or piped systems to bring water from uncontaminated sources. As in Suva, however, leakage is often a problem with these systems as they are not properly constructed. Many villages have large rainwater tanks to collect water from the roofs of large buildings such as churches and community halls. The Water Resources Unit of SOPAC together with the NGO FSP had a project wherein a technician was sent to Tonga to learn the technique of building the ferro-cement tanks that are common in Tonga, and bring that idea and technique back to Fiji (Burke, *pers. comm.*).

Source: a)

Related Agency	
①	Water and Sewerage Department, Public Works Department (PWD)
②	Water Resources Unit, South Pacific Applied Geoscience Commission (SOPAC)

Source: a)

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

Nabukalou Creek passing through the heart of downtown Suva is known to contain a level of faecal *E. coli* far above internationally acceptable standards. IAS carried out tests on water quality in Fiji's main ports and found that organic waste (including sewage) was the main cause of pollution although heavy metals and other pollutants and refuse were also present. The low level of connection to sewage systems, which become overloaded in rain storms in any case, and the prevalence of only partially effective septic tanks leads to seepage of sewage into streams and coastal waters.

In all of Fiji's urban areas with sewage-treatment plants, the capacity of the plants is considerably below the population of the urban area. Plans are now in progress for new sewage facilities in Suva.

Related Agency
① Public Works Department (PWD)
② University of the South Pacific (USP)

Source: a)

Sewerage facilities in some urban areas of Fiji

Town	Population (1986 Census)	Capacity of Sewage treatment plant (EP)	Point of sewage discharge waste
Suva	141,273	50,000 (Kinoya) 15,000 (Raiwaqa)	Laucala Bay Vatuwaqa River
Labasa	16,537	6,000	(no information)
Nadi	15,220	10,000	Nadi River downstream of the town
Lautoka	39,057	25,000	Sea outfall, inside Barrier Reef
Sigatoka	4,730	4,000	Mouth of Sigatoka River
Nausori	13,982	6,000	Rewa River bridge
Total	230,799	116,000	

Source: Institute of Natural Resources, USP (a-51))

Note: EP: Estimated Population

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 Monitoring system	?	

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

4.8 Forest Conservation

The Forestry sector currently contributes 2.5 % of GDP and some \$F50 million to foreign exchange in 1997. The wood-product exports come from three types of forest within the approximately 49 % of the land that forests cover in total in Fiji. These three types are indigenous forests, plantations of pine, and plantations of exotic hardwoods (mahogany: *Swietenia macrophylla*) (Ministry of National Planning 1997).

The pine plantations of Fiji have been a success story environmentally and economically. Planted over the past several decades, mostly on degraded grassland with little other use, pines now cover some 43,000 ha and form the basis of an important export product (woodchips, sawn timber, and posts and poles). The environmental impact of the hardwood plantations are more questionable as they can be seen to be replacing and disrupting the native forests. Currently, Government policy is to develop the hardwood plantations further through the activities of a new corporate body Fiji Hardwood Corporation Ltd., which will commence harvesting and marketing the extensive mahogany forests (Ministry of National Planning 1997; Fiji Pine Ltd. 1998).

In part because of the plantation forestry, Fiji's rate of deforestation has been slow compared with that of, for example, Solomon Islands and parts of Southeast Asia. Over the past three decades, Fiji has lost less than 1 % annually of its forest area to non-forest uses. This conversion rests on four causes: large-scale commercial agricultural/rural development projects (such as Seaqaqa sugar development on Vanua Levu); the continuing expansion into forest by smallholder mixed subsistence-commercial farmers; the continuing spread of settlement and urban growth and the infrastructure to service this growth; and fire. It is generally held that the most important of these is the advance into forest of smallholder farmers (Korovulavula, *pers. comm.*).

Logging itself is also a factor in deforestation although it is not necessarily be so permanent if practices are good. In Fiji, although there is a National Code of Logging Practice, its enforcement is weak. Also, local practices by villagers (who communally own most of the forest) are harmful to forest regeneration as villagers commonly view logs and the land beneath them as resources to be converted to cash rather than as a sustainable source of production of forest products and ecological services. Several projects are in operation to change these views and to encourage sustainable forest management.

Source: a)

Related Agency	
① Forestry Department	
② Native Land Trust Board (NLTB)	
③ German Agency for Technical Cooperation (GTZ)/Secretariat of the Pacific Community (SPC)	
④ Foundation for the Peoples of the South Pacific (FSP)	
⑤ Pacific Regional Agricultural Programme (PRAP)	
⑥ Secretariat of the Pacific Community (SPC) Forestry Programme	

Source: a)

Forest Reserves (1992)

Forest Reserve	Province	Estab	Area (ha)	Forest Reserve	Province	Estab	Area (ha)
Central/Southern Division				Western Division			
Colo-I-Suva	Naitasiri	1963	369.5	Buretolu	Ba	1926	1,197.9
Maranisaqa and Wainiveiotea	Naitasiri	1955	77.3	Lololo	Ba	1968	8.3
Nabero	Rewa	1969	19	Nadarivatu	Ba	1954	7,400.7
Naitasiri	Naitasiri	1955	30	Saru Creek	Ba	1973	3.2
Qoya	Rewa	1955	67.2	Tavua	Ba	1958	2 roads
Savura	Naitasiri	1963	447.6	Northern Division			
Suva and Namuka harbour	Rewa	1913		Korotari	Cakaudrove	1961	1,046.9
Vago	Naitasiri	1959	24.7	Taveuni	Cakaudrove	1914	11,290.7
Yarawa	Serua	1962	161.9				

Source: c)

Estimate of the Forest Resource in Fiji

	Hectares	% *
Natural Forest Areas:		
Production Forests	237,300	13
Under concession agreements (143,128)	—	
No concession agreement (94,172)	—	
Protection/Conservation	269,100	15
Non-Commercial	298,500	16
Sub-total	804,900	44
Plantation Forests:		
Softwoods: Fiji Pine Commission	32,500	2
Private	10,800	1
Hardwoods: Forestry Department	42,000	2
Sub-total	85,300	5
Total	890,200	49

Source: Extracted from Forestry Sector Study (FAO 1988), with additional data from the Ministry of Forestry, and Fiji Pine Commission Ltd., 1991.

Figures rounded

Note: * % of total land mass of 1,827,200 ha.

- Non-commercial forests (unsuitable for timber production) in which 15 categories were distinguished
- Production Forests (suitable for timber production) in which 23 categories were distinguished
- Protection Forest (to be protected from soil erosion: unsuitable for timber production) in which 6 different categories were distinguished

Source: a-51)

On-going Projects to Protect Forest

- A project by the International Tropical Timber Organisation to train landowners in methods of sustainable management of indigenous forests. The project has two specific objectives: (1) to educate the forest-owning groups (*mataqali*) and the Native Land Trust Board (NLTB) estate managers to manage forests to fully sustainable standards, and (2) to train landowners and logging contractors the skills and requirements of managing to those standards.
- Foundation of the Peoples of the South Pacific (FSP) is implementing an EU-funded project aimed at promoting sustainable forest management.
- GTZ, in cooperation with the NLTB and the Forestry Department is now running a pilot project in Viti Levu entitled "Implementation of Sustainable Indigenous Forest Management Practices". This project will be extended to an area in Vanua Levu. The purpose, again, is training and education toward sustainable forestry that produces a total benefit package that includes financial benefit to the landowners but also continued subsistence and ecological benefits from the sustained forest.
- Secretariat of the Pacific Community (SPC) executes the Pacific Islands Forests and Tree Support Project on a regional basis, including Fiji. Funded by UNDP and AusAID, the general goal is to strengthen national capacities to manage forests and tree resources sustainably in both an economic and an environmental sense.
- The EU-funded Pacific Regional Agricultural Programme (PRAP) activities include a strong component on agroforestry education and training in the Pacific Region.

Source: a-24), a-22)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on forest conservation	?	
② Laws and regulation on protection area	?	
③ Laws on desertification	?	

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

4.9 Biological Diversity

The causes of biodiversity loss in Fiji include a moderately expanding human population; deforestation; an ever-increasing concentration of population, tourism, and industry in coastal areas so that reefs and coastal waters suffer great pressures; destructive fishing practices such as the use of dynamite and cyanide; chemicalization of agriculture; an increasing focus on commercialisation of resource exploitation; and the introduction of alien plants and animals.

Looking just at reefs and coastal waters, Fiji is listed as using seven of the nine destructive fishing methods studied in a recent survey (Veitayaki *et al.* 1995). Indiscriminate harvesting for the export of sea cucumber (beche-de-mer) is threatening the stock of the creatures. The drive behind the trade, which has also proven dangerous to the divers, is the high payments for the product, exports of which doubled from 1995 to 1996, when they were valued at over \$F6 million (article in *Fiji Times*, 27 May 1997). There is continuing concern over the extinction of sea turtles despite educational campaigns and a partial ban on their use, a ban that at times has roused antipathy because turtle meat is much favoured and has great cultural significance.

Reefs and reef life are threatened by many activities, including the possibility of coral bleaching from temperature increase, coral harvesting for export, inadequately treated sewage, soil erosion and fertilizer run-off, trampling by tourists, over fishing and collecting (increasingly for market rather than subsistence purposes), oil pollution, blasting for channels or for fishing purposes, other destructive fishing practices, and so on. As the reefs and coastal waters are divided into communally-owned customary fishing grounds (*qoliqoli*), there are possibilities for local people to exercise their rights by establishing reserves and policing their local *qoliqoli*, and many community-education efforts are now directed to that purpose, but in the face of the view of some owners the *qoliqoli* are no more than a source of disposable income. Similar concern exists for the related ecosystems of the mangroves and seagrass communities (Lal 1990).

A great many projects are focused on biodiversity conservation and education. Among these are the South Pacific Regional Environment Programme (SPREP) and South Pacific Biodiversity Conservation Programme, which are focused on the establishment and management of conservation areas, for example, the Koroyanitu Ecotourism Project in western Viti Levu, that also receives support from New Zealand Official Development Assistance (NZODA). SPREP also provides support for a number of other projects including help to member countries in the implementation of their obligations as members of the Convention on Biological Diversity. Another biodiversity program active in Fiji is the Biodiversity Conservation Network (BCN), which is presently part of the larger Biological Support Program, funded by USAID. The Biodiversity Strategy Action Plan (BSAP) is housed in DOE and involves several NGOs in community-based actions. There are a variety of other activities from various sources, all of which could be designated as Community-Based Biological Management (Thaman 1994; Biodiversity Conservation Network 1997).

Source: a)

Related Agency
① University of the South Pacific (USP)
② Biodiversity Strategy Action Plan (BSAP), Department of Environment (DOE)
③ Biodiversity Strategy Action Plan (BSAP)
④ Biodiversity Conservation Network (BCN)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on protection for fauna and flora	?	
② Laws and regulations for protection for specific species	?	
③ Laws and regulations on hunting	?	
④ Laws and regulations on protection area	?	
⑤ Listed species in the Red Data Book	?	

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

4.10 Natural Resources Management

It is clear that the Government's environmental management capability is weak because of lack of funding, staff, training, and in some areas political resolve. In the face of global deregulation, an increase of commercialisation of natural resources within the country, and other environmental and economic pressures, this is a critical weakness, and one which has been widely recognized as applicable to many developing countries globally, as in Chapter 35 of *Agenda 21*. This recognition has led to considerable donor involvement in capacity building in Fiji and the other small island states of the South Pacific.

SPREP has supported a variety of workshops and training programs, as listed in the SPREP Annual Reports. NZODA and UNDP are also much involved in capacity building, generally and in support of the requirements for data, control, and monitoring under the Sustainable Development Bill. The Government of Fiji has identified several priority activities and projects that need urgent implementation if the National Environment Strategy and the Sustainable Development Bill are to be successfully executed, for example, many training programmes, as in EIA and Environmental Information Systems; the funding of Conservation Officers; or a project to undertake a nation-wide fisheries resource survey as a basis for the owners of customary fishing grounds (*qoliqoli*) to develop their own management plans, which will be a key part of the Coastal Zone Management Plan and the National Resource Management Plan, which will be stipulated in the Sustainable Development Bill.

Source: a)

Related Agency
① Department of Environment (DOE)
② United Nations Development Programme (UNDP), Suva

Source: a)

Area of Nature Resources

Nature Reserve	Province	Estab	Area (ha)
Central/Southern Division			
Draunibota & Labiko	Rewa	1959	2.2
Vuo Island	Rewa	1960	1.2
Western Division			
Nadarivatu	Ba	1956	93.1
Naqaranibuluti	Ba	1958	279.2
Tomaniivi	Ba	1958	1,323.4
Northern Division			
Ravilevu	Cakaudrove	1959	4,018.7
Vunimoli	Cakaudrove	1968	20.2
Total			5,740.2

Source: h)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on conservation of natural resources	?	
② Laws on use and conservation of mining resources	?	
③ Laws on underground resources	?	

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

4.11 Natural Disasters

Fiji recurrently experiences tropical cyclones (hurricanes), usually between November and April. Some of these storms and associated rough, high seas and storm surges up to 3 or 4 m cause severe damage (Chung 1988).

Other natural disasters include flooding (also associated with cyclones), earthquakes, landslides, and tsunami. Fiji lies in a seismically active place in relation to the geography of tectonic plates, and the islands have experienced several major earthquakes during its historic period. The worst struck Suva in 1953, causing landslides and tsunami. Studies suggest that an earthquake of magnitude 7.0 (Richter scale) is likely to occur somewhere in the Fijian islands every 30 to 35 years.

Eleven tsunami have struck Fiji since 1877. Two of these originated in Chile, the rest somewhere between Vanuatu and Tonga. None of these waves compare with the recent catastrophic tsunami on the northern coast of Papua New Guinea, with Fiji's highest recorded wave, on Kadavu in 1953, being 4.6 m, and the damaging Suva wave being 1.8 m. The reefs protect most of the Fiji islands from tsunami, and only the 1953 waves are known to have caused damage and loss of life. Compared with the high-tsunami risk areas to both the east and west of Fiji, Fiji lies in a low- to moderate-tsunami risk area (Howarth 1998).

Fiji's steep mountainous topography favours landslides, which occur commonly as natural events and contribute to the large sediment loads of the rivers. Unwise agricultural practices (such as clearing for ginger and commercial taro on the steep slopes at Waibau inland from Suva), logging, and road building can increase the hazard.

Fiji is exceedingly well served with radio cyclone warnings as the meteorology centre at Nadi is a highly qualified regional warning centre. The telephone book contains a useful cyclone plotting map as well as civil defence procedures for cyclones, earthquakes, floods, and tsunami. Tsunami warnings are available from the Hawaii-based tsunami warning centre. The Government's National Disaster Management Centre (DISMAC) is in charge of disaster warning and management. DISMAC carried out an earthquake-risk management project last year; it recommended that an Earthquake and Tsunami Response Plan be developed. DISMAC is currently working on this plan together with the Department of Mineral Resources and the UNDP's South Pacific Disaster Reduction Programme. SOPAC has a Hazard Assessment Unit, which deals with the full range of natural and human-induced disasters. One of its projects is "Seismic Zonation of Suva Central City and Simulation of Tsunami Risk in the Harbour" (McCutchan 1998b).

Source: a)

Related Agency
① South Pacific Applied Geoscience Commission (SOPAC)
② United Nations Development Programme (UNDP)
③ National Disaster Management Centre (DISMAC)

Source: a)

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

Environmental education is not new in Fiji. *The Green Book for Fiji: A Teacher's Handbook on the Conservation of Nature in Fiji*, by Margaret Knox, having been published in 1978 by the National Trust for Fiji. There is no doubt, however, that the amount of environmental literature and teaching materials have increased tremendously since then, especially during the 1990s. DOE is actively involved in environmental education, and it and the National Trust and other organisations produce many attractive posters carrying environmental messages. Sponsored by Shell Oil Company, DOE also produces environmental clips, as on the value of mangroves, to be shown on TV. The Department of Energy, with USP and the Curriculum Development Unit of the Government of Fiji, have carried out an energy awareness programme in Fiji's schools since 1995.

SPREP has a programme in environmental education that works to develop a wide range of formal and non-formal curriculum resources. The programme also provides training activities for teachers, NGOs, church leaders, and the media. In July of 1998, SPREP organised a Pacific Regional Conference for Environmental Education and Training. The meeting, which was held at USP, brought together participants from all over the Pacific to attend workshops and talks and to draft the Pacific region's first action plan for environmental education. NGOs such as WWF and Greenpeace publish environmental information in the newspapers. Arbour Week is celebrated every year with the participation of school children, and a different theme each year — for example, mangroves one year, food-producing trees the next.

At a higher academic level, several departments or programmes at the USP teach and carry out research on environmental matters. Particularly strong in this regard are the Departments of Biology, Chemistry, and Geography. Other environmentally focused USP centres or programmes are Development Studies, Population Studies, Ocean Resources Management, Marine Studies, Atoll Research Programme (in Kiribati), Institute of Applied Sciences, and the Institute of Marine Resources. There is current interest at the USP in creating an Environmental Centre to coordinate the many environmental activities carried out by USP staff and to provide environmental advice.

The most significant change in environmental education in Fiji and elsewhere is the recent very pronounced shift toward community-based workshops. Such community work is now very common in many fields, it having been recognised that significant environmental action — and often incremental degradation — occurs where local inhabitants interact directly with their environment through fish hooks, axes, bush knives, shovels, pesticides, chain saws, livestock management, matches, or fish nets. If these local inhabitants' beliefs about the environment, their needs and their desires, the constraints they live under, and so forth are not understood and taken into account, all top-down management approaches are doomed to failure. Now, almost all forest- or fisheries- or biodiversity-management action plans or projects follow this community-based approach and seek ways to combine economic with environmental benefits. Fijian Affairs, a Government of Fiji statutory organisation, is establishing pilot projects in communities on practical activities to enhance environmental consciousness and prevent degradation in the local area.

Source: a)

Related Agency
① Department of Environment (DOE)
② University of the South Pacific (USP)
③ USP's Environmental Center
④ Department of Education
⑤ Fijian Affairs

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on education	?	
② Guidelines on environmental education	?	

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

5. INTERNATIONAL RELATIONSHIP

Trans-Boundary Issues

Trans-boundary issues relating to Fiji have most importantly to do with the boundaries of the Exclusive Economic Zone (EEZ) and with migratory fish stocks. In the formal delimitation of the EEZ boundary, there remain uncertain issues with regard to the boundary between Fiji and Tonga. This delimitation issue is subject to study by South Pacific Applied Geoscience Commission (SOPAC) in association with the Fiji Fisheries Department and the Forum Fisheries Authority (FFA) (Lodge 1997).

International Environmental Cooperation

Bilateral aid comes from many countries, most notably Australia, Canada, China, France, Germany, Great Britain, Japan, New Zealand, and the USA, as well as the European Union. Multilateral international agencies such as the World Bank and the ADB are also important. UN agencies such as ESCAP, UNESCO, and particularly UNDP contribute a great deal. Regional agencies such as SPREP, SOPAC, FFA, USP also play a strong role in projects and programmes throughout the South Pacific Region, with their funding coming a wide range of sources. SOPAC, for instance, is funded by member-country contributions and supported by the following donors: Australia, Fiji, Canada, France, Israel, Japan, Korea, New Zealand, People's Republic of China, ROC-Taiwan, UK, USA, the Commonwealth Secretariat, the European Union, and the UN family (SOPAC 1998, 3).

Source: a)

5.1 International Convention

Conventions and agreements on environmental issues	Year
1) International Plant Protection Agreement	1956
2) Convention on the Continental Shelf	1970
3) Convention on the High Seas	1970
4) Convention of Fishing and Conservation of the Living Resources of the High Seas	1971
5) Plant Protection Agreement for South East Asia	1971
6) Treaty Banning Nuclear Tests In the Atmosphere, Outer Space and Underwaters	1972
7) Treaty on Non-Proliferation of Nuclear Weapons	1972
8) International Convention for the Prevention of Pollution of the Sea by Oil	1972
9) International Atomic Energy Agency	1973
10) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxic Weapons and their Destruction	1973
11) International Convention Relating to the Intervention on the High Seas in Cases of Oil Pollution Casualties	1975
12) International Convention on Civil Liability for Oil Pollution Damage	1975
13) South Pacific Forum Fisheries Agencies Convention	1979
14) United Nations Convention on the Law of the Sea	1982
15) International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage	1983
16) South Pacific Nuclear Free Zone Treaty and Protocol	1985
17) Vienna Convention and Montreal Protocol on Substances that Deplete the Ozone Layer	1989
18) Convention on the Conservation of Nature in the South Pacific (Apia Convention)	1989
19) Convention for the Protection of Natural Resources and Environment of the South Pacific and Their Related Protocols (SPREP Convention)	1989
20) Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)	1990
21) United Nations Framework Convention of Climate Change	1992
22) Convention on Biological Diversity	1992
23) Wellington Convention (Drift Net Fishing)	1994
24) Waigani Convention on the Transport of Hazardous Waste	1996
25) Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES)	1997

Source: a)

5.2 International Cooperation Project

Project	Donor
<p><u>PICCAP (Pacific Islands Climate Change Assistance Programme)</u></p> <p>PICCAP, which became operational on 1 July 1997, is implemented by the South Pacific Regional Environment Programme (SPREP) with financial assistance from the Global Environment Facility (GEF) through UNDP. The objectives of PICCAP include (SPREP 1998):</p> <ul style="list-style-type: none"> ·Enable Pacific Island countries to fulfil their UN Framework Convention on Climate Change obligations to report regarding their development of inventories of greenhouse gas sources and sinks. ·Assist Pacific Island countries to identify climate change mitigation options. ·Enable Pacific Island countries to fulfil their UN Framework Convention on Climate Change obligations to report regarding (i) their vulnerability to future climate change and sea-level rise, (ii) their options for adaptation to climate change, and (iii) their development of national implementation plans. <p>The PICCAP Manager and the PICCAP scientific adviser are located at SPREP in Apia, Samoa, and in Fiji the PICCAP Project Officer is located in the Department of Environment. Two staff members of the University of the South Pacific are associated with the training aspects of PICCAP in Fiji: Dr Muhendra Kumar (Physics Department) and Mr Seremaia Tuqiri (Marine Studies Department).</p>	GEF
<p><u>Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region</u></p> <p>Fiji became party to the Waigani Convention in 1996. When the Convention enters into force, SPREP will act as its Secretariat to act in response to the threats to human health and environment arising from the increasing generation and transport world wide of hazardous and radioactive waste.</p>	(no information)

Source: a)

6. INFORMATION SOURCE

6.1 Governmental Agency and Others

Name of Organization	Contact Address
1) Atmospheric Pollution	
a) Department of Environment (DOE)	(no information)
b) University of the South Pacific (USP)	
2) Water Pollution	
a) Institute of Applied Sciences (IAS), USP	• Tel: 212477
b) National Fire Authority	• Tel: 312877
3) Other Pollution	
a) University of the South Pacific (USP)	• Tel: 212416 Email: aalbersberg@usp.ac.fj
b) Institute of Applied Sciences (IAS), USP	
4) Waste Management	
a) Permanent Secretary for Housing and Urban Development	• Tel: 211415
b) Institute of Applied Sciences (IAS), USP	• Tel: 212251
5) Energy Conservation and Alternative Energy	
a) Department of Environment (DOE)	• Tel: 381377
b) Department of Energy	
c) South Pacific Applied Geoscience Commission (SOPAC)	
6) Water Supply	
a) Public Works Department (PWD)	• Tel: 381377
b) South Pacific Applied Geoscience Commission (SOPAC)	
7) Waste Water Management	
a) Public Works Department (PWD)	• Tel: 212343
b) University of the South Pacific (USP)	
8) Forest Conservation	
a) Forestry Department	• Tel: 312733 • House 10, Forum Secretariat, Ratu Sukuna Rd, Suva Tel: 305983 Email: gtz@is.com.fj • FSP Fiji, PO Box 451, 12 Cakau St, Lautoka Tel: 668315 • Private Mail Bag, 57 Duncan Rd, Suva Tel: 315148 • Private Mail Bag, Suva Tel: 370733 Email: forestry@spc.org.fj http://www.spc.org.nc/
b) Native Land Trust Board (NLTB)	
c) German Agency for Technical Cooperation (GTZ)/Secretariat of the Pacific Community (SPC)	
d) Foundation for the Peoples of the South Pacific (FSP)	
e) Pacific Regional Agricultural Programme (PRAP)	
f) Secretariat of the Pacific Community (SPC) Forestry Programme	
9) Biological Diversity	
a) University of the South Pacific (USP)	• Tel: 212546
b) Biodiversity Strategy Action Plan (BSAP), Department of Environment (DOE)	• Tel: 311699
c) Biodiversity Strategy Action Plan (BSAP)	• Tel: 381322
d) Biodiversity Conservation Network (BCN)	• c/- SPACHEE, 2 Denison Rd, Suva Tel: 312371, Email: drussell@is.com.fj • Tel: 212416, Email aalbersberg@usp.ac.fj
10) Natural Resources Management	
a) Department of Environment (DOE)	• Tel: 381322
b) United Nations Development Programme (UNDP), Suva	• Tel: 312500
11) Natural Disasters	
a) South Pacific Applied Geoscience Commission (SOPAC)	• Tel: 381377
b) United Nations Development Programme (UNDP)	

Name of Organization	Contact Address
c) National Disaster Management Centre (DISMAC)	
12) Environmental Education	
a) Department of Environment (DOE)	• Tel: 311483
b) University of the South Pacific (USP)	• Tel: 313900
c) USP's Environmental Center	• Tel: 212269
d) Department of Education	• Tel: 306077
e) Fijian Affairs	• Tel: 304200
13) Environmental NGOs	
a) World Wide Fund for Nature (WWF)	• Tel: 212018
b) South Pacific Action Committee for Human Ecology & Environment (SPACHEE)	(no information)
14) Libraries	
a) Institute of Applied Sciences (IAS), USP	(no information)
b) S. Pacific Action Committee for Human Ecology & Environment (SPACHEE)	(no information)
c) South Pacific Applied Geoscience Commission (SOPAC)	(no information)
d) The USP general library	(no information)

Source: a)

6.2 Embassy

Name of Organization	Person in Charge	Contact Address
Embassy of Japan	no information	• 2nd Floor, Dominion House, 1 Suva, Fiji
Embassy of Fiji	no information	• 14 fl. NOA bldg. 2-3-5 Azabudai, Minato-ku, Tokyo, Japan 106-0041 Tel: 03-3587-2038

Source: e)

List of Abbreviation			
ADB	Asian Development Bank	NZODA	New Zealand Official Development Assistance
AUSAID	Australian Agency for International Development	OISCA	Organisation for Industrial, Social & Cultural Advancement
BCN	Biodiversity Conservation Network	OTEC	Ocean Thermal Energy Conversion
BSAP	Biodiversity Strategy Action Plan	PICCAP	Pacific Islands Climate Change Assistance Programme
DISMAC	National Disaster Management Centre	PRAP	Pacific Regional Agricultural Programme
DOE	Department of Environment	PWD	Public Works Department
EEZ	Exclusive Economic Zone	SOPAC	South Pacific Applied Geoscience Commission
EIA	Environmental Impact Assessment	SPACHEE	S. Pacific Action Committee for Human Ecology & Environment
EU	European Union	SPC	Secretariat of the Pacific Community*
FCCC	Framework Convention on Climate Change	SPREP	South Pacific Regional Environment Programme
FEA	Fiji Electricity Authority	UNCED	United Nations Conference on Environment and Development
FFA	Forum Fisheries Agency	UNDP	United Nations Development Programme
FSP	Foundation for the Peoples of the South Pacific	USP	University of the South Pacific
GDP	Gross Domestic Product	WWF	World Wide Fund for Nature
GEF	Global Environment Facility		
GTZ	German Agency for Technical Cooperation		
IAS	Institute of Applied Sciences, USP		
JICA	Japan International Cooperation Agency		
NGO	Non-Government Organisation		
NLTB	Native Land Trust Board		

*Formerly, South Pacific Commission

Source: a)

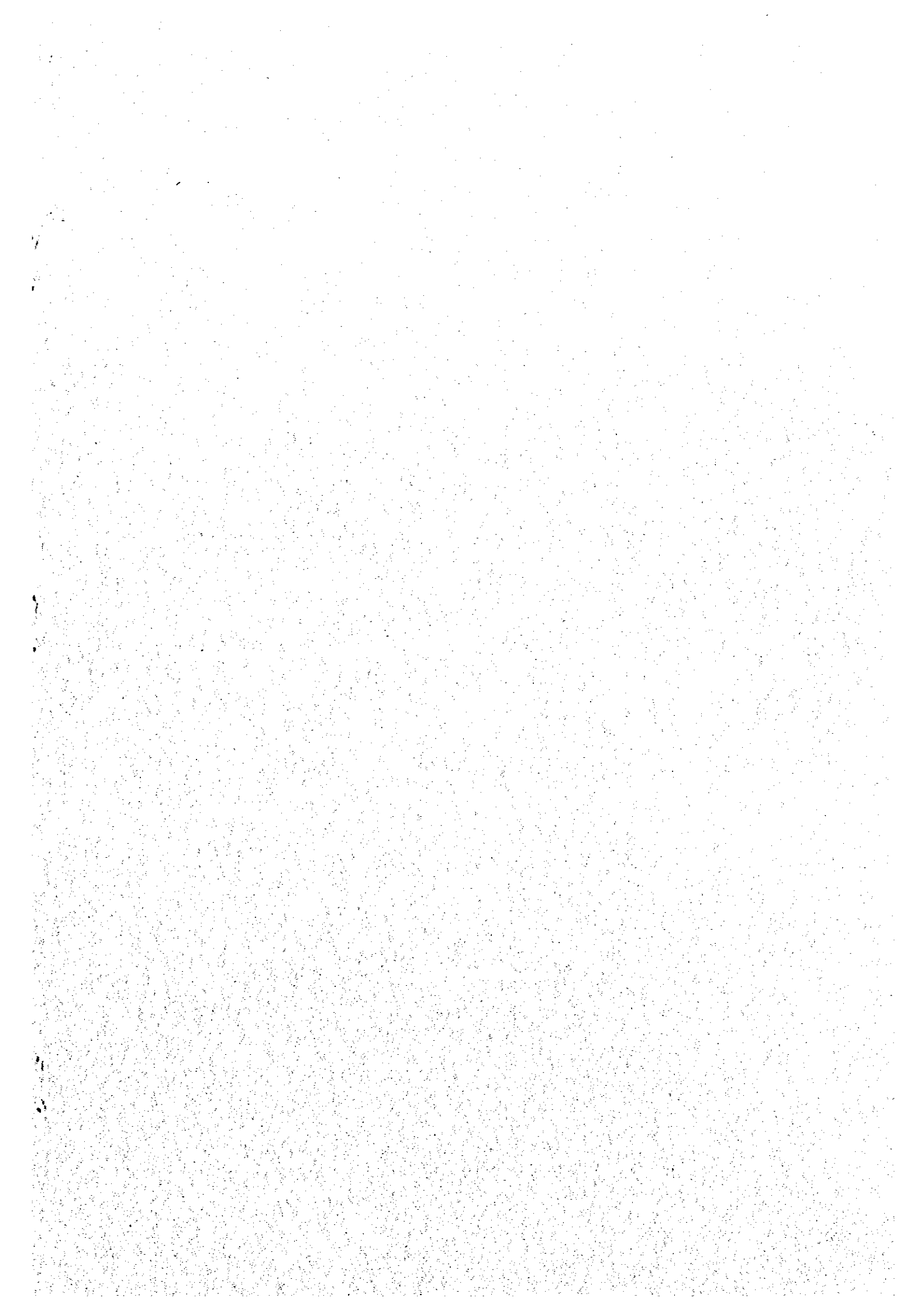
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