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SOUTH PACIFIC REGIONAL ENVIRONMENT PROGRAMME

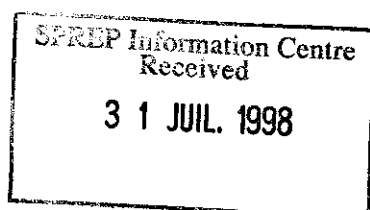
NEW CALEDONIA

COUNTRY REPORT

(by Jean Douheret, August 1980)

TERRITORIAL DIVISION OF RURAL SERVICES  
DEPARTMENT OF WATERS & FORESTS

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SOUTH PACIFIC REGIONAL ENVIRONMENT PROGRAMMENEW CALEDONIACountry Report1. Territorial environmental policy and its implementation1.1 Policy

New Caledonia's main goal in the field of economic and social development are defined in the "long-term economic and social plan for New Caledonia", drawn up in 1978 and adopted by the Territorial Assembly on 21st February, 1979.

This plan covers all fields of activity : resources (mining, energy, farming and forestry, maritime ...), industry, research, tourism, public utilities, organisation, external relations, education and training, land problems, social welfare, culture, etc.

The priority objectives set for the ten years to come are as follows:

1. Maximization of nickel deposits and other mineral resources in the Territory.
2. A progressive rural policy.
3. Establishment of diversified processing industries in New Caledonia.
4. Development of the tertiary sector in New Caledonia.
5. Implementation of a marine resources development programme.
6. Maximisation of scientific institutions in the Territory.
7. Maximisation of the unique tourist potential of New Caledonia.
8. Opening of New Caledonia to the outside world.
9. Provision of the road and energy infrastructures necessary for the development of the Territory.
10. Completion of works provided for under the Noumea town plan, to produce a modern capital.
11. Construction of additional infrastructures to relieve the isolation of rural communities.
12. Development and improved quality of life in rural communities through community activities.
13. Development and improvement of the outer islands.
14. Protection of the natural heritage.
15. Application of national solidarity provisions.
16. Definition of the local population's contribution to the development of the Territory.

17. Extension to all New Caledonians, on an equal basis, of the social services and facilities that should be enjoyed by French citizens.
18. Systematic quest for cultural approaches that will enhance the multiracial character of New Caledonia.
19. I : Promotion of Melanesian culture, which should be regarded as an intrinsic component of the French national culture.  
II : Promotion of handicraft production and traditional lifestyles.
20. Reinforcement of the characteristics of the Territory's European community.
21. Full integration of minority groups (Wallisians, Tahitians, Vietnamese, French West Indian, Indonesian), with due regard for their cultural diversity.
22. Diversification, adaptation and modernisation of general and vocational education systems, taking into consideration ethnic differences.
23. Solving the land tenure problem on the basis of the historical land rights of Melanesian communities.

The Protection of the Natural Heritage can be seen to be one of the chosen objectives and the plan lays down recommendations in the following fields :

- protection of the primary forest against fire, erosion and mining damage,
- regulation on dangerous, noxious, and insanitary establishments,
- water resources policy,
- mining conditions,
- forest policy,
- protection of fauna and flora,
- accidental marine pollution,
- urban waste,
- conservation of the historic and human heritage,
- administrative re-organisation and review of statutory instruments.

It should be noted that the now well-established awareness of environmental problems at the political level is a relatively recent phenomenon dating approximately from the mining boom : the damage caused by intense and wide-spread mining activity was to a large extent responsible for it.

## 1.2 Legislation

### 1.2.1 Environmental legislation

The statute of New Caledonia (Law No. 76-1222 of 28 December 1976) gives the Territory full powers in environmental matters. The legislative authority and the local executive responsible for issuing rules and regulations therefore define the policy to be enforced.

### 1.2.2 Existing legislation

Existing legislation covers virtually all fields where the quality of life is at risk.

#### Fresh water

A water resources and pollution law, established by resolution No. 105 of 9 August 1968 "Journal Officiel de la Nouvelle-Caledonie" of 26/08/68, p.691) in particular prohibits discharge into surface, underground or seawater of any matter harmful to public health, fauna or flora. Regulations drawn up under this law provide for the establishment of protection zones in which activities likely to endanger water purity are prohibited or controlled.

#### Sea and lagoon

Law No. 64-1331 of 26 December 1964 prohibits seawater pollution by hydrocarbons and Law No. 73-477 of 16 May 1973, modifying Law No. 64-1331 of 26 December 1964, prohibits seawater pollution by hydrocarbons (enactment No. 1493 of 15 July 1974 "Journal Officiel de la Nouvelle-Caledonie" of 19/07/74).

Law No. 76-599 of 7 July 1976 concerns the prevention and control of marine pollution by dumping from ships and aircraft and the control of accidental marine pollution (enactment N. 1513 of 20 July 1976 "Journal Officiel de la Nouvelle-Caledonie" of 23/07/76, p. 786).

Law No. 79-5 of 2 January 1979 modifies Law No. 64-1331 of 26 December 1964 concerning seawater pollution by hydrocarbons (enactment No. 228 of 26 January 1979 "Journal Officiel de la Nouvelle-Caledonie" of 2/02/79).

#### A i r

Decree No. 77-134/CG of 12 April 1977 (Journal Officiel de la Nouvelle-Caledonie of 21/04/77, p. 380) concerns air pollution caused by electric power plants installed at DONIAMBO.

Decree No. 79-082/CG of 27 February 1979 (Journal Officiel de la Nouvelle-Caledonie of 2/03/79, p. 237) modifies decree of 12 April 1977 concerning air pollution caused by the NICKEL Company's smelting works and electric power plants installed at DONIAMBO.

#### S i t e s

A regulation on the protection of sites and monuments (Law No. 56-1106 of 3 November 1956 and Resolution No. 225 of 17 June 1965 resulting in the classification of approximately forty protected sites (Journal Officiel de la Nouvelle-Caledonie of 22/07/65, p. 550).

A regulation on bill-sticking and advertising resulting from Resolution No. 48 of 13/08/64 (Journal Officiel de la Nouvelle-Caledonie of 14/09/64, p. 799) particularly concerning roadside advertisements.

#### Urban sites

A regulation on dangerous, noxious and insanitary establishments, resulting from Resolution No. 315 of 29 July 1971, based on French legislation (Journal Officiel de la Nouvelle-Caledonie of 13/08/71, p. 906).

Urban master plans laying down standards and requirements for housing construction in certain municipal districts.

Noise control : decree No. 79-058/CG of 13/02/79 concerning noise of motor vehicles and tolerable noise levels in urban areas.

#### NOUMEA township

A great deal of legislation exists on industrial pollution in the town of Noumea :

Decree No. 77-133/CG of 12 April 1977 (Journal Officiel de la Nouvelle-Caledonie of 21/04/77, p. 366 to 378) concerning air pollution caused by the activities of a metal processing industry and based on numerous circulars :

- circular from the Ministry of Industrial and Scientific Development of 24/11/70, concerning the construction of smoke stacks in the case of combustion works,
- circular of 13/08/71, concerning the construction of smoke stacks in the case of plants producing fine dust,
- circular of 25/08/71, concerning cement works,
- circular of 24/07/72, concerning iron ore processing (listed establishments).

#### Mineral deposits

In order to safeguard certain areas in the Territory and in pursuance of decree No. 54-1110 of 13 November 1954 (Journal Officiel de la Nouvelle Caledonie of 30/12/57, p. 705), a number of protection zones prohibiting or controlling mining activity were established. A mining pollution control commission was set up to determine pollution control measures to be implemented for each mine in operation.

#### Forests

Forest policy is governed by :

- Decree No. 405 of 18 March 1910 modified (Journal Officiel de la Nouvelle-Caledonie of 1/06/1910, p. 258) prohibiting the deforestation or clearing of certain hill-sides and river-banks.
- Decree 51-100 of 26/01/1951 laying down conditions for forest classification.
- Resolution No. 233 of 14/11/75 and 107 of 9/05/80 defining conditions of forest utilisation.

#### Fauna and flora

Lastly, sanctuaries or special nature reserves were established for the protection of fauna or flora. At present, there are approximately twelve in the Territory and a resolution was adopted by the Territorial Assembly with a view to bringing local regulations into line with relevant international regulations (Resolution No. 108 of 9 May 1980, enforced by Decree No. 1504 of 21/05/80).

In addition there are numerous regulations on hunting and fishing, aimed especially at protecting endemic species and living terrestrial and marine resources.

#### Agriculture and livestock production

A regulation protecting the agricultural and pastoral heritage, which controls or prohibits the introduction of plants and plant produce, live or dead animals or animal products (Resolution No. 219 of 4/06/65 on plant quarantine and Resolution No. 67 of 26/01/68 on introduction of animals from any source whatsoever and products of animal origin into New Caledonia).

#### 1.2.3 International Agreements

In conclusion, it should be noted that two international conventions are fully applied in New Caledonia since they were formally ratified by France :

- the so-called Washington Convention of 3 March 1973 on international trade in endangered species of wild flora and fauna, ratified by Law No. 77-1425 of 27/12/77.
- the Convention on Conservation of Nature in the South Pacific, signed in Apia in 1976 by France, Papua New Guinea and Western Samoa, but which will only enter into force when a fourth Government has acceded to it.

#### 1.2.4 Effectiveness - Need for additional legislation

Only the regulation limiting the exploitation of living resources (in the lagoon and on land) has been found difficult to enforce, and this is mainly due to the large areas to be controlled and variable degrees of public awareness of environmental conservation problems.

However, in some specific fields, additional regulations would make government action more effective, for instance with regard to town planning, food quality and food adulteration, protection of endangered lagoon species, exportation of plant or animal specimens for mock-scientific institutions, use of agricultural pesticides, herbicides and fertilizers.

#### 1.3 Planning

- Before environmental factors can be satisfactorily integrated into economic planning, two main obstacles must be overcome :
  - a) current precedence of pressing economic needs, due to the local and international economic slump;
  - b) the existence of special land tenure problems which hinder the rational utilisation of lands. Land reform in progress could improve this situation.
- However, a number of resource or land use surveys have already been conducted (forest survey, geological and soil maps, agro-pedological capability maps, etc.); others are in progress or in the preparatory stage (mining survey, animal diseases survey).

While each government department normally incorporates the data concerning its particular sector of interest into its decisions, it unfortunately rarely makes use of data from other fields of activity because there is no institution especially responsible for overall development planning.

- The environmental impacts of certain activities (mining and the SLN works at Doniambo, for instance) have now, at least in part, been assessed but much still remains to be done in this connection.

What shortcomings there are stem more from the attitude of the public and occasionally the authorities who are often poorly informed and ignorant of environmental planning matters rather than from any lack of expertise.

In order to improve environmental planning in New Caledonia, it would seem very advisable to set up, firstly, a special institution for with development planning, along the lines of the Organisation for Environmental Planning and Management (OREAM) and the Regional Workshop for Economic and Rural Development Studies (AREEAR) existing in France, and secondly, a Department to co-ordinate all environmental activities.

#### 1.4 Administration

Departments concerned :

Several Government departments are currently responsible for the implementation of environmental policies :

The Department of Waters and Forests is responsible for the implementation of forestry policy, the protection of fauna and flora and in particular the enforcement of regulations governing hunting and fishing, the monitoring and mangement of reserves and sanctuaries. It also acts as the secretariat for the Environmental Committee.

The Department of Mines and Geology is responsible for enforcing mining regulation in the Territory. Officers from this Department monitor prospectation and mining sites. During inspections, they make sure that mining activities are being conducted according to approved standards and that known pollution control techniques, adapted to the different situation encountered, are being properly applied.

Before a new mine is opened, the Mining Pollution Control Commission, made up for representatives of the technical departments and institutions concerned (Waters and Forests, Civil and Hydraulic Engineering, ORSTOM, Mining and Geology) under the chairmahship of the Head of the Department of Studies and Legislation lays down, in consultation with the miner and representatives of any local communities affected, the technical measures which must be applied to protect the environment as effectively as possible. Compliance with these rules is then ensured by the Department of Mining and Geology.

In addition, the Mining Department monitors the Nickel Company's atmospheric pollution control efforts, proposes and enforces protective measures against accidental discharge of oil into the sea and against noise nuisance.

The Department of Public Works is responsible for the protection of sites and landscapes against unauthorised and unsightly building, by enforcing town planning regulations.

The Department of Health and Public Hygiene proposes and enforces regulations on the treatment of waste water, which is normally the responsibility of every municipality.

The Territorial Department of General Administration is responsible for undertaking inquiries as to degree of annoyance likely to be caused to neighbours before permits are granted for the installation of dangerous, noxious or insanitary establishments.

The Public Security Office is responsible for implementing the following :

- safety standards for buildings,
- preparation of an "ORSEC Plan" for protection of the population in the event of a natural disaster,
- preparation of a "POLMAR Plan" for controlling accidental sea pollution (oil spills)
- monitoring discharge into the lagoon of industrial waste from the Nickel works and enforcing regulations on entry of tankers.

The Department of the Merchant Navy is responsible for enforcing regulations concerning the coastal zone, lagoon and ocean, particularly in connection with the exploitation of its living resources.

The Department of Civil Engineering and Hydraulics is responsible for monitoring and conserving surface water and ground-water. It expedites surveys and draws up preliminary technical reports for catchment and drilling permits, including projects for hydroelectric plants.

The Departments of Agriculture and of Livestock Production and Animal Industries are respectively responsible for enforcing quarantine regulations on plants and domestic animals, in particular for inspecting imported plant and animal produce on arrival.

The "Gendarmerie" exercises general supervision and control which includes all sorts of environmental protection activities (enforcement hunting and sea fishing regulations, for instance).

#### Effectiveness

The effectiveness of these environmental protection mechanisms varies quite considerably according to the sector considered: for example, while the application of forestry legislation results in control of forestry activities and protection of the primary forest, on the other hand, bush fires (which reduce forest areas from year to year) remain uncontrolled and there is still no forest classification, which allows certain destructions to occur without the Department being empowered to take action.

Generally, a persistent lack of inspection and enforcement staff lies at the root of a certain lack of effectiveness, despite comprehensive, and even very stringent regulations. For example, Public Security is at present only one of the side duties of an official at the High Commissioner's Office and has neither a budget



nor a fixed staff. There is no landscape architect at the Department of Public Works to assist the latter with urban planning. The Department of Waters and Forests only has technical officers in all, and only two of these are employed full-time on surveillance of reserves. The Department of the Merchant Navy has no vessel nor any officers in rural areas or outer islands to supervise and control sea fisheries, and to investigate related problems.

#### Experts

On the other hand, the Territory is well endowed with research institutes employing numerous experts capable of correctly assessing a variety of environmental impacts, and, if necessary, give assistance to neighbouring countries and territories.

Similarly, the Administration has all the experts it needs for the management of the environment, particularly, at the Department of Public Works and in departments responsible for rural matters.

#### Co-ordination

The problem of co-ordination between the various departments or organisations dealing with the environmental problems was, in theory, solved by the establishment of commissions composed of all the people concerned with a particular issue. These commissions are as follows :

- Committee for the Protection of the environment (Resolution No. 336 of 12/08/71) proposes measures and actions necessary for safeguarding the natural environment, improving living conditions, and, more generally, all the components of the human environment.
- Hunting and Freshwater Fisheries Commission (Decree No. 71-266/CG of 01/07/71) advises on all matters concerning hunting and freshwater fisheries, as well as on regulations to ensure the preservation of natural wildlife.
- Marine Fisheries and Industries Commission (Decree No. 65-253/CG of 04/06/65) is consulted for all measures aimed at safeguarding the marine resources of the Territory and ensuring the preservation of marine species.
- Mining Pollution Control Commission (Circular 10-77/SGAD-AG of 16/02/73) proposes preventive anti-pollution measures before any mine is opened.
- Commission for the Conservation of Monuments and Sites (Resolution No. 225 of 17/06/65) consulted for all activities involving the destruction, removal, restoration, modification, classification or transfer of fixed or moveable components of natural monuments and sites of historic, scientific, artistic, ethnographical or picturesque value.
- Plant Diseases Commission (Resolution No. 66-051/CG of 17/02/66) responsible for studying all matters related to plant protection and pest control.

- Commission for Territorial Development and Town Planning (Resolution No. 74 of the 10 and 11/03/59) responsible for advising on all projects concerning planning and development of the environment, both urban and rural.

These commissions meet not on set dates but at varying intervals, as called for by the situations and the occurrence of particular problems.

Undeniably, the large number of institutions involved and of commissions responsible for co-ordination in a given field makes it difficult to integrate environmental problems into overall development policy decisions. For this reason, the "long term economic and social development plan for New Caledonia" indicates that "it would be desirable for the administrative structure to be re-organised so as to be better geared to present requirements and so that overall co-ordination may be ensured by the General Administration".

## 2. Evaluation

### 2.1 Main Environmental problems

#### 2.1.1 Major development projects

- Increased exploitation of mineral resources and expansion of the mining industry is the main development objective for New Caledonia, which possesses one of the three largest known deposits of nickel as well as other minerals. Mining development should progress along three lines :
  - . modernisation of the profession
  - . implementation of two new extensive projects in the North and South of the Territory
  - . diversification of mining activity following a survey of mineral resources.

In the short and medium terms, implementation of the new projects in the North and South of the island can entail major environmental hazards, chiefly river and lagoon pollution by mining or discharge from mines or processing works.

- Farming development, which is also regarded as a priority objective can endanger the environment through the increased use of chemical fertilizers, herbicides or pesticides, unless their formulation and use are strictly controlled.
- Offshore oil exploration is also likely to have an impact through discharge of drilling sludge, and hydrocarbon waste into the sea and the risk of oil spills.
- Lastly, development of lagoon and ocean fisheries (tuna and whales) is also anticipated. The protection and exploitation of existing fish stocks should be planned on a regional basis.

### 2.1.2 Mining areas

Irrespective of possible future development, mining remains the most nature destructive activity, firstly because it lays bare vast areas of soil surfaces and spreads waste material throughout the environment, and secondly, because the necessary construction of numerous roads and tracks for prospection disfigures the landscape, encourages erosion and allows a non-environmentally-educated public access into hitherto protected zones. The condemnable practices of certain prospectors (systematic clearing of large surfaces, of by fire) fortunately appears to have disappeared.

There are approximately 3,000 ha. of land denuded through mining. Although effective techniques for replanting spoil earth and tailings are now known, the cost involved has hitherto prevented large-scale restoration programmes.

### 2.1.3 Urban areas

Problems existing in Noumea are also found in miniature in the other townships of the Territory, particularly in sub-urban settlements like the Mont-Dore district. The main topics of concern are :

- Extensive occupation of land space through predominantly villa-type housing developments often of poor quality moreover and built without any effort to preserve the site, resulting in lengthy travelling from one point to another.
- Absorption of sea space, swampland or other : most of the Noumea business center was built on land reclaimed from the sea and swamps and further large-scale operations of this type are in progress or planned.
- Visual pollution caused by too much unsightly terracing due to building on steep slopes and styleless construction.
- Air pollution, mostly due to the Nickel works (already considerably reduced, and shortly to be eliminated altogether) but also to combustion in houses and workshops, exhaust gases, the refuse dump at Ducos, building sites, etc.
- Water pollution : this is certainly the most serious problem because all forms of water pollution are present:
  - . thermal pollution (waste from SLN power plants),
  - . bacterial pollution (household sewage),
  - . particulate pollution from industry, public and building works,
  - . chemical pollution (effluents from cement works, fertilizers and pesticides residues, etc.)

In Noumea, these types of pollution are almost exclusively confined to sea-water. Freshwater resources are protected by sanitary protection zones where potentially polluting activities are strictly controlled.

#### 2.1.4 Rural areas

In the rural areas, the greatest environmental damage is done by bush fires, which each year affect several tens of thousands (if not hundreds of thousands) of hectares with the following inevitable consequences :

- destruction of flora and fauna,
- denudation of soils, followed by erosion
- "shrinking" of the forest which is burnt out around the edges.

These fires are most often deliberately started by people hoping to derive some sort of benefit from them (such as attracting rain, encouraging emergence of fresh grass to attract game, clearing undergrowth for easier walking, etc.).

Agriculture, which is very restricted, in relation to the total land area of the Territory and practised in the least vulnerable zones, is not at present a hazard to the environment, no more than grazing.

Poaching, on the other hand, is causing a rapid reduction in numbers of certain species, particularly the flying fox, notu, ringed-necked pigeon, green pigeon and freshwater prawn.

Irresponsible sampling by amateurs also endangers certain plant and animal species (Parrots, the Kagu, rare plants).

#### 2.1.5 Coastal areas

2.1.5.1 Open ocean : Tuna fishing is still in its embryonic stage. Its anticipated development in the coming years will, because of the migratory nature of this species, have to be organised on the regional level.

2.5.1.2 Lagoon pollution factors associated with human activity on land, forms of pollution affecting the lagoon waters are classified hereunder in descending order of importance :

- a) Mining pollution : the introduction of mineral particles into the lagoon causes concern, as coral systems are highly sensitive to any form of particulate pollution.
- b) Industrial pollution : at present, this is only significant in the vicinity of Noumea.
- c) Domestic pollution : as above.
- d) Pollution of agricultural origin : although this has not been investigated, it is probably not significant at present. However, it is known that the marine environment is capable of concentrating toxic elements in the successive links in the food chain. The planned development of farming, grazing and forestry activities is likely to create a problem through pesticides, herbicides and fertilizers being washed into the lagoon by rain-water run off.

Factors associated with human activity in the lagoon:

- a) Fish, crustaceans, and shellfish are intensely exploited in certain regions of the lagoon, particularly around Noumea.
- b) Aquaculture : is only a minor source of pollution (waste water discharge); on the other hand, it is particularly sensitive to any deterioration in water quality.
- c) Tourism : tourist activities in New Caledonia are quite naturally oriented towards the marine environment, particularly because of the many splendours of the lagoon. Tourist development is therefore to a large extent dependent on the conservation of this heritage. However, tourism itself is likely to become destructive, either because of disorderly constructions along the shoreline or on the lagoon islets, or through the undisciplined collection of marine animals and plants (fish, shells, coral), which can lead to irreparable deterioration of the sea floor

## 2.2 Research and Monitoring

Some of the abovementioned problems have given rise to special monitoring and control action as already partly described in Chapter 1 :

- Mining is controlled by officers from the Department of Mines and Geology, who insure, in particular, that prospection and extraction operations are conducted according to approved standards and that known and recommended pollution control techniques are implemented in a satisfactory manner.
- In Noumea, air pollution is detected and assessed by a monitoring and measuring network set up in 1977 and reinforced in 1980. Lagoon water pollution is monitored near the beaches for public health purposes. Lastly, a landscape architect is expected to be recruited in 1981 to correct the errors resulting from the haphazard building that occurred in the past and which must be avoided as far as possible in the future.
- In rural areas, control is ensured mainly by the Gendarmerie; most reports on offenses such as poaching and unlawful lighting of fires are received from this source and only occasionally from the Department of Waters and Forests, which is very short of qualified staff.

The Department of Waters and Forests occasionally conducts surveys on the abundance of a given species of animal, its distribution, hunting or poaching. It also conducts or organises forest surveys.

- In the maritime zones, routine control and surveillance are carried out by the Gendarmerie and the Department of the Merchant Navy, occasionally by the Departments of Waters and Forests and Public Works.

Unfortunately, no surveys have ever been undertaken to :

- . assess stocks of exploitable lagoon fish species,
- . study the impact of mining pollution on the lagoon,
- . determine the presence and distribution of metals (in particular nickel and chromium) so as to have a baseline from which to monitor developments,
- . draw up an inventory of sites propitious for the reproduction of useful species and the establishment of aquaculture facilities.

Other departments and a number of research institutes are usually involved in the evaluation and monitoring of environmental problems:

- the Department of Agriculture, Livestock Production and Animal Industries, deal with the prevention and control of imported plant and animal diseases, with the co-operation of appropriate research institutes : CTFT (Tropical Forestry Technical Center), IEMVT (Institute of Livestock Production and Veterinary Medicine in Tropical Countries), IFCC (French Coffee and Cocoa Institute), and IRFA (Fruit and Citrus Research Institute).
- The Institut Pasteur and the Department of Health and Public Hygiene, for public health matters.
- ORSTOM (Overseas Scientific and Technical Research Bureau), whose field of activity is particularly wide.
- CNEXO (National Centre for the Exploitation of the Oceans).

On the whole, for a country with a population of under 140,000, New Caledonia can be said to command impressive facilities for analysing and monitoring ecological conditions. However, these facilities are only adequate if one considers the area to be served and the range of problems present, and they deserve to be used to better effect.

### 3. Management

#### 3.1 State of the Resources

##### 3.1.1 Soils

A soil survey with a view to assessing farming potential was conducted by ORSTOM in 1975 ("Etude des Sols de la Nouvelle-Caledonie"- published in 1978). Findings were as follows :

Category of Land	Total Land Area (ha)	%
Arable land .....	30,000	2
Grazing land .....	180,000	11
Land with good forestry potential ..	500,000	30
Land with poor forestry potential or to be preserved in their natural state .....	460,000	27
Land to be preserved in their natural state .....	505,000	30
	1,675,000	100

Considering the very small areas at present under crop, New Caledonia can be regarded as possessing an amply sufficient potential for its needs, despite the poor natural fertility of its soils and their high vulnerability to erosion.

#### 3.1.2 Water

Total drinking water resources on the main land are adequate to meet present domestic requirements; shortages can occur locally during the dry season, necessitating supply by water tanks.

As there are no streams in the Loyalty Islands, supply is exclusively from drilled wells or rainwater tanks. During prolonged draughts, water has on several occasions had to be imported by ship.

As regards the quality of surface water, past and present mining activity constitutes the most important factor of pollution and precludes the use of untreated water in several basins, despite the establishment of protection zones around public water catchments.

Mining erosion is not solely responsible for earth sedimentation in river beds : erosion from soils denuded by bush fires also plays an extremely important role in this context.

#### 3.1.3 Crops

No comment is necessary, as available land surfaces are amply adequate in quantity and quality to meet requirements.

#### 3.1.4 Cattle

No precise count has been made, but the herd is estimated at approximately 120,000 heads, a number which has remained more or less stable for several decades. Cattle farming is practised on almost 500,000 hectares (of which only 180,000 hectares are really suitable grazing land) and is thus extremely extensive over-grazing being rare.

An animal diseases survey is due to commence within the coming months and will give an idea of both the herd composition and its state of health.

#### 3.1.5 Forests

A general forest survey was conducted on the main land in 1974-1975. It concluded that of the 375,000 ha. of forest existing only 40,000 ha. were economically exploitable, the rest to be retained as protection. The forests are mainly on Government land, therefore, under the control of the Department of Waters and Forests. All trees in the Government forests must be marked by an officer from this department before felling and on the whole protection can be thus considered satisfactory.

Only localised and partial surveys have been conducted in the Loyalty Islands and on the Ile of Pines, and the potential is not accurately known. Action by the Department of Waters and Forests often clashes with the personal interests of local owners, who could endanger certain forest species such as sandalwood (*Santalum austrocaledonicum*).

A reforestation programme has been implemented since 1975 and its present objective is to give New Caledonia self-sufficiency for ordinary timber from the year 2000, thus replacing to a large extent the exploitation of the indigenous forest. Approximately 1,000 ha. a year of tropical pines are currently being planted under the reforestation programme.

#### 3.1.6 Mangroves

Mangroves cover approximately 16,000 ha. and only appear to be endangered in or around urban areas, where they are reputed to be a health hazard.

Regulations should be drawn up to protect mangroves which act not only as a nursery for many marine animal species, but also as a filter against noxious elements.

#### 3.1.7 Reefs and lagoon

From what was stated earlier in this connection, it is clear that while marine environment problems are acute only episodically and in certain places, attempts to define an effective conservation policy invariably founders on ignorance of the biological and physico-chemical characteristics of the marine environment and their changes.

Rational lagoon and reef management therefore implies prior implementation of a programme of research in the principal fields discussed.

##### Physico-chemical or bacteriological research :

- Study of mining impact on the lagoon eco-systems by analysing the characteristics of these systems and comparing them to similar ones unaffected by mining pollution.
- Baseline studies of chemical and bacteriological pollution around Noumea and monitoring of the development of the different parameters.

##### Research on living resources :

- Continuation of the tuna stock survey and assessment programme and study of their migratory patterns on the regional level.
- Ecological study of the lagoon environment with a view to gaining a better understanding of stocks, biology and sustainable fisheries activity for the main marketable species, including those suitable for use as live bait.
- Survey and preservation planning for habitats and breeding sites of marine animals regarded as endangered species (particularly turtles on the regional level, natural oyster colonies on the territorial level).
- Survey and preservation planning for sites that lend themselves to aquaculture activities.

In a short-term perspective, measures should be taken on the territorial level to reinforce preservation of living resources in the lagoon near Noumea by restricting fishing temporarily on parts of the outer reef (rotating reserves) and establishing marine reserves around some islands.



3.1.8 Fisheries

Very little is known about the exploitable fish resources existing in the lagoon, while at the same time lagoon fishing is becoming increasingly intensive. It is urgent therefore to undertake a systematic study of the lagoon ecosystem in order to prevent depletion of stocks through overfishing.

Ocean catches have so far been insignificant but oceanic fisheries are to be developed. On-going SPC skipjack programmes should be continued and expanded to include a survey of whales.

3.1.9 Conservation - Parks and reserves

Regulations on parks and reserves were recently standardised (see parag. 1-2) and the following areas were classified :

STATUS	Name	Surface Area (ha)
Total nature reserve ....	Montagne des Sources	5,870
Territorial parks .....	Riviere Bleue	9,000
	Thy	1,050
Special marine reserve ..	Yves Merlet	22,925
Special wildlife sanctuaries.....	Haute Yate	4,300
	Lepredour Island	560
	Pam Island	450
	Aoupinie	5,420
Special botanical reserves .....	Mont Mou	675
	Mont Panie	5,080
	Mont Humbolt	1,600
	South (7 areas)	4,508
TOTAL		60,388

In addition, a certain number of unclassified areas are under the responsibility of the Department of Waters and Forests and subject to special supervision and restrictions, particularly as regards hunting :

- Forest reserve of :	COL D'AMIEU	12,368 ha
	OUENAROU	1,171 ha
	TIPONITE (Touho)	1,100 ha
	TANGADIOU (Koumac)	1,076 ha
	MONT MOU	4,363 ha
	POVILA (Poindimie)	600 ha
		<hr/>
		20,678 ha

- Afforestation areas : TANGO-FORET PLATE 29,557 ha
- Forest reserve : Michel CORBASSON 35 ha

For a certain number of other areas, classification is imminent or under consideration :

- special marine reserves of Maitre and Amedee islands
- several special botanical reserves, representing a surface area of several thousand hectares.

These parks and reserves are available for scientific study and are used routinely by existing research institutions. Mention should also be made of the large numbers of visitor's permits delivered to scientists from overseas for whom these areas constitute unique field study.

On the other hand, only limited facilities are available for allowing the public access to the parks and reserves while ensuring effective supervision. It would seem desirable to increase these facilities.

#### 3.2.10 Endangered species

Plants : A list of endangered plant species was drawn by ORSTOM for the National Parks Commission and areas under the protection of the International Union for the Conservation of Nature. It is scheduled to be finalised and supplemented during 1981 with some floral species of the parks and reserves of New Caledonia.

The plants on the list are regarded as endangered either because their distribution is extremely restricted (microendemism) or because a very small number of specimens remains or is known. The only endangered plant which is protected as a species is Neocallitropsis pancheri (formerly exploited for the essential oils contained in its wood). A number of endangered species are not found in existing reserves and it would be advisable therefore to set up additional botanical reserves.

Animals : No list of endangered species has been drawn up. However, endemic birds ("kagus", pigeons, parrots) as well as flying foxes and freshwater prawns are becoming rare.

#### 3.2.11 Local sources of energy

New Caledonia has no known resources of fossil fuel and the only natural source of energy at present used is water. On the best site available (Yate) , a hydro-electric power station has been established.

Projects for developing other good sites (Ouine - Pourina, Ouaieme, Neaoua) exist and will be implemented as requirements grow. They cause no major threat to the environment.

For the time being, the Territory is obliged to import most of the energy it uses, and a policy aimed at long-term self-sufficiency has been drawn up along the following lines :

- Use of solar energy for domestic water heaters and for low-consumption remote installations (beacons, relay stations, transmitters, etc.)
- Maximum use of hydro-electricity by the construction of micro-power plants. This project could be damaging to the environment by reducing or cutting off the flow of numerous small streams.
- Further studies for the use of ocean energy (wave energy, use of temperature differences).
- the use of the biomass : studies on the methanol chain (from plantations of eucalyptus or other species) are due to commence shortly. Utilisation of the indigenous forest for this purpose would be destructive and quite unwarranted considering that the production capacity of eucalyptus and certain leguminous species is far higher.

### 3.2.12 Mining resources

New Caledonia possesses considerable mineral resources, particularly nickel and chromium. Nickel and chromium mining is a long established activity which is becoming increasingly streamlined and is now restricted to a small number of deposits. Mining is controlled by the Department of Mines and Geology and the Mining Pollution Control Commission, so that pollution from this activity is, in principle, reduced to a minimum.

Other mineral ores have so far only been superficially prospected and a mining survey to be conducted very shortly should provide further data in this field.

### 3.2.13 Human resources

D i e t : food resources are in general adequate both in quality and quantity. Protein malnutrition continues to occur in certain Melanesian communities, but this appears to be ascribable to poor eating habits or certain mental attitudes far more than to any real food shortage (the lagoon is full of fish and never very far away).

Water : See paragraphe 3.1.2, and below.

Housing and living conditions : in view of the mild climate, many people make do with a simple shelter such as the traditional Melanesian hut. While most urban centres are now equipped with proper water and electricity distribution systems (but not with sewage disposal and treatment systems), a great deal remains to be done in the villages.

The long-term economic and social development plan provides for large-scale development of rural communities in the next ten years, with the following objectives :

- Road works : asphalt covering and sanitation in population centres, main roads made-weather proof (isolation never exceeding 24 hours).
- Piped water supply to all communities within 10 years.
- Electrification : . generalisation for compact settlements (groups of villages)  
. power taken directly from a water-course by turbines with auxiliary systems for low-flow conditions.

- School buildings :
  - . one kindergarten per village
  - . at least one boarding school per territorial subdivision or per island
  - . generalised and subsidised school busing.
 (It should be noted that school attendance is compulsory from 6 to 14 years and all children go to school).
- Socio-educational facilities : one meeting hall and one sport stadium per municipal district within 5 years.
- Public facilities :
  - . one post office per municipal district with a postal agent or agency per village within 5 years.
  - . one Basic Education and Health Education officer per village within 5 years.
  - . one officer per municipal district from the Departments of Agriculture and Waters and Forests and from the Department of Development within 3 years.
  - . one trained town-clerk per municipal district within 3 years.

Culture : New Caledonia's cultural originality stems from the co-existence of many different communities : Melanesians, Europeans descended from early settlers, Europeans newcomers, Wallisians and Tahitians. The main objectives of the territorial cultural policy are therefore :

- to systematically investigate cultural approaches that will make the most of the multi-racial nature of New Caledonia;
- to develop Melanesian culture, viewed as a valuable component of French culture;
- to promote traditional handicrafts and life styles;
- to fully integrate minority groups (Wallisians, Tahitians, Vietnamese, French West Indians, Indonesians) with due regard for their specific cultures.

### 3.2 Major development trends

#### 3.2.1 Housing

The growth of Noumea, the principal urban centre where nearly half the population lives, has fallen off sharply after a period of mushrooming during the mining boom. Large compact multi-storey residences are no longer being built, only detached family-homes covering extensive areas. Environmental considerations, which were pushed aside during the period of rapid growth, have now become an official objective; they will be costly to put into practice with the scattered type of housing favoured.

The growth of other urban centres, which has been moderate and also oriented towards detached family homes, poses much the same problems as in Noumea but on a small scale :

- over-occupation of land and sea space,
- visual pollution,
- air pollution
- water pollution.

### 3.2.2 Industrial Development

The development of the mining industry, if it is implemented as planned through the two major "North" and "South" projects, will have substantial impacts on the environment :

- the "North" project provides for the establishment of a smeltery within the mining complex, the waste from which is liable to pollute the northern part of the lagoon.
- the "South" project will focus on the exploitation of laterites, which will involve scraping the top layer off vast surfaces in an area rich in endemic plants and entail major pollution hazards for hitherto unaffected water-course as well as the complete eradication of certain rare species.

The diversification of mining activity, if and when it actually starts, will multiply extraction sites and entry tracks and roads, thus exposing to possible damage areas that have so far been protected through their isolation.

Industrial diversification, and particularly the establishment of processing industries, could also have a certain impact on the environment and will require careful monitoring.

### 3.2.3 Agriculture

Current agricultural development trends are as follows :

- Shifting cultivation of subsistence crops is giving way to more productive agriculture in permanent position with rotation, fertilisation and irrigation where necessary;
- Production of cattle feed (oleaginous plants);
- Increased animal production : cattle, pigs, poultry;
- Extension of tropical food crop production : copra , coffee, fruit.

If this development is properly conducted with expert guidance, it should be possible to minimise its impact on the environment; however, pollution of water by pesticides and fertilisers will be difficult to avoid. Farm produce processing industries (agro-industries) are also likely to cause some water pollution.

### 3.2.4 Forestry

The only major on-going programme is the reafforestation of approximately 1,000 hectares per year (or 30,000 hectares in all) with tropical pines for the production of sawing timber. This programme should benefit the environment for two reasons :

- it will regularise water resources,
- it will lead to vigorous bush fire control.

However, modifications of the vegetation and soils under this exotic forest cover will need to be watched out for and studied.

Two other projects are under consideration :

- Rehabilitation of 3,000 hectares of land degraded by mining activity. Needless to say, such a project would be particularly beneficial;
- Planting of Eucalyptus (approximately 30,000 ha) with a view to methanol production. The impact of this project should be similar to that of a conventional cash crop.

Lastly, a probable beneficial impact on the environment will be derived from the small scattered reforestation operations conducted by individuals or village communities (approximately 1,000 reforestation sites covering roughly 1,500 to 2,000 ha).

A positive, although longer term, effect of this reforestation will be to reduce exploitation of the indigenous forest.

### 3.2.5 Fisheries and Aquaculture

There is a general trend towards development in this sector :

- In the lagoon, catches are increasing and can lead to depletion of marine animal species.

At the same time, the anticipated development of aquaculture will require close monitoring of water quality, reinforced protection of suitable sites and shore management planning.

- Oceanic fisheries are certainly on the increase (by pole-and-lining or purse-seining), and further and possibly intensified studies on skipjack and other tuna will become necessary.

## 3.3 Management Methods

### 3.3.1 Coastal zone :

No planning and intergrated management of the coastal zone has as yet been undertaken.

### 3.3.2 Plans to alleviate the effect of natural disasters

There are three plans in this field :

- the ORSEC plan (general disasters and cyclones) is capable of dealing with a natural disaster occurring in the town of Noumea, mainly through mobilisation of the Armed Forces.

In the rest of the Territory, communities are gradually being equipped with facilities and staff (first aid teams).

- a POLMAR plan is being drawn up for the protection of the marine environment, particularly against oil spills; and preliminary studies have been completed. Preventive regulations governing entry into the lagoon of petrol tankers are already in force.
- An emergency plan has been prepared and can be implemented by the Nickel Company to protect the marine environment against any accidents caused by its own works.

On the other hand, there is no bush fire control plan, and the only fire fighting means available is the light equipment operated by the Department of Waters and Forests, mainly when fire breaks out in afforested areas.

### 3.3.3 Regional emergency plans to deal with oil spills or other disasters :

New Caledonia would welcome the setting up of such plans, particularly with a view to pooling certain means of action and storage of products.

3.3.4 Demographic policies and programmes

New Caledonia has no special demographic policy or programme, since it is under-populated.

3.3.5 Land use, zoning maps, etc.

In urban areas, several urban development master plans have been drawn up (Noumea Koumac ..).

In rural areas, land use maps are gradually being prepared, in addition to the 1/1 000 000 scale soil map and cultivation and forestry capability map.

Since there is no institution responsible for territorial development as a whole, the use of these plans and maps is generally confined to the departments which prepared them (or on whose behalf they were prepared).

3.3.6 Rehabilitation of degraded areas

The main degraded zones are those laid bare by mining activity; they cover approximately 3,000 ha. Trials conducted over 10 years (from 1970 to 1980) showed that it was possible to replant these areas. However, the project has not yet been funded.

4. Necessary National Action

4.1 New action

- although there is no plan at present to set up new government departments or non-government institutions to deal with environmental issues, the administrative organisation is due to be re-examined, particularly with a view to better co-ordination between existing bodies.

Under the circumstances, it would no doubt be advisable either to establish a department to take over all responsibilities formerly scattered among several departments or institutions or to entrust all these functions to one of the existing institutions or departments.

- New projects to solve existing problems. The following projects should be implemented, some of which have already been mentioned :
  - . replanting of lands degraded by mining activity;
  - . treatment of sewage in urban and industrial areas;
  - . effective bush-fire control, by means of well-equipped teams with sufficient and adequately staffed fire-fighting squads and through education and information campaigns;
  - . ecological studies of the marine environment : impact of mining activities on the lagoon determining baseline of chemical and bacteriological pollution around Noumea; continuation of the tuna survey and assessment programme; assessment of stocks and maximum sustainable fishing rates in the lagoon; inventory of endangered marine species;
  - . establishment of new botanical and wildlife reserves as well as marine and temporary rotating fishing reserves in the lagoon with a view to protecting endangered species and ecosystems.

- In order to obviate new problems, it will be necessary to :
  - . closely monitor fish stocks in the event of a major increase in fishing effort, particularly seining;
  - . study environmental impacts before launching large-scale development projects;
  - . draw up stricter town plans for growing urban centres.

## 4.2 Needs

### 4.2.1 Education

The International Environmental Education Workshop organised by UNESCO in Belgrade defined the goal of environmental education as :

" To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitude, motivation and commitment to work individually and collectively towards the solution of current problems and the prevention of new ones " .

Environmental Education cannot therefore be limited to issuing a list of facts on pollution; its objectives are comprehensive .

At primary school, where a child's mind first opens up to the outside world, it is necessary :

- 1) to make children become aware of and actively interested in environmental issues.
- 2) to make them acquire skills, especially methods of learning, investigating, testing, and organising information for the purpose of problem solving in connection with preventing or correcting environmental deterioration.

At the junior secondary level, the aim should be :

- 3) to help children acquire knowledge, particularly the basic concepts necessary for an accurate and effective understanding of the environment.
- 4) the development of a serie of responsibility and social values on which to base choices leading to genuine participation in environmental decisions and actions.

For these two first objectives, an interest must be kindled in the human and natural sciences by allowing children to investigate their near geographic environment. Out-of-school visits to scenic or recreation areas must therefore be organised, which requires free time and a means of transport.

The objectives associated with secondary school require more resources, particularly audio-visual material : T.V. films, slides, specialised reviews, survey reports, etc.

Programmes must therefore provide for group or team studies with such basic equipment as projectors, light apparatus for analysis and experiments, etc.



Both these educational strategies are currently applied in New Caledonian schools. However, the Department of Education would be very pleased if SPC were to provide comprehensive environmental education material for distribution to teachers.

Educating the public, in general, is more complicated. New Caledonia, being so far from the hub of creative activity, does not find it easy to obtain effective aid such as lecturers, T.V. programmes and "commercials", the usual methods for stimulating adult awareness.

#### 4.2.2 S t a f f

Although expertise is already available locally, additional staff will obviously be necessary in the coming years for the new actions to be undertaken. Most of this staff will have to be trained in France, which does not give rise to any special problems.

The staff requirement has not been precisely estimated, but no particular assistance for training will be required as training facilities in all fields and of all levels exist in France. In order to meet the needs expressed in paragraph 4.1, at a guess about 10 experts will need to be recruited eventually, for environmental analysis and control or planning and management.

#### 4.2.3 Equipment and facilities

Substantial facilities and equipment will be necessary to implement the projects described under paragraph 4.1, but they have not yet been precisely defined and only partly costed.

In any case, the necessary equipment will not be highly specialised as the latter is generally already available in existing laboratories.

#### 4.2.4 Outside experts

New Caledonia has no particular need in this connection since it can enlist the services of experts from France if necessary.

#### 4.2.5 Information

A number of studies, reports and inventories dealing entirely or in part with the environment are (or soon will be) available :

- Forest inventory
- Flora of New Caledonia (complete or under press)
- 1/50,000 Soil map
- 1/40,000 Soil map
- Various thematic maps
- Various wildlife studies
- Atlas of New Caledonia (under press)
- Mining survey (on-going)
- Animal diseases survey (launching stage)
- Etc...

These documents are generally available and on sale from their initiating organisations : C.T.F.T. (Tropical Forestry Technical Centre), B.R.G.M. (Geological and Mining Research Bureau), O.R.S.T.O.M. , Department of Topography, and other technical departments. As far as we know, no comprehensive summary of these publications is available for direct use by an environmental management institution, but they can be obtained individually, in convenient formats, particularly inventories and maps.

Research, inventory and survey requirements were described in paragraph 4.1 (other requirements result from on-going programmes and are met as they arise).

The setting up of a regional environmental clearing house service or data bank would certainly be welcomed by New Caledonia. Because of the regional nature of many environmental problems, which occur in very similar forms throughout the Pacific islands, it is suggested that SPC establish and operate such a service.

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