

FOREST IN PAPUA NEW GUINEA

Lourdes E. Tolentino

I. STATUS OF FOREST MANAGEMENT IN PAPUA NEW GUINEA

1. Papua New Guinea consists of a "mainland" and a collection of islands of varying sizes. The mainland is really part of the island of New Guinea, the second largest island in the world after Greenland. The Island as a whole has an area of 868,000 km², of which the eastern 474,000 sq km is part of Papua New Guinea. The western portion of the island is the Indonesian province of Irian Jaya. In addition to the mainland, the nation holds sovereignty over a number of islands, of which New Ireland, New Britain and Bougainville are the largest.

2. Approximately 4 ½ million people live in Papua New Guinea; people of a wide variety of physical and cultural types all described as Melanesian, who between them speak over 800 different languages and belong to more than 8,000 clans.

The overall population density is very low, especially by the standards of the country's Asian neighbors. The main concentrations of population are in the rural highland valleys and in the main towns which are Port Moresby, Lae, Rabaul, Madang, Wewak, Goroka, Mount Hagen and the Arawa-Kieta-Panguna urban area.

3. Geographically and topographically, the country is very new. It forms part of the so-called "Ring of Fire" around the edge of the Pacific, and most of the country has been formed by comparatively recent earth movements and volcanic activity. Earthquakes are still common, and considerable volcanic activity takes place in the northern circle of islands, in the parts of Papua, and just off the coast of Madang.

The overall appearance of the country is extremely rugged, particularly in the highlands which are characterized by sheer slopes, sharp edges, fast-running rivers and the scars of innumerable landslides.

4. The dominant feature of the country is the central spine, a complex of high mountain ranges intersected by alpine valleys and many plateaus. This spine runs from east to west, into Irian Jaya, and rises steeply from the coastal and river plains to its north and south. Along the north coast of the mainland is another group of mountains, a broken series of ranges which similarly traverses the entire length of the country and the outcrops in the ocean to the east, the Trobriand Islands.

5. The average height of the mountains is 3000 m, and the tallest mountain, Mt. Wilhelm, is 4500 m high. North of the central spine and forming interruptions to the coastal range are the basins of the Markham, Ramu and Sepik rivers, which are separated only by low-lying hills. These rivers all rise in the central spine and having tumbled out of the mountains, bearing great quantities of alluvial material, slow down. They meander through their valleys, depositing soil and contributing to wide flood plains and swamps. South of the central spine is more low-lying country, the plains of Papua. These poorly drained plains are watered by the Strickland and Fly rivers, and the delta regions form one of the most extensive swamps in the world, over 100,000 square miles including the portion in Irian Jaya.

6. The main offshore islands are Manus, New Ireland, New Britain, Bougainville and the remainder of the Solomon Islands and the Bismarck Archipelago. They form a volcanic arc to the northeast of the mainland. These islands are long and narrow and very mountainous, dominated by volcanic peaks, of which the most active are on the Gazelle Peninsula around Rabaul in New Britain.

7. The main characteristics of Papua New Guinea's climate, as might be supposed from its location in the tropics, are heat and humidity. However, the climate does not conform to any standard equatorial type, mainly because of unusual characteristics caused by the mountain ranges. Climatic patterns actually vary from one place to another.

Rainfall is the characteristic which differentiates the seasons. There are distinct wet and dry seasons, the timing of which varies from one area to another. For instance, the wet season in Lae largely corresponds with the dry season in Madang, even though both are on the north coast of the mainland. In the highlands, variations are even more striking; there are distinct "microclimates" which differ from valley to valley or even, in some cases, within the same valley. The most common wet season falls between November and April, and the dry season between May and October.

The temperatures remain fairly constant throughout the year in most regions. The annual daytime mean temperature for most of the lowlands is 27 C, accompanied by extremely high humidity. The capital, Port Moresby, is warmer and drier. In the highlands, temperatures are significantly lower and present a greater range between warm days and cool nights. For the highland valleys, the annual daytime mean temperature is 20 C with a pleasant level of humidity. Many residents and visitors describe the highland climate as invigorating.

Forest Resource

8. Papua New Guinea is blessed with a rich and abundant tropical forest resource. The country has a total land area of 46.2 million hectares. Of this land, 97% is privately owned by the customary owners. Forest covers some 78% or 36.125 million hectares of the total land mass, ranging from mangrove forests along the coast to alpine forests at higher altitudes. About 15 million hectares of these forests are considered operable (commercial) forests. However, some uncertainty exists about the exact acreage of the operable forest because the figure of 15 million hectares was estimated from aerial photographs

taken by the Australian military during the war (1944-45) and in the early 1960s making them about fifty and thirty years old, respectively. Furthermore, much of these areas has since been cleared for agriculture, infrastructure, mining and oil exploration, and by logging operations. Of the 36.1 million hectares of forest land, 35.563 million hectares are broadleaf forests, 520,000 hectares are coniferous, and 42,000 hectares are plantation forests (World Bank 1990).

Specifically, PNGs' commercially accessible timber volumes are concentrated in lowland and coastal areas with low population densities. In these areas, people generally practice shifting cultivation within well-defined pockets of secondary vegetation. Though kinship groupings, they claim customary ownership of the large tracts of natural forest, between their gardening areas, that contain the timber resources targeted for industrial logging. (The term "landowners" is used in PNG to describe groups or individuals with customary rights to land and resources).

9. Although Papua New Guinea's forests account for only 1.5 percent of the world's tropical rainforests, they are outstandingly rich in diversity by global standards. Few species of plants or animals are considered endangered, but this could be a consequence of incomplete inventory. The conservation and commercial value of this rich gene pool is considerable. The forests offer many natural resources of commercial, subsistence, cultural, and scientific importance. In terms of timber production, the country's forest contain more than two thousand species of trees, of which about four hundred are known to be commercially useful.

10. Generally, the forestry sector earns from K (kina) 15 million to more than K100 million of foreign exchange, or between 5 and 10% of the total value of all exports. It is the third most important sector of the national economy, in part because it generates revenue, employment, and infrastructure development especially in remote areas of the country. The revenue from log exports represents over 80 percent of total earnings, followed by woodchips (9%), and sawn timber (6%). However, the export of sawn timber has declined as a consequence of the 1979 policy (although it was not the intention), with greater emphasis on the export of round logs, high labor and maintenance costs, low recovery, and the low quality of logs processed.

(NOTE: Papua New Guinea has an open economy with a large international trade sector. Primary commodities include coffee, cocoa, copra, timber and fish while mineral exports of copper, gold, oil, and gas are significant revenue earners. The open nature of the economy has meant that Papua New Guinea is vulnerable to international price fluctuations and inflationary impulses. In defense, the major macroeconomic strategy has been the "hard kina" strategy, which has been in place since independence. However, the closure of the Bougainville mine and more recent economic decline forced the country to devalue its currency by 10%. As a result of several problems, including some structural and cultural ones, its mountainous landscape and its many islands, Papua New Guinea is saddled with a high-cost economy).

PNG LAWS AND REGULATIONS ON FOREST MANAGEMENT

11. The wise use of the natural resources is well enshrined in the 1975 Constitution of Papua New Guinea. Be it noted that the country has a unique property ownership system whereby land and its forest resources are owned by the customary owners and the only way to develop the forest resources is to obtain approval from the owners.

(A feature of the Constitution of Papua New Guinea (PNG) is its recognition of custom. Custom is defined as 'the customs and usage's of indigenous inhabitants of the country existing in relation to which the matter arises, regardless of whether or not the custom or usage has existed from time immemorial'. Except where it is inconsistent with statute law, custom forms part of the underlying law along with adopted principles of English common law and equity. Through custom, local kinship groups own 97% of PNGs land mass and most of its natural forest resources as mentioned above.)

To obtain such approvals in a legal manner, the government passed various Acts. Prior to 1991, the state was able to acquire rights for the development of forest resources through timber rights purchases, the Native Timber Authority, and the provisions of the Private Dealings Act.

Timber rights purchases, the main instrument for large-scale forest use, enable the state to acquire the rights over the timber resources of a given concession and then to issue a permit to a selected operator to develop it. Conditions of forest management, environmental protection, and royalty payments are all elements of a permit. The royalty collected is variously divided between the landowners and the provincial and national governments. The Native Timber Authority, on the other hand, permits a person to directly purchase small quantities of timber from a customary landowner. It is a useful tool for clearing fragmented resources on land needed for agriculture.

Under the Private Dealings Act, private landowners are permitted to directly dispose of their timber resources to any person, subject to the approval of the Minister who must be satisfied that the owners' interests are protected, the agreement does not run contrary to the national interest, and there is a reasonable prospect of economic success.

Some commentators refer to the previous Forestry Act as "interventionist" because only the state could acquire timber rights from customary landowners. The state purchased these rights under a standard form called Timber Rights Purchase Agreement. Landowners received royalties at a prescribed rate, and no legal say over which logging company held the timber permit, what infrastructure was built, or the rate at which the timber was harvested.

The "laissez-faire" Forestry (Private Dealings) Act permitted customary forest landowners to sell their timber privately. The usual practice was for a 'landowner company' to acquire timber harvesting rights from landowners and then on-

sell the rights to a foreign logging company. Provided the Minister assented to the 'dealings' the logging company could operate without a timber permit and with minimal state supervision.

12. In 1991, the new Forestry Act was enacted and came into force in 1992 superseding the Private Dealings Act and timber rights purchases (replaced by the somewhat similar Forest Management Agreement). Under the new *Forestry Act*, the state has reserved to itself a monopoly on the right to enter into a Forest Management Agreement with landowners. If they cannot strike an acceptable deal with the Forest Authority, landowners are barred from arranging industrial-scale logging on their land. In short, if a Forest Management Agreement is concluded, it is the National Forest Board, not the landowners, which selects a forest industry participant to implement the agreement and recommends to the Minister that a timber permit be granted.

The Forestry Act established a PNG Forest Authority (from the Department of Forests into a government statutory body) which oversees the administration and enforcement of the Act and any other legislation pertaining to forestry matters and specifically (i) to negotiate Forest Management Agreements and (ii) to select operators and negotiate conditions on which timber permits, timber authorities and licenses may be granted. The powers of the Authority are exercised by a National Forest Board.

The Authority is mandated by law to formulate a National Forest Plan which will provide a detailed statement of how the National and provincial governments intend to manage and utilize the country's forest resources. The National Forest Plan shall (i) be consistent with the national forest policy and relevant Government policies; (ii) be based on a certified National Forest Inventory which shall include particulars as prescribed; and (iii) consists of (a) National Forestry Development Guidelines prepared by the Minister in consultation with the Board; (b) the National Forest Development Programme; and (c) a statement, prepared annually by the Board of allowable cut volumes, being the amount of allowable cut for each province for the next succeeding year which will ensure that the areas of forest resource set out in the Provincial Forest Plan, for present or future production, are harvested on a sustained yield basis.

The National Forest Plan requires all forest development to be in accord with it. The Plan is intended to comprise a policy statement, the National Forestry Development Guidelines, a development program, and a statement of annual allowable cut. While the Guidelines were approved 'in-principle' in 1993, the Plan itself did not make its first public appearance until May 1996.

13. Provinces have Provincial Forest Management Committees established by the Forest Board with functions as follows: (i) to provide a forum for consultation and co-ordination on forest management between national and provincial governments, forest resource owners and special interest groups; (ii) to undertake continuous consultation with the provincial Minister responsible for forestry matters on matters relating to acquisition and allocation of forest resources; (iii) to assist the provincial government in preparing forest plans and forest development programs, consistent with the national and provincial programs; (iv) to make recommendations to the Board on (a) the preparation and terms of Forest Management Agreements; (b) the selection of operators and preparation of timber permits; (c) the enforcement of timber permit conditions and of the Forestry Act; (v) to make recommendations to the provincial Minister on the issue of timber authorities; and the extension, renewal, transfer, amendment or surrender of timber authorities; (vi) to supervise extension services with respect to business management, agroforestry, silviculture, reforestation, environmental protection, processing and marketing; (vii) to oversee the receipt and distribution of government levies and charges and other benefits due to landowners; (viii) to assist in the early identification and resolution of land-owning disputes affecting forest resources; and (ix) to carry out such other functions as may be required to be carried out by the Forestry Act or any other law.

14. Among the institutional arrangements which may be established under the Forestry Act is a State Marketing Agency which may be set up by the Minister within the Authority. The functions of the State Marketing Agency are: (i) to exercise the State purchase option on logs and other forest produce; (ii) to be available by mutual agreement for appointment as a general log marketing agent at the discretion of the holder of a timber permit or timber authority; (iii) to promote PNG forest products for export and for domestic use, and to provide promotional material and information to producers and buyers; (iv) to undertake market intelligence and explore market diversification; and (v) to provide market intelligence to the Board for export licensing purposes.

15. To be more specific, acquisition of timber rights under the Forestry Act is through a Forest Management Agreement (FMA) which contains the terms agreed upon between the customary owners and the Authority to harvest timber from the land or to plant, grow and manage timber on the land. No acquisition under an FMA affects the customary rights of ownership of the land.

A Forest Management Agreement shall be in writing and specify the monetary and other benefits, if any, to be received by the customary owners in consideration for the rights granted. It shall likewise specify the estimated volume or other measure of quantity of merchantable timber in the area covered by the Agreement; and set forth a term of sufficient duration in order to allow for proper forest management measures to be carried out to completion. The FMA shall be accompanied by a map showing clearly the boundaries of the area covered by the Agreement and contain a certificate from the Provincial Forest Management Committee to the effect that it is satisfied as to the authenticity of the tenure of the customary land alleged by the persons or land group or groups claiming to be the customary owners and the willingness of those customary owners to enter into the agreement.

16. Where it is proposed to enter into a Forest Management Agreement over customary land, the title of the customary owners to that land shall be vested in a land group or land groups incorporated under the *Land Groups Incorporation Act*; or registered under a law providing for the registration of title to customary land. Where it is impractical to give effect to these requirements, at least 75% of the customary resource owners of each customary ownership group owning timber affected by the Forest Management Agreement and who are residents on their land at the time of execution of the FMA, shall give their written consent to the Agreement.

17. Where the State enters into a Forest Management Agreement, the exclusive right of cutting and removing timber from the area covered by the Agreement and of planting, growing and managing timber on that area vests in the Authority and in persons claiming under the Authority. For the purposes of carrying out the activities, the Authority and persons claiming under the Authority may enter the area and harvest timber according to the terms of the Agreement; build, maintain and use roads, wharves and bridges and construct such infrastructure as is required by the Agreement but may not erect sawmills or other buildings on that area. The Minister may grant timber permits and issue licenses for the disposition and management of timber rights in that area.

Problems, Issues and Constraints

18. In 1987, the then PNG Prime Minister commissioned a Forest Inquiry on the problems which ail the forest industry. Referred to as the Barnett Commission of Inquiry, its report highlighted the major problems that exist in the forestry sector. As identified, the three main problems and issues are: no strong and clear policy and planning for forest management; lack of environmental protection; and lack of landowners participation in policy and planning of forest management.

Given that 97% of the land and resources in Papua New Guinea are under customary ownership, government allocation of land with its resources, for longer-term development or purposes other than those of the owners, is very difficult.

Ownership of land is through clans and claims to it are enforced by cooperative actions of the descent system influenced by traditional beliefs that the spirits of the forebears are the ultimate guardians. That land or resources are held under such interlocking systems of rights and obligations makes the likelihood of transfers of such assets to individuals or groups outside the immediate clan group very remote. Not only does this make land purchases or leases impossible, but it also makes it difficult to obtain general agreement for long-term land-use developments that do not show immediate and obvious benefits to the owners.

Other problems/issues requiring attention are: (i) increasing population growth at (2.2 to 2.4% per year) will place increasing pressure on the forest resources. A sizeable segment of the population is concerned mainly with day-to-day survival and with overcoming poverty rather than conserving resources for future generations; (ii) the lack of awareness, knowledge, and understanding of the real costs of unsustainable development among resource owners coupled with unrealistic expectations of returns and compounded by a lack of political will to commit and implement policies conducive to sustainable development, especially regarding forest resources; (iii) legislative arrangements, national forest policies, and environmental management plans are not consistent with each other; (iv) understanding of forest resources and ecosystem dynamics is hampered by the lack of research, trained personnel, and funds to carry out the essential tasks of project design, data generation, evaluation, and monitoring; and (v) inappropriate advice from experts who do not appreciate the socio-political realities of Papua New Guinea, especially in relation to resource use and ownership, or the vulnerability of the country's economy to fluctuations in the international markets.

Lastly, while the National Forest Policy (1991) classifies forests into Productive Forest, Protection Forest, Reserve Forest, Salvage Forest and Reforestation Areas, it is not clear what protection forest and salvage forest really mean. While the Minister can declare certain areas as reserved and certain trees as protected, it is not clear if the Minister has the right to declare an area as a production forest

Recommendations

19. The following recommendations are culled from many workshops, trainings and seminars conducted by the government, non-governmental organizations as well as studies conducted by natural resources management consultants:

(i) The Government, prior to any kind of development regarding the forestry sector, has in the past consistently shown lack of meaningful consultation with customary landholders/resource owners. The Government must consult with customary landholders and resource custodians before any forestry activity takes place. Furthermore, customary owners must have access to lawyers of their own choice to explain the Forestry Act of 1991, other relevant legislation and proposed amendments to these laws. Most of all, forestry laws and policy must recognize and confirm the participation of customary landholders to participate in policy and planning of forest management.

Forest owners must exercise control over the development of their forest resources. Customary owners must not sell or give away their rights to the State or companies. To support this policy the sale of timber rights to the state Forest Authority must be abolished. In lieu thereof, eco-forestry, sustainable logging and eco-tourism must be encouraged in order to minimize depletion of the forest and to minimize pollution. In addition, steps must be taken to provide assistance and support to small scale industries and businesses to help them sell their products within the country and to help identify overseas markets. In short, the emphasis in forest development must move away from large-scale logging projects to sustainable medium and small-scale projects. This will minimize the harmful impact on our valuable rainforest and maximise the forest's value.

(ii) Forest Management Agreements (FMA) are extremely important contracts wherein landholders deal with timber resources worth hundreds of millions of kina (PNG currency). Landholders must be allowed to freely negotiate the terms of these Forest Management Agreements, and they must have the advice of lawyers of their choice during negotiations. FMAs must provide for the real management of forests through a mechanism which allows substantial land holder permit. Landholders should sell their logs, and not their timber rights. Forest Management Agreements must ensure that landholders properly sell their forest resources by selling from a well-defined area a particular groups of trees which has had a full inventory done and logs must be purchased at a fair price that reflects the Freight on Board (FOB) market price. The emphasis in FMAs must also shift away from large-scale concessions (which should be phased out), and focus on sustainable medium and small scale development over which landholders have substantial control.

(iii) Existing forest concession contracts, such as FMAs between resource owners, the State and companies need to be reviewed because many are unfair and inequitable contracts. These contracts must be changed to allow customary landholders the right to share in the profit, control and development of their forest resources. Customary landholders must have a greater say in their forest and its resource management. All existing forest contracts must be received by an independent judicial commission to make sure that all forest contracts are fair. Where inequity/ unfairness exists, these contracts must be re-negotiated.

(iv) The government, businesses, NGOs, policy makers and the community must conserve biodiversity, sustainable manage forest resources, ensure that all forestry projects have a proper land-use management plan negotiated at the community level, enforce all relevant laws and standards governing logging and infrastructure development, and ensure environmental monitoring for all forestry projects.

Conclusion

20. The present-day dual economy of Papua New Guinea which involves both market and subsistence activities, places a variety of pressure on resources. The people's expectations have increased, and their needs have changed. Many now seek a transition from subsistence to the market economy. Be that as it may, PNG must achieve economic growth and social development without degrading the potential of its renewable natural resources.

The challenge now is to create opportunities for development consistent with the broad goal of sustainable development that will optimize all benefits from forest use, at the same time conserving the integrity of the forest ecosystem. It is imperative that sustainable development of forest resources in Papua New Guinea recognize the critical role of land and forest resources to the country's way of life and, in particular, the importance of simultaneously considering social, environmental, and market demands. The diversity of cultural practices and traditional conservation practices, largely still in place, must be integrated with the government's objective of achieving "integrated human development."

Towards this end, the objectives should be to maintain biodiversity, the ecological integrity of all natural ecosystems, and the general quality of the environment. To achieve the nation's full economic and social potential, resources must be used efficiently, without detracting from community values, and with equitable allocation of rights of access and opportunities to develop resources. This should include equitable distribution of the benefits of development to the communities. Further, the strategy of sustainable development should avoid changes that might be irreversible and should acknowledge uncertainties about the impact of economic activity on the environment.

In all these, legislation as a tool for sustainable development has a vital role to play.

Part II. BIODIVERSITY CONSERVATION IN PAPUA NEW GUINEA: LEGAL ASPECTS

Introduction

Papua New Guinea may hold more than 400,000 species, representing 5% of the world's biodiversity in less than 1% of the world's land area, according to a country study on biological diversity commissioned by the UN Environment Program published in 1994. A significant proportion of the species are endemic to the region as a result of isolation and evolutionary processes. This diversity is a bounty to the nation, supporting the productive economy and providing essential ecological functions. However, as many species have restricted biogeographical distribution, they tend to have low resilience thresholds in the face of human pressures. Protecting the great wealth of species in PNG in its entirety presents an immense dilemma for promoters of biodiversity conservation. In recent years, pressures on forests have intensified along with increases in human population, technologies have advanced and value systems of rural communities have changed.

Flora and Fauna

The mountainous region forming part of the backbone of New Guinea and its rugged terrain of high peaks and deep valleys is home to the greatest wealth of PNG's animal and plants. Of about 9000 species of plants, over 200 are tree-sized, mostly found in the lowland rainforest, but extending to an upper limit of 3500 meters, where pines and Antarctic beech thrive (reminiscent of Tasmania or New Zealand); above this on the higher mountains are alpine lakes and meadows. There are many varieties of orchids in PNG.

There are about 250 species of mammals, mostly bats and rats, including about 60 marsupials and notably tree kangaroos. There are also two kinds of egg-laying echidnas (spiny anteaters).

Be that as it may, it is for its 700 or so bird species that PNG's wildlife is most renowned. It is the home of 38 of the world's 43 spectacular and gaudy species of bird of paradise, with their bizarre displays and mating rituals. Among more familiar birds, PNG can boast more parrot, pigeon and kingfisher species than anywhere else in the world. All sizes, and colors can be found, from the world's largest, i.e. the crowned pigeon, to the world's smallest, i.e. the pygmy parrots, which scurry along small branches and feed on lichens.

Perhaps the most notable of all are the giant cassowaries. Related to the Australian emu, they are stockier birds adapted to forest areas and with a large, horny casque for crashing through the undergrowth. Like the bird of paradise, cassowaries are of great ceremonial significance to many of PNG's tribal groups.

Also represented in PNG are about 200 species of reptiles, including two crocodiles and 13 turtles, as well as about 100 snakes, which are much feared by the local people and often a cause for the repeated burning of some grassland areas, especially in the Highlands.

PNG is a paradise for insects and contains many thousands of species, notably a beautiful variety of birdwing butterflies, including the world's largest butterfly, Queen Alexandra Birdwing. Some insects such as the brilliant green scarab beetles, are used as body ornaments although the most famous ornaments, of course, are the bird-of-paradise plumes, seen at their best at the Highlands shows. They are valuable not only for sing-sings (tribal festival of dances and songs), but as bride prices, and are carefully stored for use over many years.

Protected Areas

Less than 2.8% of Papua New Guinea's area has formal status as protected areas. The present conservation system is not representative of the country's diverse habitats (some 80% of the present protected area network comprises just three sites). On paper, the system consists of four national parks on State land and some 30 other sites on both State and customary-owned land. Most of these areas are small and fragmented, and suffer from a lack of management control. Pressures include overhunting, unsustainable subsistence use and, in some cases, encroachment. Pressures are growing at some sites from landowners who wish to commit the land to extractive development uses incompatible with conservation of the nation's biological diversity.

The National Parks Board recognizes provincial parks and local parks better known as Wildlife Management Areas. The latter are intended as multipurpose areas, especially for the management of specific types of wildlife used for food or other functions. They are popular in aiding local communities to prevent over-exploitation, such as of the eggs of scrub turkeys (megapode), or certain kinds of birds of paradise, and are the responsibility of the local groups using the areas. An advantage with this arrangement is that for any commercial exploitation in a particular area, the rights of the people living in the affected area are given priority and the guidelines are clearly established in local Land Use Management Plans.

Also important is the concept of Protected Species, in which all wildlife belongs to the traditional landowners, but the same restrictions apply as in Wildlife Management Areas. The list originally began in the 1920s to protect the bird of paradise and egret from extensive commercial exploitation for their valuable plumes. Added later were most of the birdwing butterflies, the long-nosed echidnas and others. Since independence (1975) many more have been added to the list as part of PNG's cooperation with international conservation objectives.

The three (3) protected areas are the Varirata National Park, the McAdam National Park and Lake Kutubu.

Varirata National Park, (1063 hectares) is 42 km by road from the capital Port Moresby, and protects the western escarpment of the Sogeri Plateau, extending to the Astoble Mountains. There are upland rainforests and savanna areas with a good variety of birds and other wildlife and it offers an excellent opportunity to see birds of paradise. The junction of the Kukoda Trail which figured prominently during World War II is located at the Varirata National Park.

McAdam National Park (2076-hectare park) includes lowland rainforest to about 1000 meters, then submontane oak-dominated forest to about 1800 meters and above this are beech-dominated forests with dense bamboo to about 2000 meters. The wildlife includes a large variety of mid-montane species. Echidnas, cuscuses, cassowaries and birds of paradise are some of the highlights.

Lake Kutubu is a national park recently declared in the Lake Kutubu area of the Southern Highlands Province.

PNG Laws and Regulations on Biodiversity

The Constitution of Papua New Guinea is one of the first in the world to specifically address conservation of biological diversity. It declares as the country's fourth goal "to be for Papua New Guinea's natural resources and environment to be conserved and used for the collective benefit of us all, and be replenished for the benefit of future generations." The country's Environment and Conservation Policy, on the other hand, calls for "all necessary steps to be taken to give adequate protection to all our valued birds, animals, fish, insects, plants and trees."

The following statements, among others, provide the basis for PNG's environmental policy. (i) "The natural resources of Papua New Guinea including the air, water, plants and wildlife and especially examples of the different kinds of plant and animal communities must be protected for present and future generations by careful planning and management; (ii) During our development we must safeguard and wisely manage our wildlife and its habitat; and (iii) Pollution of the land, air, water and seas in quantities which are likely to be dangerous to human health, to plants and to animals, and cause damage to the environment must be prevented.

Among the biodiversity - related legislation of Papua New Guinea are the National Parks Act (1982), the Fauna (Protection and Control) Act, International Trade (Fauna and Flora) Act (1983) and the Crocodile Trade (Protection) Act (1982).

National Parks Act: The objective of the National Parks Act is the conservation of sites and areas having particular biological, topographical, geological, historical, scientific or social importance. The Head of State may commit to the care, control and management of the Director of National Parks an area that has been reserved for a national park or a reserve or sanctuary for the protection of flora and fauna. The Head of State may also make regulations for, among others, the prevention or the regulation of shooting over or on reserves; the prevention or the regulation of the trapping of birds or animals on reserves; the prevention on the regulation of the destruction or removal of the eggs of birds on or from reserves; the impounding or confiscation within reserves of firearms, traps, nets, snares, lines, hooks, lures, poisons, baits, enticements, cages and other articles capable of being used, in contravention of the regulations, for luring, holding, taking or destroying animals, birds, reptiles or fish; and the prevention of damage or injury to, or destruction of, trees, shrubs, plants and flowers on reserves.

Regulations to implement the National Park Act lay down in detail the conduct of persons inside reserves, control of vehicles as well as procedures to get camping and fishing permits a unique provision of the Regulations gives the Director of National Parks, after consultation with the Conservation appointed under the Fauna (Protection and Control) Act the power the cause the renewal or destruction of flora and fauna on a reserve which, in the opinion of the Director, is not indigenous to the reserve.

Fauna (Protection and Control) Act: It is a truism that species of animals and plants will not survive unless adequate protection is given to their habitats. PNG's Fauna (Protection and Control) Act is one law which amply provides protection to animals and their habitats. For the purpose, the Ministry may declare sanctuaries, protected areas in relation to a species or class of animals as well as wildlife management areas. A wildlife management committee formed for each wildlife management area is responsible for the protection, propagation, encouragement, management, control, harvesting and destruction (when appropriate) of fauna in the area.

The Act provides for the appointment of a Conservator of Fauna meaning, any species included in the animal kingdom, whether native, introduced or imported as well as Rangers who are responsible for the enforcement of the Fauna Act.

All protected animals in PNG are the property of the State. Any person who takes or kills any protected fauna or uses any explosive, dig, net or instrument or other means for the purpose of taking or killing any protected fauna is guilty of an offense. The penalty is a fine not exceeding K500 for each prohibited fauna. If a firearm is used within the meaning of the Firearms Regulation Act (1963), the penalty is a fine not exceeding K1,000. A person who knowingly buys, sells, offers or consigns for sale or has in his possession or control, a protected animal is also guilty of an offense.

Various Wildlife Management Area Rules have different topics for fauna protection. Among them are restriction on hunting of wild fauna and taking of eggs without customary rights (Garu); restrictions on netting dugongs (Maza); and restrictions on the use of shotguns (Mojirau). Variation also exists among Wildlife Sanctuary Rules. For example, the Balele Wildlife Sanctuary Rules concentrate on prohibitions on taking fauna, lighting fires, disposal of refuse cutting of trees within sanctuaries while that of the Crown Islands prohibits possession of a firearm within a sanctuary and restricts sea shell harvesting only to those with traditional sea shell harvesting rights.

The great importance of the role of crocodiles in the culture of the people of Papua New Guinea is best shown by the existence of a Crocodile Trade (Protection Act) which makes it an offense for a person other than a citizen to take or kill a crocodile. A license is necessary to acquire and dispose of crocodiles, acquire crocodiles for export, or to export crocodiles.

The Crocodile Trade (Protection) Regulations prescribe the procedure for the acquisition of a traders license, buyers license, exporter's license, registration of a crocodile farm and authorization/permit to take crocodiles.

Additionally, Papua New Guinea has an International Trade (Fauna and Flora) Act as well as Regulations in compliance with its commitment as a Party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Basically, the Act and Regulation sets in detail the requirements of an export/import permit and the roles of the Management authority and the Scientific authority in PNG per Convention on International Trade in Endangered Species

The PNG Biodiversity Programme

The PNG Biodiversity Conservation and Resource Management Programme (Biodiversity Programme) was established in 1993 with funding from the Global Environment Facility (GEF). The Biodiversity Programme is part of a package of interventions developed under the PNG National Forestry and Conservation Action Programme (NFCAP), an outgrowth of the World Bank's Tropical Forest Action Plan (TFAP). The purpose of the NFCAP was to effect institutional, financial and regulatory reforms to bring the forest industry under control and promote fast conservation objectives. Other conservation-focused activities proposed under the NFCAP include the: (1) *Conservation Needs Assessment* to identify priority areas for biodiversity conservation; (2) *Conservation Areas Strengthening Project* to provide management and other capacity support for existing protected areas; (3) *DEC Strengthening Project* to build internal capacity within the Department of Environment and Conservation for environmental management; (4) *Alternative Incomes Study* to identify wider productive

uses of biological diversity that could be capitalised upon as a conservation incentive; (5) *Landowner Awareness Project* to build awareness of forest sector reforms and conservation options among landowners.

These activities were designed to complement each other. Be it noted that not all of the activities were subsequently implemented; in particular, the Conservation Areas Strengthening Project (DEC & WWF 1993) remains on the drawing board, though a Protected Areas Review was conducted by the World Wide Fund for Nature DEC in 1992. Likewise, the Alternative Incomes Study was never conducted. Given the design of the NFCAP, this had adverse implications for those activities that were funded and implemented.

The Biodiversity Programme, therefore, was developed as part of a holistic approach to conservation and environmental management. This vision was outlined in a Strategic Plan developed by the Department of Environment and Conservation (DEC) in 1992.

Jointly implemented by the United Nations Development Programme and DEC, the Biodiversity Programme is being executed by the United Nations Office for Project Services (UNOPS). The objectives and strategic frame for the Programme were established by a Project Preparatory Mission set up by UNDP in mid-1992.

Mission of the Biodiversity Programme

The Biodiversity Programme's principal aim, as defined in the Project Document (UNDP 1993), is "to expand the country's protected area system in order to establish a representative system that provides for the management of PNG's considerable biodiversity endowment". The immediate objectives are to: (1) establish pilot integrated conservation and development projects to develop innovative methodologies for the conservation of biodiversity; (2) provide institutional strengthening to DEC for conservation of biodiversity; and (3) establish an institutional, legal, financial, and policy framework for the expansion and future maintenance of the conservation system.

The Biodiversity Programme has established the Conservation Resource Centre (CRC) in Port Moresby to provide technical, managerial and skills development support, as required, to the Department of Environment and Conservation. The aim is to build DEC's capacity for conservation development planning and implementation. The CRC is charged with providing management and support for the pilot integrated conservation and development projects.

The CRC also provides information on conservation-related issues to non-governmental organisations. A major function of the centre is to determine the underlying economic, political and ecological causes of PNG's conservation dilemmas.

The Biodiversity Programme is also investigating the feasibility of soliciting grants for the Conservation Trust Fund (CTF), as a means of generating stable long-term funding of conservation initiatives. In connection therewith, the World Bank, in late 1998, awarded a grant of US\$ 32.6 million to the CTF to fund conservation - oriented projects in the country. It is the largest single biodiversity grant ever awarded by the World Bank's Global Environmental Facility.

With the objective of realising the mission of the PNG Biodiversity Programme, a list of possible material incentives that would be provided to local communities in Papua New Guinea was made. It includes, but is not limited, to the following:

- Reciprocal funding for social infrastructure in conservation areas with appropriate contributions from all parties including individuals, clans, communities and external agents. A number of arrangements could be envisaged, including one whereby the community contributes a certain amount of materials plus land and labour, and external funding meets the gap to complete the project (for example, by providing imported materials).
- The provision of social services by conservation proponents under a quid pro quo compensation for conservation arrangement.
- Assisting communities to develop income-generating opportunities within protected areas including non-timber forest products, eco-timber production and eco-tourism.
- Assisting communities to develop income-generating options outside the conservation area (for example, local coffee production). The advantage is that the integrity of the natural area can be maintained while still providing income and employment (non-timber forest production based on direct extraction from the forest production based on direct extraction from the forest can be ecologically destructive; production outside protected areas can ameliorate some of these potential impacts).
- Negotiating development access agreements with outside companies, to engage in ecologically sustainable development in return for royalty payments.
- The payment of conservation rents or resource management fees. This may include the payment of access fees for research areas based on the concept of research as an eco-enterprise.
- The provision of short-term, quick disbursing financing for priority conservation areas (under immediate threat).
- The development of legislation to protect genetic resources and traditional intellectual property rights, with the aim of ensuring that resource owners appropriate a good portion of the eventual dividends from biodiversity prospecting.
- Conservation area rental arrangements whereby communities are paid not to dedicate land to conservation-incompatible uses.

REFERENCES

1995

J. Aleck and J. Rannells. "Custom at the Crossroads," Faculty of Law, University of Papua New Guinea, Port Moresby.

- 1996 N. Baird. "Saying 'NO' to Asian Loggers," *People and Planet*, Vol. 5 No. 4, London.
- 1975 Constitution of the Independent State of Papua New Guinea
- 1997 C. Filer. "The Political Economy of Forest Management in Papua New Guinea," International Institute for Environment and Development, London.
- 1998 C. Filer with N. Sekhran. "Loggers, Donors and Resource Owners," International Institute for Environment and Development, UK and National research Institute, PNG, Port Moresby.
- 1996 D. Gladman, D. Moubray and John Dunguman. "From Rio to Rai: Environment and Development in Papua New Guinea up to 200 and beyond" (Vol. 1 From Hearts and Minds and Vol. 2 Voices Unheard and Unheeded), Papers from the 20th Waigami Seminar, University of Papua New Guinea Press, Port Moresby.
- 1996 "Interim Report No. 3 on Does the National Constitution Provides Adequately for the Management of Natural resources?" Constitutional Review Commission, Port Moresby.
- 1997 R. McCallum and N. Sekhran. "Race for the Rainforest: Evaluating Lessons from an Integrated Conservation and Development "Experiment" in New Ireland, Papua New Guinea," UNDP, Port Moresby.
- 1994 Minutes of the PNG Biodiversity County Study Evaluation Workshop, Socio-Economic Working Group, Madang
- 1994 T. Nadarajah. "Forest Policy and Conservation of Papua New Guinea's Forests: A Critique," The National Research Institute, Port Moresby.
- 1997 N. Salafsky. "Eleven Steps for Setting Up Community- Based Timber Harvesting Enterprises," European Union - Islands Region Environmental and Community Development Programme in PNG, Kimbe and West New Britain.
- 1995 "State of the Environment in Asia and the Pacific, UN ESCAP, Bangkok.
- 1996 "Working Together: Sustaining Forests and Communities in Melanesia," Greenpeace PNG, Port Moresby.