

Institutional Obstacles to Conservation: Fergusson Island, Papua New Guinea*

Gordon Brent Ingram

WILL IT BE POSSIBLE TO REVERSE the loss of primary rain forest and biological resources so crucial for options for future development? Will traditional communities in marginalized regions be able to rework the globalized imperatives for conservation into local solutions that can contribute to their particular economic and social development? How can we identify problems in conservation programmes and rapidly respond with new initiatives? At a time of diminishing public resources and increasing debt, how can we identify the most cost-effective approaches to increasing the effectiveness of conservation programmes? How can the growing concerns for conserving the biodiversity of Pacific Islands influence regional efforts for environmental impact assessment and conservation as well as frameworks for international cooperation? If more international funding does become available, how can it be used to contribute to the more fundamental structural adjustments that will be necessary in how we inventory, research, conserve, and subsequently evaluate?

In exploring these questions, this discussion focuses on one of the most biologically rich and pristine islands on earth. With greater global concerns for conservation of habitat, biological resources, and life support processes, such areas will receive more attention. However, if new financial and technical resources are going to lead to more comprehensive and effective conservation, it is necessary to develop both global and local strategies that overcome obstacles that are often the result of historical legacies. But how can investigations of institutional frameworks provide us with the basis for innovative solutions involving both conservation and development? The identification and description of nagging

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institutional obstacles, often derived from the colonial period, is a useful point from which to begin to formulate such solutions.

The history of Fergusson Island, up until 1989 when logging of the primary rain forest of the island intensified and a series of national scandals called into question the entire industry, is considered through a conservation institution capability appraisal (*cica*) which leads us to some tentative conclusions on possible island-wide strategies for protection of sensitive areas and species. Sometime between 1985 and 1990, a new era in forest landscape planning came into being. Non-timber values, habitat, aesthetic and ethical concerns congealed into a "biological diversity" paradigm just as the loss of tropical forest was finally recognized as a major global problem.¹ The current ascendance of a "biodiversity" paradigm,² with its more comprehensive notions of conservation, represents a profound new phase in the "biotic approach to the land" that was proposed by Leopold.³ But in these new comprehensive initiatives there are numerous technical and administrative contradictions which threaten to stymie the construction of viable institutional frameworks. These problems are compounded in the translation of largely North American interpretations of the social imperatives for conservation of biological diversity to the starker but biologically richer contexts of the developing world.⁴

Solutions to the loss of biological resources will largely form from our concepts of the nature of local ecosystems and biogeography, from the perceived threats to respective natural habitat, and from the available conservation instruments and associated institutional vehicles and constraints. The notion of failure of conservation measures and programmes, that look effective until there is an objective evaluation, is relatively new. There are various explanations and positions related to

¹ N. Guppy, "Tropical Deforestation: A Global View," *Foreign Affairs*, vol. 62, no. 4 (1984), pp. 929-65.

² E. O. Wilson developed much of the current concept which was codified in "The Current State of Biological Diversity," in *Biodiversity*, ed. E. O. Wilson (Washington, D.C.: National Academy Press, 1988), pp. 3-17. I looked at the implications of concerns for biological diversity in "Planning District Networks of Protected Habitat for Conservation of Biological Diversity: A Manual with Applications for Marine Islands with Primary Rainforest" (Ph.D. diss., University of California at Berkeley [Ann Arbor, Michigan: University Microfilms International, 1989], and World Resources Institute (WRI), The World Conservation Union (IUCN), and United Nations Environment Programme (UNEP) have so far produced the most comprehensive exploration for policy: *Global Biodiversity Strategy: Guidelines for Action to Save, Study and Use Earth's Biotic Wealth Sustainably and Equitably* (Washington, D.C.: World Resources Institute, 1992).

³ Aldo Leopold first advanced his approach to land management, based on ethics and ecology, in "The Conservation Ethic," *Journal of Forestry*, vol. 31 (1933), pp. 634-39 and "A Biotic View of the Land," *Journal of Forestry*, vol. 37 (1939), pp. 727-30. A more extensive compilation was later produced as *A Sand County Almanac (with Essays from Round River)* (New York: Oxford University Press, 1949).

⁴ A. Argawal, "Beyond Pretty Trees and Tigers: The Role of Ecological Destruction in the Emerging Patterns of Poverty and People's Protests," *ICSSR (Indian Council of Social Science Research) Newsletter*, vol. 15, no. 1 (1984), pp. 1-27.

institutional dysfunction from lack of funding to inadequate legislative frameworks to lack of comprehensiveness and an emphasis on species conservation.⁵ There are other explanations for institutional obstacles including cultural biases against nature, wildland and traditional societies, and hidden subsidies for extractive enterprises. However, there have been few efforts to construct broader frameworks to understand institutional function and dysfunction and to develop programmes to increase effectiveness.

The central argument of this paper is that the multiple crises of loss of and threats to biological diversity in the modern period have not just been because of lack of adequate conservation biology theory, data nor will for habitat conservation. A more fundamental problem is that most land use planning frameworks are biased against locally based conservation initiatives and favour extraction of nonrenewable resources and short-term economic gains. These biases are indicative of colonial legacies even after decades of national independence.⁶ To reduce this to a problem of capital or indirect state subsidies⁷ negates the roles of historically derived institutional structures in regulating what Foucault referred to as "operational meaning" in the planning of extractive operations, social development and, indeed, the conservation of habitat.

Fergusson Island is like most of the remaining tropical islands with large remaining tracts of rainforest.⁸ The rates of timber harvesting, indeed the relatively permanent destruction of forest through a range of economic pressures, is overtaking the slow and relatively ineffective efforts for habitat conservation. The loss of forest and respective biological diversity limits development options which, in turn, contributes to a form of underdevelopment. But in the case of Papua New Guinea, to simply reduce the problem of dysfunctional apparatus for conservation to flaws in the British-Australian colonial systems or to the early withdrawal of the Commonwealth of Australia in 1975, is simplistic. And postcolonial frameworks continue to interact and evolve with archaic and contemporary patterns of tenure, local institutions, investment, and regulation. In order to manage these institutional dynamics, means of identification and countering of such obstacles must be constructed.

⁵ H. Doremus, "Patching the Ark: Improving Legal Protection of Biological Diversity," *Ecology Law Quarterly*, vol. 18 (1991), pp. 265-333.

⁶ G. W. Burnett and H. B. Stilwell, "National Park and Equivalent Reserve Creation in French and British Africa," *Society and Natural Resources*, vol. 3 (1990), pp. 229-41.

⁷ R. Repetto, "Creating Incentives for Sustainable Forest Development," *Ambio*, vol. 16, no. 3 (1987), pp. 94-9.

⁸ G. B. Ingram, "The Remaining Island with Primary Rain Forest: A Global Resource," *Environmental Management*, vol. 16, no. 5 (1992), pp. 585-95.

INSTITUTIONAL OBSTACLES TO CONSERVATION OF BIOLOGICAL DIVERSITY

In evaluating the effectiveness of conservation institutions and particular measures, the following components of programmes for the conservation of biological diversity emerge as being generic. When frameworks do not have some forms of equivalents, or these are dysfunctional, there are institutional gaps which contribute to losses of natural habitat and populations. The following is a list of institutional components which, whether traditional, formal or *de facto*, are necessary for comprehensive and "sustainable" conservation:

1. knowledge of local biological diversity;
2. social recognition and valuation of local biological diversity;
3. resilience of local patterns of tenure;
4. range of viable categories of protected areas;
5. systems of ecological impact assessment;
6. conservation interest groups;
7. comprehensiveness of land use planning;
8. site planning and the spatial decision making at appropriate scales;
9. extent of ongoing monitoring;
10. level of adaptability of land use planning and subsequent implementation;
11. extent of management and regulation of adjacent land uses; and
12. mechanisms for channelling benefits of conservation back into local communities.

Such initial criteria for institutional inquiries can be in conjunction with broader frameworks that consider the social distribution of the costs and benefits of both extractive operations and conservation measures. In addition, *cica* can be conducted within broader social impact assessments that consider dimensions such as gender, class, culture, and origin.

ISLANDS WITH PRIMARY RAINFOREST AND PRESSURES FOR EXTRACTIVE DEVELOPMENT

In the next two decades, nearly all of the primary rainforest on the earth's islands are scheduled for cutting by logging concessions or will be cleared for agriculture and tourist facilities. Resistance to pressures for liquidation of primary forests has been often anticorporate in character and has challenged the kind of Pacific Rim economic hegemonies that often involve Japanese capital and relatively monopolistic strategies for access to natural resources.⁹

⁹ Y. Kitazawa, "The Japanese Economy and South-East Asia: The Examples of the Asahan Aluminium and Kawasaki Steel Projects," in *Conflict Over Natural Resources in South-East Asia and the Pacific*, ed. C. I. Ghee and M. J. Valencia (Singapore: Oxford University Press, 1990), pp. 13-50.

In their pioneering guidelines for development on islands, McEachern and Towle¹⁰ described a global situation of poor land use planning, if any, for islands in which spatial limitations and the fragility of biota and ecosystems are ignored noting that "Islands constitute discrete points of conflict in the world's oceans, where the activities of developers directly confront fragile insular biological systems and circumscribed resources."

In recent decades, islands have often functioned as laboratories for debates about development and ecological impacts. Island terrestrial and terrestrial/marine systems are sufficiently discrete to make obvious the linkages between capital, political power, control of land and resources, irreversible loss of biological resources, and subsequent damage to local communities. Island environments have come to be backdrops for some of the more painful examples of *maldéveloppement*.

It is not possible to generalize about the traditional management and underlying cultural systems for natural resource conservation which island ecosystems have supported. Indeed on Fergusson Island there are a remarkable number of cultures and traditional strategies for managing resources. There are societies with remarkably sophisticated conservation ethics and patterns of self-management. But there are also less sustainable strategies for natural resource exploitation. What can be generalized about traditional island communities is that in order to survive for long without extensive trade, key ecological relationships and feedback loops must have been recognized, with inhibitions on use of resources and sites. It is a cliché and an understatement to say that the colonial period saw the undermining of these traditional mechanisms and that there have been few incentives to adapt any remaining traditional systems of conservation. Simultaneous to the crises of local cultures in the Pacific has been a convergence of "environmental" positions,¹¹ of a global and a local nature, and an emerging basis for new frameworks for development planning and political discourse.¹²

In much of the South Pacific, there has been both a lack of cohesive national nature conservation programmes and the necessary environmental planning. In Papua New Guinea, until recent years, land use planning has been oriented to short-term development needs in terms of expansion of the cash economy and the delivery of basic services such as

¹⁰ J. McEachern and E. Towle, *Ecological Guidelines for Island Development* (Morges, Switzerland: IUCN, 1974).

¹¹ H. J. Leonard and D. Morell, "Emergence of Environmental Concern in Developing Countries: A Political Perspective," *Stanford Journal of International Law*, vol. 17 (1981), pp. 281-313.

¹² G. B. Ingram, "The Need for Knowledge from Indigenous Communities in Planning Networks of Protected Habitat for the Conservation of Biological Diversity: The Island Settings," in *Ethnobiology: Implications and Applications*, Proceedings of the First International Congress on Ethnobiology in Belem, Brazil 1988 Part 2, ed. M. J. Plotkin (Belem, Brazil: Goeldi Museum, 1990), pp. 87-105.

medical care. The finer-scaled land management decisions, that determine whether economic development has a negative effect on local biological diversity, continue to be determined nearly completely at the provincial level. At the national level, the various legislation associated with the Australian withdrawal has yielded few viable categories of protected areas and frameworks for management — both in terms of the financing of operations and cooperation of local landowners. Of the protected areas that were established, particularly in the 1975–80 period of relatively high levels of (Australian) funding of government programmes, there was little follow-up or support for ongoing management. In most districts of Papua New Guinea, there is so much cultural diversity which is so localized that outside logging and mining interests have been able to “divide and conquer” with only limited environmental constraints placed on their operations.

Fergusson Island is the largest island in the D’Entrecasteaux Archipelago, and one of the largest islands off eastern New Guinea. In the whole Pacific it has one of the most pristine mosaics of primary rain forest on a relatively large, mountainous island.¹³ These islands were the focus for Diamond’s¹⁴ outline of “saturation” as the engine of natural loss of biological diversity within the context of island biogeography theory. In this logic, the D’Entrecasteaux Island land mass had been one island until not more than ten thousand years ago and this fragmentation is still leading to natural disappearances of species, on each island, which could be exacerbated by human beings.

The situation on Fergusson Island would, at first, seem conducive to the development of habitat conservation programmes compatible with the needs of poor local communities. Land is held by local household units, the subsistence economy is still somewhat viable, there is still reliance on a wide array of wild species, population pressures are still low and political power is decentralized. There is even a locally initiated wildlife management area for the forests and wetlands of Lake Lavu, in the island’s interior, though, so far, there have been insufficient funds, resources and education for adequate conservation. But even in this favorable context, it has still been possible for foreign logging operations to establish without any kind of comprehensive land use plan that considers local needs for traditional agro-forestry and forest products; without any

¹³ The World Conservation Union (IUCN) and the United Nations Environment Programme (UNEP), *Review of the Protected Areas System in Oceania* (Gland, Switzerland: IUCN, 1986).

¹⁴ J. M. Diamond, “Comparison of Faunal Equilibrium Turnover Rates on a Tropical Island and a Temperate Island,” *Proceedings of the National Academy of Sciences (USA)*, vol. 68, no. 11 (1971), pp. 2742–2745, and “Biogeographic Kinetics: Estimation of Relaxation Times for Avifaunas of Southwest Pacific Islands,” *Proceedings of the National Academy of Sciences (USA)*, vol. 69, no. 11 (1972), pp. 3199–3203.

decisions on a network of protected areas with representative tracts of primary rainforest and coral reefs; and without mechanisms to channel economic benefits back to local communities.

Until recently, the people of Fergusson Island had no practical understanding of the implications of massive cutting of primary forest because it never before occurred in the area on such a scale. There was not a popular sense of the loss of biological diversity because people had no frame of reference for permanent loss of subsistence species or natural habitat. There was little anticipation of the losses of these resources due to logging nor of the spatial and social distribution of these costs within communities. Because of the language and cultural diversity on Fergusson, there has been persistent acrimony between local groups that has not been mitigated with the evolution of democratically elected councils or the provincial legislature. Logging operations in New Guinea have rarely been oriented to efficient or sustained use of timber resources, let alone the conservation of local biological diversity, nor equitable development.¹⁵ Given the richness of natural resources on the island and the shift in patterns of utilization from subsistence and local inhibitions¹⁶ to "monetization of resources"¹⁷ in the 1970s and 1980s, there has been pressure for road building, conversion of forest to grassland, and for the export of timber and marine products.

CULTURAL ECOLOGIES ON FERGISSON ISLAND

The prehistory of these islands is little known though the presence of humans in the area may well extend beyond thirty thousand years. The area is notable for its highly diverse set of language groups and social structures. There was and continues to be a distinctive system of trading and intervillage contact called the Kula¹⁸ which extended north to the Trobriand Islands and east to the Woodlark Basin. Most of the communities of Fergusson Island are organized into totemic and exogamous clans. The cultural groups can be loosely grouped into the Dobuan-speaking communities, centred on the southeastern shores of the island,

¹⁵ Logging of primary rainforest began on Fergusson Island in 1987 and was originally justified by supporting the construction of a road which would allow the access that would foster export-oriented agricultural production particularly for cacao. The timber harvesting was never conceived of as being sustainable. Production of perennial cash crops have rarely been sustainable on these soils.

¹⁶ C. De'ath, "Forest Conservation Practices in Papua New Guinea," in *Traditional Conservation in Papua New Guinea: Implications for Today*, ed. L. Morauta, J. Pernetta, and W. Heaney (Boroko, Papua New Guinea, Institute for Applied Social and Economic Research, 1982), pp. 203-15.

¹⁷ J. Pernetta and L. Hill, "International Pressures on Resource Management in Papua New Guinea," in Morauta et al., *Traditional Conservation*, pp. 319-32.

¹⁸ B. Malinowski, *Argonauts of the Western Pacific* (London: Routledge and Kegan, 1922).

and the northern Massim on the remainder of the island who extend to neighbouring Goodenough Island.¹⁹

The Dobuan communities of the southeast of the Fergusson Island area were organized into matrilineal clans called *susu*, the other communities and groups on the island being patrilineal. With greater contact between neighbouring groups, the Dobuan-speaking groups are shifting to patrilineal patterns of inheritance of land, the Dobuan-speaking peoples of Fergusson Island having ritually regulated means for redistributing surplus and maintaining communal ties. The *sagari* ceremony of the Dobuan communities still goes on after a death, and involves redistribution of local food items in response to familial reorganization. In his study of acrimony in contemporary Massim society, Young describes the traditional social dynamics competition within communities and sees contradictions between the old ways and the new where "the sharp edges of the pagan culture have been worn down by the ubiquitous Methodism, but the indigenous growths of materialism, pragmatism and individualism remain firmly rooted in the people's subsistence and society."²⁰

The first European presence in the D'Entrecasteaux Islands was in 1793. There was sporadic missionary and trading contact in the nineteenth century, the British taking official control of the area in 1884. The first missionary settlement was at Dobu in 1891. It was Methodist and later became the United Church of Christ. The Roman Catholic Church is now also active in the area as are a number of smaller Protestant groups. It was not until 1920 that the Galia and Ebadidi tribes in the interior of Fergusson Island were pacified. A hospital at Salamo was opened by the United Church of Christ in 1925, and a police post established in Mapamoiwa in 1927. In the pre-World War II period there were also sporadic cargo cults centred at Basima. The World War II review of Fergusson Island²¹ lamented that there were still "ungoverned" groups in the island's interior. Intrusions into these subsistence economies have been erratic: the labour recruitment in the Australian colonial period, the World War II base on neighbouring Goodenough Island, the establishment of small plantations, and now mining exploration and logging.

Traditional land use on Fergusson Island can be grouped into zones of settlement, gardens, and gathering and hunting.²² Tenure and land

¹⁹ M. W. Young, *Magicians of Manumanua: Living Myth in Kahuana* (Berkeley: University of California Press, 1983).

²⁰ M. W. Young, *Fighting With Food: Leadership, Values and Social Control in a Massim Society*, (London: Cambridge University Press, 1971).

²¹ Allied Forces Southwest Pacific Area, "Terrain Study N. 23: Area Study of D'Entrecasteaux and Trobriand Islands" (on file Papua New Guinea Collection, University of Papua New Guinea, 1942).

²² A. Flavelle, "A Traditional Agro-Forestry Landscape on Fergusson Island, Papua New Guinea," Master's thesis, the University of British Columbia, n.d.

ownership, as a set of spatial relationships, has become increasingly problematic in the region since local warfare subsided in the decades after the coming of the missionaries. Communities that were remote and in the interior of the island, in order to elude marauders, have expanded and shifted to shore areas. Contentions over tracts of land have greatly increased and the use of traditionally owned lands for timber harvesting, mining and roads has only exacerbated these conflicts. In fact, resolutions, or more typically efforts to manage such conflict, have become central roles of the local and provincial governments.

As local populations have increased and the use of modern technologies have expanded, inevitable environmental problems have compounded the fundamental problems of integrating traditional patterns of tenure into the laws, administrative procedures, and social services of the late twentieth century state. Whereas the state apparatuses of most developing countries have had, as central functions, the management, obfuscation and obliteration of traditional tenure, Papua New Guinea along with a number of other Melanesian states, has worked in the opposite direction. This contradiction becomes central to an analysis of conservation programme dysfunction and possible solutions.

PRESSURES FOR EXTRACTIVE OPERATIONS IN MILNE BAY PROVINCE

Logging, the increased agricultural production associated with planned roads, and proposed gold-mining operations might bring a few more individuals, primarily males, into the wage economy on a temporary basis; however, for the majority of young islanders, prospects for access to regular cash and consumer goods are severely limited.

Much of the forest lands of Papua New Guinea have poor quality timber in terms of present commercial value.²³ These highly diverse stands produce low volumes of marketable timber in relation to the cost of operations and this has contributed to unsustainable, reckless and erratic operations. An additional rationale for logging, and more recently for mining, on Fergusson Island has been to allow for the building of roads into the centre of the island. Local people experience considerable hardships in walking many miles for medical and other social services. But such roads have limited utility over the long term, especially for people who cannot afford mechanized transport.

So far, only exploration and not actual mining has taken place on Fergusson Island. This has involved cutting trails, making clearings and test drilling. The most lasting impacts involve relatively small landform

²³ D. Lamb, "Conservation and Management of Tropical Rain-Forest: A Dilemma of Development in Papua New Guinea," *Biological Conservation*, vol. 4, no. 2 (1977), pp. 121-29.

alterations, soil disturbance, subsequent sedimentation in streams, and the poisoning of reefs through deposition of tailings.

In Milne Bay Province, there have been environmental and subsequent social problems related to logging and mining, which have involved conflicting approaches to the distribution of costs and benefits of the development. Landowners are given only modest payments for the logging of their land even as they make demands for the expansion of schools and other local facilities. However, local families are also under severe pressure from district officials to give permission for logging and exploration for minerals because provincial and local governments receive payments which are crucial for general operations.

In other parts of southeastern New Guinea, there has been significant local resistance to extractive operations. In his 1977 essay on logging in Papua New Guinea, Waiko²⁴ suggested that much of the commercial logging in Papua New Guinea at that time was a form of neocolonialism, and he saw a contradiction in priorities for development between localized subsistence economies and international capital. In their chronicle of conflict around the intrusion of a foreign logging company in Northern Province, Waiko and Jiregari noted that the environmental damage inflicted by the company was an assault on the autonomy of that community and "their capital resource" and stated that "advocates of development create a situation in which a false consciousness emerges . . . this was false partly because the people were not aware of the degree of destruction of the environment" and link this with the process of cultural disintegration where "tradition and custom, as a means of understanding and relating to the village environment and the mechanisms to incorporate change in it, lose their capacity to convey meaning."²⁵ In these situations, local Melanesian concerns for the conservation of biological diversity may well be most articulated through efforts for the protection of the full range of subsistence resources and religious values.

Throughout New Guinea, there have been a number of traditional practices which still contribute to forest conservation. There is *de facto* forest conservation where human population densities were low and fire has not been used extensively. Taboos have tended to allow the protection of sacred areas, referred to in pidgin as *ples masalai*. In his early description of Fergusson Island, Malinowski noted that Mt. Kilkerran, which he referred to as Koyatabu, was taboo to visit. Similar beliefs limit the use of certain species. Such a view of the forest tends to allow for the

²⁴ J. D. Waiko, "The People of Papua New Guinea, Their Forests and Their Aspirations," in *The Melanesian Environment*, ed. J. H. Winslow (Canberra: Australia National University Press, 1982), pp. 407-29.

²⁵ J. Waiko and K. Jiregari, "Conservation in Papua New Guinea: Custom and Tradition," in Morauta et al., *Traditional Conservation*, pp. 21-38.

conservation of certain species which were related to forest use. However, this does not necessarily support a holistic view nor workable approaches to ecosystem management. For example, in Carrier's case study of the Ponam of Manus Province,²⁶ wildlife conservation ideals won little acceptance because there was not a cultural appreciation for ecological principles. The same may be true for many of the traditional communities of Fergusson Island and it would be incorrect to generalize for so many localized cultures.

THE INSTITUTIONAL FRAMEWORK FOR CONSERVATION PLANNING IN MILNE BAY PROVINCE

The institutional frameworks of Papua New Guinea involve federal Australian models which, in the 1960s and 1970s, were imposed upon archaic, highly variable and decentralized systems of traditional land tenure. There are few states on earth where the contrasts between the traditional and the modern are greater. This system is generally perceived as being only partially functional and will probably be restructured in coming years. Meanwhile how has conservation fared and how can the land use frameworks be reconstructed in coming years?

The ephemeral nature of the various colonial and corporate involvements over the last century emerges as a central factor. The D'Entrecasteaux Islands were part of the former British Colony which became Papua under the post-World War I Australian administration. The institutional setting for habitat conservation in Papua New Guinea began its evolution under the colonial Legislative Council which was formed in 1951. The council was replaced by a House of Assembly which became the government in 1973. The country became fully independent in 1975. Because of low population densities in many areas and modest exploitation of natural areas, habitat protection has been less the focus of concerns for conservation than control of overexploitation of certain marketable species such as orchids, butterflies, crocodiles, birds of paradise, marsupials and marine fauna.

A central tenet of the independent state of Papua New Guinea has been support for traditional tenure and related customs and their codification within an essentially British legal system. But as the old customs, practices, and taboos have broken down with social change, and the technologies for gathering and hunting have become more sophisticated, the focus for conservation has often been on markedly declining populations. The government has been active in the conservation of certain

²⁶ J. Carrier, "Conservation and Conceptions of the Environment: A Manus Province Case Study," in Morauta et al., *Traditional Conservation*, pp. 39-43.

types of primary forest since the 1950s.²⁷ A modest national park movement started within the government in 1966.

There are three levels of government working on Fergusson Island: national — the state of Papua New Guinea; provincial — Milne Bay Province with the capital at Alotau; and local — with two councils, one for the eastern two-thirds of Fergusson Island plus the adjacent island of Dobu and the other for western Fergusson Island and extending to adjacent Goodenough Island. The local government council began meeting in the Dobu area in the early 1960s. The national legislature began meeting in the mid 1960s and became the national parliament in the mid 1970s. The government of Milne Bay Province was established in 1978. There has been some devolution of power to the provincial legislatures and executive councils but responsibilities for environmental protection have remained largely federal. Provincial governments have been key for the implementation of federal regulations though have rarely had the funds or organization to do so. Nonenforcement of contentious environmental regulations has occurred where there is conflict with land use which generates royalties for the provinces. In recent years in Papua New Guinea, there has been considerable discussion on whether to dismantle the entire system of provinces. Proposals for conservation can be made and implemented through local councils but usually involve the national government. Arguably, there was a mandate within the 1975 Constitution of the Independent State of Papua New Guinea for the conservation of biological diversity. An overall goal was that natural resources and environment be conserved and used for the “collective benefit of us all,” and its second and third points call for “conservation and replenishment . . . of the environment and its sacred, scenic, and historical qualities” and “adequate protection to our valued birds, animals, fish, insects, plants and trees.”²⁸ Fortunately for the cause of conservation of biological diversity, “valued species” in most of the subsistence communities of the country include a substantial portion of local biota. The fourth point of the Constitution of Milne Bay Province²⁹ states, “We intend to have a major say in the development of all our resources SO THAT the healthy state of our surroundings could be preserved for generations to come.”

²⁷ P. Eaton, “Institutional and Legislative Frameworks in the Field of Environment in Papua New Guinea” (Paper presented at the Expert Group Meeting on the Integration of Environment in Development: Institutional and Legislative Aspects: 5–11 June 1984, Tokyo [on file Papua New Guinea Collection, Library of University of Papua New Guinea, Port Moresby]).

²⁸ Constitutional Planning Committee of Papua New Guinea, *Final Report of the Constitutional Planning Committee* (Port Moresby: Government of Papua New Guinea, 1974).

²⁹ Papua New Guinea Department of the Milne Bay Province, “Constitution of the Milne Bay Provincial Government” (on file Milne Bay Provincial Government, Alotau, 1978).

There are three important statutes for the conservation of wildlife and the establishment of protected areas.³⁰ The National Parks Act of 1982 was established "to provide for the preservation of the environment and of the national culture inheritance by (1) the conservation of sites and areas having particular biological, topographical, geographical, historical, scientific and social importance." And there are provisions for the following categories of protected areas: national parks, provincial parks, nature reserves, sanctuaries, marine parks, historical parks, historical sites, city parks, national walking tracks, and international memorial parks, but few of these reserve types are clearly defined. The National Parks Act does not provide much guidance in the formulation of objectives for the management of protected areas. The Conservation Areas Act was intended to remedy the deficiencies of the National Parks Act. It allowed for the establishment of a National Conservation Council to advise on the selection and management of conservation areas, a registry of sites, and a management committee. Protection could be on private land with a management plan the main safeguard required. Alterations to the prescribed status quo would require permission from the minister of environment and conservation.

The Fauna (Protection and Control) Act of 1966 provides for the protection of a number of species and their habitats. The species of the Fergusson Island area which were protected under the act include the dugong and the Goldie's bird of paradise. The 1978 Environmental Planning Act allows for review of larger development proposals. Orthodox approaches to control of protected areas, focused on the ideal of the national park, cannot work in nations dominated by customary tenure. Wildlife management areas are enabled through part 3 of the Fauna (Protection and Control) Act.

For the conservation of biological diversity, in areas with pressures for logging, the Forest Act (Amalgamated) 1973 has been a potential tool for conservation planning. The act enables the government to purchase rights to exploit certain aspects of the land, such as timber, from customary owners. The royalties, which are usually much higher than the costs of the purchase of the rights, go to the government. The Forestry Act has been explicit about environmental restrictions. Logging has been prohibited from up to 20 metres from permanent water courses and 50 metres from major rivers. Selective logging was prohibited on slopes over 25 degrees and clearfelling was prohibited on slopes over 30 degrees. In areas with logging, customary landowners always have the right of access, gardening and hunting. Fruit trees and other economically important

³⁰ P. Eaton, *Grassroots Conservation: Wildlife Management Areas in Papua New Guinea*, Land Studies Centre Report 86/1 (Port Moresby: University of Papua New Guinea, 1986).

plants have been excluded from timber agreements. Logging is excluded from sacred areas. Large-scaled timber projects can be required to have an environmental statement filed under the Environmental Planning Act.

Papua New Guinea is a signatory of the 1976 Convention on Conservation of Nature in the South Pacific.³¹ This convention works to "safeguard representative samples of the natural ecosystems" in each country, and gives special attention to endangered species. The convention includes guidelines for the management and expansion of national systems of protected areas. Papua New Guinea has signed and ratified the Convention on International Trade in Endangered Species (CITES) and has the International Trade (Flora and Fauna) Act of 1979.

As in many developing countries, concerns for the environment, and conservation of wildlife and habitat in particular, have not often translated into effective programmes. Of the eight strategic objectives of the government, environmental management has had one of the lowest allocations of government resources,³² due, in part, to the pressures for expanded social services, the bulk of available funds being for basic health care and primary education.

Some of the constraints have worked on the Department of Environment and Conservation and were brought up at the Third South Pacific Parks and Reserves Conference in 1985.³³ The problems which emerged soon after independence were shortages of personnel and skills, organizational instability, and inept and "ineffective planning mechanisms." There have been difficulties in implementation of the categories of protected areas, under the National Parks Act, because of lack of funding for field surveying and personnel. Like other countries in the south Pacific, it has been difficult to gain acceptance of the concept of the national park. Indeed the National Conservation Council mentioned under the Conservation Areas Act has not been formed because of "shortage of staff."³⁴

So far in Papua New Guinea, government initiatives for habitat conservation have mainly been at the national level. There were at least thirteen categories of protected areas. But most of the enabling legislation has come from the period of rapid transition from Australian rule in the mid 1970s and remains unused. And the conventional national park approach to habitat conservation has often not been workable in this

³¹ The "Appia Convention" is on file at the South Pacific Regional Environmental Programme, Noumea, New Caledonia.

³² P. Eaton, *Grassroots Conservation*.

³³ South Pacific Regional Environment Programme/Government of Papua New Guinea, "Papua New Guinea," in *Report of the Third South Pacific National Parks and Reserves Conference held in Appia, Western Samoa, 1985, Volume 3, Country Reviews* (Noumea, New Caledonia: South Pacific Commission, 1986).

³⁴ P. Eaton, "Institutional and Legislative Frameworks."

country where roughly 97 percent of the land is under customary tenure. One category of conservation involves more land in the country than do national parks. Wildlife management areas are formed on communally owned land where committees of owners protect and manage certain species. Unfortunately, the large wildlife management area in the centre of Fergusson Island, which was established in the early 1980s, has not been actively supported and requires outside assistance to remain viable. There are a number of advantages of the wildlife management area category of protected area for Papua New Guinea at the present time and the establishment of a wildlife management area is relatively simple. A proposal goes to the Office of Environment and Conservation of the national government, formal establishment of the area requiring only the listing of the title of the area, its legal boundaries and the names of the management committee members. A number of wildlife management areas have been set aside to protect forest habitat from commercial logging. Some shifting cultivation has been allowed while cutting has been restricted to areas where cultivation has already taken place.

As for tenure and categories of protected areas in Papua New Guinea, conservation programmes must be compatible with traditional, though changing, patterns of land tenure. Some key variables in land tenure systems³⁵ include biophysical parameters and economic and cultural factors along with various territorial relationships such as rights to direct use, rights for indirect economic gain, rights of control, rights of transfer, and residual and symbolic rights. Rights to near-shore marine resources have been usually linked to ownership of adjacent land and particular species. On Fergusson Island, there is a diverse set of territorial arrangements. There are claims along clan lines which tend to be amalgamated by villages though these claims are often not vigorously enforced until resources are perceived as being scarce. There have been numerous confrontations and legal conflicts related to competition over communal resources. Particularly rich areas, such as reefs, have well-defined and demarcated claims. Remote mountain slopes were at the opposite extreme of this continuum with infrequent pressures for hunting and gathering, and with claims which were correspondingly vague.

THE LACK OF LINKAGES BETWEEN CONSERVATION AND ECONOMIC DEVELOPMENT

In situations where logic and widespread social recognition of development options prevail, conservation of primary rainforest is considered a good idea but, unfortunately, for most of the islands of the Pacific Rim

³⁵ R. Crocombe, "An Approach to the Analysis of Land Tenure Systems," in *Land Tenure in Oceania*, ed. H. P. Lundsgaarde (Honolulu, Hawaii: University of Hawaii Press, 1974), pp. 1-17.

the political economies are not so rational. It is at the two extremes of social organization — indigenous communities with subsistence economies and globally oriented market economies — that there is some appreciation for the need to conserve biological resources. The requirements for use of a living resource, its management, and its conservation vary markedly with levels of technology. Locally based “ecosystem peoples” and globally based “biosphere peoples”³⁶ may both have interests in some forms of conservation for the same resources and sites, but considerable divergence in priorities often emerges.

Fergusson is a relatively rich island with a relatively poor though diversified subsistence economy. Outside of the mission settlement at Salamo, the rural population of the island is dependent on subsistence. There are few businesses that have lasted for more than several years. Between population growth and rising expectations, there has been little rise in the standard of living and the delivery of social services since independence. In fact, some people have perceived that the opposite is true. One of the few ways that there can be infusions of cash to individuals, as well as improvement of social services, is through revenues from mining and logging. This, in turn, requires infrastructure. Social development, at the local level, has come to be perceived in terms of infrastructure, extraction and cash. In this context, it is no wonder that conservation efforts, indeed the spread of ideas on the long-term benefits of conservation, have been so frustrated. Before 1989, there were no concrete examples of how conservation projects have provided short-term benefits.

As of 1989, there was still only one formally protected area on the island, the wildlife management area at Lake Lavu, and the legal basis for its continued existence is based on the commitment of the traditional landowners. The reserve was proposed to the Department of Environment and Conservation in 1975 by the West Fergusson Island Local Government Council. The lake has freshwater crocodiles which are revered locally and there are concerns about reckless hunting by outsiders. This wildlife management area is most definitely a vehicle for greater assertion of communal property rights. The reserve was a response to the need to limit exploitation to local communities. The area was finally gazetted in 1981 with a total area of 2,640 hectares, and rules were set by a committee of seven representatives of the surrounding villages. The various rules include prohibition on the use of shotguns. Only landowners, using traditional methods, may hunt in the area.

No real conservation planning frameworks have existed for the region and there have been no viable systems of impact assessment for subsistence species nor for local biodiversity. Over the last decade, the

³⁶ R. F. Dasmann, “Difficult Marginal Environments and the Traditional Societies Which Exploit Them,” *Survival International Review*, vol. 2, no. 1 (1975), pp. 11–15.

government of Milne Bay Province has used environmental assessment, though little of this information has gotten back to local communities. Lamb noted that "not only were there strong incentives for converting or destroying rainforests, but there were a number of disincentives actually hindering long-term planning and sustained-yield forestry in Papua New Guinea."³⁷ There are still few mechanisms for channelling benefits of conservation back into local communities. There have been no tourist facilities aside from the communal buildings in Nade, and no dependable employment in guiding and hospitality. There has been little access to credit and few tangible linkages between profits from visitors and improvement of local services.

CONSERVATION INSTITUTION CAPABILITY APPRAISAL FOR FERGISSON ISLAND: PROBLEMS AND POSSIBILITIES

If we use the *cica* method to identify gaps in conservation efforts and subsequent priorities for programme development, major gaps can be identified as requiring less problematic deficiencies, requiring more incremental solutions. The sources of these problems can be categorized as involving the national government, the provincial government, the local governments and the private sector (global/national and local).

Because of the various language groups that often involve less than a few thousand individuals and because of the influence of Methodism, there are few individuals with much local knowledge of rarer species and respective sites and few ways to economically value related work in "shamanism" and ethnobiology. There have not yet been national efforts to compile this information even though it is dying with elders. Local communities are still acutely aware of the value of certain species and the natural ecosystems which support them, but both the local and provincial governments have overriding biases for short-term extraction of minerals and timber.

The local patterns of traditional tenure are some of the most resilient on earth. One viable category, the wildlife management area, might be sufficient for building a local network of protected habitat, but there needs to be support for new enforcement, management and enterprises, such as guiding and procurement of genetic material, by local communities and land owners.

While there have already been a number of assessments related to proposed extraction operations on the island, there has not been an adequate framework, or financial support for that matter, for considering both vulnerable elements of local biological diversity and subsistence resources. The prospects for the formation of new local organizations

³⁷ D. Lamb, "Conservation and Management."

oriented to sustainable development, forest and reef conservation and local natural and cultural history are relatively good as long as the country remains a democracy and controls the escalating levels of violence in daily life. Long-term decision making over sites and areas remains problematic without rapid improvements in technical capacities at national and provincial levels and without environmental education for local communities. Effective decisions over sites can be made only after considerably more technical knowledge is acquired at the provincial and local government levels respecting and integrating local knowledge and concerns. There is virtually no framework for verifying whether a land use activity or restraint is being correctly implemented or of auditing the actual impacts on natural ecosystems and local communities.

If conservation plans were devised in coming years, there would be little basis for adaptive management, particularly with such erratic economic conditions. While the private ownership of the island holds some opportunities for local initiatives, the prospects of placing constraints on land use activities adjacent to protected areas remains limited and contentious. And without a range of means for developing (sustainable) (eco)tourism and procurement of genetic resources, which generate money both for families and the entire communities, it is not possible to implement any form of conservation programme.

In terms of developing priorities for expanding conservation efforts, the major gaps could be first identified in this progression of criteria with the less major gaps following them. In this case, new programmes could first focus on social recognition and valuation of local biological diversity at the provincial and local levels and so on. Whatever the problems, given the imperatives for rapid institutional development for conservation in the coming years, in order to avert losses of species and habitats, a setting of priorities is crucial.

CONCLUSIONS: PROSPECTS FOR LOCAL DEVELOPMENT THROUGH CONSERVATION

In an institutional landscape littered with huge barriers, with historical contradictions still very much derived from the colonial period, what can be done? Can ecotourism and the conservation and utilization of genetic resources provide an economic alternative to extraction of non-renewable resources in terms of contributing to a more general rise in the standard of living and in social services? This is unlikely without additional investment capital and subsidies comparable to those often indirectly provided for the logging and mining industries.

In terms of the expansion of locally controlled conservation efforts, what is the most efficient use of funds? Two types of possible approaches emerge. It is possible to identify the major barriers in the development

of effective conservation programmes, through institutional appraisals, and to incrementally put resources into shoring up the biodiversity conservation related activities that precede the major obstacles. Perhaps a more "radical" approach, verging on the kinds of interventions of which the International Monetary Fund has been bitterly accused, is to identify the major contractions and the structural problems, and to base expanded funding for conservation around highly political and top down solutions which are often imposed on national institutions.

The division of powers between the provincial and national levels in Papua New Guinea is problematic for conservation and involves similar dynamics to those in, for example, Canada and even neighbouring Indonesia. The provinces have no investment in conservation and yet have the major portion of the powers over decision making on land use. And national programmes are often at a broad scale where the key decisions over districts and sites cannot be effectively implemented. Perhaps more decentralized cantons, where there are more direct feedback loops between land use, environmental costs and biological resources, might provide more effective frameworks for conservation.

What we see in Milne Bay Province today are two competing approaches to development with a myriad of implications for global strategies for rain forest and reef conservation. The extractive approach allows for concentration of wealth into the hands of a few individuals, with most of the profits leaving the area. In contrast, the Christian churches have worked towards a community-based development emphasizing better schools and health care facilities. Both approaches are in crisis in terms of providing viable processes of social development. Habitat conservation and wildlife tourism will not generate much money for individuals, but could contribute to modest generation of income for villages. For the diverse communities of Fergusson, conservation is only viable if it contributes to the resolution of conflicts over traditional tenure, if it produces badly needed cash, and if it provides a base for permanent jobs.

The 1992 Convention on Biological Diversity³⁸ was created, in large part, to provide a framework for more effective conservation in settings such as the D'Entrecasteaux Islands which are rich in biological diversity and genetic resources. However, the convention merely provided a framework for some international mechanisms involving exchanges of information and resources such as funds for monitoring, management and training. In the current context, it is difficult to imagine that a significant

³⁸ Since just before its first signatories in Rio de Janeiro in 1982, the convention has been mildly altered. The following is the last formalized version: UNEP (United Nation Environment Programme) (host). "Convention on Biological Diversity," Conference for the Adaption of the Agreed Text of the Convention on Biological Diversity, Nairobi, 22 May 1992. version: UNEP/Bio.Div/CONF/L.2. (on file, UNEP, Nairobi, Kenya).

portion of increased funding will not be tainted by corruption. Historically derived obstacles to conservation are not countered directly, except for possibilities of increased national government commitments. There are no mechanisms for directing international funds into local hands.

The effectiveness of new conservation efforts on the D'Entrecasteaux Islands will result, in large part, from the linking of both local and global initiatives and the building of relatively sustainable bases of communal trust. None of this will be possible without new sources of livelihood that allow people access to basic consumer products and services. This example from Fergusson Island reminds us that conservation and respective institutions are elements of social development and that they are not possible without certain basic living standards and access to the global market place. Given the history of acrimony in these communities, such a necessary level of cooperation would be highly transformative of all local institutions, a sort of conservation as development. But just as likely, for the coming decade, is the spectre of ineffective and top-down conservation efforts that only rekindle old conflicts.

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