TIGER BY THE TAIL?

Reorienting Biodiversity Conservation and Development in Indonesia

Charles Victor Barber
Suraya Afiff
Agus Purnomo

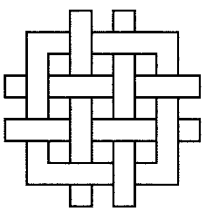
WORLD RESOURCES INSTITUTE

WALHI

PELANGI

TIGER BY THE TAIL?
Reorienting Biodiversity Conservation and Development in Indonesia

Charles Victor Barber
Suraya Afiff
Agus Purnomo



WORLD RESOURCES INSTITUTE

November 1995

Kathleen Courrier
Publications Director

Brooks Belford
Marketing Manager

Hyacinth Billings
Production Manager

Cinnamon Dornsife
Cover Photo

This report represents a timely, scientific treatment of a subject of public concern. Its collaborating partners take responsibility for choosing the study topics and guaranteeing its authors and researchers freedom of inquiry. This report's authors have also solicited and responded to the guidance of advisory panels and expert reviewers. Unless otherwise stated, however, all the interpretation and findings set forth in WRI publications are those of the authors.

ISBN 1-56973-043-1

Library of Congress Catalog Card No. 95-62087

Printed in the United States of America on recycled paper.

Contents

Foreword

Throughout the world, national leaders now recognize the importance of protecting biological resources, conserving biodiversity, and wisely managing forests and marine habitats. But though the goal of balancing conservation and development is widely accepted, how can nations achieve it? How can public and private institutions reconcile protection of natural resources with development that is sustainable and equitable? Despite recent progress in forging international agreements and new national policies, this question remains to be answered where the answer matters most: at the local, community, and regional level within nations.

In *Tiger by the Tail?: Reorienting Biodiversity Conservation and Development in Indonesia*, Charles Victor Barber, a Senior Associate at the World Resources Institute, Suraya Afiff of the Indonesian Forum for the Environment (WALHI) and Agus Purnomo, former Executive Director of Pelangi Indonesia, a policy research institution for sustainable development in Jakarta, have drawn a compelling picture of efforts to integrate biodiversity and development in the world's fourth most populous nation, and of the challenges that remain. Although focussed on Indonesia, the lessons and recommendations could also apply to many other nations now struggling to reconcile biodiversity conservation and economic development.

The authors offer a candid and realistic account of the problems faced by the government and civil society in Indonesia, where various public and private entities daily confront social, economic, and natural resource management problems that defy easy solutions. But the parties are beginning to work together to find the means to ensure the long-term survival of Indonesia's biological wealth.

Until very recently, Indonesia's protected areas policy was based on the need to forbid human habitation within parks and to punish encroachment by local populations. This approach has not been successful—many protected areas have been degraded or ruined as the needs of poor local communities overwhelm weak government enforcement capacities. In response, new policies seek to integrate conservation with local economic needs and activities—an effort that has drawn considerable financial support from international donors.

Promising work begun at three major protected areas is profiled in this volume. But, as the authors point out, two major obstacles must be overcome to create viable economic alternatives to destructive uses of park resources. First, schemes are too often designed by experts who spend too little time figuring out what will work for particular habitats, communities, and individuals, and who spend even less time involving stakeholders in planning and decision-making. Park policies need to reflect a greater commitment to participation and good management practices.

Second and most important, government policies over the past 25 years have so concentrated capital resources among commercial sector actors (such as logging conglomerates) that there is too little left to provide incentives to lure people away from the protected areas. Most real economic alternatives to encroaching on protected areas are seized by government and private-sector concessions, projects, and monopolies—which is why so many displaced people have ended up in the forest in the first place.

Dr. Barber and his colleagues note that transforming only a small part of the country's more than 60 million hectares of production-zoned forests (so many of which lie on the boundaries of protected areas) into community territories and enterprises and thereby providing people with a small percentage of the nearly $5-billion annual revenues of the timber industry would do more to draw encroachers out of parks than all ecotourism, non-timber forest products, and other such schemes combined. And this is but one example of how a policy shift could work life-saving change.

Barber, Afiff, and Purnomo recommend two specific policy changes that would ensure better use of Indonesia's living natural resources and thereby better protect its national parks:

1. In concert with local land users, the Indonesian government needs to clarify its land use and forest management policies. Otherwise local mistrust of the government's land policies will continue. Such a clarification should give local residents a stake in protecting the land's living natural resources.

2. The Indonesian government should increase its financial contribution to biodiversity protection. Although international financial assistance for biodiversity conservation has increased over the past decade, it can meet only a fraction of the need. Fortunately, Indonesia has internal funding sources. It could redirect some of its revenues from natural resources exploitation to biodiversity conservation.

A national biodiversity tax on all raw living resource extraction might also work. Even if set at only 1 percent, it would generate far more funds for biodiversity conservation than Indonesia can expect to receive from the GEF and other donors.

The policy changes recommended here may strike some as obvious and others as a major departure from existing policies. A prime purpose of this report is to catalyze dialogue between those agencies and actors with a stake in conserving Indonesia's biodiversity. To further the policy dialogue that this report attempts to begin in Indonesia, WRI, WALHI, and Pelangi are publishing an Indonesian-language version to bring the findings to the widest range of Indonesian policy-makers and citizens.

Tiger by the Tail? builds on associated work by all three organizations. WRI's 1994 *Breaking the Logjam: Obstacles to Forest Policy Reform in Indonesia and the United States* (written by Barber and Nels Johnson of WRI along with Emmy Hafild of WALHI) looks at the structural obstacles to forest policy reform in Indonesia and the U.S. Pacific Northwest. WRI's *Balancing the Scales: Guidelines for Increasing Biodiversity's Chances through Bioregional Management* (by Kenton Miller), published in 1995, deals with the challenge of managing whole landscapes to conserve biodiversity as an integral part of development and features case studies from around the world. *National Biodiversity Planning: Guidelines Based on Early Experiences Around the World,* published in 1995 by WRI, IUCN, and UNEP, draws lessons for integrating biodiversity into development planning from the experiences of some 18 countries, including Indonesia. And many of the ideas developed in this report draw on the WRI/IUCN/UNEP *Global Biodiversity Strategy* (1992), which staff from WALHI and other Indonesian agencies played a major role in shaping.

WALHI has long been a leading voice for biodiversity conservation in Indonesia, sitting on the National Biodiversity Working Group, participating (along with WRI) in development of the national Biodiversity Action Plan, and especially promoting the importance of local community rights and needs in all aspects of natural resource management. WALHI also managed translation and publication of the *Global Biodiversity Strategy* in Bahasa Indonesia, published in late 1995.

The Pelangi Institute played a major role in establishing the new Indonesian Biodiversity Foundation. It has also advised the World Bank and the Asian Development Bank on development of biodiversity projects and worked with WRI and others in developing USAID's new Indonesia environment strategy. Pelangi staff are now carrying out research on a range of forest management issues, including a major project on non-timber forest products.

WRI expresses its deep appreciation to Conservation International, the German Ministry for Economic Cooperation, the German Ministry for Technical Cooperation, and LUSO CONSULT GmbH for their important support of this study. We also thank the Netherlands Ministry of Foreign Affairs, the Sasakawa Peace Foundation, and the Swedish International Development Cooperation Agency for their support of WRI's general research on biodiversity and forest-conservation issues.

Walter Reid
Vice-President for Program
World Resources Institute

Wiku Adisasmito
Executive Director
Pelangi Indonesia

M.S. Zulkarnaen
Executive Director
WALHI

Acknowledgments

For their helpful comments on earlier drafts, the authors would like to thank Tony Adisoemarto, Laura Lee Dooley, Tom Fox, Thomas Fricke, Herman Haeruman, Nels Johnson, Asmeen Khan, Owen Lynch, Katherine MacKinnon, Jeffrey McNeely, Kenton Miller, Arthur Mitchell, Tahir Qadri, Walt Reid, Robert Repetto, Setijati Sastrapradja, Nigel Sizer, Mieke van der Wansem, and Michael Wells.

For their helpful background research in Indonesia, the authors thank Arif Aliadi and Leonard Simanjuntak.

Indispensable help in editing and production was provided by Hyacinth Billings, Kathleen Courrier, Donna Dwiggins, Samantha Fields, Steven Lanou, and Linda Starke.

Kenton Miller and Walt Reid of WRI, and M.S. Zulkarnaen and Zukri Saad of WALHI, provided overall project guidance, for which the authors are grateful.

C.V.B.
S.A.
A.P.

I. The Challenge: Integrating Biodiversity Conservation and Development in Practice

Biodiversity conservation is an extremely complex subject, but at least four generalizations hold. First, biodiversity loss has become an increasingly important national and international policy issue—witness the flurry of official rhetoric, policy pronouncements, and legal declarations in the past few years. Second, biodiversity loss continues unabated virtually everywhere. Third, vested interests who benefit from that loss remain far more powerful than those who would stop it. Fourth, a morass of anachronistic and contradictory laws and institutions frustrate new initiatives to slow the loss.

If biodiversity loss is truly to be slowed, and the management of living resources is to be put on a more sustainable footing, national and local efforts must be more effectively joined. For the most part, biodiversity exists within a matrix of resources that lie within the sovereign boundaries of nation-states and within the environments of millions of local communities that depend on them for their livelihoods. If the past decade was the era in which biodiversity became an international issue, then the decade ahead must be the one in which biodiversity becomes a truly national and local issue—a decade in which conventions and strategies are put into action.

The heart of the matter is the tension between biodiversity conservation—which requires that significant swaths of a country's territory be managed primarily to maintain biodiversity—and accelerating economic exploitation of natural resources. This tension is most acute in the tropical developing countries, where the planet's richest species diversity must coexist with large and growing human populations, extremes of wealth and poverty, and national policies dedicated to rapid economic growth.

If the goals of the Biodiversity Convention signed at the Earth Summit and of numerous lofty national pronouncements on conserving the planet's living heritage are to be achieved, the protection of areas still high in biodiversity must be reconciled with the economic needs of local populations and the development plans and projects of government and private investors. What will it take to do this in, say, Indonesia, one of the planet's largest and most biologically diverse nations? What lessons can we draw from early experience in reconciling conservation and development there, both for Indonesia itself and for other countries? What are the key policy and institutional constraints on this reconciliation?

1.1 Integrating Biodiversity Conservation and Development: The Theory

Most people concerned with conserving biodiversity believe that the establishment and maintenance of effectively managed protected natural areas—such as national parks—are the cornerstones for all biodiversity conservation. It is also widely agreed that protected areas have a dim future unless their planning and management take surrounding economic and social realities into account, particularly in developing countries (*See, for example,* McNeely, 1993; Western and Wright, 1993; Wells et al., 1992; WRI/IUCN/UNEP, 1992; Braatz, et al., 1992; McNeely and Miller, 1984).

In Indonesia, as elsewhere, these realities include large populations of generally poor rural people living near or within protected areas (Bappenas, 1993). They also include government policies and booming private-sector investments to develop agriculture, infrastructure, tourism, timber production, mining, and other economic activities adjacent to—and sometimes within—existing or proposed protected areas (RePPProT, 1990). Clearly, neither development planners nor local communities can buy into an approach that divorces protected areas from surrounding socioeconomic realities and government development priorities. Protected areas throughout Indonesia and in many other countries that are scarred and degraded by agriculture, logging, human settlements and other economic activities bear out this judgment.

A government review of Indonesia's land resources in the late 1980s concluded that "significant [reserve] areas...are either converted or degraded. Indeed, some reserves have become so degraded by logging, smallholder intrusion and human-initiated fire that their

conservation value has fallen drastically" (RePPProT, 1990). Indonesia's national *Biodiversity Action Plan* recognizes accordingly that "the integrity of conservation areas cannot be maintained without providing alternative resources and income-generating opportunities to local people who are directly dependent upon resources from those areas." It goes on to note, though, that local communities are not at the root of the problem: "Current economic policies, strategies for resource utilization and management of natural resources...all have adverse impacts on biodiversity" (Bappenas, 1993).

Biodiversity conservation advocates need to convince two audiences that conservation isn't incompatible with their needs and interests—government economic policymakers and their private-sector agents and licensees on the one hand and local communities living in or near protected areas on the other. In Indonesia and other developing countries, conservation planners have advocated a new model for protected areas management, variously termed Integrated Conservation and Development Projects (ICDP), Integrated Protected Areas Systems (IPAS), or, in one of its earliest incarnations, Biosphere Reserves.[1] The ICDP concept, first systematically elaborated in Wells et al. (1992) reconciles conservation and community interests and promotes "social and economic development among communities adjacent to protected area boundaries." According to Wells:

> The smaller ICDPs include biosphere reserves, multiple-use areas, and a variety of initiatives on the boundaries of protected areas, including buffer zones. Larger projects include the implementation of regional land use plans with protected area components, as well as large-scale development projects with links to nearby protected areas.
>
> To achieve their objectives, ICDPs engage in three distinct types of operations. *Protected areas management activities* include biological resource inventories and monitoring, patrols to prevent illegal activities, infrastructure maintenance, applied biological research, and conservation education. Some ICDPs try to establish *buffer zones* around protected areas.... *Local social and economic development* activities constitute the third type of operation, and these use approaches...comparable to those in rural development projects, or simpler approaches that rely on compensation and substitution strategies.

Like the ICDP approach, IPAS integrates conservation and development at specific sites, but it also goes farther, aiming to develop a *system* of protected areas within and across biogeographical divisions to support, for example, migratory and other species that depend on more than one ecological niche or site (Qadri, 1994). In this study, ICDP refers to all projects that try to reconcile protected areas with economic development in adjacent communities and the surrounding region.

All ICDP approaches share certain assumptions and features. The literature already cited, and analysis of the approaches taken in Indonesia reveal several:

Conservation cannot succeed unless it is linked to economic opportunities and investments targeted at those whose pursuit of livelihood threatens a protected area's viability. Upgraded protected areas management must be combined with concrete strategies for providing livelihood opportunities for communities living in or next to protected areas without compromising conservation objectives.

The ICDP approach requires reorientating land-use policies and practices. Specifically, the protected area boundary must be demarcated definitively, adjacent "buffer zones" where limited economic activities are permitted must be established, and clear and secure property rights must be guaranteed in all adjacent areas to give owners long-term management incentives and to discourage additional migration.

To be effective, ICDP efforts must enlist the cooperation of local communities. Local people, who often hold a *de facto* veto over conservation, must at the least understand and support biodiversity-conservation objectives and approve of the economic opportunities offered to them (and accept the loss of some others).

Development and management of ICDPs requires skills beyond those of traditional protected-areas managers. Agriculture, economics, sociology, anthropology, law, and public policy analysis all come into play in the ICDP approach.

Under ICDP, protected areas management cannot end at the reserve border nor focus exclusively on keeping people out.

Cross-sectoral and cross-disciplinary, the ICDP approach requires developing new interagency governmental mechanisms that allow various sectoral agencies to work together and facilitate input from academics, non-governmental organizations (NGOs), and others.

In Indonesia, this general ICDP model enjoys increasing acceptance among government agencies, NGOs, and international donors. Major recent statements of law and policy—such as the 1990 Basic Conservation Law and the 1993 national *Biodiversity Action Plan*—prescribe the ICDP approach for Indonesian protected areas. Coordi-

nated by National Development Planning Agency (Bappenas), an interagency effort to promote the ICDP approach was launched in 1992 with eight national parks targeted as test cases (ARD, 1994). The Asian Development Bank, World Bank, and USAID are either supporting or developing ICDP-style projects. And several international NGOs, including the World Wide Fund for Nature (WWF), Conservation International, and The Nature Conservancy, are supporting protected areas ICDP projects.

While these numerous efforts vary in scope, size, and emphasis, all mark a departure from the longstanding Indonesian style of forest-area protection. Rooted in the Dutch colonial regime, that approach was to close off all public access to protected areas, criminalize encroachers, and largely ignore the adjacent area's socioeconomic dynamics or demands (Peluso, 1992).

1.2 Unresolved Issues Confronting the ICDP Approach

As more and more ICDP efforts have been initiated in Indonesia and around the world over the past few years, various points of tension or conflict have arisen. Most stem from the choices that must be made as theory is put into practice:

Where and how should the balance be struck between "conservation" and "development?" Are ICDPs a way to ensure that regional development supports conservation of a protected area, or a way to ensure that the protected area supports—or at least does not interfere with—regional and national economic development? The frequent answer that "both" are important and must be "harmonized" does not resolve real-world conflicts between, say, regional economic planners and champions of endangered species of large mammals. As Wells (1994) notes: "Many biodiversity projects which have broadened to focus on local economic needs have lost sight of their original conservation goals and are unable to establish a coherent link between their conservation and development activities.... It is essential to clarify whether projects are attempting to improve local welfare through economic development as a principal *objective* or, more simply, as a *means* of enhancing biodiversity conservation." Often at root here is an outright conflict between visions of how an area's resources should be used and by whom.

To what extent can local cultural and economic activities in or adjacent to protected areas coexist with the maintenance of biodiversity? Some conservationists view human occupation and use as almost always incompatible with effective biodiversity conservation, particularly in such complex and fragile habitats as lowland tropical rainforests. Others consider rural communities, particularly tribal groups, effective defenders of biodiversity who, in any case, hold customary land rights that must be respected. Still others view these latter claims with some skepticism but also see involuntary resettlement and other preservationist prescriptions as impolitic and impractical and advocate "sustainable use" micro-enterprise instead. Particular communities and situations can be found to support any of these views. A basic problem, however, is that "in the haste to demonstrate some progress, many new programs have been launched without adequate research or reflection on the circumstances in which biodiversity conservation and sustainable economic development are compatible" (Wells, 1994).

Although the term "participation" percolates through the ICDP discourse, there is little agreement on what this means in practical and political terms. Some interpret the phrase to mean that local communities need to be "educated" about the importance of biodiversity and have to be given some material incentive to support a project. Others insist that local communities should have the right to accept or reject conservation or development initiatives proposed by outsiders and should largely shape and manage any that they do accept, with government merely facilitating and providing services. In between these two poles of opinion are the many advocates of "process" who believe that local communities—or their NGO advocates—must be brought into planning and management of ICDPs even though government's power to make ultimate decisions is legitimate. Debate over these positions is animated mainly by philosophical and political differences over the proper relationship between the individual and the local community on the one hand and the state on the other.

There is little consensus about institutional changes needed within government to foster coordination among the diverse sectoral agencies that need to be involved in ICDP efforts. Some analysts advocate the creation of new integrative national or regional government entities with the power to compel cooperation and coordination from sectoral agencies. Others argue that predictable resistance from entrenched ministeries of forestry, agriculture, or the like makes the wiser course upgrading coordination mechanisms through such existing channels as a national planning agency. A key question here is the degree of governmental decentralization needed to optimize ICDP efforts.

Consensus on which scale is appropriate for ICDPs or on how small pilot efforts can be scaled up to have an appreciable

impact has yet to gell. ICDP efforts focussed on a few communities may lessen their demands on the park, but still have little impact on the park as a whole. On the other hand, attempts to intervene in hundreds of communities at once while also reforming regional development and land-use policies may become so complex and bureaucratic that they have little impact on the livelihoods or behavior of people in any of the communities (Wells *et al.*, 1992). Furthermore, it is unclear whether small, apparently successful pilot projects provide models that governments and major funders such as the Global Environment Facility can scale up (Wells, 1994).

Finally, differences over the capacities and appropriate roles of domestic and international NGOs are common. Many officials in Indonesia and other developing countries view environmental NGOs—particularly those that engage in advocacy work as foes of economic development and unwelcome monitors of environmental and human rights abuses. At the same time, some government agencies have found it useful to cooperate with selected NGOs in designing and implementing ICDPs since government agencies have less relevant experience. International donors that support ICDPs have often championed NGO involvement. That said, the actual capacities of domestic NGOs to move beyond advocacy and small pilot projects is often limited, so donors and governments frequently turn to large international conservation NGOs for technical support. But these organizations also have little capacity—and no political mandate—to manage ICDPs day to day, and many in government or in domestic NGOs resent being bypassed in favor of NGOs from the North.

In short, ICDPs and similar approaches have become a template onto which the objectives and biases of various stakeholders and interest groups—and the conflicts among them—are superimposed. A recent survey of 23 such projects around the world concluded that:

> ICDPs cannot address the underlying threats to biological diversity. Many of the factors leading to the erosion of biodiversity and the degradation of protected natural ecosystems in developing countries originate far from park boundaries....
>
> Today, even under the best of conditions, ICDPs centered on protected areas and directed to local populations can play only a modest role in mitigating the powerful forces causing environmental degradation (Wells, et al., 1992).

If the ICDP approach is logical and promising in theory but alone does not ensure the conservation of protected natural areas in Indonesia or elsewhere, what is needed to address these forces that originate "far from park boundaries"? Simply put, an integrated conservation and development *project* will not succeed—no matter how well designed and executed—unless it is supported by integrated conservation and development *policies* and institutional initiatives. This conclusion is hardly new. Indeed, the need to integrate environmental protection and economic development lies at the core of the concept of sustainable development and forms the cornerstone of *Agenda 21*, the plan of action agreed to at the 1992 United Nations Conference on Environment and Development. Investments are being made at particular sites without adequate attention to the economic development policies and investments that will ultimately make or break them.

Most crucial are policies affecting land-use changes, the development of infrastructure and human settlements, resource extraction, and economic production in the larger region in which a particular protected area is located.

Also important are various cross-sectoral national policies including, for example, those that misvalue forests and other natural resources and thus invite their overexploitation (Pearce et al., 1993; Repetto, 1988). Property rights regimes that devalue traditional land rights, place vast areas under government ownership (without commensurate government ability to manage), and thus create a *de facto* open access situation also fall into this category (Lynch and Talbott, 1995; Ostrom, 1990; Bromley, 1989), as do national policies that constrain the form and level of community participation in natural resource decision-making and management (Barber et al., 1994; Little, 1993). With impacts far beyond protected areas, such macro-policies are not likely to be changed solely to make conservation policy more effective, but even where reform is out of the question, ICDP advocates and managers must at least understand these policies and try to mitigate their worst impacts.

1.3 Study Overview

This study seeks to understand the policy and institutional obstacles to implementing the ICDP approach to biodiversity conservation in Indonesia and to propose policy recommendations accordingly. It combines detailed analysis of representative case studies with an overview of the national institutional and policy context to derive strategic national policy recommendations rooted in the experiences of specific communities, regions, and protected areas.

The central thesis is that while the dominant emphasis of the ICDP approach—changing the nature of conser-

vation policy and practice to better fit with development—is sound, it makes up only half the picture. The central finding is that the nature of development policy and practice must change to better fit with biodiversity conservation. If both national and regional development policies in Indonesia are not altered to reduce pressures on particular protected areas, then ICDP investments and approaches will at best forestall the degradation, fragmentation, and ultimate disappearance of these biodiversity areas.

To make this case, the authors first review the national economic and political context for biodiversity conservation in Indonesia, summarize the status of the country's biodiversity, and analyze the forces and policies that are eroding it. They then explain the legal and institutional framework for biodiversity conservation. The third chapter presents three case studies on protected areas where ICDP-type approaches are under way. Grounded in these cases, the report ends with a discussion of the policy and institutional keys to conserving biodiversity in the nation's protected areas and spells out recommendations for developing a supportive institutional and policy context for integrating conservation and development approaches throughout Indonesia. The extent to which these recommendations apply beyond Indonesia is a matter of opinion, but in the authors' view, they could be modified for application in many other countries, especially those in tropical Asia.

II. Biodiversity Conservation and Development in Indonesia: Context, Status, and Trends

With some 180 million people, Indonesia is the world's fourth most populous country. Its 17,000 islands—about 6,000 of which are permanently inhabited—stretch from mainland Southeast Asia to Australia. The population clusters on the fertile "Inner Islands," principally Java (home to some 65 percent of Indonesians but only 7 percent of the country's land area). Java is also home to the economically, culturally, and politically dominant Javanese people. The "Outer Islands"—the largest of which are Sumatra, Kalimantan (Indonesian Borneo), Sulawesi, and Irian Jaya (the western half of New Guinea)—are lightly settled by diverse cultural groups, some of whom live in the forest in a manner essentially unchanged for centuries.

The fertile volcanic soils of Java, Bali, and some limited areas of other islands have long attracted high-density populations of settled cultivators, mainly growers of irrigated rice. The less fertile soils of the Outer Islands are more suited to the diverse subsistence strategies that have evolved there, including a mix of swidden cultivation, hunting, fishing, and the gathering of non-timber forest products. This agricultural difference has political manifestations. Large hierarchical kingdoms based on irrigated rice have evolved on Java, whereas in the Outer Islands, societies are smaller, more dispersed, and less hierarchical. Ecologically, Javanese have tended to view standing forest as an obstacle to agriculture, while many Outer Islands cultures see the forest as an important and permanent element of an overall agro-forestry production system (Dove, 1985).

In 1967, Indonesia ranked as one of the world's poorest countries in the world, with a per capita income of $50. Under the military-backed regime of President Suharto—in power since 1966—Indonesia began and sustained a dramatic period of economic growth based largely on exploitation of its oil, timber, and other natural resources, foreign investment, and high levels of donor aid and international loans (Schwarz, 1994). By 1994, per capita income had climbed to $650; impressive gains were made in education, health care, agriculture, and infrastructure development; and the country was poised to join the other "tigers" of East Asia in the twenty-first century (World Bank, 1994a; 1993a).

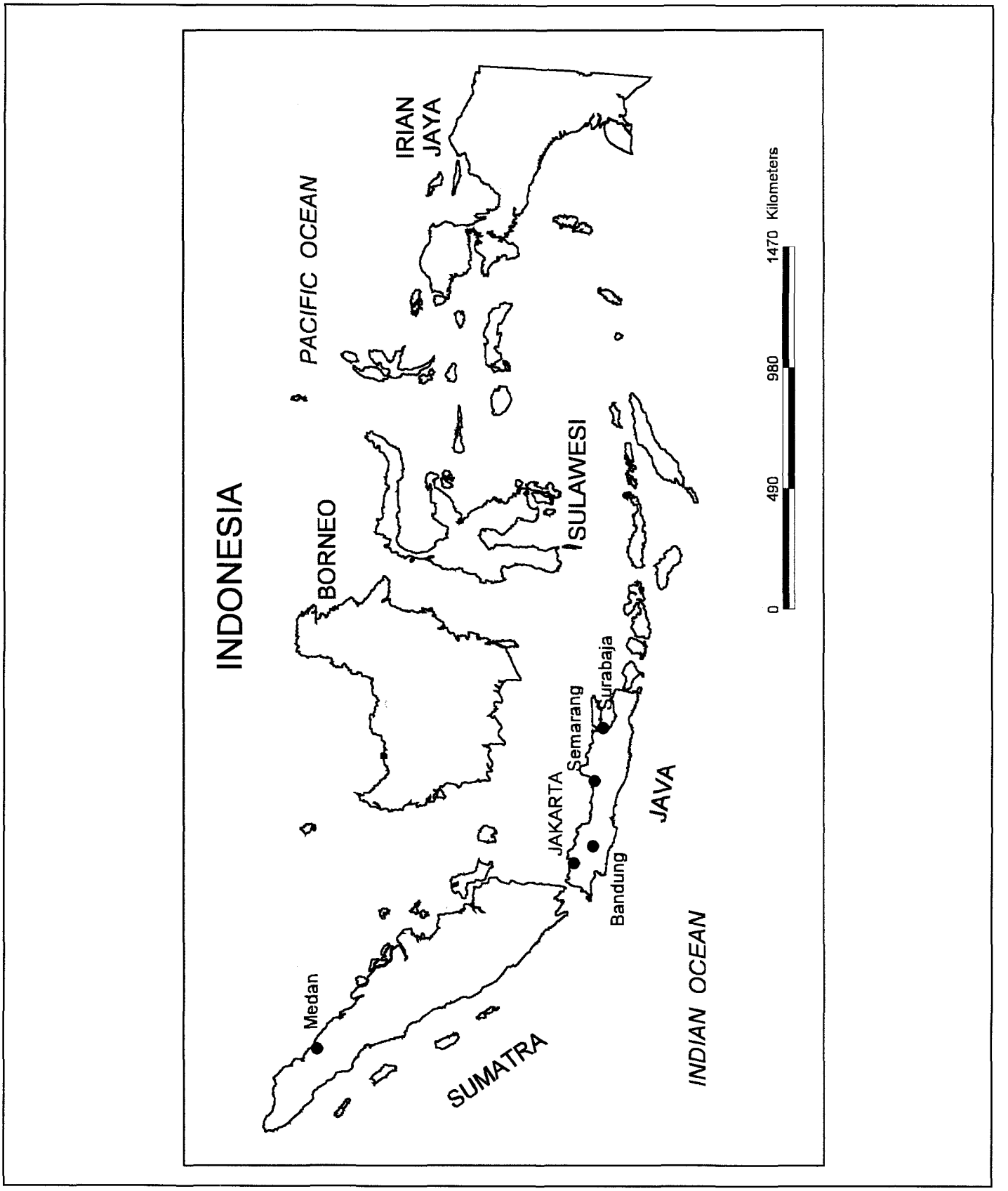
These solid achievements have been bought, however, at considerable environmental cost. Although economic development and environmental degradation are not inevitably connected, they have been strongly linked in Indonesia—witness the accelerating loss of biodiversity, spreading land degradation, silted and polluted rivers, and ruined coral reefs. The social and economic costs of these "externalities" have been borne mainly by poor and isolated rural communities that have also benefitted least from Indonesia's economic boom and the dramatic reduction in poverty that Indonesia has experienced overall since the early 1970s (World Bank, 1994a).

Indonesia's advances have also had costs in political development. Based on the argument that national stability and prosperity must take precedence over individual rights, freedom of expression, the right of labor to organize, and restraints on the state, Indonesia's governing system remains centralized, top-down, and authoritarian (Mackie and MacIntyre, 1994; Vatakiotis, 1994). In the countryside, rural communities have had little say over development policies and projects in their areas and few options for protesting or halting unwanted developments (Guiness, 1994; Dove, 1988). Conversely, private and parastatal firms in oil, forestry, mining, and other resource-based sectors have been given a relatively free hand to exploit natural resources, and a number of firms and individuals—often closely connected with the political elite—have become extremely wealthy and powerful (Schwarz, 1994; Shin, 1989).

2.1 Indonesia's Biodiversity: Status and Trends

Although Indonesia comprises only 1.3 percent of the earth's land surface, it harbors 10 percent of the world's flowering plant species, 12 percent of its mammal species, 16 percent of its reptile and amphibian species, and 17 percent of its bird species. The country's 17,000 islands span the Indomalayan and Australasian realms, and the archipelago contains seven major biogeographic

Figure 1. Orientation Map of Indonesia



Box 1. Statistical Profile of Indonesia

Indonesia—Background Data

Population (1995 est.)	201.5 million
Population density (national)	93 per sq. km (national)
Urban population	30%
Population growth rate	1.6% (national) 5% (urban)
Life expectancy	64.5 (female) 60.9 (male)
Adult literacy (1990)	77%
Gross domestic product (1993)	$144.8 billion
GDP per capita (1994)	$884
GDP annual growth rate (1994)	7.3%
Coastline	81,000 km
Land area	189 million ha
Forested area (closed canopy)	110 million ha
Protected areas	19 million ha
Forests zoned for logging	65 million ha
Annual deforestation rate	800,000–1.3 million ha* (.7%–1.1%)1.0%

*Estimates of deforestation vary according to source and definitions
Sources: GOI, 1994; Parkinson, 1993; World Bank, 1995, 1994©.

realms and a great diversity of habitat types. Many islands have been isolated for millennia, so levels of endemism are high. Of 429 locally endemic bird species, for example, 251 are unique to single islands. Most of Indonesia's insects are also found nowhere else, with many genera confined to individual mountain tops. The country's three main centers of species richness are Irian Jaya (high species richness and endemism), Kalimantan (high species richness, moderate endemism), and Sulawesi (moderate species richness, high endemism) (Bappenas, 1993).

Terrestrial habitats range from evergreen lowland dipterocarp forests to seasonal monsoon forests and savanna grasslands, non-dipterocarp lowland forests, swamp and peat forests, and alpine areas. Virtually all under threat, these habitat types have lost between 20 and 70 percent of their original extent. From a biodiversity perspective, losses of the lowland rainforests, particularly in Kalimantan and Sumatra, are the most destructive. Once blanketing three fourths or more of the country, remaining forests cover some 109 million hectares at most, and the annual deforestation rate is estimated at between 600,000 to 1.3 million hectares. Losses of the species-rich lowland dipterocarp forests have proceeded particularly rapidly: Sumatra, for example, had by the early 1980s lost nearly 70 percent of its original lowland rainforests, which are poorly represented (less than 5 percent of what is left are included) in the national system of protected areas (Bappenas, 1993).

Table 1. Comparative Biotic Richness: Indonesia and the World

Group	Indonesia (number of species)	World (number of species)	Percent of world's species found in Indonesia
Bacteria, blue-green algae	300	4,700	6
Fungi	12,000	47,000	26
Sea grasses	1,800	21,000	9
Moss	1,500	16,000	9
Ferns	1,250	13,000	10
Flowering plants	25,000	250,000	10
Insects	250,000	750,000	33
Molluscs	20,000	50,000	40
Fish	8,500	19,000	45
Amphibians	1,000	4,200	24
Reptiles	2,000	6,300	32
Birds	1,500	9,200	16
Mammals	500	4,170	12
TOTAL	325,350	1,194,570	27

Note: Total known species to date = 1,435,670 species but there are likely to be 5–10 million insects alone.
Source: Bappenas, 1993.

Table 2. Habitat Coverage and Loss

Habitat	Original Area (square kilometers)	Percent Remaining
Forest and Limestone	135,793	39.3
Freshwater Swamp	103,054	46.8
Heath Foresrt	91,660	28.6
Ironwood Forest	3,420	34.2
Lowland Evergreen Rainforest	896,157	57.5
Montane Rainforest	206,233	77.1
Peat Swamp	219,252	78.8
Semi-Evergreen Rainforest	150,877	28.3
Tropical Pine Forest	3,215	60.0
Mangrove Forest	50,800	43.9
Forest on Ultrabasic Soils	8,299	46.9
Monsoon Forest	24,192	38.0
Alpine	2,170	100.0
Other	390	39.7
TOTAL	1,895,512	55.8

Note: The areas of remaining habitats are based on forest cover figures from the early 1980s. Habitat loss has continued in the last decade.
Source: Bappenas, 1993.

Indonesia's territorial waters cover some 3,650,000 square kilometers, nearly double the country's land area. Its coastline extends over 81,000 km, accounting for 14 percent of the earth's shoreline. The habitats within that area include extensive coral reefs that, together with those of the neighboring Philippines, constitute the global center of coral reef diversity (Kelleher, et al., 1995). Some 25 percent of the world's fish species are found in Indonesia's waters (Bappenas, 1993). In one bay on the island off Flores, some 850 species of fish from 82 families have been identified (Berwick, 1989).

Indonesia also boasts the world's most extensive and diverse mangrove forests, estimated at 4.25 million hectares before the 1970s, when some 1 million hectares were lost—due to logging and conversion to fishponds and other agricultural uses (Berwick, 1989). Today, their destruction continues unabated. According to the national *Biodiversity Action Plan*, 95 percent of all mangrove habitats in Kalimantan are already allocated for chipwood production, and the area in South Sulawesi slated for conversion to fish ponds is believed to exceed the area of remaining mangrove stands (Bappenas, 1993). On-shore pollution, heavy sediment loads from deforested uplands, blast- and cyanide-fishing, coral mining, and overfishing in some areas also threaten the nation's unparalleled coastal and marine biodiversity.

2.2 Human Uses and Abuses of Indonesia's Biodiversity

The many distinct peoples of Indonesia have taken their livelihood from the archipelago's rich living resources for millennia, devising a staggering diversity of complex management and utilization regimes in the process. More recently, systematic exploitation of forests and other biological resources has fueled the push for rapid economic growth. Generally, human uses—and users—of biodiversity in Indonesia can be divided into two broad types:

- small-scale traditional or semi-traditional uses of resources in the users' local area—mainly direct consumption or barter-type trade that takes place within a well-defined local system of rules and obligations and thus usually has less negative impacts on biodiversity; and

- the large-scale extraction of commodities for the world market and the conversion of habitats to commercial agriculture, settlement, or industry, driven by both producers and consumers from outside the immediate area.

There is considerable blurring between these two poles, as well as many complex synergies. Logging, for instance, makes it easier for migrant farmers to enter into forest areas (Barber, et al., 1994), and virtually any kind of development that opens hinterlands to external markets stimulates the commercial exploitation of local wildlife and other living resources. Swidden cultivators whose traditional systems are sustainable as long as sufficient land is available (Hardjono, 1994) may be forced to shorten fallow periods and overexploit resources when they lose access to lands and resources handed over by the government to logging concessions, resettlement schemes, and agribusiness (Weinstock, 1989). "Small," however, by no means always means "sustainable." Migrant slash-and-burn cultivation, some forms of wildlife collection, and many other small-scale uses that are not rooted in traditional sustainable management systems have been pushed beyond traditional sustainable limits as new technologies were introduced or market opportunities opened up.

Two elements characterize virtually all of Indonesia's diverse traditional systems of living resource management and use. First is complexity: hundreds of species are cultivated or harvested, though not all at the same season. This "portfolio" approach minimizes the risk of systemic failure and also minimizes the ecological impact on any one species or resource. For instance, people might combine subsistence and cash-cropping of dozens of species, hunting and fishing, animal husbandry, and the collection of hundreds of forest and marine species (Barber, 1987; Dove, 1985). No two groups pursue identical strategies, though. Second, traditional uses of biodiversity are generally part of a well-defined system of local authority and law (*adat*) that regulates harvests, controls access, and mediates disputes (Barber and Churchill, 1987). These *adat* resource-management systems are closely linked to other aspects of community life, such as family and clan relationships and religion (Dove, 1988). Apart from these two fundamental characteristics, traditional uses of biodiversity in Indonesia vary greatly with the local ecosystem, the available resources, access to markets, and other features of particular areas.

Swidden farming—often called "shifting cultivation"—is the predominant traditional biological resource-management strategy taken throughout the Outer Islands. Swidden systems generally require a relatively large area of land per capita and rely mainly on forests and forest-based resources. They are exceptionally complex (Weinstock, 1989). As many as 200 or more specific plant species or varieties may be cultivated, providing food, cash crops, medicines, building supplies, fish poisons, and ritual materials (Barber, 1987). Hunting, livestock, and the collection of wild forest products (such as rattans, palms, bamboos, and such resins and oils as gaharu, tengkawang, and damar) supplement most systems. Perennial cash crops (such as rubber, coffee, and pepper) are also important in some areas, and at least 18 million people in the Outer Islands are thought to rely primarily on such crops for their livelihoods (Hardjono, 1994).

The impacts of these traditional systems on wild biodiversity are generally low compared to more recent human practices, such as logging or intensive agriculture. Indeed, traditional systems may have had generally positive effects on wild biodiversity by keeping the forest at different stages of succession and promoting higher species diversity (McNeely, 1994; World Bank, 1994c). The impacts on the genetic diversity of food crops have been decidedly positive: The diversity of swidden systems and their isolation from each other on different islands have led to the development of a stunning array of crop varieties over the years (Tjahjadi, 1993).

Traditional medicines derived from diverse wild and cultivated species are produced and used widely throughout Indonesia. Ranging from "folk medicines" used by small groups in isolated regions to the mechanized *jamu* herbal medicine industry worth more than $35 million in 1990, plant-based compounds and remedies are a mainstay of Indonesia's health-care system (Hutapea/ADB, 1992). The *jamu* industry, located primarily on Java, uses a wide range of plants—the 109 *jamu* products of one major producer, for example, rely on 77 species of medicinal plants (Gerke, 1992)—while 1988 government figures list 285 plant species used in traditional drug manufacture (Hutapea, 1992). According to one recent study, some 1,259 species of medicinal plants are in use throughout Indonesia (Zuhud and Haryanto, 1994).

Traditional resource-use systems are not static, timeless, or inevitably benign. New markets, increased transport accessibility, local government needs for income, aggressive commodity harvesters and traders, and underdeveloped community awareness of how natural resource regenerate all change the dynamics of community resource management and the institutions that have regulated it in the past (Zerner, 1992). Population growth and increased competition with immigrants for land also threaten once-sustainable traditional systems. In addition, according to one analyst commenting on the breakdown in traditional forms of management that usually follows changes in land use, "while demographic pressure can bring about these changes, more frequently they are policy-induced and stem from government decision to use the land itself or the resources associated with it for certain purposes" (Hardjono, 1994).

"Traditional" resource management as now practiced should not be romanticized or considered to be inevitably sustainable. Nevertheless, in the search for workable models for "integrating conservation and development," it is wise to remember that many traditional communities have been doing just this for a long time and may be able to continue if given the support and resources needed to adapt to changing socioeconomic circumstances.

Recent large-scale economic development policies and practices are quite another matter. Indonesia's rapid economic development over the past 25 years has brought greater food security, higher incomes, increased educational opportunities, and better health care to a large percentage of the population. Fueled largely by the no-holds-

barred exploitation of natural resources, particularly forests and forest lands, Indonesia's development has, however, been a disaster for the other species that share the archipelago with its human inhabitants, as key habitats such as lowland rainforests and mangroves have been degraded and rolled back. So too, some groups within Indonesian society, particularly traditional forest-dwelling and coastal communities, have been marginalized and impoverished by development projects and programs (Harahap et al., 1993; Zerner, 1992).

Thus far, poor rural communities have borne the brunt of ecological costs brought on by large-scale resource exploitation but have not reaped its financial benefits, which accrue largely to urban elites and large corporations (Barber et al., 1994; WALHI, 1994; Triwahyudi et al., 1993; Tjitradjaja, 1991). The cumulative impacts of resource degradation and biodiversity loss are also increasingly threatening the prosperity, political stability, and adaptive capacity of Indonesian society as a whole (Barber, forthcoming).

The logging industry has been a major cause of biodiversity loss and the marginalization of traditional forest-dwelling communities. Since the basic laws on forestry and foreign investment were passed in 1967, more than 60 million hectares of forest land has been allocated to more than 500 commercial timber concessions. While logging operations are not the greatest direct source of deforestation, they open forest areas to agricultural encroachment, planned resettlement, and other kinds of forest conversion. Furthermore, the laws governing logging concessions extinguish traditional *adat* rights to land and resources, removing local communities' incentives to act as long-term stewards of the forest (Barber et al., 1994).

Clearing forests for agriculture has helped meet Indonesia's food production needs, but it too has taken a toll on biodiversity. The area that produces six major food crops in the Outer Islands rose from 5.2 million to 7.6 million hectares between 1969 and 1989, an increase of almost 50 percent. And between 1970 and 1989, the area in production (that is, mature stands) for the three major tree crops—rubber, coconut, and oil palm—rose by 275 percent, from 2.7 million to 7.4 million hectares (World Bank, 1992a). In total, some 35 million hectares are currently committed to plantation development, and an additional 3 to 5 million hectares are planned for development by the year 2000 (Bappenas, 1993).

Transmigration—the government's program to resettle people from Java and Bali to the Outer Islands—has also led to the degradation and conversion of a great deal of forest land. Between 1969 and 1994, the government sponsored resettlement of some 8 million people in the Outer Islands, clearing, by its own count, 1.7 million hectares of land (GOI, 1994). The actual impacts on forests and biodiversity are much greater, given the poor site choices and the land-clearing practices employed. A 1994 World Bank evaluation of the $560 million in loans it made to Indonesia for the transmigration program through the 1970s and 1980s concluded that land clearing was not carried out according to legally agreed guidelines. Slopes over 8 percent had been cleared, trees were bulldozed into waterways, erosion measures along contours were not taken, the opportunity to introduce settlers to a range of forest products that they could grow was lost, and no attempt was made to harvest the commercial timber left partly burned in the field. Impacts on local indigenous communities have also been extremely negative. In the case of the forest-dwelling Kubu people of Sumatra, for example, "there has been a major negative and probably irreversible impact" (World Bank, 1994b).

Mining development can also make it harder to integrate biodiversity conservation into socio-economic development, particularly since mineral and oil exploration concessions regularly overlap protected areas. Between 1969 and 1994, production of key minerals swelled by 550 percent for tin; more than 250 percent for nickel, 25,000 percent for phosphate, more than 10,000 percent for copper, and 16,000 percent for gold. Meanwhile, coal production during this period increased by 4,300 percent, while oil production—long a mainstay of the Indonesian economy—more than doubled (GOI, 1994).

Coal mining is a particular threat to biodiversity because Indonesia's proven reserves (4.4 billion tons) and estimated reserves (27.7 billion tons out of the estimated 35 billion tons in all ASEAN countries) are so large and mostly lie underneath biologically rich rainforest. Annual production of coal, mainly centered on Sumatra, rose from approximately 337 thousand tons in 1980 to 22.5 million tons in 1992 (Marr, 1993). Current plans call for an expansion to 71 million tons by 1999 (GOI, 1994).

Road-building also threatens the nation's biodiversity by making a wide range of planned and unplanned forest-conversion activities possible. Between 1970 and 1990, paved roads in the country expanded from 20,000 km to 110,000 km (World Bank, 1992b). In the 1990s, the government hopes to "open up" the isolated parts of eastern Indonesia, especially in Irian Jaya (GOI, 1993; Parkinson, 1993).

Each of these development sectors and activities has significant local impacts on biodiversity. In the aggre-

gate, however, their potential impacts are regional and national. As one recent World Bank study concluded:

> When viewed alone, it is likely that no single transmigration site, tree crop area, logging concession, or industrial timber plantation resulted in a loss of forest or biodiversity that had any great significance at national level. It is only when they are viewed in combination that their serious and unmitigatable impacts can be appreciated (World Bank, 1994b).

If development and biodiversity conservation are to be reconciled in Indonesia, both ends of the resource-utilization spectrum must be addressed. On the one hand, small-scale local uses that provide livelihoods for local communities in and adjacent to protected areas and other areas of high biodiversity value must be developed in ways that do not significantly diminish biodiversity. Given the changing socioeconomic context for community-level resource use and the progressive breakdown of traditional institutions, simply legitimating and supporting traditional resource-management systems are not enough, even though both are vital. On the other hand, large-scale commercial uses of forests and other resources pose the greater threat to Indonesia's biodiversity, through both direct damage and the indirect effects on community-based resource use.

As the case studies in Chapter 3 show, greater progress is being made in reconciling local needs and resource uses with conservation than in changing large-scale development policies and investments to relieve pressure on biodiversity. A brief examination of the national laws and regulations affecting biodiversity conservation and the utilization of biological resources suggests why.

2.3 Biodiversity Conservation Laws and Institutions

Under Indonesia's Constitution, authority and responsibility for "branches of production which are important for the State and which affect the lives of most people" are held by the state, and since 1967 the government has established numerous laws and policies to make the large-scale exploitation of natural resources easier. In the past decade, however, the government has also developed laws and planning instruments designed explicitly to conserve biodiversity. Since the latter are essentially superimposed on existing laws and policies and are not yet fully operational, their eventual impact is difficult to judge. Even so, these two bodies of law and policy are often at odds—both a cause and an effect of systemic conflict between conservation and development objectives and actions on the ground.

The Basic Forestry Law of 1967 remains the central legal framework for conservation, though its primary emphasis is on timber exploitation. Under this law, which recognizes several categories of protected areas, government has gazetted or designated 348 terrestrial reserves on 16.2 million hectares—8.2 percent of the country's land area—and another 2.7 million hectares are proposed for protection (Bappenas, 1993). Management is in the hands of the Directorate General of Forest Protection and Nature Conservation (PHPA) within the Ministry of Forestry. PHPA's annual budgets in 1988-91 were around $5 to $6 million, most of which went to headquarters administration and a few prominent national parks. The figure increased nearly fivefold in 1994, but with a staff fewer than 5,000 and with few skilled technical and management professionals in the field, PHPA's ability to use increased funding effectively remains in doubt (Sumardja, 1994). The national *Biodiversity Action Plan* concludes that "at present many parks and reserves exist on paper only and have little or no effective management" (Bappenas, 1993).

The legal basis for protected areas management was strengthened with the passage of the 1990 Act on Conservation of Living Resources and Their Ecosystems. Intended to provide a comprehensive framework for biodiversity conservation and utilization, the Act is aimed at protecting life-support systems; preserving plant and animal species diversity, including their ecosystems; and preserving protected plant and animal species. The Act establishes a number of new protected area categories and methods—including biosphere reserves and buffer zones. How it will affect current laws governing natural resource exploitation is unclear since implementing regulations are still being formulated, but it does clearly abolish several obsolete regulations imposed during the colonial period and it has also been cited to justify innovative multiple-use arrangements in some protected areas. (*See Chapter 3.*)

A key weakness in the 1990 Conservation Act, however, is its provision dealing with local communities and popular participation, which says only that "the government will lead and mobilize its citizens to participate in conservation of living resources and their ecosystems." No provision is made for the thousands of traditional tribal communities living either inside or adjacent to many protected areas and claiming customary *adat* land and resource rights within them. To the contrary, in implementing the Act, the government may cancel land rights, *adat* or otherwise, giving compensation under

current law. The legitimacy of *adat* claims on lands designated as "public forest lands" by the state are not recognized, at best communities get token compensation for standing crops (Barber et al., 1994; Moniaga, 1993; Zerner, 1992).

On the other hand, the 1992 Act on Population Development and Family Welfare is one of the first major laws to address the perennial conflicts between *adat* rights and government land and forest policies. The Act guarantees the rights of communities to "the use of territory that constitutes a traditional customary inheritance" and notes that "the rights of use of territory that constitute local customary inheritance guarantees that groups who have traditionally developed an area for generations may not be subordinated in importance by newcomers." The practical effect of this provision remains unclear, though some studies point to it as evidence of a possible softening of the government's position on the legitimacy of *adat* rights (Ministry of Forestry, 1994a; Zerner, 1992).

Government's continuing resistance to recognizing *adat* rights, however, is illustrated by a 1993 Forestry Decree on the use of forest products by *adat* communities within timber-concession areas. While the decree asserts the rights of traditional communities to take both timber and non-timber products from concession areas, it can be invoked only when the government formally acknowledges the pre-existence of valid *adat* rights in the area—unlikely to happen in the face of pressure from powerful concession-holders (Barber et al., 1994). Furthermore, any products harvested must be directly consumed rather than sold, even though most of Indonesia's traditional forest-based communities sell collected forest products (Dove, 1993).

Legalized hostility to *adat* communities is further illustrated in a 1993 joint Decree of the Ministers of Forestry, Home Affairs, and Transmigration dealing with forest dwellers and shifting cultivators. Both groups are characterized as destroyers of forest resources who disturb the balance of the natural environment and impede local and national development. One recent analysis concludes that under this Decree, "all forest dwellers and shifting cultivators are liable to identification and transmigration" into government-mandated settlements (Ministry of Forestry, 1994a).

The legislative and institutional framework governing the exploitation and conservation of coastal and marine resources is also inimicable to integrating biodiversity conservation into development. No single body is responsible for coastal and marine resources, and there is no well-defined jurisdictional structure for the coastal zone. Indeed, at least 17 government agencies hold some mandate for coastal and marine management (Sloan and Sugandhy, 1993). While the Ministry of Forestry (via the PHPA) holds jurisdiction over marine protected areas, there are no marine specialists on PHPA staff, few resources are directed to these areas, and PHPA's jurisdiction ends at the shoreline (unless onshore areas are independently gazetted as protected areas), preventing the agency from controlling or influencing on-shore impacts such as pollution. PHPA also has no authority to regulate fisheries or coastal aquaculture.

In short, the legal landscape on which efforts to integrate biodiversity conservation and development will rise or fall is confused and contains few support structures. Some new legislation seems to provide the basis for reorienting aspects of development, but most has yet to be implemented. The system of protected areas is extensive, but the government's management agency lacks the human and financial resources needed to run it or even to control access and exploitation. At the same time, a great deal of legislation, both new and old, seems to systematically favor large-scale commercial resource extraction and land conversion over both conservation and local community needs, rights, or welfare.

2.4 National Biodiversity Planning Initiatives

Since the legal framework for biodiversity conservation seems to follow social and policy developments rather than to trigger or shape them, considerable attention has shifted away from legal reform and toward development planning in the past few years. The first systematic conservation planning exercise in Indonesia was carried out in the 1970s by PHPA's predecessor agency in cooperation with the U.N. Food and Agriculture Organization (FAO) to increase the country's protected areas from 3 to 10 percent of total land area and to ensure that sufficient and representative habitats were covered. While the resulting plan did not specify costs or allocate responsibilities for implementation, many of its proposals were later adopted, and some 8 million hectares of new protected areas gazetted (MacKinnon, 1994).

Chief among these later efforts were the Consensus Forest Land Use Plans (TGHK) prepared for each province in the mid-1980s and used to set official forest categories and boundaries and the eight regional land-resource reviews carried out between 1985 and 1989 for the Ministry of Transmigration (RePPProT, 1990) and used to refine the TGHK boundaries and classifications. The RePPProT data, in turn, formed the basis for an

FAO-assisted review of the entire forestry sector completed in 1990 (GOI/FAO, 1990) and for the Indonesian Forestry Action Programme (GOI, 1991a) developed under the aegis of the global Tropical Forestry Action Plan.

All these reports and plans contained elements of biodiversity conservation, but were mainly concerned with rationalizing commercial use. Explicit and systematic focus on biodiversity conservation planning *per se* did not begin until 1988 with the establishment of an intersectoral National Working Group on Biodiversity chaired by the Minister of State for Population and Environment. This group, whose membership reflected an expansion of biodiversity concerns beyond protected areas and forests (for example, agriculture and biotechnology were included), developed a National Biodiversity Strategy (KLH, 1993). It also coordinated production of a biodiversity Country Study under the auspices of the United Nations Environment Programme (KLH, 1992).

Most important, however, is the *Biodiversity Action Plan* published in 1993 under the leadership of the powerful National Development Planning Agency (Bappenas), with support from the World Bank (Bappenas, 1993). *(See Box 2.)* Developed with a good deal more cross-sectoral, provincial, and non-governmental organization participation than any previous effort, the *Action Plan* provides specific and comprehensive objectives and priorities for investment, policy reform, and institutional capacity-building. While it seems to have altered the language of mainstream development planning documents, what will happen when the *Action Plan*'s objectives for policy reforms in forestry and other resource-exploitation sectors come up against those sectors' entrenched policies and interest groups is uncertain.

The *Action Plan*'s primary objective is to catalyze "immediate action...to slow the rate of biodiversity loss and to develop a strategy which allows sustainable utilization of natural resources while conserving biodiversity and the natural resource base." To that end, it provides "an integrated operational framework to set priorities and guide investments," a charter for institutional reform, and "an opportunity for government ministries, sectoral agencies, provincial planners, national NGOs and international conservation organizations to work together as real partners, under the coordination of Bappenas, to set a course for conserving biodiversity in Indonesia."

The *Action Plan* does not shirk the difficult issue of reforming environmentally destructive economic policies:

> Much loss of biodiversity in Indonesia, as elsewhere, is due to economic policy distortions that encourage rapid, rather than sustainable, exploitation of biological resources...The Plan emphasizes the need for policy reform to develop a policy environment that will support biodiversity conservation and sustainable use.

At odds with government policy, the Action Plan's stance on forest-dwelling and forest-dwelling communities may herald a perceptual shift among some development planners:

> Approximately 40 million people live in, or are dependent on, resources in the public forest estate. These people are the *de facto* forest managers and this must be recognized. This means recognizing their rights to land and resources and working with them to develop sustainable systems of forest management, land restoration and agrosilvicultural production for both local and national needs....If forest-dwelling and forest-dependent communities are to play an active role in biodiversity conservation and management they must have a decisive voice about resource use in their area.

As strong and comprehensive as the *Action Plan* appears on its face, its influence on mainstream development planning instruments is still small. For instance, in Indonesia's Sixth Five-Year Development Plan (1994/95–1998/99)—a six-volume document of more than 3,600 pages covering every sector of development in each of the country's 27 provinces—strong statements in favor of biodiversity conservation are mixed with prescriptions for continued or intensified resource exploitation sure to accelerate biodiversity loss.

Chapter 18 of the Development Plan, on Environment, stresses that:

> Indonesia's biodiversity constitutes an important set of "development capital" opportunities, and natural ecosystems protect water and soil resources, clean the air, and protect environmental stability. Biodiversity also has an important role as a source for genetic resources, food, medicines, and various commodities that can benefit the nation's income....
>
> The conservation of the nation's forests, including their flora and fauna and unique ecosystems, must therefore be intensified to protect genetic, species, and ecosystem diversity....
>
> ...(Natural resources) that are still intact must be protected so as not to compromise the diversity of

Box 2. A Brief Outline of Indonesia's *Biodiversity Action Plan*

The *Action Plan* has three general objectives:

1. to slow the loss of primary forests, wetlands, coral reefs, and other terrestrial and marine habitats of primary importance for biodiversity;
2. to expand the data and information available on the nation's biodiversity and make it available to policy-makers and the public; and
3. to foster the use of biological resources in ways that are sustainable and less harmful than current practices.

Within that framework, it elaborates eight Action Areas under which specific priority actions are detailed:

- *in-situ* conservation in terrestrial parks and protected areas;
- *in-situ* conservation outside national parks and reserves;
- coastal and marine conservation;
- *ex-situ* conservation;
- community participation in conserving biodiversity;
- research and development needs;
- information use and management; and
- education, training, and extension programs.

The *Action Plan* also provides a state-of-the-art compendium of data on biodiversity status, trends, and conservation efforts in the country, including 64 pages of biodiversity data tables.

Source: Bappenas, 1993

resources available for development needs in the future. In this connection, a part of still-intact ecosystems should be set aside as conservation areas to protect genetic resources (that may be needed in the future.) During the Sixth Five-Year Development Plan, approximately 10 percent of natural ecosystems should be set aside for these reasons.... In addition, efforts must be made to protect biodiversity outside of protected areas.[2]

Similarly, Chapter 26, on Forestry, lays out a program summary for "Conservation of Forest, Soil and Water" that includes support for protected areas, *ex-situ* conservation, and "strengthening the conservation of biological diversity." But other sections of the chapter—those on logging and timber plantations, for example—scarcely mention biodiversity conservation, and the Plan calls for some 131 million cubic meters of timber to be cut from the nation's forests between 1994 and 1999.

The Plan's Chapter (Chapter 21), on agriculture, barely mentions crop genetic diversity, noting only that agricultural policy should not contribute to the extinction of species or varieties found within Indonesia's territory. The only specific activities mentioned that relate to biodiversity are increasing the use of integrated pest management, rehabilitating degraded lands, and intensifying genetic diversity conservation through the development and use of gene banks. The section on marine isssues (Chapter 15) does not mention marine biodiversity conservation except to vouch generally for the importance of sustainable utilization of marine resources, though the chapter on forestry details some plans to upgrade marine conservation areas.

Chapters covering other sectors with large negative impacts on biodiversity do not deal with biodiversity at all. The section on transportation (Chapter 24), for example, mandates the building of roads across South Kalimantan, from the west to east of Sulawesi, across north Flores, Irian Jaya, Halmahera, northern Kalimantan, and Ceram—the most pristine and biologically important areas of Indonesia. The Chapter on mining (Chapter 25), calls for a dramatic increase in coal mining during the 1990s, and knowledgeable officials say that the increase may be double what the Plan calls for. Nearly all the country's coal deposits are located in biologically important rainforests, but no mention is made of the impacts on biodiversity, much less ways to mitigate them.

In short, though a good deal of text on biodiversity conservation has indeed been imported into the Plan, concern has yet to influence mainstream development sectors appreciably, at least on paper. However, the Chairman of the *Biodiversity Action Plan* Steering Committee believes that the *Plan* can be used to monitor and in some cases change sectoral development proposals. The Presidential Decree that gives the Sixth Five-Year

Development Plan its legal authority does in fact say that "the details of implementing (the Plan) shall be provided in Annual Plans which reflect the National Budget and other governmental policies." If the *Action Plan*'s proponents in Bappenas aggressively promote it as one of these "other governmental policies" and use their power of the purse to back it up, they may be able to infuse biodiversity conservation further into the Development Plan as it is refined and implemented.

Two other girders in Indonesia's legal and policy framework could also support two gradual changes. The 1992 Law on Spatial Planning could be used to bring biodiversity concerns into decisions on land and resource-use decisions, since it divides all land into "Protection" and "Human Cultivation" areas (Ministry of Forestry, 1994a). Also. the rigorous application of Indonesia's Environmental Impact Assessment (EIA) procedures to public and private-sector projects in or adjacent to areas of high biodiversity value could give the *Action Plan* additional relevance. As it stands now, though, the EIA process focusses little on either the direct or the indirect biodiversity impacts of development (Dahuri, 1994).

2.5 The National Policy Framework for Biodiversity Conservation—A Summary

Indonesian policies affecting the country's biodiversity have passed through two phases in the past 25 years and are poised to enter a third. The mid-1960s through the late 1970s, saw the expansion of state control over natural resources and their use as capital for both economic growth and the consolidation of the New Order regime's political base. Conservation took a back seat, and both the control and the economic benefits of natural resource exploitation accrued to an increasingly concentrated economic elite and their political patrons. In the second period, commencing in the late 1970s, a parallel policy framework dedicated to conserving biodiversity developed, catalyzed partly by the growth of environmental non-governmental organizations, by such events as the World Parks Congress in Bali in 1982 and the Earth Summit in 1992, and by mounting donor concerns about the environmental toll of Indonesia's development policies. During this period, the government expanded its protected area network, assisted by FAO and the World Wide Fund for Nature. But this wave of institutional and legal development—and public concern—has not yet appreciably changed the assumptions behind development policy and practice.

Indonesia is now poised to enter a phase in which biodiversity conservation is integrated into development policy-making, transforming both development and conservation. The prognosis, however, is uncertain, given these factors:

- many thousands of rural communities have long depended on controlling, maintaining, and using biological diversity for locally based livelihoods;
- the store of tradition-based biodiversity-management systems and knowledge is still considerable, despite their progressive erosion and suppression;
- the state has assumed ownership of forests, waters, land, minerals, and other natural resources and so concomitant traditional rights have been extinguished, along with local incentives to conserve;
- planned developments in multiple sectors depend on the use or conversion of natural resources;
- powerful private interests depend on government-granted rights to exploit resources;
- unplanned and largely uncontrolled migration, settlement, and resource exploitation have been set in motion by planned development processes;
- a system of governance and policy-making in which the voices of rural communities and others who reject part or all of the current development model are often ignored or suppressed; and
- government conservation institutions claim an exclusive mandate to manage conservation areas and activities but lack the necessary human, financial, and technical resource capacities to carry out that mandate effectively.

Many government officials recognize the need to revamp the policy, legal, and institutional framework for biodiversity management, and some important first steps have been taken in the past few years. These have been limited, however, to national policy statements and broad legal enactments—not all of them consistent—and to some innovative pilot projects here and there. What happens in the decade ahead will depend on proving that biodiversity conservation and development can be integrated in practice by actually doing it and at the same time on making the substantial policy changes from the top that are needed to sustain initiatives on the ground.

III. Integrating Conservation and Development: Case Studies

The great diversity of Indonesia's natural habitats and human communities means that there are no generally applicable blueprints or formulas for conservation projects and policy development. What is needed is a careful assessment of the widely varying conditions under which conservation and development must co-exist, the identification of cross-cutting policy issues, and the careful adaptation of general principles to local situations.

The following case studies discuss three protected areas in parts of Indonesia. They represent diverse biodiversity-conservation settings and highlight the different approaches that fall under the general banner of "integrating conservation and development." Each provides a general situational overview and analysis, but also explores one particular issue in greater depth. While all of the sites have ongoing integrated conservation and development projects (ICDPs) planned or under way, none is mature enough to allow for a definitive analysis of which project approaches reconcile biodiversity conservation with economic development in a lasting way. But if it is still too early to analyze successes and failures or strengths and weaknesses, it is not too early to cull insights into the challenges faced in carrying out ICDPs and into the most important policy issues that must be addressed if they are to succeed.

3.1 Kerinci Seblat National Park: Conservation Under Severe Regional Development Pressures[3]

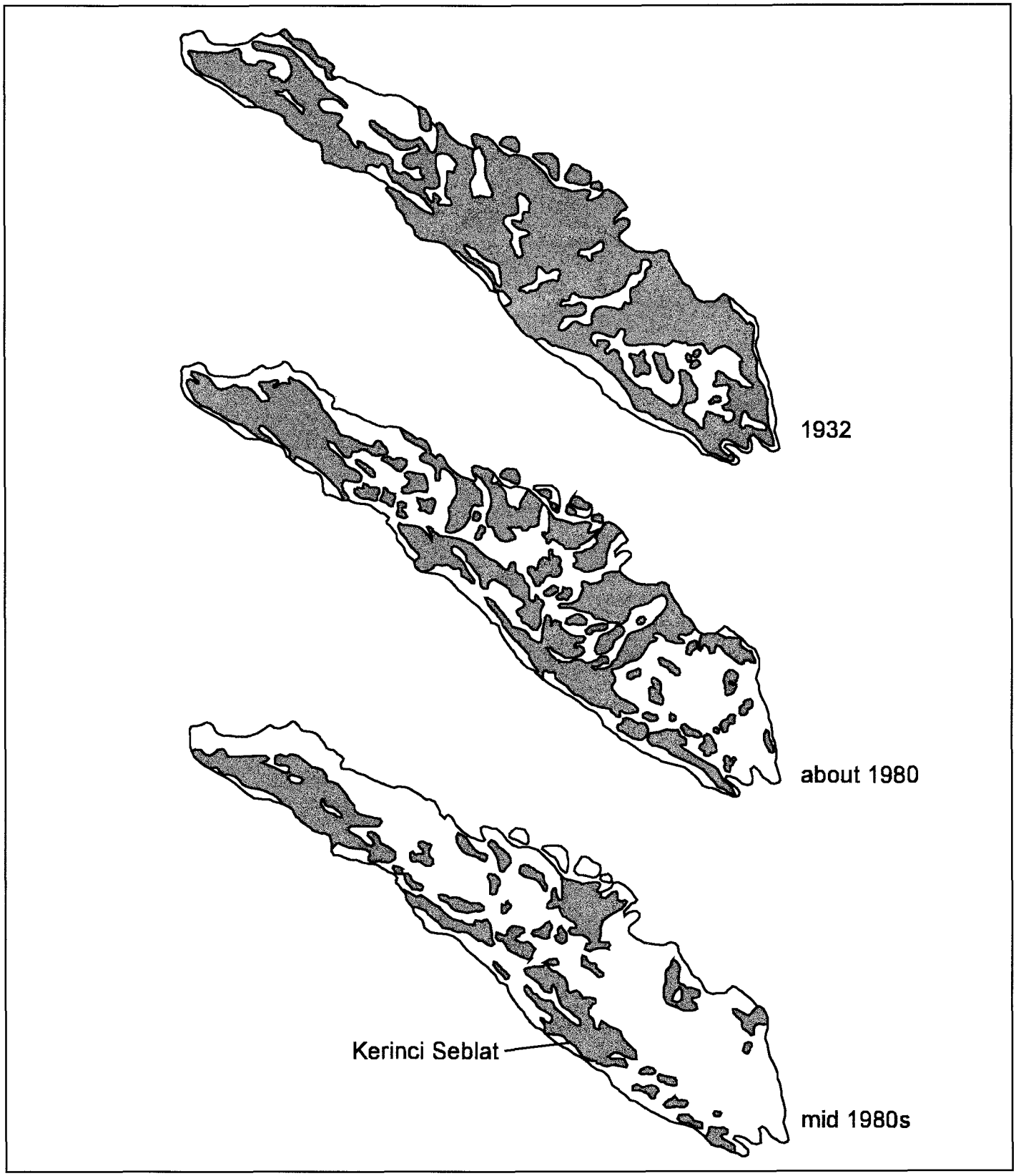
Biogeography: Kerinci Seblat National Park lies in the southern half of Sumatra, stretching nearly 350 km from south to north along the island's mountainous spine. At its maximum width of about 70 km, it surrounds the broad and densely populated Kerinci valley, which almost completely bisects the park. The Barisan mountains, a chain of active and dormant volcanoes that includes Mount Kerinci (3,805 m), Indonesia's second-highest peak, dominate the park, and the range is a major water-catchment area for lowlands to both the east and west.

The park's great biological diversity is due to both its size and the variety of habitats. Ten vegetation types have been identified, plant endemism is high, and the area's fauna includes many endemic, rare, and endangered species. The park contains what may be some of the last viable populations of such endangered large mammals as the Sumatran Rhino and the Sumatran Tiger. One in 50 of the world's birds have been seen in the park, and one in three of the island's avian species. Sumatra has been severely deforested over the past 60 years, and the Kerinci Seblat region represents one of the few sizable blocks of the island's forests that remains in reasonably good condition. Large contiguous areas of great biological value lie outside the current park boundaries, however, and some vegetation types are represented only in areas currently under logging concessions.

Local Population and Livelihoods: In 1990, the four provinces in which the park is located had a total population of about 13.5 million, while the 36 subdistricts (*kecamatan*) bordering the park had a total of about 3.3 million people, some 235,000 of them living in 194 villages directly adjacent to the park boundaries. The largest nearby towns are Sungai Penuh (62,000) in the central Kerinci Valley, and Lubuk Linggau (103,000) and Curup (131,000) at the park's southern extreme. The annual population growth rate of the four provinces averaged 2.8 percent between 1970 and 1990, well above the national average. In-migration is one reason for this high growth rate, particularly in Bengkulu province, where annual growth topped 4 percent (DHV, 1993a). A 1991 report from the Ministry of Transmigration's Advisory Group concluded that "spontaneous in-migration is one of the greatest environmental hazards faced by Sumatra and greatly upgraded measures to plan for this movement now seem to be imperative" (TAG, 1991).

Indigenous inhabitants of the region come from four major ethnic groups, while Javanese migrants have been settling in the region since the Dutch colonial period, brought in as contract estate crop laborers and in an effort to introduce sedentary cultivation in place of swidden. After independence, transmigration—both government-sponsored and spontaneous—continued, and few villages now have an ethnically homogeneous

Figure 2. Loss of Rainforest in Sumatra over Sixty Years



Source: DHV 1993.

population. Islam remains the overwhelmingly dominant religion of the entire area, however. Most people are farmers, but there is a sprinkling of traders, shopkeepers, and civil servants.

Farmers in the park vicinity use some combination of three cropping systems. Irrigated rice cultivation (*sawah*) is found mainly in lowland areas; home gardens (*pekarangan*) are cultivated with a variety of annual and perennial crops (such as fruit trees); and rainfed annual and perennial crops on non-irrigable land (*ladang*) are cultivated on sloping upland plots, often far from a family's residence. Farmers combine these elements differently depending on altitude, soil and water type, hydrological features, marketing opportunities, and the like. Six distinct systems were identified by researchers doing background work on the proposed ICDP project during 1992–93, ranging from vegetables grown above 1,000 meters for urban markets, where pesticide use is high, to irrigated rice and rubber grown below 500 meters, where marketable crops are mixed in with secondary forest that provides timber and a variety of fruits.

Certain features are common to almost all the systems: small and often fragmented holdings; the priority given to irrigated rice for consumption; a high level of commercialization, particularly of perennial crops; limited use of commercial fertilizer and pesticide (except for irrigated rice and temperate vegetables); little reliance on livestock; and relatively little access to extension advice and external inputs.

Ownership of land in the area is unclear and frequently disputed, both inside and outside the formal park boundaries. In the past, land rights were vested in traditional *(adat)* communities comprising one or more villages and their constituent clans. Anyone who obtained permission from the local *adat* authorities could clear a plot of forest to cultivate and thereby establish a right of future use for themselves and their descendants. Under national law, however, legally binding title to land can be issued only by the government's National Land Agency, and areas classified as forest land cannot be owned at all. *Adat* land rights are thus weak—some would say non-existent—under national law.

The commercialization of agriculture in the area has also weakened *adat* property rights, and under the 1979 Law on Village Governance, *adat* governance institutions *(marga)* in southern Sumatra—institutions that regulated *adat* land use and land rights—have been legally abolished, though some continue to function. Summarizing the land-tenure situation in the Kerinci Seblat region in 1993, one study concluded:

> Land administration in the rural areas is in limbo. The old institutions in charge have become weak or obsolete, while the new organization has not yet created the conditions to work effectively. Therefore... land rights are still established, allocated and inherited according to the customary rights systems. But there are no registers and accurate maps, and land conflicts are difficult to resolve, especially when the government is one of the parties. Sometimes it is the government who takes advantage of this situation, by simply ignoring the rights of individuals. In other cases it is the people who, by invading state land, confront the government. (DHV, 1993a)

Local institutions of governance and community cooperation are in a similar state of transition and disarray. Pursuant to the 1979 Law, the government formally abolished local *adat* governance institutions—though a consultative *adat* forum is still legally recognized in West Sumatra province—and its position is that every village is formally represented by its headman. Government-mandated village organizations are supposed to provide venues for community consultation and for the planning and proposal of development priorities and projects to higher levels of government. In practice, this system of "bottom-up" planning does not really function. "There is a general feeling that the needs of and requests from the villages are not really cared for at higher levels, because the assistance they receive is rather imposed and not well adapted to local conditions," noted another study (DHV, 1993b).

Village headmen's influence and authority vary with the perceived impact of government policies on the village. In one park border village—Napa Licin—the headman has lost support because so much of the village was included in the revised park boundaries, and a further 100 ha was given by the government to a tourist enterprise. Where the headman is perceived to have personally profited from a deal harmful to the village—ceding of land for a government project, for example—his authority is even more severely eroded.

Adat institutions and leaders, remain powerful in some areas. A whole range of informal traditional organizations still exists for cooperative village endeavors related to agriculture, home construction, and the like. But indigenous institutions and leaders wield less influence in predominantly immigrant villages, and in many their power is rapidly fading as that of government-backed leaders and institutions grows.

In early 1992 many local NGOs active in the area came together to form WARSI, a network of NGOs concerned

about or working in the park area. Along with several Java-based NGOs, WARSI was involved in the recent Global Environment Facility (GEF)-assisted preparation of an ICDP for the area. But few local NGOs have much experience with biodiversity conservation (most focus on small-scale community development and income-generating projects), and their presence in the field is fairly limited.

Park History and Status: In 1982, the government announced the creation of the Kerinci Seblat National Park (KSNP)—an area of approximately 1.5 million hectares. A management plan had been completed in 1981 with U.N. assistance. The area at the time consisted of a complex of 17 gazetted and proposed reserves and watershed-protection forests—some dating to the colonial period—with additional forest lands in between. Since 1982, the boundaries of KSNP have been repeatedly revised to accommodate logging concessions, development schemes, and other encroachments both existing and planned. The macro-scale, province-by-province Consensus Forest Land Use Mapping initiative of the early 1980s led to major changes in forest zoning in all four provinces. In the process, about 230,000 hectares of lowland and hill forests were turned over to logging concessions, leaving the park with new boundaries and an area of 1.25 million hectares.

In 1991, the Ministry of Forestry began developing a new management plan that further reduced the Park area to slightly more than 1 million hectares. In 1992, a "consensus" boundary was agreed to by the Ministry, provincial governments, and logging concession-holders, within which the park shrunk to 996,850 hectares, about 66 percent of the area proposed in 1982. Almost all the excised territory was lowland and hill forests below 1,000 meters; very little undisturbed lowland forest below 300 meters—the most biologically diverse habitat—remains in the park.

In short, the current boundary has not been established with biodiversity conservation objectives in mind. Rather, lands too steep or inaccessible for logging or other forest conversion are left within the boundaries, and all exploitable areas are excised. Much of the new boundary, for example, simply follows the 40-percent slope contour that, as a recent report notes, "may be a suitable criterion for delineating logging concessions but is inappropriate for conservation area boundaries" (DHV, 1993c).

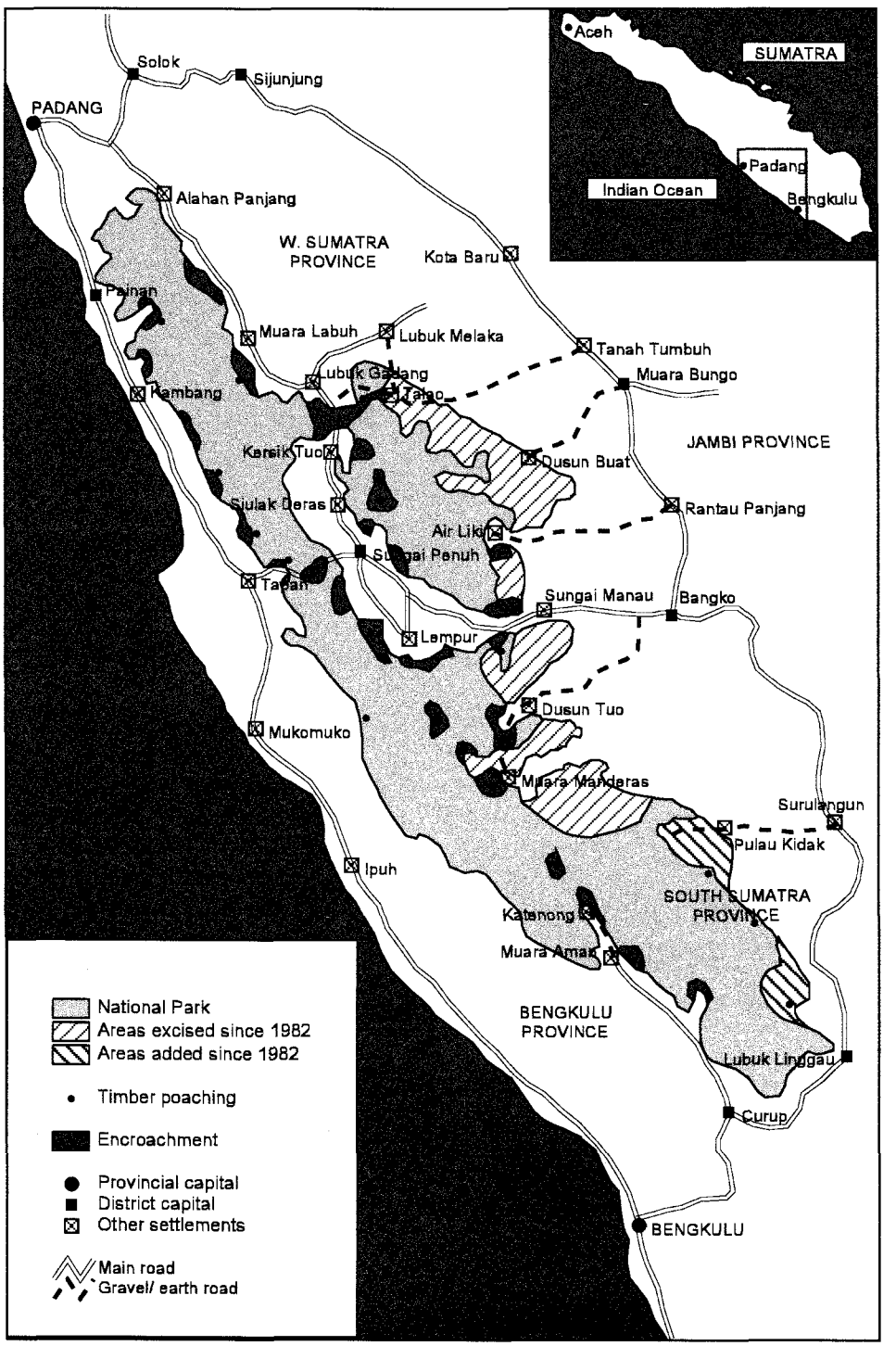
The new boundary has also increased in length to 2,730 km. Only about 1,600 km of the boundary was marked at all by 1993, however, and only 1,000 km of that has permanent concrete markers. The rest exists only on paper. Even where marked on the ground, however, the boundary-setting process has largely ignored local land and resource uses. A 1993 socioeconomic survey of six KSNP border villages reported that park boundaries had been set without local participation and that villagers were upset about the appropriation of their lands for conservation without compensation (DHV, 1993d). Since the government has scant capacity to patrol the boundaries, these and similarly situated communities around the park are unlikely to pay much attention to the occasional concrete post.

Lying within four provinces and nine regencies (*kabupaten*) and covering much rugged and inaccessible territory, KSNP presents enormous challenges for administration and coordination. Management is within the sole jurisdiction of the Directorate General of Forest Protection and Nature Conservation (PHPA) in the Ministry of Forestry, which operates through its local office. From 1982 until recently, though, PHPA ran the park as a project activity, with little money or staff. In 1991, when the government began to develop the ICDP approach, the annual budget increased from about $75,000 to $550,000, rising to about $700,000 in 1992. While this was a significant percentage increase, it still represents an outlay of only 70 cents per hectare. PHPA receives some assistance from the World Wide Fund for Nature (WWF). (The Kerinci Valley office focusses on biological monitoring, staff training, local socioeconomic surveys, assistance to a community-based ecotourism project, and a boundary stabilization pilot project in one village.)

Trained staff are in short supply. Currently, park staff total 74, of whom 56 serve as guards in 20 field posts (World Bank, 1995). With such a meager staff, PHPA cannot maintain the existing park boundary or effectively exercise any other management functions and must rely on local government to enforce regulations against encroachment, poaching, illegal logging, and the like. This help is difficult to mobilize, though, and so slow in coming that the damage is inevitably inflicted before action is taken.

The principal direct threat to the park comes from agricultural encroachment. There are three general types, cash and subsistence cultivation along the boundaries by people who live outside the park; irrigated rice cultivation and dryland cultivation in community enclaves within the park; and cassiavera (cinnamon) plantations along roads transecting the park by sharecroppers living outside (World Bank, 1995). Annual forest clearance within the park has been estimated to be as high as 13,000 hectares, with at least 50,000 ha lost to

Figure 3. Location of Kerinci Seblat National Park, Park Boundary Changes 1982–1992, and Areas of Encroachment and Timber Poaching



Source: DHV 1993

agricultural encroachment during the past 20 years. Current cassiavera cultivation alone is estimated to cover as much as 17,000 hectares. Annual clearing for smallholder shifting cultivation, however, probably does not exceed 1,500 hectares. All in all, an estimated 15,000 households farm some land within the park (World Bank, 1995).

Cassiavera is a very lucrative crop, and the area supplies 60 percent of Sumatra's output. Production is concentrated in and around the densely populated Kerinci Valley, where some 30,000 hectares of forest have been converted to cassiavera in the past 20 years and nearly one third (42,000 hectares) of cultivated land is planted with the crop, 41 percent of which is inside the park.

Illegal logging is also common in many parts of the park, though accurate data are difficult to come by since people are increasingly aware of potential sanctions. A 1993 survey of six border villages found some 116 forest species that were directly used by local people for timber, food sources, medicines, roofing and binding materials, spices, and other purposes.

The enclave communities lie deep within the park in areas very important to fauna as corridors, feeding grounds, and salt licks. Both present activities in these settlements (forest clearing, hunting, and so on) and likely future developments (immigration, population growth, development of access roads) pose severe threats to the park. But resettling of these enclaves would be politically sensitive and practically difficult and is thus unlikely.

Wildlife poaching is common in many parts of the park. Hunters target deer, tapir, the Sumatran rhino (for its horn), and the Sumatran tiger (for its bones—a valuable ingredient in many Chinese medicines—and its skin). Experienced rhino trackers live in the area and local villagers sell several species of bird—a business that seems to be increasing.

Several non-timber forest products, most notably gaharu resin and rattan, are collected in the park for sale. Gaharu collection (for incense production) increased in the 1980s with rising world prices, and some areas have already been overharvested and abandoned. Rattan is also still collected in many areas in and around the park, though the most desirable species have become very rare. Damar resin is also tapped by some collectors.

Traditional gold panning is practiced in the dry season by some villagers in park rivers, particularly to the south. Miners use 4 kg of highly poisonous mercury (to separate the gold) for every kilogram of gold produced—a menace to aquatic life and to people who eat, fish, or drink from the polluted waters.

Government has done more to address these threats in the past few years, but so far efforts have been limited largely to data-gathering, updating the management plan, establishing coordinating mechanisms, and designing projects with donor assistance. PHPA prepared a new management plan in 1991 (GOI, 1991b). In the same year, a project called "Addressing the Problems of Kerinci Seblat National Park" was initiated by the National Development Planning Board (Bappenas) to step up planning and investment coordination in the region. By mid-1993, some $25 million from the national development budget had been allocated to 22 projects, some for reforestation and soil and water conservation, but 40 percent for bridge and road upgrading (World Bank, 1993c).

One recent and promising government initiative currently being tested, the Multipurpose Tree Program, encourages villagers with land inside the park to grow indigenous tree species after harvesting existing tree crops, and grants them 20-year rights of use to the land in order to slow further encroachment (World Bank, 1995). It is unlikely, however, that some other recent investments will support conservation of the park. Indeed, road projects are likely to facilitate encroachment.

Government has tried to resettle park encroachers through the transmigration program. By mid-1993, some 1,513 households had been resettled from KSNP—mostly to estate crop areas in adjacent lowlands—and an additional 670 were to be resettled by the end of 1994. But PHPA lacks the resources to inventory the estimated 11,000 park encroachers—let alone the $50 million it would take to resettle them. Even if that could be done, its impact would probably be minimal since there is little effective park access control and new encroachers continue to enter. In addition, many resettled families return to their plots in the park once subsidies at the transmigration sites expire. Indeed, some resettled households continue to farm in the park indirectly through extended family members (World Bank, 1993c).

The GEF/World Bank ICDP: An important recent catalyst for attention to the Park's plight has been the effort to design a major GEF/World Bank-funded ICDP for the park and surrounding areas. In 1991-92, the government worked with the World Bank to develop a proposal to the GEF for the project, which was approved in April 1992. The GEF provided $1.5 million in initial project preparation funds. Additional funding was subse-

quently obtained from one of the World Bank's technical assistance grant windows. During 1992-93, an international consulting firm (DHV Consultants BV) was retained to carry out preparation work. Despite the exhaustive gathering of data and a voluminous output of reports (20 background reports and a synthesis Project Brief) prepared by DHV's expatriate and Indonesian consultants, the government and the World Bank (the GEF's executing agency for the project) could not agree on a project design at that point. A 1995 Regional Impact Assessment prepared for the World Bank and the government concluded that despite the wide range of recommendations put forth by the DHV team, "it appears that no mechanism was established by the World Bank and the Government of Indonesia to review and address these recommendations" (Sustainable Visions, 1995).

The World Bank argued that the DHV-proposed project was "still incomplete and that in any case, (its) scope will need to be scaled down in order to be feasible....This delay is in large part due to the conceptual and institutional challenges of ICDP design, for which there are few if any relevant models" (World Bank, 1993b). The government, however, viewed the Bank's cautious position as a retreat from implicit promises of significant international assistance—not just more studies and pilot projects—for a major ICDP effort at Kerinci Seblat, including sizable funding for regional economic development.[4]

Starting in mid-1993, the World Bank renewed efforts to facilitate consensus-building dialogue among national government agencies, provincial governments, non-governmental groups, and its own staff. In August 1994, the formal project preparation process started up again, and a revised and comprehensive Project Preparation Report was issued in March 1995 (World Bank, 1995). A formal project agreement was at that time expected to be negotiated by late 1995.

Under the current ICDP proposal, the project would last six years and cost $39 million—about 35 percent from a GEF grant, 35 percent as a World Bank loan, and the remainder from Indonesia's government. Its major intervention components are the strengthening of park management; investments in rural development to lessen local pressures on the park in 134 border communities; and restructuring and reforms in logging concession management in the concessions adjacent to the park that are important lowland forest habitats (many of which were part of the park until the mid-1980s.) In addition, the project has four support components:

- improvement in procedures and capacity for inter-provincial and regional spatial planning to ensure that the planning system incorporates biodiversity considerations;
- conservation awareness programs for boundary villages and government officials;
- training and extension activities for all relevant stakeholders; and the
- strengthening of monitoring capacities (World Bank, 1995).

Throughout the development of this new version of the project, efforts to enlist the input and participation of local communities, non-governmental groups, logging concession-holders, and local government units have been systematic. Consultation with local communities has been facilitated by collaboration with WWF and WARSI. The project proposes to tackle the perennial issue of local land rights by developing "Community Conservation Agreements" that will give rights of use to local communities for buffer zone areas and allow them to prevent outsiders from opening new lands within the park.

In short, after a lengthy and quite costly false start during 1992-93, the Kerinci-Seblat ICDP now seems to be headed in promising directions. The key to its eventual impact, however, will be the extent to which it can influence decisions about regional economic development in the larger Kerinci-Seblat region. As the Preparation Report notes, the major risk associated with the project is that "current trends, such as road development, poor logging practices and encroachment continue unabated, thus causing further biodiversity impoverishment and potential Park fragmentation prior to project implementation" (World Bank, 1995).

***Policy Focus—Regional Economic Development Policies and the Proposed ICDP Response*:** Currently Kerinci-Seblat National Park is an embattled island isolated within a sea of resource exploitation concessions, new human settlements and expanding access roads. It is not a setting in which the park is likely to survive as a functioning ecosystem with its full complement of habitats and species.

Can the proposed ICDP ameliorate growing external pressures? Inevitably, pressures on the park will intensify as Sumatra's population and economy grow. Beyond that, developments explicitly mandated, sited, and subsidized by government policies pose significant threats, and government inaction exacerbates others. Strengthened park management and rural development

investments in boundary villages are important, and the ICDP plan emphasizes them. Perhaps even more critical, however, are the specific steps that the ICDP proposes in order to change government policies on regional economic planning and investment.

In the short term, the World Bank has set out conditions on logging concessions, road-building, mining, inmigration, legalization of community-based management plans, and other matters. Government must agree to these if the project is to move forward through appraisal, negotiation, and initial implementation. In the longer term, the ICDP plan proposes restructuring the institutions and processes through which regional development decisions and investments are made, as well as reforms in the management of the logging concessions adjacent to much of the park.

Seventeen logging concessions belonging to 12 companies border almost the full length of the park boundary in Jambi and Bengkulu. (Sixty-one percent of the park lies within these two provinces.) Some concessions include lowland rainforest areas that lay within the original 1982 park boundaries, while nearly 70 percent of the areas lie in hill systems that meet official government criteria for watershed-protection forest. Deforestation rates are high in these concessions—the overall rate of decline for those in Jambi Province is about 48 percent. Reasons for the high rate of deforestation include "an apparent total lack of enforcement against encroachers by Forest officials, concessionaires and local government"; the inappropriate felling criteria in the Indonesian Selective Cutting System, which leads to over-harvesting and serious damage to residual stands; generally poor logging practices; and disparity between regional processing capacity and sustainable wood supply (Sustainable Visions, 1995).

Once logging roads are built into these areas, encroachment follows rapidly. Concession-holders have no incentive to control encroachment in logged-over areas, and local and provincial governments are not inclined to help either (since local revenues from logging are small). As currently managed, these concessions are thus an open-access magnet for encroachment and resource exploitation on the very boundaries of the park. Lacking clear property rights or effective control of access, the concessions are likely to follow the prevalent cycle of authorized but sloppily executed logging, further illegal logging, agricultural encroachment, and ultimate conversion to either degraded scrub and grasslands or monocultural plantations (Barber et al., 1994). They are thus the antithesis of the "buffer zone" concept, in which economic activities surrounding a park are limited, controlled, and supportive of a park's physical and biological integrity (Sayer, 1991).

Change is difficult to bring about, though. The initial ICDP Brief for the GEF noted that "the importance of the Park's biodiversity is based largely on its lowland forest habitat...anything more than a minor reduction in this habitat would substantially reduce the biological significance of the park and may jeopardize the rationale for GEF Financing" (GEF, 1992). The Jambi provincial government, for example, would like to see some logging concessions adjacent to the park included within its boundaries since serious downstream flooding is thought to be caused by poor logging practices. But provincial governments have little say in the granting and oversight of logging concessions, and the powerful timber industry's views generally hold sway (Barber et al., 1994).

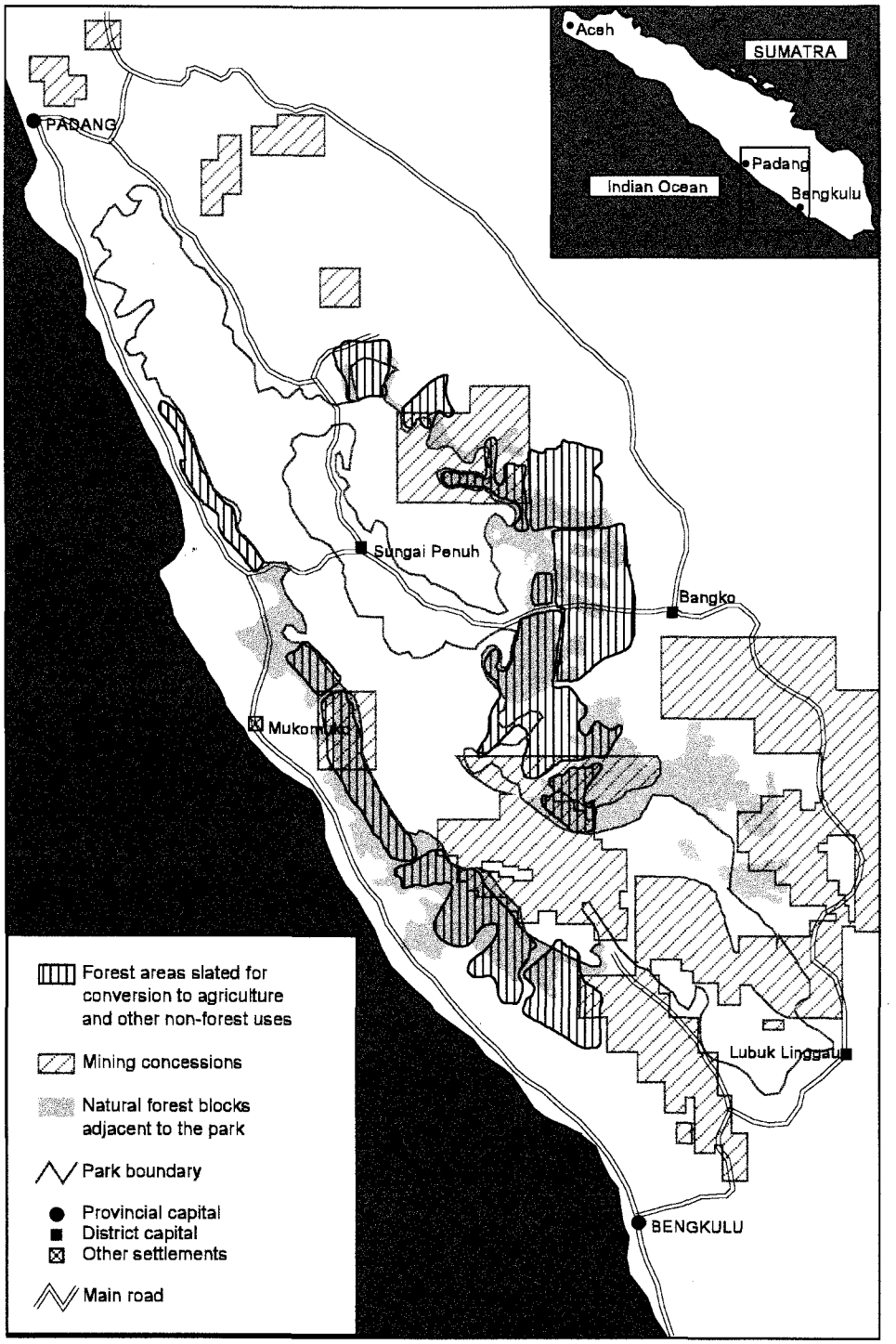
Thus far, the Ministry of Forestry has not been willing to cancel or phase out concessions in these areas, as has been done, for example, on Siberut island. *(See Section 3.2.)* Rather, they have agreed to negotiate with the concession-holders for improved management, including biodiversity conservation. Considering how weak park-access controls are now, these forests may survive longer in well-managed concessions than in the park, if concessions management and monitoring is completely overhauled, as the ICDP proposes.

Major elements of the ICDP plan's concession management strategy are:

- redefinition of the park/concession boundaries to improve the park's biodiversity status;
- development of government capacity for concession monitoring, enforcement and audit;
- contracting a forest-inspection firm to perform independent audits;
- inventory and protection of sites of particular biodiversity importance within concessions; and
- development of community forestry projects in 24 villages near concession areas to stem encroachment.

A key aspect of the ICDP concession plan is its link to the Permanent Production Forest Units (KPHP) program launched by government in 1991. The objective of the KPH approach is to reorganize forest production into rational, profitable units based on reclassifying production-forest boundaries with regional spatial plans,

Figure 4. Mining and Logging Concessions and Forests slated for Conversion in the Park Area



Source: DHV 1993

watersheds, and other physical features in mind. One of the three KPH pilot sites is in Jambi Province, close to the park. Under the ICDP plan, the KPH approach will be applied to the concessions on the park's boundary, with particular attention to biodiversity-conservation priorities and local resource use patterns.

While the KPH analysis is under way, government is obliged to place a one-year moratorium on logging in any areas within the original 1982 park boundaries that meet the government criteria for protection forest. Once the KPH analysis is completed, areas of high biodiversity value outside the new concession boundaries are to be returned to the park. Intact forest areas suitable for neither the park nor logging concessions will be placed in community forests, where local people may harvest minor forest products or hand-log commercial timber species on a sustainable basis under a buffer-zone use contract administered jointly by local government and the park authorities (World Bank, 1995).

The inclusion of these efforts as specific project requirements with firm dates for implementation is an important step toward reducing the pressure on the park from adjacent logging concessions and the encroachment that they facilitate. It will take strong resolve on government's part, however, along with a willingness by the World Bank to stick firmly to its conditions, to make a dent in the current disastrous situation in the forests adjacent to the park.

Logging concessions are not the only developments in the region that threaten the park. Most of the surrounding forest areas not slated for logging are allocated for clearing and conversion to non-forest uses. Tea plantations have been established in the region since the 1920s. More recently, oil palm, rubber, and cocoa plantations have been developed near the park. Additional estate-crop development is planned for the lowlands of Bengkulu to the west of the park and Jambi to the east. "Thus far there has been little consideration of park or wildlife interactions in the planning of any estate crops" (Sustainable Visions, 1995).

Industrial timber estates are also planned for the immediate park area: two cover more than 11,000 hectares in proposed buffer zone areas. One of these is planned for an area still covered in good natural forest, in seeming contradiction to government policy that such plantations be sited on degraded lands.

Timber and agricultural estates might, in theory, provide employment in buffer zones, but wages are so low and working conditions so hard that local residents in the park area generally prefer other work. For this reason, transmigrants from Java are recruited for estate work. Thus, the area's population grows, while local people may be displaced from land outside the park by the plantations, increasing incentives for park encroachment.

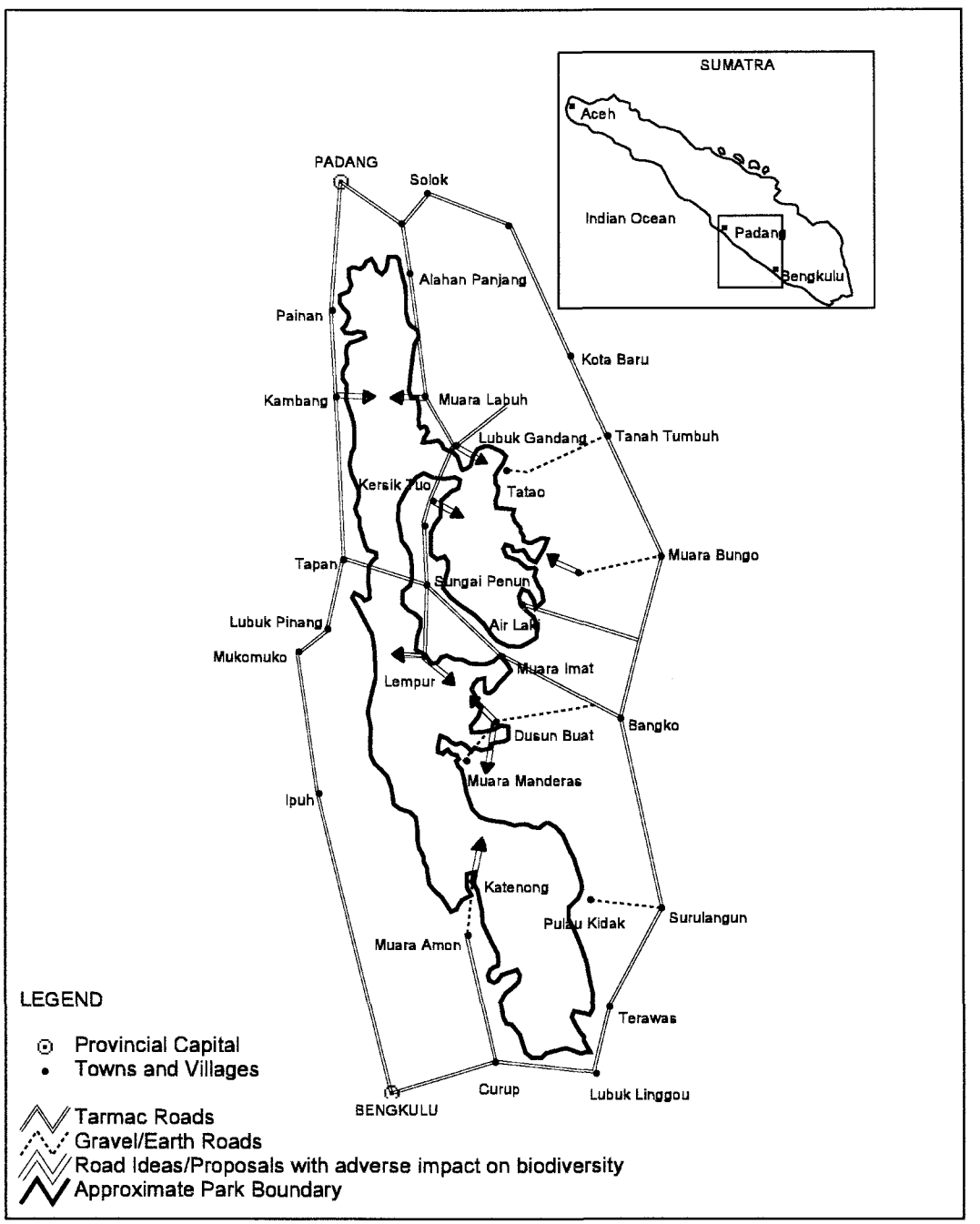
Three mining-exploration concessions are currently operating in the park and surrounding buffer zones. If any of them reveal promising deposits of gold or copper, though, production concessions are likely to cover only a fraction of the current exploration areas since such deposits are usually quite localized. The ICDP would allow exploration to continue for five years, with a guarantee that if no viable deposits are found within that time the concessions will be canceled without compensation. It also requires government to agree not to issue any further concessions within the 1982 park boundaries until the final park boundary is determined. If any deposits are found, the terms of exploitation will have to be set case by case through an Environmental Impact Assessment process (World Bank, 1995).

If these conditions are followed, copper and gold mining should not be a great direct threat to the park. In the worst case, large deposits would draw wildcat miners into the park area (already small-scale mining is creating encroachment and mercury pollution problems at the park's southern end) and make-shift settlements would appear. And given the government's commitment to expand coal mining greatly over the next decade, any discovery of significant coal deposits in the park area could become a major threat. Coal and lignite deposits do occur in and around the park, though there is no record of any coal mining or exploration activity to date (Sustainable Visions, 1995).

Finally, road-building into the park area—and in some cases right through it—has been vigorously promoted by the area's provincial governments in places that seem specifically designed to fragment KSNP. A survey by a DHV consultant found six planned roads that would bisect various parts of the park. He concluded that not only would each road in isolation cause significant damage (increased illegal logging, encroachment, poaching, settlement, and so on), but also that their combined effect would be a "chain reaction" of major disturbances. He noted, too, that most of these plans were "ill-considered" decisions taken in the context of inter-provincial squabbling (DHV, 1993e).

Given strong local pressures for new roads, the ICDP plan seems to have struck the best bargain it could. First, as a condition for project appraisal, it requires a temporary moratorium on construction of all new roads

Figure 5. Simplified Road Map of Kerinci Seblat Area, Showing Recent Road Ideas and Proposals with Adverse Impacts on the Park's Biodiversity



traversing the park, pending completion of biological surveys, research to improve impact prediction, and enlarged capacity to prevent encroachment. Second, any roads proposed after the moratorium have to undergo "rigorous assessment and project justification" through a full environmental assessment (World Bank, 1995).

The requirements laid out in the plan to mitigate the impacts of regional economic and infrastructure developments in the park region are extremely important. Without them, project interventions in park management and local rural development probably won't have any lasting impact. In the long term, however, the viability of the park and of the ICDP's interventions depends on whether regional development planning and investment decisions are reoriented to take biodiversity impacts into account. The Regional Impact Assessment report carried out as part of the ICDP preparation notes that there are two kinds of regional impact assessments: assessment of the impacts of a single large project on a particular region, and "assessment of the cumulative impacts of a number of development projects on a geographic region, and the design of a common, coordinated impact management program to guide the activities of the government and the various project components" (Sustainable Visions, 1995). Unfortunately, only the first type was carried out.

The ICDP plan does, however, include a "regional and spatial planning" component that could provide the basis for developing a coordinated impact management program across sectors and provinces. Its key elements are:

- support to relevant central government agencies to incorporate environmental concerns into regional planning guidelines and apply them to the preparation of spatial plans for the four park provinces;
- development of an interprovincial regional development plan;
- revision of provincial and subprovincial plans to "ensure that they properly reflect agreed community resource management and conservation priorities"; and
- training and institutional strengthening for provincial and subprovincial planning units.

Completion of the interprovincial spatial plan and the passage of local laws that recognize the legality of village land-use plans and community conservation agreements and that provide a mechanism for incorporating them into the spatial planning process are set out as firm project requirements to be implemented by the end of the project's second year of operation (World Bank, 1995).

The current ICDP plan for the Kerinci Seblat region, an innovative departure from business as usual, provides hope that biodiversity conservation and economic development might co-exist, even given the dire threats that the park now faces. The challenge is still immense, though. Currently, a whole range of policies are promoting intensive natural resource exploitation by large private firms and parastatals for the world market, without consideration of the environmental impacts and costs. Conservation of the park's biodiversity appears to rank last behind many other priorities for many key stakeholders. As ICDP work proceeds at Kerinci Seblat, the most important changes to watch for will be those changes in the nature of economic development decisions and investments in the region. The acid test of sustainable development will be forgoing economic benefits that can be gained only at the expense of the region's biodiversity. This is a lot to ask in the context of Indonesia's current political economy, but a great deal is at stake.

3.2 Siberut Island: Tribal Peoples, Biodiversity Conservation, and Development

Biogeography: Siberut is the largest island (4,030 sq km) in the Mentawai island chain, off the west coast of Sumatra. It is administratively part of West Sumatra Province. The island is dominated by sedimentary formations and the soils are characterized by relatively young shale, silt, and marl (WWF, 1980). Although quite hilly, the highest point is only 384 meters above sea level. River systems occur throughout the island, especially in the eastern part.

The island's natural vegetation is tropical rainforest with high rainfall (3,300 mm per annum). The main forest types are primary dipterocarp, primary mixed, freshwater swamp, and mangrove. Common species in the mixed forests are *Shorea*, *Dipterocarpus*, palms, wild species of durian and other fruits, and abundant rattan. Freshwater swamp and mangrove forests are extensive in the east. The Sago palm, the main staple food of the Mentawaians, is common in the swampy areas (WWF, 1980). Despite some logging and the overexploitation of some forest products in recent years, most of the island remains under good forest cover.

Isolated for 500,000 years from the Sumatran mainland, Siberut is known for its high degree of endemism. More than 60 percent of its vertebrates—including four

primate species—and 15 percent of its plants are endemic. About 90 percent of the Mentawai land mammals taxa are endemic and 58 percent of these are endemic at the species or genus level. No other islands of this size have any endemic higher primates, and no other islands in the entire world have nearly so many endemic primates per unit area (WWF, 1980). Of the 112 species of birds found in the Mentawai chain, 11 percent have evolved distinct subspecies, and one species (*Otus Mentawai*) is endemic. The python is the major predator on the island. Few crocodiles are left today after extensive killing by mainland hunters.

Coral reefs ring the east, south, and southwest coasts of Siberut and its small islands, but the largest lie off the central east coast. Green, Hawksbill, and Leatherback turtles breed in Siberut's waters. Dugongs and dolphin also have been reported (Mitchell, 1982).

Local Population and Livelihoods: Siberut's approximately 25,000 people are unevenly distributed in 63 settlements. About 10 to 15 percent of the population is thought to consist of migrants from Sumatra and Java who settled on the east coast over the past 20 years (Mitchell, 1995). Some of the indigenous Mentawaians living on Siberut today still represent an early Neolithic cultural tradition characterized by an egalitarian sociopolitical structure and by the absence of knowledge of weaving techniques, pottery, iron working, or rice-growing. Most, however, do not adhere to traditional ways. Since early times, Siberut has traded with the Sumatra mainland (WWF, 1980). Some of the effects of these external contacts have been the spread of Islam and Christianity, accelerating monetization, the erosion of customary sanctions, and a decrease in self-esteem among Mentawaians. More subtly, traders on the east coast set the standard for what is considered "modern" (Fricke, 1995).

Economic and employment opportunities on the island are limited. Education levels outside of the main towns are quite low, since it is hard to attract and retain teachers in such remote locations, and children spend much of their time with their families away from village settlements. Health conditions are poor, with periodic epidemics of cholera and measles. Infant mortality is higher and adult life expectancy much lower than on mainland Sumatra (PHPA, 1995).

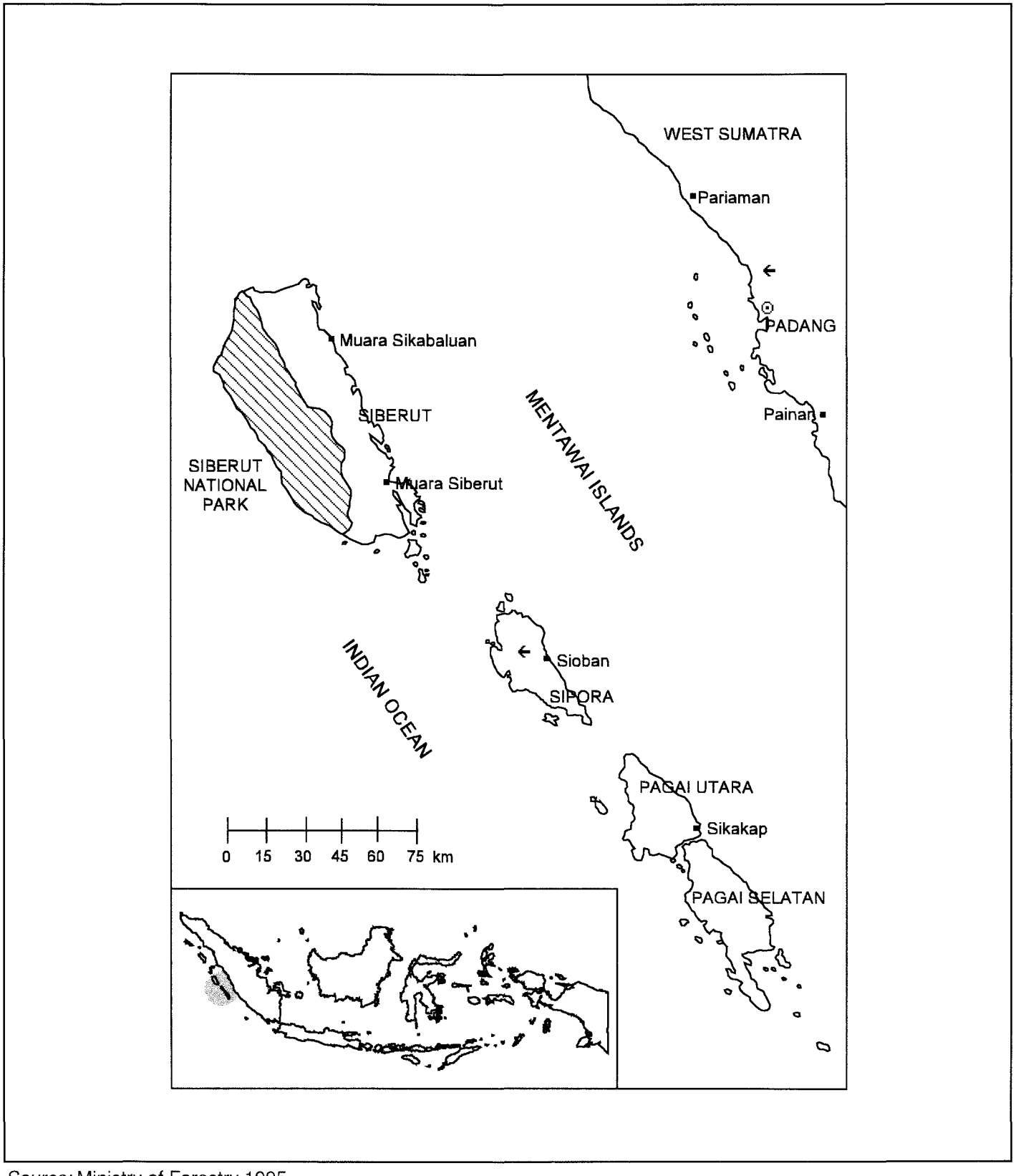
The island has virtually no roads, so all travel is by river and by foot. There is no airstrip, and ocean transportation to the mainland is infrequent and erratic. The rugged western coast, with treacherous currents and surf, is particularly isolated. Siberut's traditional life—at least, until recent government efforts to move people into villages—centered around the *uma*, a clan longhouse that served as the spiritual and socioeconomic center of activities. Each clan has their own traditional religious leader and healer, as well as a traditional leader who manages such *adat* law issues as land rights and marriage. Every family builds field- and pig-farm houses in the surrounding forests, often far from the *uma*, while each clan has specific sago-bearing swamp areas and agricultural lands managed by members of the group. Resource use is regulated by taboos that function as a *de facto* resource conservation regime (Ave and Sunito, 1990).

The forest ecosystem plays a central role for the people in Siberut, who still obtain their livelihoods from hunting and gathering as well as from cultivation and pig-raising. A 1990 survey for example, found more than 100 medicines derived from forest plant species, most composed of a mixture of numerous species (Ave and Sunito, 1990). Traditional forest uses have been ecologically benign. The provincial Medium-Term Plan for the Mentawai Islands notes that "the Mentawai people have, generally, almost never damaged the forest. To farm, they only open what land they need and never use fire to do so. Thus, the forests of Mentawai have been well preserved" (Government of West Sumatra, 1990). This is changing in some ways. The introduction of air rifles has led to the overhunting of some species (primarily monkeys), while the booming market for gaharu resin, obtained from fungus-infected *Aquilaria* trees for the production of incense, has led to the virtual depletion of mature trees of this genus (Fricke, 1995).

Traditional land and resource tenure is complex. All land is owned by clans, and clan members possess full rights, including inheritance, rental, exchange, and sale. Newcomers can acquire land with the permission of the owner and agreed-upon payment. Most have failed to honor this system, however, or to compensate traditional owners for losses of lands, trees, and other resources (UNDP/UNESCO, 1993).

Barter is still significant in some areas, although much less common than in the past. Rattan, gaharu resin, coconuts, nilam (patchouli), cloves, and various marine species are the most frequently traded commodities. Trade is dominated largely by intermediaries from the Sumatran mainland and from Nias island, to the north. Tourism, while still extremely modest, has increased rapidly in the past several years—from about 100 arrivals in 1985 to 2,200 in 1994, almost all young "budget travelers" (PHPA, 1995). Small-scale operators from the mainland bring these tourists to Siberut principally to

Figure 6. Location of Siberut National Park



Source: Ministry of Forestry 1995

see—and photograph—the tribal people and villages of one river valley in the south.

Resentment by Mentawaians in this area against the tour operators—who are "little more than young adventurers out to make a fast buck," who generally know little or nothing of the local culture or ecology (Davidson and Robinson, 1991), who bring little economic gain to the local villages, and who burden them with often-unannounced arrivals of large tour groups—has increased in the past few years. The Mentawaians also increasingly resent foreign tourists, who take too many photographs, sometimes invading islanders' privacy to do so. As one study noted, the islanders are "now rebelling against being regarded and advertised as Stone Age human exhibits" (UNDP/UNESCO, 1993). On the other hand, this "ethno-tourism" also boosts local cultural pride, provides an economic incentive for some communities to maintain traditional practices, and provides income to clans that don't want to change their ways. In any case, tourism currently probably only affects 2 to 4 percent of the clans on the island (Fricke, 1995; PHPA, 1995).

More far-reaching changes in Siberut's economy and society, however, have been caused by government policies designed to integrate Mentawaians into mainstream Indonesian culture and to exploit the island's land and forest resources within the framework of national development priorities and programs. Commercial logging has taken place on Siberut since 1914, but appears to have been unsuccessful through the 1950s, when an attempt to establish a sawmill failed (Van Beek, 1992). Nevertheless, timber concessions covered most of the island by the 1980s, and since they were only marginally profitable because the terrain is so difficult and remote, companies logged extremely recklessly:

> Concessionaires have not respected the terms of their contracts...trees smaller than 50 cm. DBH are cut; logging near rivers, watercourses and steep slopes is common; none have initiated reforestation programmes on logged over forest areas (ADB, 1992).

In March 1992, however, President Suharto issued an order effectively ending all (legal) logging on the island in November 1994. Before this successful phaseout, however, extensive areas of the eastern part of the island, from the north to the south, were heavily logged, sometimes more than once. Some areas were so damaged that they are now dominated by pioneer tree species and scrub, while other areas—probably rarely visited before being cleared—are now used for farming and hunting (PHPA, 1995).

The provincial government's philosophy remains, however, largely biased toward "an infusion of people, land clearing for development and infrastructure and alteration of the traditional economy" (ADB, 1992). In 1990, for example, surveyors mapped out an area in the south of the island reportedly ranging from 10,000 to 250,000 hectares for an oil palm plantation (SKEPHI, 1992), cancelled after an international campaign formed against it (ADB, 1992).

Transmigration schemes have also been put on hold for now, but 15,000 ha in the south and 17,000 ha in the north are still legally reserved as possible transmigration sites (UNDP/UNESCO, 1993). The provincial Medium-Term Plan sees transmigration as an important way to increase the number and development level of Mentawai's population and to "improve the motivation of the local population to become more modern." It would like to see some 20,000 transmigrant families moved to the islands by 1998, at least half of those to Siberut (Government of West Sumatra, 1990). This would mean about 40,000-50,000 new people on the island—about twice as many as live there now. This human wave—and the large land clearings to support it—would rapidly spell the end of indigenous Mentawai culture and would greatly lessen chances for effective biodiversity conservation. A 1992 Asian Development Bank (ADB) report concluded that:

> The negative consequences of forest removal on Siberut may not be fully comprehended by the Provincial government. Many of the current and planned development activities seem to indicate that the authorities are not aware of or have discarded the recommendations of the numerous scientists and specialists who have worked on the island and who have an intimate knowledge of its people, ecology, and potentials...(The government is) without ecological considerations in their overall development plans for the island. (ADB, 1992)

The ADB-funded ICDP recently initiated on the island may be changing the situation in favor of biodiversity conservation on Siberut, however. As noted, logging has ended, and in late 1994, the government assured the ADB that it has no plans to start transmigration settlements or establish estate crops on the island (Qadri, 1994). The fate of Siberut's indigenous tribal people and culture, however, is still very much in question.

Park History and Administration: Siberut's first protected area was the small (6,500 ha) Teitei Batti wildlife sanctuary established in 1976 and surrounded on all sides by recently granted logging concessions. In 1980,

WWF proposed a new land-use plan to the government, dividing Siberut into three zones: 150,000 ha was allocated for protected status under this proposal; 50,000 ha as a strict "core" nature reserve; and 100,000 ha as a traditional-use buffer zone. The remainder of the island—250,000 ha—was allocated for villages, agricultural, and forestry development.

The government responded by expanding the Teitei Batti reserve to 56,500 ha in late 1979. The proposal for a 100,000 ha traditional-use buffer zone was rejected, however, and the government also continued to grant logging concessions overlapping with the new reserve. In 1981, the Teitei Batti reserve was officially designated as a Biosphere Reserve by UNESCO's Man and the Biosphere program. Proposals to declare the entire island a Biosphere Reserve are now being considered by the Indonesian Government and UNESCO (Mitchell, 1995). In 1982, WWF submitted a proposal to the government for an expansion of the existing reserve to 138,000 ha, and the government did expand it that year to 132,900 ha.

In August 1993, the government broadened Siberut's protected area to 190,500 ha and changed its designation to a National Park. The PHPA has also recently revived a 1982 WWF proposal (Mitchell, 1982) to create a marine reserve on parts of the southeast coast.

Early on, a Conservation Master Plan (WWF, 1980) and a subsequent five-year Management Plan (Mitchell, 1982) were developed for Siberut. Although neither plan was implemented as written, both seem to have at least influenced the government to expand the island's protection area (McNeely, 1994). Only a small portion of the boundary has been surveyed and marked, and as of 1992 PHPA had posted only four field staff for the whole park—too few to have much impact on destructive gaharu and rattan-gathering methods or on logging encroachments into the park. The buffer zone is poorly defined, and no efforts have been made to reduce local people's overexploitation of non-timber forest products in the reserve.

Damage from such overexploitation continues. Indeed, increased contact with the mainland and the development of a cash economy, and intensification of some traditional activities—such as collection of rattans and gaharu resin—now seriously threatens the island's biodiversity.

Beginning in 1986, people on Siberut started to gather gaharu, a valuable resinous wood that has long been collected in many parts of the Outer Islands. Gaharu is extracted from the heart wood of the *Aquilaria* tree, but only some *Aquilaria* trees produce the marketable resin, which is thought to be caused by a fungal infection. Prized as an incense and medicine in Asia and the Middle East, the demand for high-grade gaharu far outstrips the available supply, prices are extremely high, and rapid exploitation now threatens *Aquilaria*. In Kalimantan, the traditional source for the world market, gaharu collection is a customary activity of various forest-dwelling Dayak groups, and collectors have developed methods for determining if a particular tree is resin-bearing. In Siberut, however, where collection has only recently become part of the local economy, collectors indiscriminately cut all *Aquilaria*. The harvest is processed and consumed abroad, and most profits are made by traders outside the collection areas.[5]

Rattan collection has also reached unsustainable levels. Two species, Manau (*Calamus manan*) and Sega (*Calamus caesius*), are widely gathered. Although prices for raw rattan have tumbled since the government's 1987 ban on unprocessed rattan exports, it is still sought on Siberut. Stocks of desired species are now so depleted, however, that collectors must go far into the forest to find it. In 1994, more than 300,000 poles of the more valuable (and larger) Manau rattan were harvested in the north of the island, a level that is definitely unsustainable (Fricke, 1995). As with gaharu, the rattan trade is largely dominated by mainlanders—one company in the north and another in the south (UNDP/UNESCO, 1993). A cooperative of Mentawaians with 70-100 members, however, controls about 20 percent of the Manau rattan market (Fricke, 1995). Both rattan and gaharu overexploitation not only eradicate the particular species sought, they also cause deleterious changes in forest structure through erosion (ADB, 1992).

In the past, hunting monkeys and other animals did not appreciably reduce their populations, partly because the Mentawaians value harmony between human activities and other species and because ritual regulation has provided sustainable limits.

Outsiders have long tried to "civilize" the Mentawaians. Under the current government, they have been obliged to choose one of the officially authorized religions—Islam, Christian, Hindu, or Buddhist—and most have registered as Protestant or Catholic, though some are Moslems. The imposition of these new religions has progressively loosened traditional proscriptions on the overexploitation of natural resources, especially among the younger generation. Other important factors include the introduction of new technologies such as air rifles and chain saws, and, perhaps most important, the in-

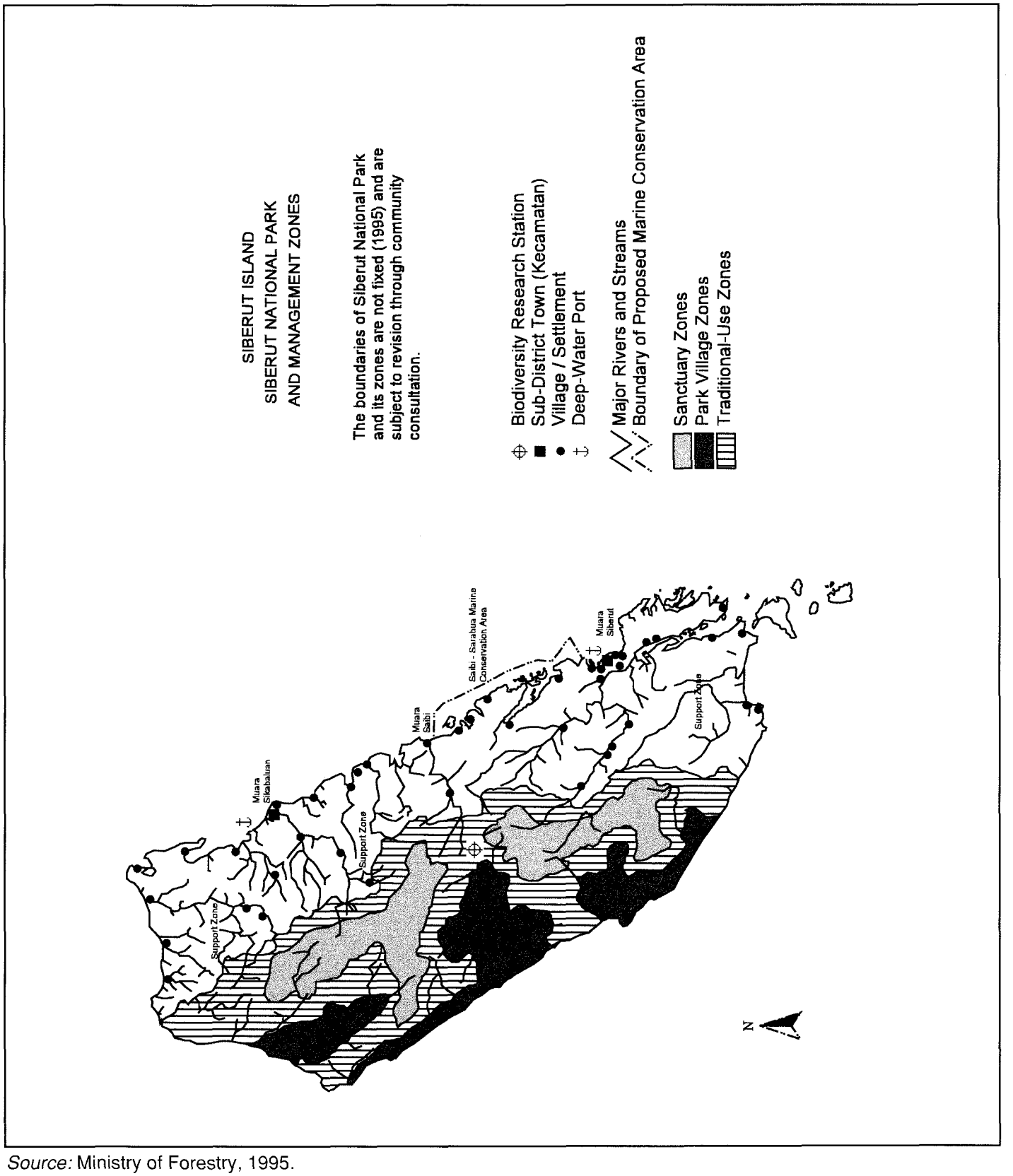
creasing integration of Mentawaian society into the cash economy of the mainland.

The Siberut ICDP: In 1993, the Asian Development Bank agreed to a loan in support of a $40 million government project to carry out ICDPs over six years in two areas of the country, including about $18 million for Siberut.[6] Among the most important objectives and activities set forth in the most recent version of the Siberut Integrated Conservation Management Plan are to:

- manage the entire island of Siberut as an Integrated Conservation and Development Project or Biosphere Reserve through a zoning system that includes Sanctuary, Traditional Use, Intensive-Use, and Park Village Zones within the National Park, and a Support Zone outside the Park;
- maintain the biological diversity of lowland tropical rainforest in the National Park, including its complete array of natural ecosystems, flora, and fauna;
- initially place all designated forest lands on the island under the unified authority of the PHPA and strengthen its management capacity;
- eventually transfer management responsibility from PHPA to a partnership of co-management that includes local institutions, such as traditional clan councils, PHPA, other government agencies, and the private sector;
- support local communities by respecting customary rights to forest resources within the National Park and allowing traditional sustainable uses that do not threaten the conservation values of the park;
- implement a Community Awareness, Mobilization, and Extension Program (CAMEP) to mobilize people to plan and implement their own village-based development plans and to facilitate community input into delineation of traditional land claims and park boundary delineation and zoning, the program carried out by a partnership of local Mentawaian NGOs and the PHPA;
- support the establishment of Village CAMEP Councils to catalyze the full participation of local communities in planning and implementing both park management and local development activities, and have the Councils, composed of existing community *adat* organizations, eventually co-manage the park with the PHPA;
- establish an island-wide Siberut Socio-Cultural Council to support and protect indigenous land and resource rights as well as Mentawaian cultural integrity;
- facilitate the improvement of health care by improving facilities and access, linking traditional and modern health care practices, and developing a health extension program and Mobile Health Clinic;
- promote the production of a range of cash and subsistence crops, small-scale logging outside of the National Park, and a range of small enterprises, including support for the development of entrepreneurial skills and for the establishment of at least one new financial institution on the island to provide local credit;
- establish a Biological Research Station in the Park and an island-wide program of anthropological, biological, and ecological research, with highest priority given to research with direct applications for ICDP implementation; and
- integrate the National Park into Provincial development plans to ensure achievement of both long-term conservation and local socioeconomic development goals (PHPA, 1995).

These are ambitious goals, and the project is still in the early stages of implementation. Even so, the government's end to logging on the island, and pledge that neither transmigration nor estate-crop schemes will be initiated there are important and tangible steps toward a working ICDP on Siberut. Although the island's isolation and its relative lack of economic importance have doubtless contributed to the government's willingness to reverse past policies and essentially declare Siberut off-limits to large-scale commercial exploitation, the result is that Siberut may be a case where an ICDP is taking place within a supportive regional economic development policy framework. The key challenge will be to make good on the promises to respect and support the fragile Mentawaian culture while improving the health and livelihoods of its people and conserving the island's biodiversity. To do this, the ICDP must get the active participation of affected communities and work with them to improve their welfare. In particular, cultural integrity will follow from true respect and commitment from the government for indigenous land tenure rights. If the Siberut ICDP can actually protect the island's cultural diversity as well as its biological diversity, it will be a truly innovative enterprise and a model for other ICDPs in areas occupied by indigenous groups.

Figure 7. Siberut Island, Siberut National Park and Management Zones



Source: Ministry of Forestry, 1995.

Policy Focus—Indigenous Culture, Government Policy, and ICDPs: Isolated from the mainland and lacking resources of commercial interest, Siberut received little intervention from the Dutch colonial government, and its traditional culture remained largely unchanged into the 1950s. After independence in 1945, Catholic and Protestant missionaries arrived on the island; in 1954, the government banned the island's traditional religion and gave the Mentawaians three months to choose between Islam and Christianity.[7] Resisters were harassed by police and missionaries who burned their religious implements. Concurrently, the government began resettling Mentawaians from their scattered *uma* communities into concentrated government camps near the coast and forbade all signs of their "backwardness," including long hair, beads, loin cloths, and traditional body tattoos (Schefold, 1988).

In the 1970s, as noted above, the government handed over virtually the whole island to logging interests without compensation for the Mentawaians, despite their long-standing claims of ownership of the lands in question. Compensation has been sporadically provided for the loss of some trees to development projects, but payments have been tokenistic (UNDP/UNESCO, 1993). In 1993, much of their former territory was declared a National Park. Despite the professed intention of the ICDP to incorporate local rights and resource uses fully, many Mentawaians are by now understandably suspicious of altruism from outsiders.

Past attempts at deculturation and dispossession of the Mentawai of Siberut stemmed mainly from the misguided zeal of missionaries and local officials. But many national policy-makers also seem to want to suppress indigenous cultures throughout the country:

> Traditional cultures and lifestyles are regarded as clear signs of underdevelopment and as formidable obstacles to necessary socio-economic advancement.... (M)ost development planners in Indonesia view traditional culture, before the fact, as at best no asset to development and at worst as a hindrance to it; after the fact, they blame it for many of their failures. (Dove, 1988)

Indeed, the official government position has long been that there are no "indigenous peoples" in Indonesia. As a government delegate to the March 1995 U.N. Social Summit stated: "What we have is people in remote and isolated communities." (*Jakarta Post*, 1995). Accordingly, a special Directorate for Development of Isolated Peoples (DBMT) within the Ministry of Social Affairs is charged with defining, locating, and directing the development of isolated tribal groups. DBMT's literature characterizes such peoples as "backward," "primitive," and "disoriented in time." The remedy, according to DBMT, is to bring these communities out of their historical territories into an idealized state of modernity by physically moving them closer to government supervision (Zerner, 1992).

In Siberut, as in most other parts of the country, the government has not been very successful in this venture. The provincial government reported in 1990 that of the 17,560 people classified as "isolated and backward" on the Mentawai chain (three smaller islands and Siberut), only 29 percent had been moved to resettlement camps to date. And while the report admitted that little had been done to "develop" those already moved (largely because officials live two hard days of traveling away, on the mainland), it asserted that the remaining 71 percent should be resettled in coming years (Government of West Sumatra, 1990).

Although they have waxed and waned in intensity over the past several decades, these policies of cultural assimilation have had significant impacts on Siberut's society, economy, and environment. Incidence of disease has increased in resettlement villages, and government health services are nearly nonexistent, though the local government has sporadically sought to eradicate traditional healers (UNDP/UNESCO, 1993). Resettlement has also changed land-use patterns, particularly in the north, caused economic hardship, and helped erode the traditional way of life. Sago groves and other subsistence resources are now far from resettlement villages, and so people must rely increasingly on the cash economy to buy necessities, to pay taxes, and to purchase the clothes and shoes that the government pressures them to wear. To pay, the people have turned to the only ready source of cash—overexploitation of rattan, gaharu, and other forest products.

Resettlement has also disrupted traditional authority and governance mechanisms. All legal authority is now in the hands of the government's village headman (*kepala desa*); abuses of power and the misappropriation of funds are frequent as a result (Simanjuntak, 1993). In any case, concentrating power in the hands of one person is completely antithetical to the clan-based traditional authority and dispute-resolution system. All administrative personnel above the rank of village headman are based on the mainland and have little contact with the island, so appealing decisions of the headman is close to impossible (UNDP/UNESCO, 1993). As in other parts of Indonesia, "the government is attempting to create and impose an entirely new reg-

ulatory system based upon civil law. In practice, this has succeeded only in eliminating a traditional system that worked and introducing a new one that does not" (Dove, 1988).

Traditional environmental knowledge has been similarly disparaged. The curriculum at government schools excludes traditional knowledge, and the government's view of the people as backward and primitive has resulted in disinterest—at best—in the resource-management systems that the Mentawaians employ. Their system of shifting cultivation, for example, is unique in its avoidance of fire to clear land and its nonintrusive integration of farming into the forest ecosystem. Despite its oft-repeated intention to find alternatives to "destructive slash-and-burn farming," the government has not, until the advent of the ICDP at least, expressed interest in or support for the Mentawaians' sustainable alternative.

Does the ICDP project reflect significant change in government attitudes, and can it reverse the erosion of the Mentawai culture? The alternative to the ICDP is not for the Mentawaians to develop as they see fit, without any outside pressures. Indeed, the most likely alternatives would be extensive commercial logging, transmigration, and the development of estate crops—the activities planned for the island until the ICDP came along. Exposure to wider market and cultural forces and to expanded economic and educational opportunities is in any case going to trigger substantial changes in Mentawaian society, as it has in virtually every other society across the planet.

To the extent that it represents a true change in government policies toward indigenous Mentawaian culture, the ICDP plan for Siberut now being put forward provides the Mentawaian people with a reasonable chance of both preserving their culture and improving their socioeconomic status. The ban on logging and the cancellation of plans for estate crops and transmigration has provided the breathing space needed to do so. Strengthening traditional institutions as well as nongovernmental groups and giving them a stronger role in planning and managing both the park and local economic development activities, can provide the necessary institutional vehicles. Acknowledging that *adat* land rights and resource uses must be respected is a key element of the ICDP plan that must be acted on if the project is to work.

Already, though, at least some observers who have been involved in the project feel that the emphasis has been more on delineating traditional boundaries to ensure that local communities do not trouble the project, and that the commitment of the government to truly participatory conservation and local empowerment is tenuous. Community leaders remain quite skeptical, and the apparent government vision of Siberut as an ecotourism playground and biodiversity prospecting collection site does not promise significant concrete benefits to either local culture or welfare. The Management Plan sets a new and innovative course, but it is unclear whether existing government-management institutions and attitudes can realize the Plan's promise.

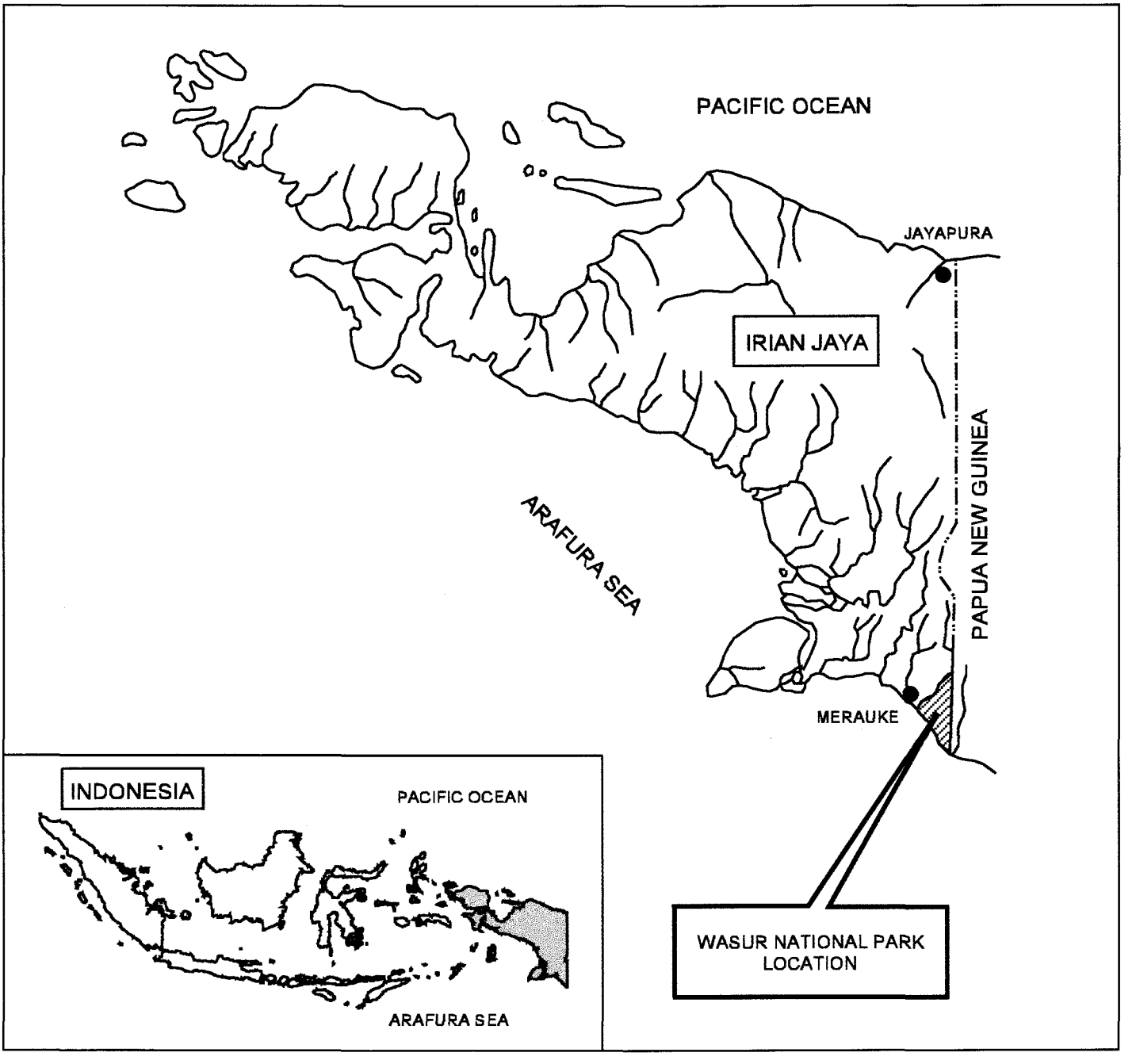
Just as ICDPs cannot flourish in an unsupportive regional economic policy environment, they cannot succeed where the institutional culture of the implementing agencies is essentially at odds with key components of the project. Support for strong community participation and respect for indigenous cultures outside the mainstream have not been elements of Indonesian forestry policy in the past. Nor does the Asian Development Bank, the chief project funder, have a very good record in these areas. The Siberut Management Plan sets a course to change this, but makes no provision for reforming PHPA and the agencies of local government who must carry the plan out. Whether they are up to the task is an open question. But the world will be watching this project, often with a skeptical eye.

3.3 Wasur National Park: Can People Living in a Park Actually Save It?

Biogeography: Wasur National Park is located near Merauke town (capital of Merauke District) in the extreme southeastern corner of Irian Jaya, bordered by the Arafura sea to the west and south and by Papua New Guinea on the east. It is contiguous with that country's 51,000 ha Tonda reserve. Covering 413,810 ha in the flat alluvial southern plain (this figure is in doubt, as discussed later), its highest point is only 90 meters above sea level. The park extends northward from the Arafura coast, through a flat coastal plain, and rises gently to a low, flat to gently undulating plateau. It is bisected by the Trans-Irian Highway, built in the 1980s. The landscape—unique in Indonesia—strongly resembles that of northern Australia's coastal areas.

Habitat types in the park include the littoral zone, the coastal back plain, floodplains, plateau, and riverine areas. There are five main vegetation types, including forests of mixed *Eucalyptus spp.* and *Melaleuca spp.*, forest with *Melaleuca spp.* dominant, riverine vegetation, mangroves, and savanna-like grasslands. While the park is known to support certain plant communities and species not found in Indonesia outside of the Merauke

Figure 8. Location of Wasur National Park



Source: PHPA 1994

region, data on the area's flora are very limited. Some 240 bird species have been recorded in the park, 114 of which are protected and 74 of which are endemic to Irian Jaya. Some eighty mammal species also live in the park, 27 of them endemic to Irian Jaya. Although little is known about the area's reptiles, amphibians, and fish, it is estimated that there may be 72 freshwater fish species, representing 21 percent of all known freshwater species in New Guinea. Both flora and fauna show close affinities with neighboring Australia (PHPA, 1994). Many areas of the park are interrupted succession ecosystems that require periodic burning and the culling of the deer population to maintain their current biodiversity (Bowe, 1995).

Local Population and Livelihoods: Some 2,500 people live within the boundaries of Wasur National Park in 13 villages. Of these, 1,900 are classified by the Park Management Plan as "traditional"—members of tribes that own land in the park under traditional law—while the remainder have government-issued legal titles to land. The park encompasses a major part of the territory of the Kanum people (whose lands extend into Papua New Guinea) and also a significant stretch of Marind territory along the coast. (Most of the park lies within the territory of these two tribes.) The Marori people also have lands within the park, and the Yei people use Kanum land in the far northern part.

Traditionally, these tribes lived as hunters and gatherers, taking from the forest only what they needed to live without depleting its resources. Their traditional pattern of life revolves around collecting sago, gardening, and hunting and fishing in traditional collecting grounds known as *dusun*. The *dusun* and villages, the centers of everyday life for the people, are where culture and traditions are passed on from generation to generation. Although life-styles have changed considerably following contact with outsiders, traditional ways are still important.

Land ownership patterns developed over centuries are inextricably linked with tribal histories and interactions. Many sites are considered sacred, ranging from a specific area of forest to a particular tree or spring.

The boundary of each tribal area is further divided into settlements and then clan areas. Each clan member has a strong obligation to guard the clan's lands against encroachment by outsiders and misuse or overexploitation by clan members. The entire Wasur National Park is thus under a land-ownership system supported by traditional law, though under national law it is—legally, at least—controlled and managed by the state. The Director of National Parks stated in 1992, however, that traditional "land rights remain intact as far as this does not interfere with the overall conservation of the National Park" (PHPA, 1994).

Park History and Status: The Wasur area, first designated a Wildlife Reserve in 1978 with an area of 210,000 ha, increased to 308,000 ha. in 1982. In 1990, the reserve was declared a National Park. Subsequent surveys have determined the actual size of the designated area to be 413,810 ha, but the figure of 308,000 ha (incorrect due to a technical error) remains in the official proclamation. No official National Park gazettement has yet been issued, however.

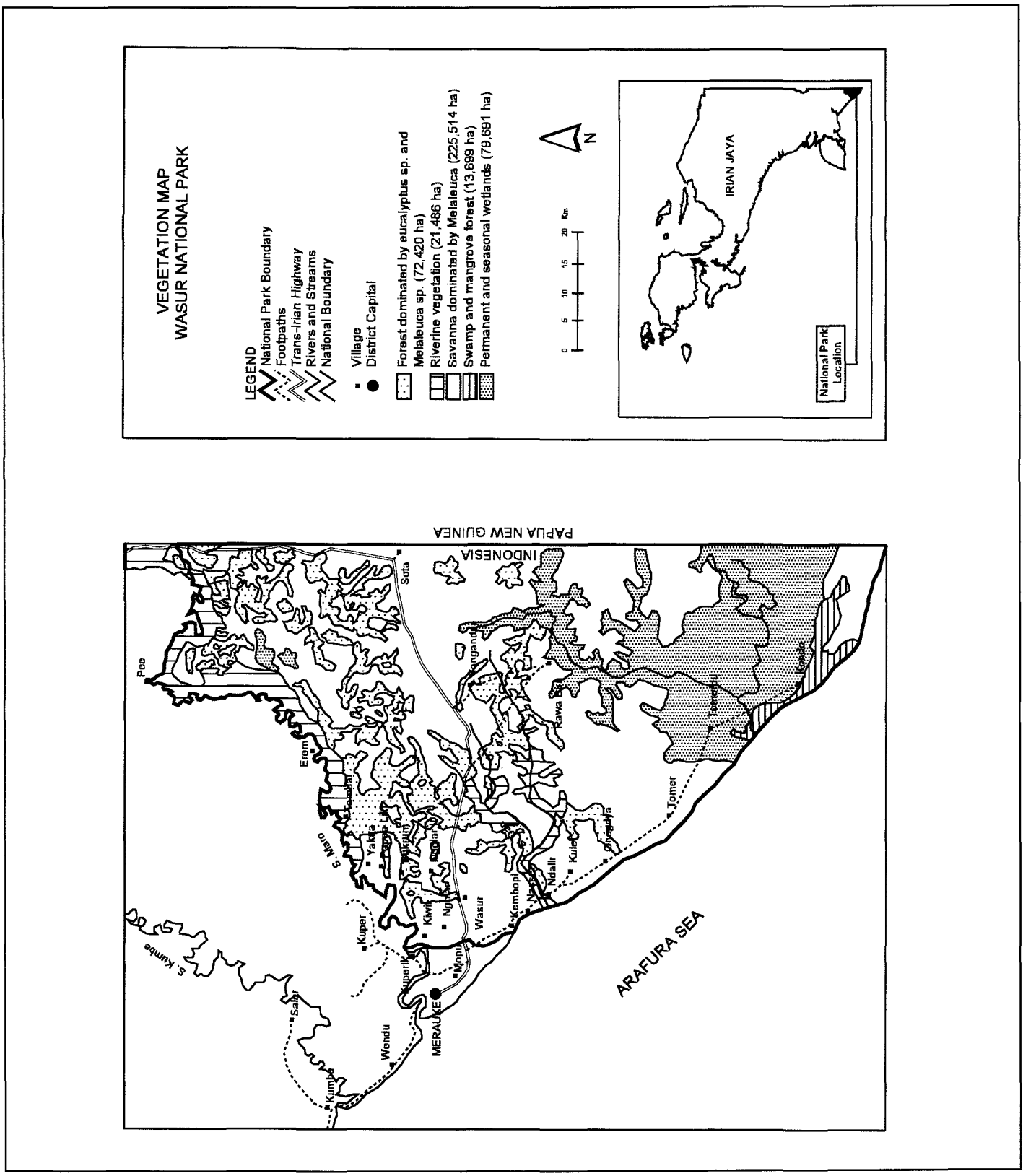
PHPA, with assistance from WWF, drafted a Management Plan in 1992 and held consultations in Jakarta and in Irian Jaya during 1993. With a World Bank loan, a team of consultants commissioned to finalize a 25-year management plan completed their work in March 1994, though the plan is still being revised. Its key management objectives are:

- preservation of the park's natural and cultural heritage;
- protection of the traditional rights and practices of traditional residents;
- generation of sustainable economic development for direct benefit of park residents;
- raising awareness of the park's values for residents and visitors; and
- development of sustainable tourism efforts.

The park's management infrastructure is extremely underdeveloped. Prior to 1991, the park was essentially unmanaged. The local PHPA office, a small building lacking electricity and telephone service, currently serves as the park headquarters (though the local WWF office has served as an additional *de facto* office). In 1992, the only full-time paid staff were three field officers, a senior PHPA operations advisor, a WWF project advisor, and a forestry officer (PHPA, 1992). The local PHPA guard force had increased to five by 1994, their salaries paid by WWF. WWF has played a major role in strengthening management of the park, providing both funding and expertise for fieldwork (such as "ground-truthing" zoning plans) and development of the Management Plan. The local government treats the WWF office as if it were a *de facto* government agency. Realizing, however, that it will not be in Wasur forever, WWF has been working to establish a new local group—the Foundation for Community Development in Wasur National Park—with a field staff of community organizers; a management board of community representatives, teachers, and other informal leaders; and a steering committee composed of the PHPA, WWF, the local District head, and community representatives. While the foundation's legal status is just being established, it is already working in the park to help local communities meet their immediate economic needs (Bowe, 1995).

Just 2 km from Merauke (population 44,000; the major town in southern Irian Jaya), bisected by the Trans-Irian highway, and near several large transmigration settlements, the park faces severe threats. The Asian Wetlands Bureau avers that "the threats are so great that it is estimated that within 3 years a considerable portion of

Figure 9. Vegetation Map: Wasur National Park



Source: PHPA 1994

the reserve will be destroyed" (PHPA, 1994). Southern Irian Jaya is a major target for the transmigration program, and more than 19,000 people have been settled directly across the Maro River from the Park. Transmigrants combined with the population of greater Merauke thus total 70,000 people living on or near the park boundaries, nearly 28 times the number of park residents. A decision has recently been made to reroute the Trans-Irian Highway along the far side of the river from the park, which will substantially ameliorate encroachment pressures. The existing road into the park will be used only for park-related access (Bowe, 1995).

Poaching is common, mostly for deer, but also for birds. On many nights between September and December, the park receives an onslaught of deer hunters in jeeps and on motorcycles, hunting with guns and machetes. The deer meat (from an introduced but protected species, *Cervus timorensis*) is sold in Merauke, where it constitutes 80 percent of meat consumption. About 5,000 are killed each year, and a 1992 survey found only about 7,200 deer left. More recently, however, gun-hunting has been brought under control (hunting by local residents with traditional weapons is permitted), and deer populations have grown large enough to damage some areas of the park (Bowe, 1995). More than 1,000 cattle are also grazed in parts of the park, doing considerable harm.

The Management Plan concludes that "the single biggest threat" to the park is poverty: "The motivation behind hunting, logging both small and large scale, species trading and land selling, to name but a few, is the continual search for cash to buy food, clothing, education, improved housing and medication" (PHPA, 1994). These are threats that the plan tries to address in innovative ways, but its scope appears too restricted given the threats arising from the rapid growth of population, settlements, and economic activity in the region around the park. If the planning grid for integrating conservation and development does not extend to regional economic development decisions—particularly vis-a-vis continued transmigration—at best the park's destruction will simply be forestalled. Nevertheless, the plan and related activities advance Indonesian thinking on how to integrate biodiversity conservation and development.

Policy Focus—Multiple-Use Zoning of a National Park: The most creative feature of the Wasur Management Plan is its system of multiple-use zoning, including strategies and incentives to establish sustainable types and levels of use in each zone. Based on the assumptions that traditional land rights, settlement, and uses are too well established to be overridden or ignored, that external threats to the park cannot be countered without energetic access control and resource management efforts by traditional residents, and that the park must provide tangible economic benefits to park residents if they are to support it, the Management Plan departs completely from the hitherto dominant Indonesian park management model in which government officials restrict park access against local encroachers. At Wasur, the "encroachers" are in essence seen as the primary line of defense against the park's destruction.

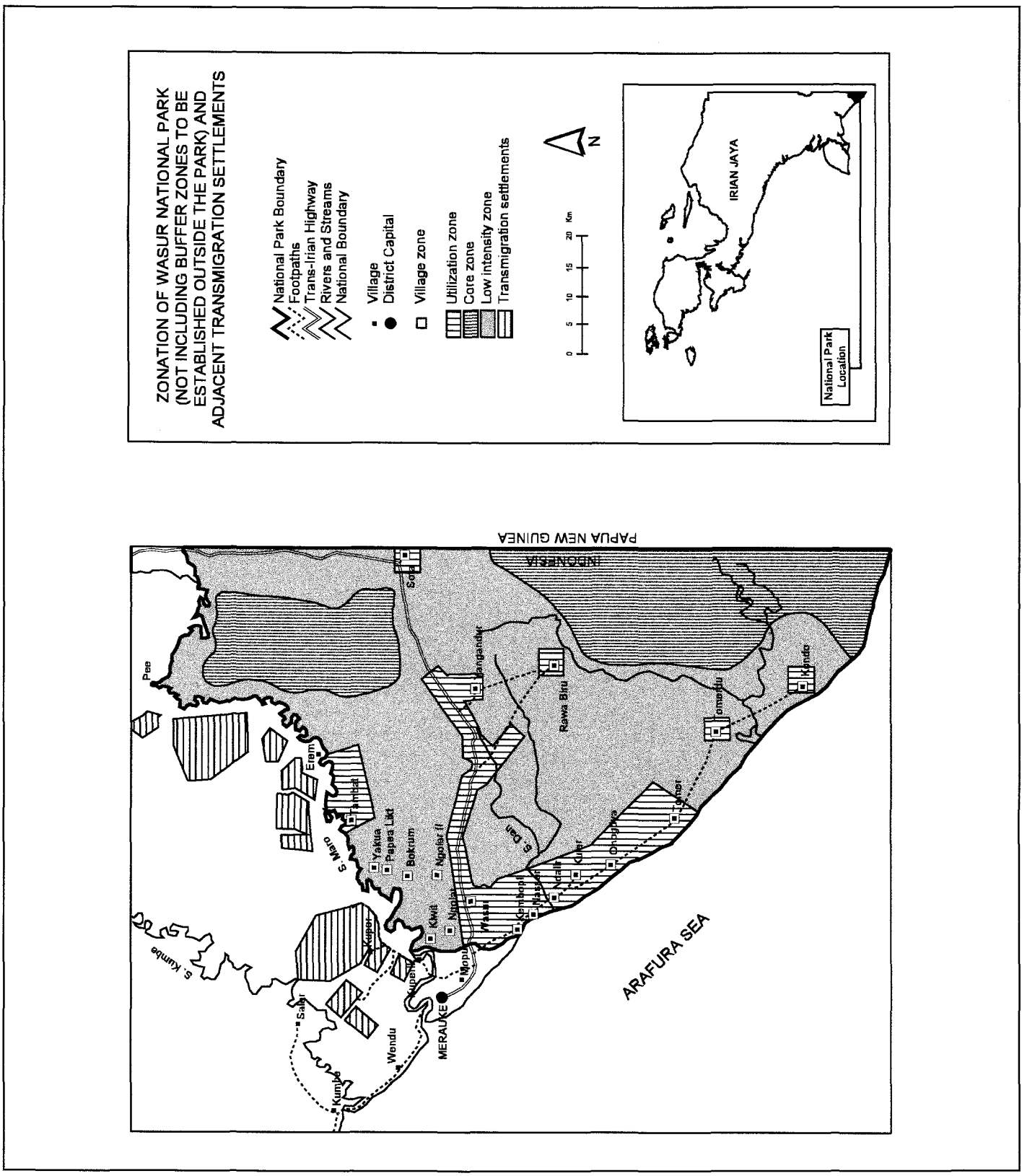
The Plan divides the park into six zones: traditional use zones, village zones, utilization zones, low-intensity use zones, core zones and a buffer zone outside the park border. These zones are to be legalized through new park by-laws. Establishing the overall boundary has not been as difficult as it has proven elsewhere since the park is naturally bordered for most of its perimeter by large rivers and the Arafura Sea. Boundaries for the remaining sections were set by the government in consultation with local landowners.

The *traditional use zone* covers the entire park area, and other zones are laid over it. Rather than allocating limited areas of the park for traditional use as an exception to strict protection, traditional use is assumed to be dominant, while other zoning categories are exceptions carved out of it. Recognized traditional uses include bow, spear, and club hunting of various game; farming on small plots; cultivation of sago, coconut, betel nut, and bamboo in the long-established traditional growing areas (*dusun*); fishing; collection of various forest products and fuelwood; brush burning for such purposes as flushing game; and canoe and foot travel to all parts of the reserve and across the border into Papua New Guinea.

Not all activities may proceed unchecked, however, since non-traditional activity has depleted some species (such as crocodile) to the point where a recovery period is necessary. There is also provision to monitor traditional uses closely to ensure that local residents do not use new technologies (such as air rifles) and do not exploit traditionally-harvested resources for commercial gain. Park residents are, however, allowed to hunt deer for commercial purposes—within certain guidelines—as an economic alternative to the practices that are depleting some wildlife populations. Notably, non-residents may not hunt or collect plants and animals from *any* zone within the park, under severe criminal penalties.

Village zones, in practice inseparable from surrounding utilization zones *(see below)*, allow established communities to remain in place. Community-development pro-

Figure 10. Zonation of Wasur National Park



Source: PHPA 1994

jects (such as schools and health clinics) are allowed, but can be established only in coordination with the park management. Immigration into these zones is, however, strictly forbidden.

The *utilization zones* provide for recreational activities (for example, recreational fishing), visitor-oriented infrastructure development, and non-traditional sustainable development activities consistent with conservation objectives, in addition to the traditional uses noted above. These zones are established surrounding all villages and major roads, with their exact boundaries decided through close consultation with the villagers and after detailed research to ensure that proposed economic activities (such as distillation of aromatic oils from Melaleuca trees) will not exceed an area's biological capacity.

The *low-intensity use zone* overlays the traditional use zone, but also allows low-impact visitor uses, such as walking, horseback riding, recreational fishing, and solitary camping. All motor vehicle use in this zone will be strictly regulated and, if necessary, prohibited.

In several *core zones*, all access other than approved scientific research and those traditional activities needed to maintain human-influenced habitat and biodiversity are restricted. These zones also protect some of the most important sacred sites from disturbance.

A *buffer zone* is to be established outside the park along its western and northern boundaries, where human pressures are intense and the Trans-Irian Highway enters the park. Two unofficial villages of settlers from other parts of the province have developed near the boundary in this area, and garden expansion and fuelwood gathering are occurring ever closer to the park. Meanwhile, large-scale sand extraction is devastating mangroves along the coast. Plans are to establish a "living boundary" of tree species already recognized as traditional boundary markers, survey threats to the park in the buffer zone, and promote forest replanting and sustainable collection of forest products. Hunting, fuelwood collection, and agriculture are all prohibited in the buffer zone, and PHPA border-guarding activities are to be stepped up.

To implement this zoning plan and the many other activities envisioned under the management plan (tourist-facility development, public awareness, control of exotic species, fire prevention, and so on), the Management Plan envisions a greatly strengthened PHPA presence, including nine headquarters staff, 15 park rangers, and new headquarters facilities and guardposts. Village Park Councils, however, are seen as the most important part of the management structure for the park. They are to channel information back and forth between traditional decision-making processes and the PHPA, to serve as advocates for park residents, to enable these residents to become formally and integrally involved in the management of the park, and to provide a village-level organization that nongovernmental groups can work with.

The membership and structure of each council is to be decided by the villagers. In addition, a Park Resident Advisory Body is to be formed from representatives of each Village Council to meet every few months to assess new plans offered by the park management, submit requests and proposals, and table intertribal problems (such as land conflicts) for resolution (PHPA, 1994). Local WWF staff consider these Councils are a workable concept, but believe that it will take at least a decade for them to become effective resource management actors (Bowe, 1995).

The Wasur Management Plan is a hopeful first step in reversing the degradation of the park's biodiversity, partly because its philosophy toward the tribal peoples living within the park's boundaries is so innovative. By protecting their traditional rights in land and resource use while offering the opportunity to acquire new skills and sources of income compatible with the region's growing market economy, the plan strikes a balance rarely seen in Indonesia between biodiversity conservation, protection of indigenous rights and cultures, and economic development. As such, it is a model for many protected areas in Indonesia (and elsewhere) and deserves strong support from the central government and the international donor community.

These strong positive features notwithstanding, the plan does not seem to take on the issue of how it fits into the larger regional development future of the Merauke area. In the late 1980s, the government strongly promoted a massive pulpwood scheme (eventually abandoned) with U.S.-based Scott Paper, which would have turned some 200,000 ha of tribal land north of Merauke into a giant plantation and factory complex and flooded the region with people. The current national development plans calls for intensified transmigration to the Merauke area over the coming decade.

In line with the government's policy (since 1990) to accelerate development in eastern Indonesia, donors such as the World Bank and ADB have been asked to target project support to that region. It is this push for rapid economic growth based on in-migration of non-Irianese and natural resource exploitation that poses the greatest

long-term threat to the park. The participatory, multiple-use approach to managing Wasur must therefore be accompanied by regional development policies that minimize the inflow of people and natural resource-intensive investments into the surrounding region if this innovative new approach is to make any difference in the long run.

IV.
Key Policy Issues and Recommendations

The cases of Kerinci Seblat, Siberut, and Wasur illustrate the diverse and complex policy issues confronting on-the-ground biodiversity conservation the in Indonesia. Three sets of issues are particularly important. First are those related to planning and managing of protected areas in the field. The second involve policies that catalyze and shape economic development in the regions surrounding protected areas. Third are certain multisectoral national policies that can determine the fate of Integrated Conservation and Development Projects (ICDPs)—especially the laws and regulations governing property rights and relations and the economic policies affecting the balance of incentives for exploitation and conservation of forests and other natural resources.

4.1 Protected Areas Planning and Management

Protected areas policy must change in four ways to facilitate ICDP-type efforts. First, the reality of human use and occupation of protected-area lands and resources must be acknowledged and policies designed to minimize their impacts, secure local livelihoods, and enlist local residents in controlling park access and resource exploitation. Second, new policies on protected-area border-setting and zoning needed to support the first objective. Third, the structure and mandate of the government agency charged with managing protected areas—the Directorate General of Forest Protection and Nature Conservation (PHPA)—must be strengthened. Finally, the political will must be marshaled to channel a greater proportion of the $1.3-billion Reforestation Fund (derived from timber levies) into financing the reinvigorated protected-areas system.

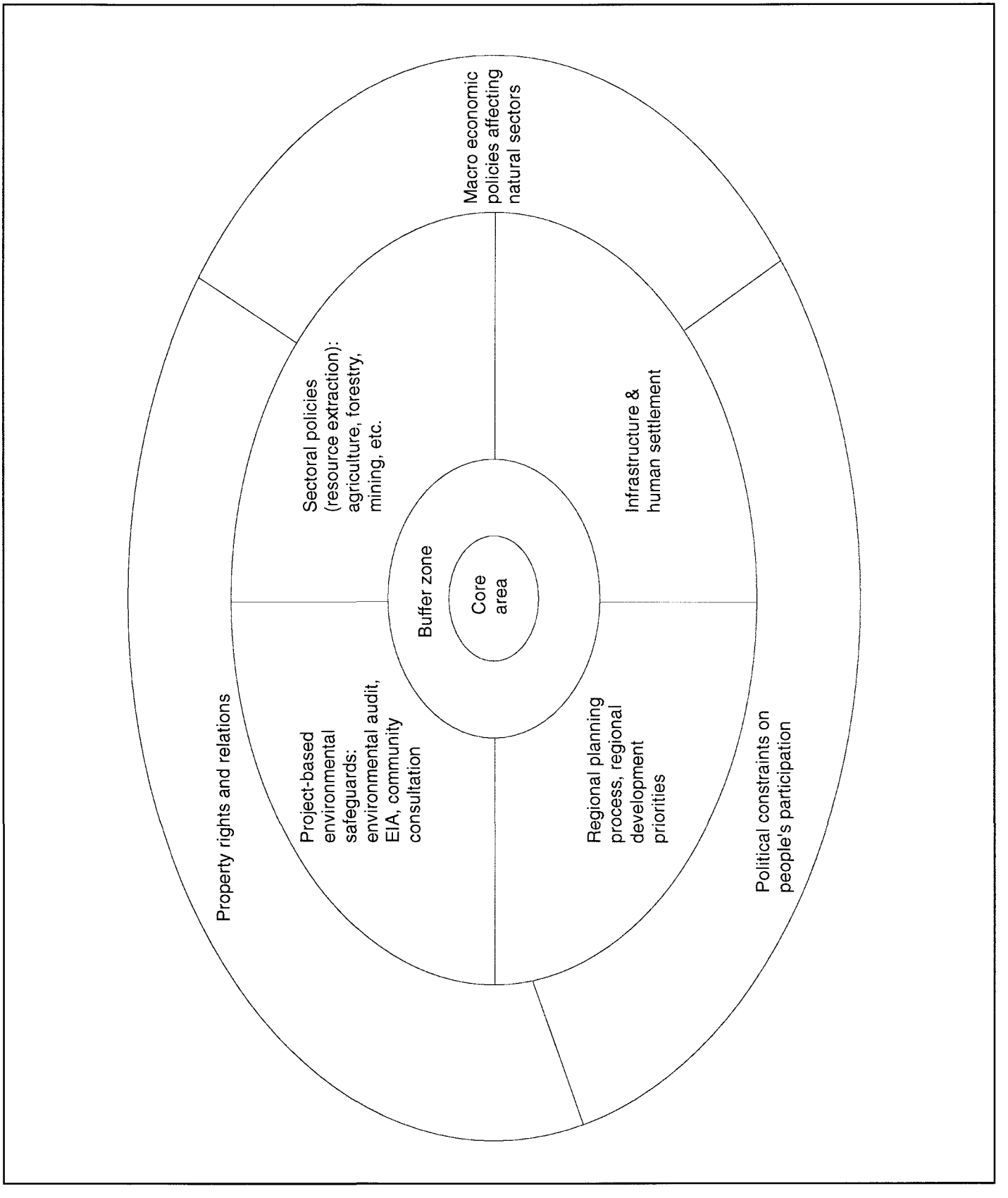
Acknowledging the Reality of Human Uses of Protected Areas: Although there are no figures available on the number of people living in or adjacent to Indonesia's protected areas, estimates for the public forest zone as a whole range from 12 million to 65 million people (Zerner, 1992). Certainly, the case studies presented here support the view that most of the country's protected areas have significant populations who either live in them or enter regularly them to farm, hunt, and collect forest products. Other studies have concluded the same for several parks in Sulawesi (Schweithem *et al.*, 1992), the Arfak and Lorentz reserves in Irian Jaya (Craven, 1990; Manembu, 1991), and the Halimun reserve in West Java (Biological Sciences Club, 1992), to name just a few.

Integrating conservation and development thus means, at a minimum, acknowledging the existence of these people and their dependence on resources within protected areas. It also means that their claims of traditional *adat* rights to lands and resources must be taken seriously and the role of *adat* law in conserving resources understood and acknowledged.

Moves in this direction are afoot in all three cases discussed here. At Wasur, park planners have conducted a systematic census of park residents and have explored their various uses of park resources through research and community dialogues. At Kerinci Seblat, similar efforts have begun, such as the detailed socioeconomic surveys of six border villages carried out as part of the Global Environment Facility (GEF) project preparation. In Siberut, an inventory of park residents and their resource uses is currently under way. These kinds of surveys, carried out by independent and qualified specialists, should be legally required whom any protected area is gazetted or its management plan developed.

Just as important as knowing who lives in or near a park, though, is understanding the impacts of local resource users on the park's biodiversity. Some uses, particularly subsistence activities using traditional technologies, are generally benign, as are those of Siberut's fire-less swidden cultivators. Other uses, such as tribal uses of fire in Wasur, may actually maintain key habitats that have coevolved with their human inhabitants over hundreds of years. Some traditional practices, however, such as hunting monkeys on Siberut or crocodiles in Wasur, may no longer be sustainable as technologies become more powerful and markets larger. Others, such as gaharu collection on Siberut, may be new practices that appear traditional to casual observers (and may be traditional in other places, as gaharu collection is in Kalimantan), but that are not backed by the local knowledge and restraints to ensure sustainability. Yet others, such as the

Figure 11. The Scope of Action for Integrating Biodiversity Conservation and Development



expansion of cassiavera cultivation or rhino poaching in Kerinci Seblat, may be wholly destructive and driven largely by opportunistic greed rather than need.

Protected-area resource uses and users are so varied that it makes no sense to condemn all uses as uniformly destructive nor to romanticize them as all-wise and perpetually sustainable. The first step is to understand their real biological impacts through scientific study and dialogue with the resource users. This kind of research needs to be built into ICDP projects and processes while policies that brand all forest dwellers and swidden cultivators as ecological outlaws need to be repealed. Then, protected-areas policy must be adjusted to support and subsidize uses that maintain biodiversity, interventions to make potentially destructive uses more sustainable (such as introducing rattan cultivation to replace forest-product collection), and suppression of activities that destroy the park's biodiversity conservation function (such as conversion of forest to cassiavera plantations).

Where local uses of a protected area's biodiversity are destroying it, they should be limited or stopped, whether sanctioned by tradition or not. If commitment to do this is lacking, or if local resistance is too great, then the area should probably not be protected at all—limited resources would better be directed to other sites. But offered attractive economic alternatives, many people will willingly revamp their livelihood strategy. Many of the cassiavera farmers in Kerinci Seblat, for example, are just poorly paid labor for opportunistic entrepreneurs. Given the right incentives, many might be willing to leave the park.

Two policy problems arise in providing viable economic alternatives to destructive users of park resources. First, schemes are often designed by outside experts who spend too little time figuring out what will actually work for particular habitats, communities, and individuals—in other words, what they will accept and what they will reject. Park policies need to reflect a greater commitment to participatory social science—combined with good business practice.

Second and most important, government policies over the past 25 years have so concentrated control over natural resources among commercial sector actors (such as logging conglomerates) that precious few such resources remain to lure people away from the protected areas (Barber et al., 1994). Most real "economic alternatives" to encroaching on protected areas are monopolized by government and private-sector concessions, projects, and monopolies—which is why so many displaced people have ended up in the forest in the first place (Dove, 1993).

Giving things to park encroachers is far less important than giving things *back* to people. Transforming only a small part of the country's more than 60 million hectares of production-zoned forests (so many of which lie on the boundaries of protected areas) into community territories and enterprises—as the Kerinci Seblat project aims to do—and providing people with a small percentage of the nearly $5-billion annual take of the timber industry, for example, would do more to draw encroachers out of parks than all ecotourism, non-timber forest products, and other such schemes combined.

Border Setting and Zoning: Setting protected-area boundaries and multiple-use zones within them that local people agree to is the first, indispensable step in enlisting communities as partners in changing the current "open access" situation. Accustomed to conflict over access and control of forests and other resources, most rural communities in Indonesia distrust government promises and motives (Peluso, 1992). The process by which boundaries and use zones are set therefore becomes a key test of the government's sincerity when its agents arrive in a village to say that "this time, with the ICDP approach, it is going to be different" (Craven, 1990). Current boundary and zoning policies—on the books, at least—are unsuited for ICDP projects. Actual practice, though (in the Wasur and Siberut cases, for example) seems to be moving ahead of formal regulations—an encouraging trend.

One simple policy change needed is the formal recognition that current boundaries, whether on paper or delineated by occasional concrete markers, are by themselves essentially meaningless. A survey of residents in one village in Siberut near a recently marked reserve boundary did not turn up even one person who knew (or admitted knowing) that the boundary existed (Barber, 1993a). In Wasur, project personnel have concluded that marking boundaries in the field in the conventional manner is a waste of time unless they are first locally defined and accepted (Bowe, 1995). In some places, such as Lempur village in Kerinci Seblat (Barber, 1993b) or Irian Jaya's Arfak reserve (Craven, 1990), marked boundaries are rejected and even destroyed by the community, as the national *Biodiversity Action Plan* acknowledges (Bappenas, 1993).

The mechanistic, top-down nature of the border-setting process is to blame. It is based on map data that has never been "field-truthed," and it is carried out by poorly paid PHPA staff or contract laborers. Worse, its overriding goal has been to get as many regulation-size cement markers in the ground as possible. PHPA staff themselves realize that a better process is needed and

have worked in Irian Jaya with the World Wide Fund for Nature (WWF) over the past five years to develop one. At the Wasur park and Arfak reserve, boundaries have been set out through a process of dialogue and cooperation with affected communities, local government, and the local forestry agency's unit charged with surveying, mapping, and boundary setting. WWF and PHPA are also trying this approach at Lempur village in Kerinci Seblat. The process can belong and tedious, but the end result is a "living boundary"—useful tree species mark it and the community itself supports and defends it.

These and other innovative experiments are not yet reflected in Forestry Ministry regulations and guidelines. The rules should be changed to make borders that work the main objective, rather than numerical targets and specification of the height, shape, and spacing of concrete posts. Continued experimentation and development of a flexible boundary-setting system should be allowed. But changes in the border-setting system must not become a pretext for intensification of resource exploitation in fragile ecosystems. Already, road-building, dams, and mining exploration seem to be *de facto* exceptions to rules against human uses in protected areas—witness the bisection of Wasur by a major highway, the many plans on the drawing board to cut roads through Kerinci Seblat, plans—recently put on hold—to build a hydro-electric dam in the middle of Lore Lindu National Park in Sulawesi (Sangadji, 1994) and the frequent overlap of mining concessions with protected areas throughout the country (such as the massive Freeport exploration concession within Irian Jaya's Lorentz and Mamberamo National Parks) (Freeport Indonesia, 1992).

Within protected-area boundaries, policies need to shift to recognize and support a variety of land-and-resource use zones—from strictly protected sanctuaries to traditional-use areas and zones for low-intensity tourism and "biodiversity prospecting." Official policy seems to be headed in this direction—the 1990 Conservation Law recognizes "buffer zones," the Wasur Management Plan provides for a comprehensive multi-use zoning system, and the Siberut ICDP project also envisions a similar system. But the core legislation on protected areas under the 1967 Basic Forestry Law still holds the traditional "all or nothing" view, in which all human activity is barred within protected areas and anything goes outside the boundary, no matter how destructive it is to the adjacent park.

The idea of the "buffer zone" (*see, for example,* Sayer, 1991) needs to be rethought too. The idealized model of a "doughnut" of limited economic activity around a "core" of strict protection is not really applicable in Indonesia for two reasons. First, areas of traditional use tend toward a patchwork rather than a doughnut pattern, as the zoning of Wasur shows. And, second, the many residential enclaves *within* protected areas, as in Kerinci Seblat, Siberut, and Wasur, make an external buffer ring rather ineffective.

A somewhat different kind of "buffer zone" concept is extremely important, however, a buffering perimeter around protected areas in which plantations, roads, resettlement sites, mines or other intensive forms of development are prohibited since these inevitably form the springboard for encroachment into protected areas. Of course, this kind of a buffer zone cannot work in isolation from the larger spatial and economic development plan for the region. Indeed, its creation should be an objective of regional development planning, not just of protected areas policy.

Protected-Areas Planning and Management Institutions: Recent changes in how some protected-areas management plans are developed, such as at Wasur, bode well for the ICDP approach. But even the best management plans will not improve things on the ground unless the structure of institutions charged with implementing those plans changes significantly. All three cases examined here, and numerous other studies (e.g., ARD, 1994), reflect the flaws of the current system: not enough money or trained personnel; political weakness in the face of pressures from other sectors; and, perhaps most important, the lack of a management structure in the field that can get divergent and conflicting interest groups to talk and compromise to ensure the vitality of protected-areas boundaries and resources. Clearly, substantial change is needed.

In the short term, the government should institutionalize the *ad hoc* cooperative arrangements developed for the ICDP initiatives discussed in this study (and for numerous other projects). Especially important are interagency and interprovincial management committees, local resource-management councils, village-conservation and development plans, and other such multi-sectoral and multi-stakeholder planning and management institutions and mechanisms. That said, moves to institutionalize these innovations should not restrict further innovation by spelling out which structures and processes are legitimate. Results, rather than form or procedure, should ultimately determine legitimacy.

In the longer term, the PHPA should be moved out of the Ministry of Forestry and reconstituted as an independent body or as an agency responsible directly to the

President, like Indonesia's new Environmental Protection Agency (Bappedal). If this new agency is politically independent of the Ministry of Forestry, the conflicts of interest that arise when the same agency is responsible for both cutting down and conserving forests will diminish. As it stands now, disagreement between the PHPA and the production-oriented branches of the Ministry over, say, the overlap of a timber concession and a protected area is resolved internally within the Ministry, far from the light of public scrutiny, and the PHPA almost always loses out. Negotiation of conflicts with other Ministries (such as Transmigration or Agriculture) is also handled by the Forestry Ministry as a whole, not the PHPA. Under a restructuring such as proposed here, these conflicts will at least be aired more publicly. In addition, the revamped structure could draw more attention to Indonesia's growing number of marine protected areas than a ministry of forestry specialists can.

This proposed "Protected Areas Management Coordination Agency" would coordinate and develop national protected-areas policy and provide technical and financial assistance for managing particular reserves. So doing, it would be a key member of the national biodiversity policy structure and would and cooperate closely with the Ministries of Forestry and Environment and with the National Development Planning Agency (Bappenas). It would not, however, directly manage protected areas. Rather, each one would be managed by a local Protected Area Management Unit under the day-to-day supervision of a provincial ICDP Board chaired by the Director of the Provincial Planning Board (Bappeda) and co-chaired by the provincial representative of the new agency. Representatives of the Protected Areas Management Units in the province would sit on the ICDP Board, as would representatives of sectoral agencies and university faculties and local nongovernmental organizations with relevant expertise. In cases such as Kerinci-Seblat, where a protected area spans several provinces, an *ad hoc* interprovincial committee would be set up to coordinate provincial agencies and activities.

Although it departs radically from present arrangements, such structural change builds on the logic of ICDP approaches being pursued at Wasur, Kerinci Seblat, Siberut, and many other areas. It is also in line with the current Five-Year Development Plan, which transfers some authority to provincial and district (*kabupaten)* governments for many aspects of development.

Under this approach, the way money is spent on protected-areas management would also have to change. A new district-level (*kabupaten)* "Green Fund" should be created (on per-hectare of protected area basis). Allocation of funds and monitoring would be carried out through the District and protected-area structures, with broad guidelines and general oversight from the national and provincial levels respectively. Protected Areas Management Units within the District would have a relatively free hand in determining how their share was to be spent within agreed guidelines and procedures. Precedent for such a nation-to-village fund exists: the Presidential Fund for Villages (*Inpres Desa*) bypasses the mid-level bureaucracy. And creation of a "forest dwellers' fund" along similar lines—to fund for forest stabilization and livelihood-creation projects—has recently been discussed by the government and the World Bank (Douglas and Khan, 1993).

Higher levels of the new structure would also need assured funding. Thus, a portion of the total resources available would support the central operations of the national Protected Areas Agency, a portion would go to the provincial ICDP Boards, a major part would go directly to the protected areas themselves, and some could go to key biodiversity research institutions through the national sciences agency (LIPI). The precise spending breakdown must, of course, be negotiated, but it should be guided by two principles. First, those who manage protected areas on the ground must have a guaranteed and adequate source of direct funding under their control, subject to the oversight of the provincial ICDP board, adherence to workplans, and the approval of the national agency. Second, protected-areas funding must support the whole range of institutions and individuals needed to manage them, including researchers and NGO community-development specialists.

Decentralizing both management and funding will help cure one of the perennial problems of protected-areas management—the lack of incentives for attracting and keeping the most energetic and qualified personnel working at the local level rather than in the national and provincial capitals.

Financing a Reinvigorated Protected-Areas System: How could this new institutional structure be funded well enough to make it effective? International assistance for biodiversity conservation in Indonesia has increased in recent years in the wake of the 1992 Earth Summit, the Convention on Biological Diversity, and the creation of the Global Environment Facility. But it will never be more than a complementary funding source, especially in a country so vast. And the short time horizons of donor organizations mean that few will provide the long-term funding that biodiversity conservation requires.

Fortunately, Indonesia needs little external financing to conserve its biodiversity. While economic rent capture from natural resource exploitation is too low and could be raised substantially (as discussed below), ample funds are already available from current rent capture in the forestry sector. All that is missing is the political will to channel them back into the maintenance of the nation's biological capital.

The government's Reforestation Fund, financed through a levy on logging established during the 1980s, had accumulated $1.3 billion by late 1993—a sum far more than the total GEF funds available for biodiversity conservation worldwide. A recent study supported by the Asian Development Bank (ADB) reported, however, that disbursements during 1989-93 totaled only 16 percent of the funds received over those years and that fund utilization before 1989 amounted to only 5 percent of the amount collected (Ministry of Forestry, 1994b). Much of what has been spent has gone into subsidies for fast-growing monocultural timber plantations, some of which have actually displaced natural forests (Barber *et al.*, 1994). In mid-1994, controversy erupted over the diversion by Presidential decree of about $190 million from the Reforestation Fund in a loan to a state aircraft company. NGOs filing a lawsuit against the decree argued that the diversion is illegal under the laws by which the fund was established (Pura, 1994). While the lawsuit was ultimately rejected, it stirred widespread discussion on the Fund and its proper uses, and it highlighted the finding of the ADB-backed study that the Fund is controlled largely by the President and the Ministry of Finance.

A breakdown of Fund utilization for 1990–93 shows that only 2.2 percent went to the Directorate General for Forest Protection and Nature Conservation, while nearly 45 percent flowed to the Secretariat General in Jakarta and 33 percent went to the Directorate General responsible for timber plantation development. In 1991, some 70 percent of the total went to timber plantations while only 0.4 percent was allocated to the protected-areas agency (Ministry of Forestry, 1994b).

In short, Indonesia has vast financial resources already in the bank and legally available to fund a reinvigorated protected-areas system. Since the Fund is ultimately controlled by the President, not the Ministry of Forestry, separation of the PHPA from the Ministry would not jeopardize access to money from the Fund if the President was truly committed to strengthening biodiversity-conservation institutions. (An administrative reorganization could never take place without his approval in any case.) Even at current low levels of disbursement, channeling only 10 percent of the available funds to biodiversity conservation would free up sums far greater than any the country will receive under the Biodiversity Convention or through the GEF.

Missing in this picture is the political will—and an effective and decentralized structure for putting funds to work on the ground. Aid donors could help marshal the necessary political will by getting government's assurances that all grants for conservation projects be matched by a substantial contribution from the Reforestation Fund projects and that the Fund contribution be administered and accounted for through the same procedures as the grant funds.

4.2 Transforming Regional Economic Development Policies to Support Protected Areas

Population and development pressures clearly require the prevailing theory and practice of protected-areas management to change, and the ICDP approach can help. But development policies and practices must also change to accommodate biodiversity conservation. The cases of Wasur, Kerinci Seblat, and Siberut show why. Islands of wilderness amid seas of unrestricted and ever-increasing human settlements, land-clearing, road-building, and the like eventually sink. If the regional development policy around Kerinci Seblat does not change, the prognosis for the park—and especially for its large mammals—is grim. Conversely, banning logging and oil palm plantations on Siberut might save its rich biodiversity well into the next century.

The issue here is not just "promoting sustainable development." Rather, the ICDP should alter development policies, practices, and investments in the region surrounding a protected area so that they do not directly or indirectly harm biodiversity. Under a new approach that might be termed a "regional Environmental Impact Assessment," both the region's aggregate carrying capacity and the specific impacts of development plans and investments on the protected area(s) in the region could be addressed together. The general outlines of this approach might be as follows.

First, specific projects—of both government agencies and the private sector—should be subject to an Environmental Impact Assessment (EIA). Indonesian law currently provides for an EIA process, but it has three nearly fatal weaknesses with respect to biodiversity that must be rectified: scientifically solid analyses of specific impacts on biodiversity at genetic, species, and habitat levels are not required; probable unplanned impacts do not have to analyzed; and the agency responsible for an

EIA is also the project proponent—with an obvious conflict of interest (a particularly grievous problem because there is little public scrutiny of EIA processes or results and no effective way to appeal an EIA).

Second, the 1992 Spatial Planning law should be developed and used to facilitate the regional EIA approach. Few implementing regulations for this law have been written yet, so there is an opportunity to remodel regional development planning to support rather than compromise the integrity of protected areas. In particular, the law could be used to zone mining, road-building and other especially damaging activities out of protected areas and to minimize these and other developments in adjacent areas. It could also be used to ensure that protected-areas management plans are integrated into larger regional management plans.

Third, international aid donors and lenders should evaluate progress on these two issues in particular regions and use measurable improvements as a key criterion for setting ICDP investment priorities. In short, biodiversity investments should favor regions that take steps to minimize development's negative impacts on protected areas, while regions that continue with business as usual should not receive additional funding from donors. For example, Siberut, where logging has been banned, would be a greater priority than Kerinci Seblat, where settlement, logging concessions, forest clearing, and mining concessions inside or on the borders of the park are still supported.

4.3 Some Cross-Cutting National Policy Issues

Two national issues much broader than protected-areas management also require attention if ICDPs are to succeed in Indonesia: the current regime of property rights on public lands and waters and the failure to use much of the financial returns of exploiting the country's living resources to support biodiversity conservation.

Currently, all forest lands and marine territories are under the government's legal control. But the government lacks the human or financial capacity to manage this vast territory. So it has slipped largely into a state of open access where numerous claimants compete for overexploited resources. Customary *adat* claims are largely unrecognized, further discouraging local conservation and sustainable management.

Two changes would greatly boost ICDP's chances of success. First, formal laws—especially the Basic Forestry Law and its implementing regulations—must be changed to recognize the *prima facie* validity of *adat* claims on land and resources. Not every claim would or should be recognized. But with this political backing and legal basis, valid and sustainable *adat* rights and resource-management regimes could be integrated into protected-areas planning and management and into the surrounding regional development matrix. The dividends of recognizing such rights have already been recognized by the national *Biodiversity Action Plan* and the 1992 Law on Population and Families, as well as in the evolving management regimes for the three protected areas discussed in Chapter 3. Needed now is formal support from national law.

But the issue of local land rights and uses extends beyond established *adat* communities. The broader question is what kind of local property rights on currently public lands need to be created or recognized to regulate access to natural resources and to provide incentives for local stewardship? A number of experiments are under way across Indonesia to answer this question. One that has captured the attention of policy-makers and donors alike is a pilot project in West Kalimantan supported by the government and the German aid agency to establish a "community forest concession." Another sign of hope: the Forestry Ministry, cooperating with the Planning Agency and the World Bank, recently published a report on *Operationalizing Community Participation in Forestry Development* (Bappenas, 1994). Building on these and other pilot projects and new ideas, government needs to establish a more clearly defined but flexible system of rights in public lands and waters to allow for future experimentation and development.

The second key area for national policy change involves increasing the capture of excess rent from natural resources exploitation and dedicating a significant portion of the proceeds to funding a network of ICDPs throughout the country, as well as the institutions needed to plan and manage them. If the ample funding already in government coffers cannot be directed to the protected-areas system, perhaps new sources of funding can. Currently, rents from logging and other forms of resource extraction, are far lower than need be (World Bank, 1994a). Increasing them would discourage the exploitation of forest resources in areas where it does not now make economic sense to do so, and the new revenues that it would produce could be channelled to biodiversity conservation efforts and institutions.

Two new levies would effectively serve these purposes. First, a national biodiversity tax on all raw living resource extraction—even if set at only 1 percent—would generate far more funds for biodiversity conser-

vation than Indonesia can expect to receive from the GEF and other donors. Second, a provincial tax on specific projects expected to directly or indirectly damage the province's protected area(s)—or projects that benefit from the protected area—could yield revenues earmarked for the Protected-Areas Management District "Green Fund" units, and other structural innovations recommended above.

International funding will still be necessary to supplement these two levies. In the long run, biodiversity conservation costs less than compensating for the loss of watersheds, genetic agricultural diversity, needed income from tourism, and the like. But in the short run, conservation requires significant financial outlays, and international support is certainly justified given the global importance of Indonesia's biodiversity and the commitments that Northern governments have made under the Convention on Biological Diversity. Attracting outside funding will be easier if Indonesia strengthens its resource management structure, adopts participatory protected-areas management plans that meet local needs, and commits itself to making regional development policies sustainable, setting up economic disincentives for overexploitation, and funding biodiversity conservation at a level commensurate with its professed commitment.

Notes

1. The Biosphere Reserve concept was launched by UNESCO's Man and the Biosphere project in 1979. In the model reserve, a strictly protected "core area" is surrounded by a "buffer zone" and then a "transition area." While the Biosphere Reserve Network as of 1992 consisted of 300 reserves covering some 12 million hectares in 76 countries, most were superimposed directly on existing parks and reserves without the mandates, resources, inclination, or capability to address overall rural development issues in adjacent areas. As a result, the change of status is often in name only, with little obvious change in emphasis or philosophy (Wells 1991). Indonesia's 1990 Law Concerning Conservation of Living Natural Resources and Their Ecosystems recognizes Biosphere Reserves as a category of protected area that contains "natural unique and/or degraded ecosystems [that] need to be protected and conserved for its research and educational value." The Law goes on to recognize the concepts of "core zone," "utilization zone," and "buffer zone" as well, showing that the essentials of the Biosphere Reserve concept have indeed been incorporated into national law. In practice, however, the terms ICDP and IPAS are used by the government with reference to projects incorporating these elements.

2. All English translations from the Sixth Five-Year Development Plan are unofficial translations from the original by the authors.

3. Unless otherwise specifically cited, all data in this case study are drawn from DHV Consultants BV's 18 Background Reports on the Integrated Conservation and Development Project (ICDP) for Kerinci Seblat National Park, prepared for the Government of Indonesia and the World Bank.

4. For a detailed analysis of the GEF ICDP preparation process at Kerinci Seblat up to mid-1993, *see* C.V. Barber, "Indonesia Kerinci-Seblat National Park Integrated Conservation and Development Project" in Bowles & Prickett, 1994.

5. In 1989, one kilo of prime-grade gaharu netted its collectors on Siberut island $125, while the same kilo sold on Sumatra for $750, eventually fetching as much as $5–$10,000 in Saudi Arabia. The official figure for market volume in 1989 was only $135,170, but by far the larger part of gaharu production leaves the country illegally (Seibert, 1992).

6. The ADB loan constitutes 61 percent of the project total, the remainder of which is to be funded from the regular government budget.

7. The Indonesian government requires all citizens to choose between five "world religions" (Islam, Catholicism, Protestantism, Hinduism, or Buddhism), and views adherents of minority tribal faiths to be "without religion." "Atheist," "Agnostic," "Animist," or "Other" are not permissible choices (Dove, 1988).

References

ADB (Asian Development Bank). 1992. *Management and Conservation of Tropical Forest Ecosystems and Biodiversity* (in Indonesia): *Final Report*. Jakarta: ADB Project T.A. No. 1430-INO.

ARD (Associates in Rural Development). 1994. *Policy Towards Protected Areas in Indonesia: Draft Final Report*. Jakarta: Consultant's Report to Bappenas (National Development Planning Board)/U.S. Agency for International Development (AID) Natural Resources Management Project.

Ave, W. and S. Sunito. 1990. *Medicinal Plants of Siberut*. Gland, Switzerland: World Wide Fund for Nature.

Bappenas. 1993. *Biodiversity Action Plan For Indonesia*. Jakarta.

Bappenas, Ministry of Forestry, and World Bank. 1994. *Operationalizing Community Participation in Forestry Development: A Workshop Report*. Jakarta.

Barber, C.V. (Forthcoming.) *Environmental Scarcity, State Capacity, and Civil Violence: Indonesia Case Study*. Project on Environmental Scarcity, State Capacity, and Civil Violence, University of Toronto Peace and Conflict Studies Program and American Academy of Arts and Sciences.

——. 1993a. Field notes from Matatonan village, Siberut. May.

——. 1993b. Field notes from Lempur village, Kerinci valley, Sumatra. September.

——. 1987. *Harmonizing National Forest Land and Resource Policies with Existing Patterns of Settlement and Subsistence in Kalimantan, Sumatra and Irian Jaya: Legal and Institutional Issues*. Jakarta: Consultant's Report to 1987 World Bank Indonesia Environmental Mission.

Barber, C.V. and G. Churchill. 1987. *Land Policy in Irian Jaya: Issues and Strategies*. Jakarta: Government of Indonesia-United Nations Development Programme (UNDP)/World Bank Project INS/83/013.

Barber, C.V., N. Johnson, and E. Hafild. 1994. *Breaking the Logjam: Obstacles to Forest Policy Reform in Indonesia and the United States*. Washington, D.C.: World Resources Institute (WRI).

Berwick, N. 1989. *Background Paper on Indonesia's Coastal Resources Sector*. Washington, D.C.: U.S. AID.

Biological Sciences Club. 1992. *Biological Diversity Conservation in Gunung Halimun National Park*. Jakarta. Unpublished Manuscript.

Bowe, M. (WWF Conservation Officer, Wasur National Park Project, Merauke, Irian Jaya) 1995. Personal Communication, 16 February.

Bowles, I. and G. Prickett. 1994. *Reframing the Green Window: An Analysis of the GEF Pilot Phase Approach to Biodiversity and Global Warming and Recommendations for the Operational Phase*. Washington, D.C.: Conservation International/Natural Resources Defense Council.

Braatz, S., in collaboration with G. Davis, S. Shen, and C. Rees. *Conserving Biological Diversity: A Strategy for Protected Areas in the Asia-Pacific Region*. Technical Paper No. 193. Washington, D.C.: World Bank.

Bromley, D. 1989. "Property Relations and Economic Development: The Other Land Reform," *World Development*, Vol. 17, No. 6: 867–877.

Craven, I. 1990. *A Management Prescription for the Arfak Mountains Strict Nature Reserve, 1990–1992*. Jakarta: WWF.

Dahuri, R. 1994. "Incorporating Biodiversity Objectives and Criteria into Environmental Impact Assessment Laws and Mechanisms in Indonesia." in *Widening Perspectives on Biodiversity*, A.F. Krattiger, J.A. McNeely, W.H. Lesser, K.R. Miller, Y. St. Hill, and R. Senanayake, eds. pp. 319–325. Gland and Geneva, Switzerland: The World Conservation Union (IUCN) and International Academy of the Environment.

Davidson, R. and N. Robinson. 1991. "Siberut Practicalities." In *Sumatra*, E.M. Oey, ed. pp. 202–203. Berkeley, CA and Singapore: Periplus Editions.

DHV (DHV Consultants BV). 1993a. *Local Area Development and Resource Rights Rationalization*. Background Report No. 3, Integrated Conservation and Development Project: Kerinci Seblat National Park. Prepared for the Government of Indonesia and the World Bank. Jakarta.

——. 1993b. *Participation and Promotion*. Background Report No. 7, Integrated Conservation and Development Project: Kerinci Seblat National Park. Prepared for the Government of Indonesia and the World Bank. Jakarta.

——. 1993c. *Biodiversity Conservation and Park Management*. Background Report No. 2, Integrated Conservation and Development Project: Kerinci Seblat National Park. Prepared for the Government of Indonesia and the World Bank. Jakarta.

——. 1993d. *Social and Economic Conditions in Six Villages in the KSNP Border Area*. Background Report No. 16B, Integrated Conservation and Development Project: Kerinci Seblat National Park. Prepared for the Government of Indonesia and the World Bank. Jakarta.

——. 1993e. *Micro-Regional Development and Planning*. Background Report No. 4, Integrated Conservation and Development Project: Kerinci Seblat National Park. Prepared for the Government of Indonesia and the World Bank. Jakarta.

Douglas, J. and A. Khan. 1993. *The Community Forestry Fund: Enhancing Community Participation in Forestry Development*. Paper presented at Workshop on Community Participation in Forestry, Pulau Matahari, Indonesia. 18–19 November.

Dove, M.R. 1993. *A Revisionist View of Tropical Deforestation and Development. Environmental Conservation*, Vol. 20, No. 1.

——. 1988. "Introduction: Traditional Culture and Development in Contemporary Indonesia." In *The Real and Imagined Role of Culture in Development: Case Studies From Indonesia*, M.R. Dove, ed. pp.1–37. Honolulu: University of Hawaii Press.

——. 1985. *The Agroecological Mythology of the Javanese and the Political Economy of Indonesia. Indonesia*, Vol. 39: 1–36.

Freeport Indonesia, 1992. *P.T. Freeport Indonesia*. Jakarta.

Fricke, T. (Business Manager—Southeast Asia, Cultural Survival Enterprises, and consultant to the ADB-funded "Biodiversity Conservation Project in Flores and Siberut") 1995. Personal Communication.

GEF (Global Environment Facility). 1992. *GEF Investment Projects—Third Tranche; Indonesia—Biodiversity Conservation Project Brief*. Washington, D.C.: GEF.

Gerke, H. 1992. *Prospects for Medicinal Plant Processing in the Integrated Protected Area System (IPAS)*. Jakarta: Consultant's Report to ADB/Government of Indonesia Project T.A. 1430-INO. Management and Conservation of Tropical Forest Ecosystems and Biodiversity.

GOI (Government of Indonesia). 1994. *Rencana Pembangunan Lima Tahun Keenam: 1994/95–1998/99* (Sixth Five Year Development Plan: 1994/95–1998/99). (In six volumes.)

——. 1993. *Lampiran Pidato Kenegaraan Presiden Republik Indonesia di depan Sidang Dewan Perwakilan Rakyat, 16 Agustus 1993: Pelaksanaan Repelita V Tahun Keempat*. (Appendix to the State of the Nation Speech of the President of the Republic of Indonesia before the People's Representative Assembly, 16 August 1993: Implementation of the Fourth Year of the Fifth Five Year Development Plan). Jakarta.

——. 1991a. *Indonesian Forestry Action Programme*. Jakarta. (In three volumes.)

——. 1991b. *Rencana Pengelolaan Taman Nasional Kerinci Seblat* (Kerinci Seblat National Park Management Plan). Bogor: Directorate General for Forest Protection and Nature Conservation, Ministry of Forestry. Jakarta.

GOI/FAO. 1990. *Situation and Outlook of the Forestry Sector in Indonesia*. Jakarta. (In four volumes.)

Government of West Sumatra. 1990. *Rencana Jangka Menengah Pembangunan Wilayah Kep. Mentawai, Propinsi Sumatera Barat* (Medium Term Plan for Development of the Mentawai Islands Region, West Sumatra). Padang.

Guiness, P. 1994. "Local Society and Culture." In *Indonesia's New Order: The Dynamics of Socio-Economic Transformation*, H. Hill, ed. pp. 267–304. St. Leonards, Australia: Allen and Unwin.

Harahap, D., A. Nababan, Nuripto, Triwahyudi, and P.E. Nyombe. 1993. *Menjadi Orang Asing di Tanah Sendiri: Laporan Observasi di Kalimantan Timur* (Foreigners in Their Own Land: Observation Report on East Kalimantan). Jakarta: Sejati Foundation. Unpublished Report.

Hardjono, J. 1994. "Resource Utilization and the Environment." In *Indonesia's New Order: The Dynamics of Socio-Economic Transformation*, H. Hill, ed. pp. 179–215. St. Leonards, Australia: Allen and Unwin.

Hutapea, J.R. 1992. *Prospects for Indigenous Herbal Drug Processing in the Framework of the Integrated Protected Area Systems (IPAS) Approach*. Jakarta: Consultant's Report to ADB/GOI Project T.A. 1430-INO. Management and Conservation of Tropical Forest Ecosystems and Biodiversity.

Jakarta Post. 1995. "Indonesia Likely To Play Active Role at Global Summit." February 23.

Kelleher, G., C. Bleakely, and S. Wells, (eds.). 1995. *A Global Representative System of Marine Protected Areas*, Volume III. Washington, D.C.: The Great Barrier Reef Marine Park Authority, World Bank, and The World Conservation Union (IUCN).

KLH (Ministry of State for Population and Environment, Indonesia). 1993. *Strategi Nasional Pengelolaan Keanekaragaman Hayati* (National Biodiversity Management Strategy). Jakarta.

——. 1992. *Indonesian Country Study on Biological Diversity*. Jakarta.

Little, P.D. 1993. *The Link Between Local Participation and Improved Conservation: A Review of Issues and Experiences*. Paper presented at the Liz Claiborne/Art Ortenberg Foundation Community Based Conservation Workshop, Airlie, VA: 18–22 October.

Lynch, O. and K. Talbott, with M. Berdan. 1995. *Balancing Acts: Community-Based Forest Management and National Law in Asia and the Pacific*. Washington, D.C.: WRI.

Mackie, J. and A. MacIntyre. 1994. "Politics." In *Indonesia's New Order: The Dynamics of Socio-Economic Transformation*, H. Hill, ed. pp. 1–53. St. Leonards, Australia: Allen and Unwin.

MacKinnon, J. 1994. *Too Many Plans: Personal Views on the Planning Process*. Paper presented at the IUCN General Assembly, Buenos Aires, Argentina, January 1994.

Manembu, N. 1991. *The Sempan, Nduga, Nakai and Amungme Peoples of the Lorentz Area*. Jayapura: WWF.

Marr, C. 1993. *Digging Deep: The Hidden Costs of Mining in Indonesia*. London: Down To Earth and Minewatch.

Mastaller, M. 1991. *Report on Surveys of Lowland Plains Lorentz National Park, Muara Siberut Marine Reserve, and Togian Islands Marine Reserve for Multipurpose Use*. Consultant's Report to ADB/GOI Project T.A. 1430-IN. Management and Conservation of Tropical Forest Ecosystems and Biodiversity.

McNeely, J.A. (Chief Biodiversity Officer, IUCN, Gland, Switzerland) 1994. Personal Communication, 29 December.

—— (ed.). 1993. *Parks for Life: Report of the IVth World Congress on National Parks and Protected Areas*. Gland, Switzerland: IUCN.

McNeely, J.A. and K.R. Miller. 1984. *National Parks, Conservation and Development: The Role of Protected Areas in Sustaining Society*. Gland, Switzerland: IUCN.

Ministry of Forestry (Indonesia). 1994a. *Evaluation of Forest Policy Regulatory Reforms*. Working Paper No. 6, Mid-Term Report: Forestry Sector Policy Analysis, Forestry Sector Study. ADB Project Preparation Technical Assistance T.A. No. 1781-INO.

——. 1994b. *Utilization of the Reforestation Fund*. Working Paper No. 2, Mid-Term Report: Forestry Sector Policy Analysis, Forestry Sector Study. ADB Project Preparation Technical Assistance T.A. No. 1781-INO.

Mitchell, A. 1995. Personal Communication. August 8, 1995.

——. 1982. *Siberut Nature Conservation Area, West Sumatra. Management Plan 1983–1988*. Bogor: WWF.

Moniaga, S. 1993. "Toward Community-Based Forestry and Recognition of Adat Property Rights in the Outer Islands of Indonesia." In *Legal Frameworks for Forest Management in Asia: Case Studies of Community/State Relations*, J. Fox, ed. pp. 131–150. Honolulu: East-West Center.

Ostrom, E. 1990. *Governing the Commons*. Cambridge: Cambridge University Press.

Parkinson, B. K. 1993. *The Eastern Islands of Indonesia: An Overview of Development Needs and Potential.* Manila: ADB. Occasional Paper No. 2.

Pearce, D., K. Brown, T. Swanson, and C. Perrings. 1993. *Economics and the Conservation of Global Biodiversity: A Report to the Global Environment Facility.* London: CSERGE.

Peluso, N.L. 1992. *Rich Forests, Poor People: Resource Control and Resistance on Java.* Berkeley, CA: University of California Press.

PHPA (Directorate General of Forest Protection and Nature Conservation). 1995. *Siberut National Park Integrated Conservation and Management Plan, Vol II: Plan for Conservation and Development Activities.* Jakarta. Fourth Draft, March.

——. 1994. *Wasur National Park Management Plan.* Bogor. (In three volumes.)

——. 1992. *Wasur National Park Management Plan—Final Draft.* Bogor. Prepared in collaboration with WWF.

Pura, R. 1994. "Suharto Lawyers Ask Court to Reject Suit Over Decree." *Asian Wall Street Journal,* November 1: 1.

Qadri, S.T. (ADB Project Manager for Biodiversity Conservation in Flores and Siberut Project, Indonesia) 1994. Personal Communication, December.

Repetto, R. 1988. *The Forest for the Trees? Government Policies and the Misuse of Forest Resources.* Washington, D.C.: WRI.

RePPProT (Regional Physical Planning Programme for Transmigration). 1990. *The Land Resources of Indonesia: A National Overview.* Jakarta: Overseas Development Administration (UK) and Department of Transmigration (Indonesia).

Sangadji, A. (ed.) 1994. *Bendungan, Rakyat dan Lingkungan: Catatan Kritis Rencana Pembangunan PLTA Lore Lindu* (Dams, People and the Environment: Critical Notes on Planned Development of the Lore Lindu Hydroelectric Dam). Jakarta: WALHI (Indonesian Forum on the Environment).

Sayer, J. 1991. *Rainforest Buffer Zones: Guidelines for Protected Area Managers.* Gland, Switzerland: IUCN.

Schefold, R. 1988. "The Mentawai Equilibrium and the Modern World." In *The Real and Imagined Role of Culture in Development: Case Studies From Indonesia,* M.R. Dove, ed. pp. 201–215. Honolulu: University of Hawaii Press.

Schwarz, A. 1994. *A Nation in Waiting: Indonesia in the 1990s.* St. Leonards, Australia: Allen and Unwin.

Schweithelm, J., N. Wirawan, J. Elliott, and A. Khan. 1992. *Sulawesi Parks Program Land Use and Socio-Economic Survey: Lore Lindu National Park and Morowali Nature Reserve.* Jakarta: The Nature Conservancy and PHPA.

Seibert, B. 1992. *Ethnobotany and its Relevance to IPAS.* Jakarta: Consultant's Report to ADB/GOI Project T.A. 1430-INO. Management and Conservation of Tropical Forest Ecosystems and Biodiversity.

Shin, H.S. 1989. *Demystifying the Capitalist State: Political Patronage, Bureaucratic Interests, and Capitalists-in-Formation in Soeharto's Indonesia.* Doctoral Dissertation, Yale University, New Haven, CT.

Simanjuntak, L. 1993. *Laporan Observasi Lapangan Siberut* (Siberut Field Observation Report). Jakarta: Pelangi Foundation. Unpublished manuscript.

SKEPHI (Indonesian Network on Tropical Forest Conservation). 1992. *Destruction of the World's Heritage: Siberut's Vanishing Forest, People and Culture.* Jakarta.

Sloan, N.A. and A. Sugandhy. 1993. *An Overview of Indonesian Marine and Coastal Environmental Management.* Jakarta: Manuscript submitted to *Coastal Management,* July.

Sumardja, E. (Director of Conservation Planning, Directorate General of Forest Protection and Nature Conservation, Ministry of Forestry) 1994. Personal Communication, May 5.

Sustainable Visions Natural Resource and Environmental Management Consultants. 1995. *Kerinci-Seblat National Park Regional Impact Assessment.* A report prepared for Bappenas and the World Bank. Victoria, B.C., Canada. March.

TAG (Transmigration Advisory Group). 1991. *Forest Clearance Study.* Jakarta: Ministry of Transmigration.

Tjahjadi, R. (ed.). 1993. *Nature and Farming: Biodynamic Agriculture and Communal Resources Adaptation Systems—Selected Cases in Indonesia.* Jakarta: Pesticide Action Network Indonesia.

Tjitradjaja, I. 1991. *Differential Access to Resources and Conflict Resolution in a Forest Concession in Irian Jaya.* Paper presented at workshop on Legal Issues in Social Forestry, Bali, Indonesia, 4–6 November.

Triwahyudi, M.A. Muhshi, and H.A. Farchad. 1993. *HPH dan Ekonomi Regional: Kasus Kalimantan Timur* (Timber Concessions and Regional Economies: The East Kalimantan Case). Jakarta: WALHI.

UNDP/UNESCO. 1993. *Report of UNDP/UNESCO Consultancy and Study Team for the Ecological Anthropological Development of the Mentawai Society in Siberut Island.* Jakarta. Draft.

Van Beek, H.H. 1992. *Siberut on the Edge: World Systems and an Indonesian Island.* Unpublished Thesis, University of Amsterdam and University of Leiden.

Vatakiotis, M.R.J. 1994. *Indonesian Politics Under Suharto.* London: Routledge.

WALHI. 1994. *Indonesia's Gold Green: Dying Forests, Undying Issue.* Paper presented at the International Symposium on Rain Forest Management in Asia, Centre for Development and the Environment, Oslo, Norway, 23–26 March.

Weinstock, J.A. 1989. *Study on Shifting Cultivation in Indonesia, Phase I Report (Draft).* Jakarta: GOI/FAO Project UTF/INS/065/INS. Forestry Studies.

Wells, M. 1994. *Community-Based Forestry and Biodiversity Projects Have Promised More Than They Have Delivered: Why is This and What Can Be Done?* Paper presented at the International Symposium on Rain Forest Management in Asia, Centre for Development and the Environment, Oslo, Norway, 23–26 March.

—— and K. Brandon, with L. Hannah. 1992. *People and Parks: Linking Protected Areas Management with Local Communities.* Washington, D.C.: World Bank/WWF/USAID.

——. 1991. *Trust Funds and Endowments as a Biodiversity Conservation Tool.* Policy and Research Division Working Paper No. 1991–26, Environment Division, World Bank, Washington, D.C.

Western, D. and M. Wright. 1993. *Issues in Community-Based Conservation.* Paper presented at the Liz Claiborne/Art Ortenberg Foundation Community Based Conservation Workshop, Airlie VA. 18–22 October.

World Bank. 1995. *Kerinci-Seblat Integrated Conservation and Development Project Preparation Report.* Revised March.

——. 1994a. *Indonesia: Stability, Growth and Equity in Repelita VI.* Washington, D.C.: Report No. 12857-IND.

——. 1994b. *Indonesia Transmigration Program: A Review of Five Bank-Supported Projects.* Washington, D.C.: Report No. 12988.

——. 1994c. *Indonesia: Environment and Development: Challenges for the Future.* Washington, D.C.: Report No. 12083-IND.

——. 1993a. *Indonesia: Sustaining Development.* Washington, D.C.: Report No. 11737-IND.

——. 1993b. "Aide Memoire: Indonesia Biodiversity Conservation Project Preparation Mission, May 5–21, 1993." Washington, D.C.. Unpublished.

——. 1993c. "Kerinci-Seblat National Park (KSNP) Integrated Conservation and Development (ICDP) Facilitation Mission Report." Prepared by A. Khan and T. Nurdin for the World Bank Resident Mission in Indonesia. Unpublished.

——. 1992a. *Indonesia: Agricultural Transformation Challenges and Opportunities.* Washington, D.C.: Report No. 10504-IND. (Two volumes.)

——. 1992b. *Indonesia: Growth, Infrastructure and Human Resources.* Washington, D.C.: Report No. 10470-IND.

WRI, IUCN, and UNEP. 1992. *Global Biodiversity Strategy.* Washington, D.C.

WWF. 1980. *Saving Siberut: A Conservation Master Plan.* Bogor.

Zerner, C. 1992. *Indigenous Forest-Dwelling Communities in Indonesia's Outer Islands: Livelihood, Rights, and Environmental Management Institutions in the Era of Industrial Forest Exploitation.* Consultant's Report to World Bank Indonesia Forestry Sector Policy Review. Washington, D.C. Draft.

Zuhud, E.A.M. and Haryanto. 1994. *Pelestarian Pemanfaatan Tumbuhan Obat Hutan Tropika Indonesia.* (Conservation and Utilization of Medicinal Plants of the Indonesian Tropical Forest). Bogor: LATIN (Lembaga Alam Tropik Indonesia—the Indonesian Tropical Institute) and Institut Pertanian Bogor (Bogor Agricultural Institute).

World Resources Institute

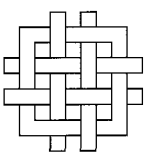
1709 New York Avenue, N.W.
Washington, D.C. 20006, U.S.A.

The World Resources Institute (WRI) is an independent center for policy research and technical assistance on global environmental and development issues. WRI's mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations.

Because people are inspired by ideas, empowered by knowledge, and moved to change by greater understanding, the Institute provides—and helps other institutions provide—objective information and practical proposals for policy and institutional change that will foster environmentally sound, socially equitable development. WRI's particular concerns are with globally significant environmental problems and their interaction with economic development and social equity at all levels.

The Institute's current areas of work include economics, forests, biodiversity, climate change, energy, sustainable agriculture, resource and environmental information, trade, technology, national strategies for environmental and resource management, and human health.

In all of its policy research and work with institutions, WRI tries to build bridges between ideas and action, meshing the insights of scientific research, economic and institutional analyses, and practical experience with the need for open and participatory decision-making.



WORLD RESOURCES INSTITUTE
1709 New York Avenue, N.W., Washington, D.C. 20006 USA