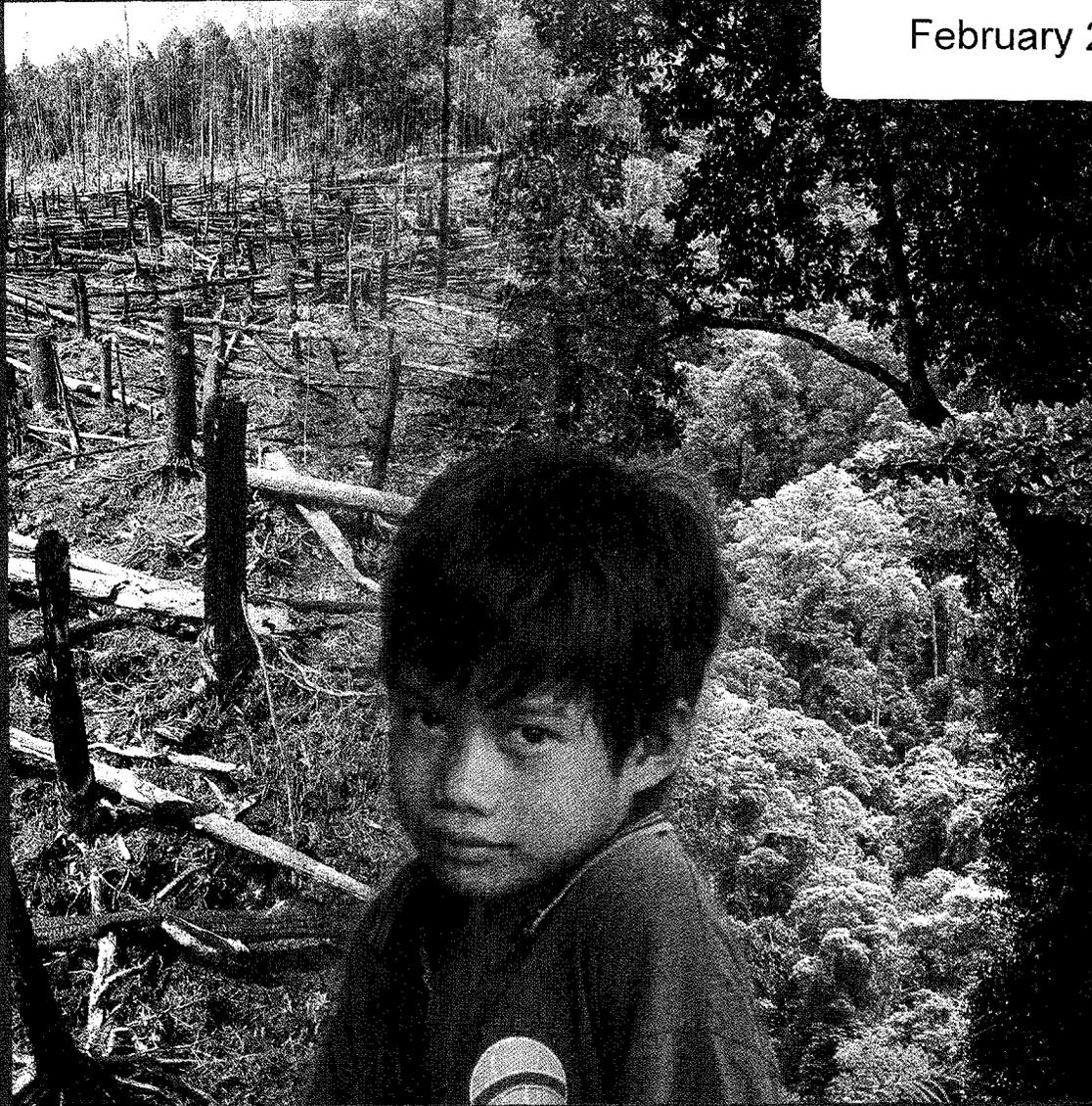




T H E W O R L D B A N K

23149

February 2001



INDONESIA

Environment and Natural Resource
Management in a Time of Transition

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Abbreviations and Acronyms

ADB	Asian Development Bank
AMDAL	Environmental Impact Assessment
APKINDO	Indonesia Plywood Association
ASB	Alternatives to Slash and Burn Program
BAPPEDA	Regional Development Planning Board
BAPPENAS	National Development Planning Board
Bina Desa	Community assistance requirements under forest concessions
BPN	National Land Agency
CBD	Convention of Biodiversity
CGI	Consultative Group on Indonesia
CI	Conservation International
CIFOR	Center for International Forestry Research
COREMAP	Coral Reef Rehabilitation and Management Program
Dinas	Provincial or district agency reporting to governor, mayor or bupati
DPR	People's National Assembly
EIA	Environmental Impact Assessment
EKUIIN	Coordinating Ministry for the Economy, Finance and Industry
ENSO	El Niño Southern Oscillation
GDP	Gross Domestic Product
GEF	Global Environment Facility
GoI	Government of Indonesia
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
Ha	Hectares
HGU	Use rights (hak guna usaha)
HPH	Hak Pengusaha Hutan (production forest use rights)
HTI	Industrial tree crop estate (hutan tanaman industri)
IBRA	Indonesia Bank Restructuring Agency
ICDP	Integrated Conservation and Development Project
ICRAF	International Center for Research on Agroforestry
IDCF	Interdepartmental Committee on Forestry
IMF	International Monetary Fund
IPB	Bogor Agricultural Institute
IPK	Clear Cutting Permit
Kabupaten	District
Kanwil	Provincial office of a central line agency
LEI	Lembaga Ekolabel Indonesia (Ecolabeling Institute)
MLH	Ministry of Environment
MoFEC	Ministry of Forestry and Estate Crops
MPR	People's Consultative Assembly
NFI	National Forest Inventory
NFP	National Forest Program
NGO	Non-Governmental Organization
PA	Protected areas
RePPPProT	Regional Physical Planning Programme for Transmigration
TELAPAK	A National NGO
TGHK	Forest Land-Use Plan, 1982(Tata Guna Hutan Kesepakatan)
TNC	The Nature Conservancy
TPI	Selective logging system (Tebang Pilih Tanam Indonesia)
UKL	Upaya Pengelolaan Lingkungan
UPL	Upaya Pemantauan Lingkungan
UPT	Technical Execution Unit for national park management
USEPA	United States Environmental Protection Agency
WALHI	The Indonesian Environmental Forum
WATSAL	Water Resources Sectoral Adjustment Loan
WWF	World Wildlife Fund for Nature
WWF	World Wildlife Fund
Yayasan Kehati	National Biodiversity Foundation

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Acknowledgements

The team preparing this report wishes to express its appreciation to numerous officials of the Government of Indonesia, as well as others in research and non-governmental organizations, and donor agencies, who provided valuable advice and support.

Report preparation was the responsibility of a core team led by Jean Aden (Task Team Leader) and including Giovanna Dore, Jeff Vincent (HIID) and Tom Walton. Preparation was conducted under supervision of Zafer Ecevit and Kristalina Georgieva. Nona Sachdeva formatted and produced the report.

The material used was drawn from field research and contributions by Bank colleagues as well as other donors. Key source materials are shown in the Bibliography. Main authors, staff who contributed written materials, and others who provided valuable advice and guidance, are listed below by major topic area:

Forest resources and land conversion: Tom Walton authored the forest resources chapter, Derek Holmes provided valuable data on deforestation rates and land conversion, and Stefano Pagiola drafted a background paper on land conversion. Background papers were contributed by William Sunderlin (CIFOR) and Michael Rock (Consultant). The chapter benefited from discussion with Dr. Hariadi Kartodihardjo (IPB) and, and comments from James Douglas, Stephen Mink and Tim Brown (NRM).

Biodiversity protection and management: Kathy MacKinnon and Tony Whitten co-authored the chapter, with comments from Scott Guggenheim, Asmeen Khan (World Bank), Reed Merrill (NRM), and Untung Iskandar, Wahyudi Wandoyo and Listya Kusumawardhani (Directorate-General of Nature Conservation).

Mining and the environment: Gary McMahon and Elly Rasdiani Sudibyo co-authored the chapter. Aziz Bouzaher was co-task team leader, with contributions from Ramanie Kunanayagam, and comments from Kirk Hamilton, David Hanrahan, Bob Scouller, John Strongman and Peter van der Veen.

Environmental expenditure: Jeff Vincent was main author, with contributions from Jean Aden, Magda Adriani, Giovanna Dore, Vivianti Rambe, and Tom Walton, and helpful insights and comments from John Dixon, Sudarshan Gooptu and Kirk Hamilton.

Decentralization in the natural resource sectors: Jean Aden authored the chapter, with contributions from Sampri Ganguli and Michael Rock, and valuable insights and comments from Stephen Dice, Bert Hofman, Jacqueline Pomeroy and Tom Walton.

A Policy Agenda Review background paper, a cross-cutting summary of implementation of recommendations of the World Bank's 1994 *Indonesia – Environment and Development* report across 11 sectors during the period 1994-99, was prepared by Yani Witjaksono, Jeff Vincent and Tom Walton.

The team also wishes to express its appreciation for collaboration with other donors, including in particular James Tarrant and Tim Brown of the Natural Resource Management II Program, and Penny Davies, of the DFID-supported Indonesia-UK Tropical Forest Management Program.

I. Introduction

In the series of severe economic, political, and environmental shocks that Indonesia experienced in quick succession in 1997-98, the environmental dimension loomed relatively larger than in other East Asian crisis countries. Forest cover loss rates, already high and rising in the mid-1990s, were compounded by devastating forest fires, unprecedented in number and geographic scope, in two of the country's resource-richest islands, Kalimantan and Sumatra. With the loss of 80 percent of the value of the Rupiah by early 1998 and the collapse of much of Java's industrial sector due to the disappearance of working capital, policymakers and households alike looked to their traditional economic base in natural resources to power the country's economic recovery. The authority of the center over regional affairs, including natural resource extraction both on and off Java, virtually disappeared with the fall of the Suharto government in May 1998. Removal of central control over natural resources, biased and limited though it had been before the change of government, led to virtually no control at all, and illegal logging and mining spiraled upward. Public environmental expenditure, already low relative to neighboring countries, fell at a faster rate than GDP and overall government spending, and dropped more steeply than in other East Asian crisis countries.

A new and unpredictable element in this scenario is the governance reform agenda. Reform aspirations reach into every sector and every corner of the country, with natural resources being no exception. Resource-rich provinces are demanding greater control over resource-based revenues, and local populations are demanding access to resources they had long been denied. Indonesia's economy will remain natural resource-dependent over the next decade, and decentralization in the natural resource sectors, a major item in the reform agenda, creates both risks and opportunities. It offers an opportunity to move toward more local participation in resource allocation decisions, greater accountability by regional governments, a refocusing of central agencies on policy and oversight, and, ultimately, more efficient and more sustainable use of natural resources. However, decentralization also carries a substantial risk of accelerating environmental degradation in the near term, which could block realization of its long-term benefits. The formidable combination of factors behind this risk include the lingering economic crisis, political uncertainty, local natural resource agencies that have historically lacked authority and funds, official corruption and a partial breakdown of law and order.

This Indonesia Environment Report analyzes trends and issues in terrestrial resource use, specifically, forestry, biodiversity, and mining, with particular emphasis on the resource-rich regions off Java. The report also presents data on the prospects for decentralization of the natural resource sectors and environmental management. The report's audience is Indonesia's regional government officials and regional civil society, who stand on the verge of a major decentralization over the next three to five years. Its overarching objective is to provide a practical analysis of the natural resource issues and options for which they are about to assume much greater authority and responsibility for the first time – both by sector (forestry, biodiversity protection and mining) and in terms of the cross-sectoral issues and opportunities offered by decentralization – and an explanation of the need to ensure adequate regional expenditure for environmental protection.

Because of the economic crisis and the governance reform process, the readiness of Indonesian stakeholders to deal with resource policy issues is moving at different rates in different sectors and locales. Hence, the report offers only a broad "vision" of the elements that need to be included in the evolving forestry policy reform process. In contrast, biodiversity protection and management have already received extensive consideration by the Government, Bank and Global Environment Facility (GEF) during the past six years; hence, the report's recommendations are more specific than for forestry. Mining is only now entering the national environmental agenda, but some initial actions to address the more obvious environmental issues are recommended.

II. Forestry

Previous governments in Indonesia repeatedly expressed commitments to bring production forests under sustainable management by 2000, but the situation in the forests in the latter half of the 1990s was something quite different. The most obvious forest-related problem was, and remains, the country's high rate of deforestation. New forest cover maps completed by the Ministry of Forestry and Estate Crops (MoFEC)¹ for Kalimantan, Sumatra, Sulawesi, and West Papua (formerly Irian Jaya) revealed that the rate was higher than expected: 1.7 million hectares per year from 1985-97, compared to previous estimates of 0.6-1.3 million hectares per year. For the Outer Islands as a whole, well over 20 million hectares of forest were lost.

The Government formerly tended to blame deforestation on "shifting cultivators," but commercial development, especially oil palm plantations, was mainly responsible for accelerating deforestation in the 1990s. Large-scale land conversion was, moreover, the largest single cause of the 1997-98 fires, which burned nearly 5 million hectares of forest and imposed some US\$8 billion in economic losses on the citizens and businesses of Indonesia.

Forestry practices by concessionaires fall far short of the goal of sustainable management of production forests. Illegal log and pulpwood production was estimated at nearly three times the official harvest in 1998, and it occurred in protection forests and national parks, as well as production forests. One of the main drivers of illegal logging is excess capacity in the Indonesian wood-processing industry, a result of more than a decade of below-market stumpage fees and log prices, and banks' failure to analyze new wood-processing investments carefully. Of the US \$51.5 billion in private debt owed to the Indonesia Bank Restructuring Agency, \$4.1 billion is in loans to the forest industry, of which \$2.7 billion are classified as non-performing.

Forest allocation decisions under the Suharto government were made in a "top-down" fashion by central agencies, and often denied communities access to their customary natural resource assets, thus exacerbating, not alleviating, poverty for many rural households. These difficult issues can no longer be ignored. Communities that believe they have claims for compensation or return of land use rights against the Government or logging or plantation companies are becoming vocal and recognizing that they do have power. Hence local pressures on forests have exacerbated the already critical strains imposed by large-scale operators. Although there have been some successful pilot projects in forest management by communities and traditional user groups in Indonesia, they have not been replicated on a large enough scale to make a difference to the forests or a substantial portion of the rural population.

¹ The Ministry of Forestry and Estate Crops and Ministry of Agriculture were merged by Presidential order when a new Cabinet was formed on August 26, 2000. The new organization is the Ministry of Agriculture and Forestry. However, since this report had already gone to press when the change was made, the earlier names have been kept throughout.

Recommendations

Forestry was placed on the agenda of the Consultative Group on Indonesia (CGI) for the first time ever at its annual meeting in July 1999. The outcome was a proposal by the Indonesian delegation for a high-level seminar on forestry, which took place in January 2000. At the seminar, MoFEC made commitments to:

- establish an Interdepartmental Committee on Forestry (IDCF);
- proceed with formulation of a National Forest Program (NFP); and
- take immediate action on eight urgent issues, including: measures against illegal loggers and illegal sawmills; forest resource assessment as a basis for NFP formulation; a moratorium on all natural forest conversion pending agreement on the NFP; downsizing and restructuring the wood-based industry; closure of heavily-indebted wood industries, with debt write-offs linked to capacity reductions; connecting the reforestation program with wood-processing facilities; recalculating the real value of timber; and use of decentralization as an opportunity to enhance sustainable forest management.

As progress on these commitments has been slow and uneven, it is important to maintain a clear focus on formulation and implementation of a NFP, containing an overall strategy, a policy reform agenda and specific action steps, in a manner that engages the commitment and support of all concerned agencies and stakeholders at national and regional levels. If Indonesia wants to keep forests other than those on land too steep to be accessible, the NFP will surely need to include at least the following nine elements:

- *An interagency, multi-stakeholder body responsible for forest policy.*
- *A freeze on conversion of natural forest for any purpose until the National Forest Program is in place and a transparent mechanism for forest land-use decisions is functioning.*
- *A system to broaden and guarantee access to forest benefits for forest dwellers and local communities, through ownership or secure, long-term use rights, with tenure conditional on continuous responsible forest management.*
- *Environmental education and awareness programs to build regional and national constituencies for forest conservation and sustainable management.*
- *Incentives and penalties to improve forest concession management, including an independent inspection system.*
- *Rigorous and consistent enforcement of the laws concerning illegal logging, burning, and encroachment, and aggressive disciplinary action against corruption in forest management.*
- *Restructuring the wood processing industry so that its raw material needs are balanced with sustainable yield of the forests, supplemented by plantation timber and imports*
- *Renewed commitment to conserving Indonesia's world-class biodiversity heritage by establishing a national network of parks and protected areas that can be effectively managed by the government in partnership with local communities and other stakeholders.*
- *Aggressive replanting programs to return damaged forest land to productive use and relieve industry pressure on natural forest, while generating rural employment and income.*

III. Biodiversity protection and management

Indonesia is the world's most biologically diverse country. Habitat loss is the primary threat to the country's biological diversity. Forest cover has been lost mainly in the lowlands, which have not only the greatest potential for plantations and other large-scale development but also the most biologically rich forests. In addition to being reduced in total extent, the remaining natural habitat is being broken into ever smaller fragments that cannot sustain viable populations of many species, especially wildlife subject to hunting and trapping.

Since the mid-1990s, there has been a dramatic increase in attention to biodiversity at the national level as well as among donors. Many of the actions identified as priorities in the national Biodiversity Strategy and Action Plan (BSAP) have been implemented, and the GEF is now financing the preparation of a second BSAP.

Although Indonesia has a generally well-designed and biogeographically representative protected areas system, there are still several important gaps, with coastal, marine, and freshwater ecosystems being largely ignored. More important, existing protected areas are not secure, and their management is weak. Many protected areas are still in a proposed or declared status, due to the slow and often confusing process of demarcating forest boundaries. There are many overlapping and conflicting claims to lands within protected areas. This legal quagmire makes it easier to excise land from protected areas for development and more difficult to prosecute illegal activities within protected areas.

With decentralization, local governments will have to supplement block grants by raising revenue locally. This creates tension between local governments and conservation officials, as national parks do not contribute any land tax on the land they occupy. Ecotourism has not yet generated sufficient revenues to offset the loss in potential tax revenue, and a recent review suggests that integrated conservation and development projects (ICDPs) in parks and buffer zones have provided very limited development opportunities to local communities. Moreover, national parks rely heavily on local police and district heads to assist with law enforcement, but they provide no formal mechanism for local governments to participate in park management decisions.

Recommendations

Confirm and demonstrate political will - The Government of Indonesia made commitments on forestry issues to the major donors at the Consultative Group on Indonesia (February 2000) including a commitment to stop illegal logging within national parks. A major test of GOI's commitment to address forestry issues will be whether the central government is willing or able to take strong actions against illegal loggers, especially in PAs. Until GOI, or the provincial governments, can deal effectively with this issue there is little point in assisting with area-based conservation efforts, and there is small likelihood of major conservation funding from donors.

Increase public awareness and knowledge of biodiversity facts and issues - Stemming current unsustainable forest management and biodiversity loss will require a change in attitudes and behavior at all levels of society. Changing the behavior of policy and decision makers will require a stronger and better informed civil society, fully aware of the environmental and social costs of biodiversity loss. This will require:

- Targeted awareness programs aimed at different audiences and stakeholders to expand understanding of the multiple benefits of biodiversity and PAs, including watershed values and other ecosystem services;
- Capacity building of local NGOs/civil society, local universities to monitor the status of PAs and other biodiversity and disseminate information;
- Development of national/local school and university curricula, promoting biodiversity and environmental economics;
- Development of materials to be used by faith groups linking their scriptures to biodiversity conservation;
- Dissemination of information informally, through multiple media, to develop a conservation constituency e.g. field guides, theatre, newspapers, building on current successful conservation campaigns at individual PAs.

Bring biodiversity into sectoral planning - Article 6b of the Convention on Biological Diversity, which Indonesia has ratified, emphasizes the need to integrate, as far as possible, and appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross –sectoral plans, programs and policies. This involves developing sustainable land use strategies, adopting appropriate policies and programs, and removing perverse economic incentives that fail to recognize that biodiversity conservation is a vital aspect of sustainable development. At the national, provincial and kabupaten level Indonesia will need to:

- Integrate PAs and protected forests into agreed provincial and district spatial plans
- Encourage land use and agricultural policies that promote maintenance and regeneration of forests with plantations restricted to already cleared and critical lands (see Chapter 2)
- Increase capacity of BAPEDAL to address green issues both nationally and locally (see Chapter 6) and emphasize impacts on PAs and biodiversity in environmental assessments.
- Develop programs to determine the economic benefits of environmental services and widespread dissemination of this information at the local level.
- Link block grants for local development to environmental performance at the district and provincial level.

Strengthen the protected area network - There is a need to consolidate and further strengthen the national PA network through:

- Strengthening protection and management of existing priority PAs and "paper" parks
- Establishing additional PAs of high biodiversity value to improve representativeness of the system, focusing on identified proposed priority areas and especially threatened lowland forests e.g., Sebuku-Sembakung (Kalimantan), Sembilang (Sumatra)
- Test new management models for PAs and buffer areas, involving local communities, NGO partnerships, private sector and local government

- Identifying new and additional financing mechanisms for recurrent costs of priority PAs within the national system (e.g. debt-for-nature swaps, carbon funds, environmental taxes for ecosystem services, visitor fees)
- Encouraging provinces to provide support for reserves of local importance to supplement the national parks and other nationally important areas
- Training on conservation laws and enforcement issues to members of the judiciary and local police forces to ensure better enforcement and prosecution of illegal activities

Build a strong local constituency for PA and forest management - Ultimately biodiversity and protected areas will only survive in Indonesia with strong local ownership. With devolution of many resource management decisions to the district level there is an increasing need to:

- Support block grant incentive schemes linked to environmental performance indicators to encourage local government support for high biodiversity areas, especially in kabupatens with large national parks within their boundaries;
- Support adoption of downstream user fees or 'green taxes' to generate revenues from PAs for ecosystem services provided e.g. downstream fees for water use;
- Build local, provincial and national capacity to monitor and evaluate status of PAs and biodiversity and to feed information back into management decisions;
- Improve consultative forest boundary demarcation processes and involve local communities in demarcating boundaries and assuming responsibility for protecting forests.

IV. Mining

Conflicts between production or protection forestry and mining as prospective land uses are endemic in Indonesia. A long-standing Presidential Decree gives mining priority over all other land uses. The mining boom experienced by Indonesia in the 1990s disturbed hundreds or thousands of hectares at each mine site, generated tailing wastes that raised the risk of costly accidents, and contaminated rivers with pollutants whose effects can last centuries. Still, Indonesia has been relatively fortunate—so far. The portion of its territory dedicated to mining is well below the global average (one-half of one percent) and, with the exception of a tailings dam rupture in 1990, it has not experienced any major mining accidents.

The economic crisis has not altered significantly the growth trends of large-scale mining companies. Moreover, most environmental problems in large-scale mining can be rectified for minimal cost (less than one percent of gross revenues). Reclamation standards are not clearly defined in Indonesia, however. If reclamation is defined as restoring the original ecosystems, then environmental expenditure will need to be significantly higher.

Environmental mismanagement is most severe for medium-scale mines and, especially, artisanal and small-scale mines (ASM). The crisis has brought increased mining applications from medium-scale coal companies, and production by ASM coal and gold mines has skyrocketed. Illegal, unregulated ASM gold operations are releasing untreated mercury, which causes severe and irreversible health damage to both adults and children, into rivers that supply drinking water and fish. There has been little or no attempt to close down these operations, due to a lack of law

enforcement, powerful interests' support for some ASM operations, and the general sympathy for anyone trying to survive the economic crisis.

Lack of coordination within and between agencies has hindered the balancing of environment and development issues in the mining sector. Two different units within the Ministry of Mines and Energy provide environmental management services and oversight, and two distinct agencies have responsibility for mining within regional governments. Coordination problems also occur between MME and the Ministry of Environment (over water quality standards) and MME and MoFEC (over reclamation standards).

Recommendations

Clarify environmental management roles and build technical capacity at the regional level—The transfer of permitting and inspection responsibilities to provincial and district governments under Government Regulation 22 of 1999 could reduce both cross-sectoral conflicts between different prospective users of the same tract of land and inconsistencies in treatment of different categories of mineral resources. Similarly, the devolution of AMDAL functions to the provinces could reduce the disconnect between review processes for mining permits and ANDALs and offer an opportunity to utilize an “integrated ANDAL” approach. This approach would facilitate evaluating the cumulative effects of the multiple components of large mining operations (mine site, processing, harbors). For devolution to work, however, technical capacity at the provincial and local levels must be upgraded, especially in outlying regions with the largest mining sectors. Before the economic crisis hit, MME had already embarked on a three-year program to upgrade its environmental regulatory capacity in the large- and medium-scale mining sectors, which now needs to be extended to ASM.

Develop improved environmental management instruments—Performance-based standards for assessing compliance with ANDAL and reclamation plan requirements, better targeting of inspections and audits on potential trouble spots and worst offenders, and a stronger reclamation bond program are needed. So is strengthening of enforcement, including a schedule of intermediate sanctions, tailored to the severity and frequency of violations and higher for repeat offenders. Mine closure, the single regulatory sanction currently available to inspectors, is too blunt an instrument for all infractions. Pilot environmental audits for existing mines could emphasize “win-win” pollution prevention options. MME might consider making auditing results public and promoting a system whereby mining companies give ASM miners access to deposits within their concessions on the condition that they work in an environmentally sound manner and process the ore in centrally located concentration plants.

Reduce exposure to heavy metals released by mining operations—Although the serious human health impacts of exposure to heavy metals are well known in many countries, they have not been widely communicated in Indonesia. To avert the potentially disastrous consequences of rapidly increasing exposure to mercury in the vicinity of ASM gold operations, a mining and health public awareness program on the effects of heavy metals (especially mercury) on human health is desperately needed. Making communities more aware of the health consequences of mining activities would serve to increase pressure on mining companies to adopt less damaging practices. The awareness program should be accompanied by technical assistance and incentives for small miners to adopt low-cost mercury emission control technology. More broadly, a major campaign to publicize the long- and short-term dangers of uncontrolled mining, both for individuals and communities, is needed at national and regional levels.

V. Environmental Expenditure

Analysis of public expenditure data for the period FY94/95-FY98/99 points toward two broad conclusions. The first is that public expenditure on environmental activities is extremely low in Indonesia, in terms of percentage of GDP, percentage of government expenditures and per capita expenditure level. In FY98/99, expenditure of domestic resources on development projects with environmental objectives was only about a third of the level in FY94/95. From FY97/98 to FY98/99, environmental expenditure fell from 0.9 percent of the overall development program to 0.5 percent and from 0.04 percent of GDP to less than 0.02 percent. These percentages were already generally lower than in other East Asian crisis countries before the crisis. Moreover, the declines from FY97/98 to FY98/99 were greater than in other East Asian crisis countries. Additional funding is needed to keep pace with major increases in pressure on Indonesia's forests, biodiversity stock and land affected by mining operations, and as well as urban and industrial pollution. Yet the recent environmental expenditure trend at an aggregate level has been the opposite.

The second conclusion is that environmental expenditures at regional levels have suffered especially deep cuts since the crisis, and the share of the total environmental budget allocated to activities at the center relative to regional activities has increased. In light of the country's far-reaching decentralization reforms, the share of environmental expenditures in the regions needs to increase significantly, relative to environmental expenditures at the national level. Improved local environmental management will not be possible without increased provision of human and financial resources. The three types of environmental expenditure that will be needed at district and provincial levels include *core* expenditures (for example, funding for safeguards capacity building, protection of local conservation areas and enforcement of national minimum standards), *mitigation* expenditures (such as expenditure on erosion control during road construction and maintenance), and *incidental* expenditures (such as water supply projects to reduce exposure to contaminants in existing water sources).

Recommendations

Regional government officials and civil society, who are about to assume increased authority and responsibility for natural resource management for the first time, need to be aware of the implications of environmental expenditure trends and options for their jurisdictions. Whether regional budgets include environmental expenditures commensurate with increasing pressures on regional resource bases will be a critical indicator of political will to support adequate regional safeguards. Central budget support for a substantial share of the environmental and sustainable natural resource management activities conducted at the regional level will be essential.

VI. Decentralization in the Natural Resource Sectors

Under Indonesia's far-reaching legislative framework for decentralization, the approximately 350 districts gain greater autonomy and new responsibility to manage most government services, and the subnational share of public expenditures will be more than doubled to over 40 percent. This reallocation would make Indonesia, now unusually centralized for its size and diversity, one of the most decentralized countries in the region.

Whether the drive to decentralize leads to more sustainable resource use or invites serious environmental deterioration will depend to a large extent on whether decentralization goes

forward with or without adequate environmental safeguards in the regions. The core safeguards are national minimum environmental standards and a consultative environmental assessment (AMDAL) process, and the regional environment agencies (BAPEDALDA) and the line agencies (MoFEC, PKA, MME) share responsibility for their proper application at regional levels. The greatest short- to medium-term opportunity of the decentralization process lies in improved accountability of and coordination among these agencies, leading to integrated planning, permitting, environmental safeguards and monitoring of resource use at district and provincial levels.

However, by making rural districts more dependent on resource-based revenues, decentralization could accelerate land conversion and natural resource exploitation in the forestry and mining sectors. These perverse incentives could prove compelling for regional heads in revenue-starved rural districts. This is more likely to occur where regional technical capacity and regional environmental constituencies are weak. A survey of opinion leaders in resource-rich provinces off Java showed significant variability in the proportion of provincial leaders with pro-environmental attitudes and in the inclusiveness of provincial environmental constituencies. Without proactive environmental constituencies, environmental safeguards cannot function properly. These differences underline the fact that some regions are more ready for decentralization with adequate safeguards than others.

Recommendations

The report outlines key elements of a decentralization support strategy for Government and donors.

Strengthen the "checks and balances" in the legal framework for decentralization to prevent misallocation of functions among levels of government. Strengthen the adjudication role of the Regional Autonomy Advisory Board, by mandating proactive and systematic monitoring of regional performance of decentralized functions generally, and relative to natural resource and environmental management in particular. Also, establish a cross-sectoral Natural Resources Council to provide technical advice to the Board on implementation of natural resource management and environmental safeguards at provincial and district levels. Ensure that Board and Council members include all levels of government and civil society, and that local communities have standing to appeal when regional natural resource and environmental management performance is inadequate.

Recognize that regional BAPEDALDAs' technical credibility with the regulated community is an issue, and is particularly acute in regions where priority environmental issues are mainly in the natural resource sectors. Given BAPEDAL's focus on industrial and urban pollution to date, and limited success in either, both BAPEDAL and the BAPEDALDAs lack knowledge and experience in applying safeguards in the natural resource sectors. Development of a capacity building strategy that includes training in environmental aspects of the natural resource sectors should be a top priority. Virtually all governments that have pursued a decentralized approach to environmental management have left the main permitting, monitoring and enforcement functions at the provincial level, relying on municipalities for operation but not regulation. Indonesia should consider these examples in deciding how to divide responsibilities between provincial and district BAPEDALDAs.

Environmental constituency-building should have high priority for BAPEDAL, the BAPEDALDAs and other agencies and stakeholders with environmental responsibilities. Campaigns to spread environmental knowledge, build pro-environmental attitudes, and forge links between attitudes and proactive behaviors to improve environmental quality should be targeted on key decision-makers in districts and provinces. Constituency-building efforts should focus on provinces first, because their institutional infrastructures ordinarily lead to early emergence of environmental constituencies. Constituency-building should be accompanied by “accountability pilots,” featuring two-way communication between officials and constituencies, in which the official is prepared to explain and justify government performance and use of public resources related to natural resource and environmental management.

Recognize that successful devolution will necessarily be asymmetric: some regions will be ready for devolution of natural resource and environmental management sooner than others. Assigning differentiated authority to regional governments based on political commitment, technical capacity, revenues, population, and constituency strength can alleviate the pressure of having to implement a country-wide uniform decentralization program. Decentralization grants to districts and provinces that demonstrate commitment to technical capacity building, constituency-building and regional implementation of safeguards could be a mechanism to facilitate decentralization, while recognizing the need for an asymmetric approach. Through such grants, decentralization should proceed first and farthest in the provinces that are ready soonest, to provide an incentive for those that decentralize later.

VII. Conclusions

Although the three sectors differ in many ways, the analyses of them point toward three broad conclusions:

Environmental safeguards must be strengthened to ensure that Indonesia’s economic recovery is sustainable. Unsustainable logging, forest fires, loss of natural habitat and the species in it, tailings spills, exposure to heavy metals, and other forms of natural resource degradation impose heavy short-run and long-run costs on the Indonesian economy and Indonesian society. The core elements of environmental safeguards—environmental standards, environmental impact assessment, spatial planning, and monitoring and enforcement systems—suffer various shortcomings in forestry, biodiversity protection and management, and mining. Poor coordination across agencies and levels of government and, especially at the provincial and district levels, limited technical capacity in core environmental agencies and natural resource agencies weaken the implementation of existing safeguards. Decentralization will magnify the consequences of these weaknesses. Most fundamentally, improved governance of natural resources requires a strengthening of the rule of law and eradication of official corruption. By their own admission, some 75 percent of logging concessionaires do not follow the law; illegal logging, sawmilling, and forest conversion are rampant; and artisanal and small-scale mines operate, and pollute, with impunity.

Although a few of the measures necessary for improved natural resource management can be achieved at minimal cost, the majority will require significant public and private expenditure on preventive and mitigating measures. Among other activities, additional funding is required to rehabilitate degraded forests, expand replanting programs, improve forest fire management, protect and manage parks better, prevent mining accidents and reclaim mined-out areas, establish credible

databases, build technical capacity in government agencies, and support public awareness programs. Yet, the recent trend at an aggregate level has been the opposite, as the Government cut environmental expenditure deeply in FY97/98 and FY98/99. Most worrisome in light of decentralization is evidence that expenditure fell more in the regional budget than in the national budget.

Regions, not the center, are the critical nexus where natural resource utilization and governance issues will intersect in the post-Suharto era. In addition to stronger regional technical capacity, three factors—the incentives created by the legal framework for decentralization, the presence or absence of regional environmental constituencies, and scope for asymmetric decentralization—will largely determine whether decentralization leads to positive or negative environmental outcomes. To reach the ultimate objective of devolution to the districts, full use should be made of available technical capacity and constituency-building resources in the provinces. For example, provincial BAPEDALDA and BAPPEDAs could train district-level trainers in technical capacity and constituency building, and central agencies like MoFEC, PKA, and MME could train trainers at the provincial level and provide training and piloting support to districts.

1. Introduction

A major lesson of the East Asian economic crisis of 1997-98 is that high growth without good governance, at both government and corporate levels, can lead directly to a national crisis. New Order Indonesia did not lack for growth, but as a patrimonial state, it lacked an institutional framework capable of ensuring that private ends would not compromise the interests of the larger society. During the miracle growth years, what Indonesia and many of its neighbors lacked was *quality* of growth, which implies parallel growth of economic indicators, good governance and sensible regulatory frameworks. In hindsight, it is apparent that the New Order state, which distributed all manner of favors, from forest concessions to tariffs, on a personal basis, was overcome by its mixture of low quality governance and high quantity economic growth.

In the series of severe economic, environmental and political/institutional shocks that Indonesia experienced in quick succession in 1997-98, the environmental dimension loomed relatively larger than in the other East Asian crisis countries. Forest cover loss rates, already high and rising in the mid-1990s, were compounded by devastating forest fires, unprecedented in number and geographic scope, which drew global attention to the massive scale of environmental damage occurring in two of the country's resource-richest islands, Kalimantan and Sumatra. With the loss of 80 percent of the value of the Rupiah in early 1998 and the collapse of much of Java's industrial sector due to the disappearance of working capital, policymakers and households alike looked to their traditional economic base in natural resources to power the country's economic recovery.

With the fall of the Suharto government in May 1998, the authority of the center over regional affairs, including natural resource extraction both on and off Java, virtually disappeared. Weak institutional and regulatory frameworks that had never been allowed to develop in the years of certainty under Suharto were now incapable of controlling natural resource exploitation. Removal of national control, biased and limited though it had been before the change of government, led to virtually no control at all, as local populations gained more democratic (*and sometimes anarchic*) access to resources they had long been denied. Easy-entry extraction activities, such as illegal logging and small-scale mining, spiraled upward in 1998-99.

A new element in this scenario of economic and environmental loss, which had been virtually absent before the mid-1990s, was the governance reform agenda. Governance reform aspirations had long been building, as the Suharto regime entered its fourth decade in the mid-1990s. Groups that had gained middle class status and heightened expectations due to the growth and welfare policy successes of the Suharto government were becoming less and less tolerant as the government seemed to become more arbitrary and the province of a single ruling family. Moreover, the center's ability either to stifle or assuage the resentment of groups that had been marginalized by the centralized and authoritarian pattern of control of natural resources in the islands off Java was also diminishing. The new governance reform aspirations reached into every sector and every corner of the country, with environment and the natural resource sectors no exception.

Two governance reform themes receive particular attention in this report. The first is the rush to decentralization, driven largely by demands of the resource-rich, low population provinces for a greater share of revenues and say in their management. The second theme is environmental

safeguards – the insistence that natural resource utilization should comply with national minimum standards and environmental assessment requirements, and that regional governments should be accountable for application of safeguards.

Previous Reports

This is the third World Bank report on environment in Indonesia since 1989. Before addressing the problems and prospects of environmental and natural resource management in the new era, it is useful briefly to recap the pressing issues and prescriptions of the two previous reports.

The first report, *Indonesia - Forests, Land and Water: Issues in Sustainable Development* (1989), focused primarily on land and forest management in the Outer Islands, and land and water resource management in Java. This report advanced the concept of “sustainable development” – the view that growth pursued without due regard to its immediate impact on the environment and natural resource base can jeopardize longer term development. While acknowledging that sound natural resource management without growth is not feasible where poverty is a major contributor to resource degradation, the sustainable development approach emphasized that natural resources are finite and the wasteful use of resources today will cause unnecessary sacrifice of income and well-being tomorrow. Such an approach encourages looking beyond immediate preoccupations in order to detect unsustainable practices in their early stages, when they are easier and less costly to address. Underpinning this approach is the view that forests, land and water have important ecological functions not easily measured in economic terms, and the belief that new knowledge and the emergence of shortages will increase their future value. Based on these assumptions, a sustainable development approach tries to keep open as many options for future choice as possible, and urges caution when an undertaking carries risk of irreversible environmental damage.

During the decade preceding the first report, Indonesia had already taken the first steps toward sound environmental management of its burgeoning growth by appointing a highly respected State Minister for Population and Environment, enacting basic umbrella environmental legislation and environmental impact assessment requirements, and undertaking specific actions such as the nationwide introduction of integrated pest management. However, by the late 1980s, signs of environmental distress were mounting, including land degradation resulting from development unsuited to agroecological conditions in the Outer Islands under the transmigration program, and incipient water shortages in Java. Under these circumstances, a major recommendation of the report was strengthening of environmental management institutions.

The comprehensive scope of the second report, *Indonesia – Environment and Development* (1994), included urban and industrial pollution, natural resources management, and equity issues in land use and access to natural resources. The report observed that, while growth would continue to rely extensively on the country’s natural resources, an increasing share of growth would be concentrated in urban areas. With largely Java-based industrial output having increased eight-fold since 1970 and annual growth rates of 7 to 17 percent in major urban centers, the report devoted particular attention to urban pollution trends, the shifting composition of industrial pollution, and available instruments for industrial pollution prevention and control, including the use of public information. The report culminated in a broad agenda of some 139 medium term recommendations under eleven sectoral headings.

With the establishment of BAPEDAL as the operational arm of the Ministry of Population and Environment (MKLH) in 1991, the central government gained a clear mandate to address industrial pollution, and donors, including the World Bank, thronged to provide support for the fledgling agency. Through most of the decade, BAPEDAL's work remained largely Jakarta-based and centered on industrial pollution, with outreach to some 200 of the most polluting industries along some sixteen of the country's major rivers. With environmental assessment review authority vested in the line agencies, progress in "mainstreaming" environmental knowledge and good practice in the major development ministries was slow and uneven. Hence, the vast natural resource base off Java, on which export growth remained critically dependent, remained largely beyond the institutional reach of the still new central agencies – MLH and BAPEDAL – in which the country's limited environmental management capacity was concentrated.²

World Bank's Environmental Engagement

In the current context, in which natural resource issues have percolated to the top of Indonesia's priority environmental issues, the World Bank has followed a three-pronged approach to environmental engagement in Indonesia from end-1998.

- First, a set of environmental and natural resource policy and management conditions has been attached to the structural adjustment operations of the World Bank and Letters of Intent of the International Monetary Fund.³
- Second, in the context of monitoring the implementation of these conditions, the World Bank, along with concerned, expert Indonesians and donors with programs in the forestry sector, have jointly embarked upon a forestry policy dialogue with the Government of Indonesia and international and Indonesian NGOs. This dialogue has the conditions of the structural adjustment and letter of intent operations as its starting point, but in the current context of the wide-ranging reform debate, often ranges beyond implementation of the structural adjustment conditions.
- Third, to update the prior *Environment and Development Report* in light of the economic, environmental and institutional watershed of the last three years, the World Bank has prepared this third environmental sector review.

Themes

This report analyzes trends and issues in terrestrial resource use, with particular attention to the relatively resource-rich provinces off Java.⁴ Overall, it advances several main themes.

First, restoring economic growth alone is not enough; ensuring sustainable economic growth requires simultaneous growth of governance frameworks capable of protecting public goods from market failures, and this is just as true for forestry and mining as for banking. The potential benefits of institutional reform in Indonesia are immense, but the problems are also daunting, especially in the short term.

² In about 1993, the State Ministry of Population and Environment (MKLH) became the State Ministry of Environment (MLH). There were regional Environment Bureaus (Biro Lingkungan Hidup, BLH) at the provincial level from the late 1980's, but they were tiny, buried at the bottom of the regional government hierarchy, under-resourced and ineffectual. See Chapter 6.

³ See Chapter 2, Tables 2.10-2.12

⁴ See the classification of provinces by resource endowment and population, Chapter 6.

Second, a few of the measures necessary for improved environmental and natural resource management provide both economic and environmental benefits to the resource user and can be achieved at minimal cost – for example, reduction of fine coal particulate emissions in the medium-scale coal industry. However, the majority will require significant public and private expenditure on preventive and mitigating measures, and must be accompanied by long-term institutional change. Yet, government has cut environmental expenditure deeply and it faces a set of social, political and economic conditions that will make change difficult.⁵

Third, regional governance is the critical nexus at which natural resource utilization, environmental issues and governance issues intersect in the post-Suharto era. Responsible decentralization of environmental and natural resource management requires significant institutional growth, including the transformation of local communities' habits of non-participation into a civil society with an environmental constituency that practices new participatory behaviors. Creation of regional environmental safeguards and robust "checks and balances" to correct failures of decentralization must be integral to the country's decentralization strategy.

Fourth, environment has been a leader among sectors in opening new governance options in many countries, and this can also be the case in Indonesia.

Organization

The report is comprised of seven chapters:

- Chapter 2 on Forest Resources presents new data on loss of forest cover over a 12-year period and, by documenting the ongoing national forestry policy dialogue, conveys the critical importance of *process*, including broad dissemination of natural resource data and widespread consultation, in sustainable natural resource management;
- Chapter 3 on Biodiversity Protection and Management documents trends and causes of habitat loss, assesses ongoing management programs and pilot initiatives within and outside protected areas, and recommends essential steps to build knowledge, constituencies and partnerships for biodiversity protection;
- Chapter 4 on Mining and the Environment surveys environmental and social issues by scale of mining operations, from large-scale to artisanal and small-scale mining, and offers a lower-bound estimate of the annual costs of environmental damage in the sector;
- Chapter 5 on Environmental Expenditure presents a policy-relevant method for analysis of public environmental expenditures, charts national and regional environmental expenditure trends during the period 1994-99, and draws international comparisons for the period 1997-99;
- Chapter 6 on Decentralization in the Natural Resource Sectors analyzes the new legal framework for decentralization of environmental and natural resource management, the trade-offs to be made in its implementation, regional safeguards capacity and constituency building requirements for successful decentralization; and
- Chapter 7 on Conclusions and Recommendations summarizes the main messages of the report.

⁵ See Chapter 5: Environmental Expenditures.

Process and Dissemination

The priority issues to be analyzed in this report were identified through a series of focus group meetings of mid-career Indonesian professionals with substantial knowledge and concern about environmental issues, held in Jakarta in August-September 1998. The report reflects the focus group's primary concern to identify options for an environmentally sustainable economic recovery, and its highlighting of natural resources as a potential route to recovery.

Of necessity, the priority topics identified by the focus group were narrowed during report preparation. For example, in the case of water- and marine-related environmental issues, this report has not attempted to duplicate the significant work on these issues undertaken since the 1994 environment report, in particular, the World Bank- and Asian Development Bank-supported Coral Reef Rehabilitation and Management Project (COREMAP) and the World Bank-funded Water Resources Sectoral Adjustment Loan (WATSAL). Likewise, industry and urban problems require a separate report in light of the issues raised by the Java-centered industrial recession. These issues are critical to the environment but merit separate consideration.

The report owes much to the contributions of Indonesian environmental professionals, particularly to preparation of the *Forest Resources, Mining and Environment*, and *Environmental Expenditure* chapters, and several background papers, including the *Policy Agenda Review* and CIFOR study of smallholders in forest areas.

On completion of the draft chapters, provisional conclusions of the report were presented to a second focus group in Jakarta, comprised of officials and private sector environmental professionals. Their comments and clarifications were carefully noted, and have been incorporated into the final version of the report.

The final report, annexes, background papers produced during report preparation, and documentation of the report preparation process will be available at <http://eap.worldbank.org/indonesia/environment>.

2. Forest Resources

Introduction

Prior to the economic crisis, resource-related exports from the natural forest were an engine of economic growth. Forest-based exports (plywood, furniture, and pulp) rose from around \$200 million in the early 1980s to more than \$ 9 billion per annum in the mid-1990s. In 1997, just prior to the crisis, total output from forest-related activities was about \$20 billion, or 10 percent of GDP. Forest-related employment amounted to about 800,000 jobs in the formal sector, and many more than this engaged in activities in the non-traded forest products sector. Royalties and other government revenues from forest operations exceeded \$1.1 billion per annum.

Previous governments in Indonesia repeatedly expressed commitments to bring production forests under sustainable management by 2000 (World Bank, 1994), but the situation in the forests as the economic crisis worsened through 1998 was something quite different. Disastrous fires in 1997-98, theft and destruction in tree crop and industrial timber plantations (more than \$3 billion in losses in 1998), widespread social unrest in forest communities, and continuing patterns of inadequate planning, lack of consultation, and collusion and corruption in forest land conversion were unavoidable evidence that management was anything but sustainable.

The reform movement accompanying the fall of the Suharto government was visible in the Ministry of Forestry and Estate Crops (MoFEC) in several ways: the Minister formed *Komite Reformasi* to advise him on policy and reorganization, issued decrees intended to make forest benefits accessible to local communities, and seemingly supported policy changes proposed by the World Bank and the International Monetary Fund in its crisis-response programs of structural adjustment and budget support (discussed further later in this chapter). There was, nevertheless, a sense that change was neither moving fast enough nor reaching deep enough to stem the destruction of the forests. Reports of illegal logging in national parks were confirmed. The bill that became the new Law on Forestry (Law No. 41/1999) was rushed into hearings in the DPR (National Assembly) despite complaints from NGOs, donors, and even MoFEC's own *Komite Reformasi* that the agreed-on prior consultation with stakeholders had not occurred. In light of these concerns, the World Bank placed forestry on the agenda of the Consultative Group on Indonesia (CGI) for the first time ever, at its annual meeting in Paris in July 1999. A memorandum on the sector, prepared jointly by the European Commission, Germany, and the United Kingdom, was tabled at the meeting, and it prompted extensive discussion by the donors. The outcome was a proposal by the Head of the Indonesian Delegation for a high level seminar on forestry with a report to be submitted to the next CGI meeting, in 2000.

That seminar, entitled "Removing the Constraints: Post-CGI Seminar on the Forestry Sector," took place on 26 January 2000, just six days before the full CGI meeting. The seminar received extensive advance publicity in international and national media, and almost 200 people attended. It was convened and opened by the Coordinating Minister for the Economy, Finance and Industry (MenKo EKUIN). The core of the event was a series of short, impactful illustrations of the problems in the forestry sector, delivered by acknowledged Indonesian experts.⁶

⁶ The Bank provided the funding for the seminar. CIFOR, ICRAF, GTZ, EU, DFID, WWF Indonesia, and Ford Foundation assisted by identifying speakers and helping them prepare their presentations, and by covering the costs of their travel to Jakarta.

This chapter begins with an overview of the current status of eight principal issues in the forestry sector, drawn primarily from presentations made at the seminar, and supplemented where useful with material from Bank forestry sector work and analytical studies that supported the presentations. The chapter then describes the Bank's experience with policy dialogue in the sector, paying particular attention to events since mid-1999. It highlights the lessons of this experience and concludes with a statement of a vision for the sector under improved management.

Current Issues in Indonesia's Forest Sector

Deforestation. The most obvious forest-related problem in Indonesia is the country's high rate of deforestation, which the new forest cover maps completed by MoFEC for Kalimantan, Sumatra, Sulawesi and West Papua (formerly Irian Jaya) have confirmed. The causes and consequences of this problem were examined in some detail by the Bank, in parallel with MoFEC's mapping work (see Holmes, in press).

Table 2.1 summarizes both the measurements of forest area in the mid-1980's based on the RePPPProT mapping program and those from the current MoFEC work, which is based wherever possible on imagery from 1996 or later.⁷ Over the Outer Islands as a whole, well over 20 million ha of forest have been lost over the past twelve years. This equates to an average overall deforestation rate of 1.7 million ha/yr for the period -- a figure that is substantially higher than the previously accepted deforestation rate estimates that ranged from 0.6 to 1.3 million ha/year (World Bank 1994). At that rate, the 1997 estimate of gross forest area nationwide, 100 million ha, must be reduced to no more than 96 million ha for 2000.⁸

In Sumatra, total forest area has decreased from over 23 million ha to probably less than 16 million ha, with the provinces of South Sumatra and Jambi recording the most rapid rates of forest loss (Lampung already had little forest cover in 1985). In Kalimantan, total forest area has decreased from 40 million ha to about 31 million ha, with East Kalimantan having the highest rate of conversion. Much lower rates of deforestation have prevailed in Sulawesi, mainly because most of the lowland forests suitable for conversion had already been cleared by the mid-1980s.

Provisional rates of deforestation in Maluku appear to have been high, in the areas analyzed, but the rate in Irian Jaya has not been dramatic. No mapped information has been seen for the southern islands of Java and Nusatenggara.

Table 2.2 relates the current forest cover with the total area of land officially designated as forest and thus under MoFEC control, based on the results of integration with provincial spatial plans. On the three islands of Sumatra, Kalimantan and Sulawesi, over 69 million hectares have permanent forest status, yet total forest cover is only around 57 million ha, a deficit of over 12 million ha (and an overestimate at that, because not all of the mapped forest cover lies within the official forest boundaries).

⁷ The presence of a mapped forest cover is *not* a statement on forest quality. The many reports of widespread illegal logging, including within the boundaries of national parks, indicate that degradation is likely to be occurring along every forest edge in the region.

⁸ "Estimated deforestation rate for Indonesia" presented at Post-CGI Seminar by Ir. Moch. Toha M.B., Head, Planning Department, MoFEC.

It is difficult, with the present level of map detail, to determine how that deficit is distributed within forest use categories. If one assumes that all the protected areas have forest cover, the gross area of concessions in a given province often exceeds the remaining forest cover with production forest status. For example, North Sumatra has 2.18 million ha of protected areas and 1.63 million ha of production forest, yet the forest cover is only 1.89 million ha. In practice, of course, substantial proportions of protected areas also are no longer forested. This is illustrated in Table 2.3, which compares forest cover within the principal forest status boundaries (TGHK) that were in force during the 1980s (limited and normal production forest are combined). These represent *former* forest status boundaries, and the areas for each category differ from the revised forest status areas given in Table 2.2. Nevertheless, Table 2.2 provides an indication of the extent of degradation within some of the protected areas.

Over the three regions of Sumatra, Kalimantan and Sulawesi, 82% of the conservation forest has forest cover, but in some provinces, the fraction is only half the designated area. Only Aceh, Central Kalimantan and North Sulawesi still carry forest cover over more than 90% of their conservation areas. Protection forest carries only 77% cover in gross with whole swathes of protection forest in North and South Sumatra, Lampung and South Kalimantan no longer tree-covered. Aceh, Central and East Kalimantan and North Sulawesi have the highest percentage of forest cover in protected areas. Only 66% of the production forest still have forest cover overall. In Lampung this is only 6% and in South Sumatra it is 25%.

It is mainly the lowland forest that has lost forest cover. It is the most accessible and has the greatest potential for plantations and other large-scale development. Unfortunately for the futures of both forestry and conservation, it is usually the forest that supports the highest biodiversity and that has the highest potential for commercial timber production. Differences in definition of forest types in previous mapping exercises make it impossible to ascertain precisely how much lowland forest has been lost. However, Holmes (in press) has estimated area by forest type for 1900, based on what is known about the extent of human settlement at that time, and adjusted RePPPProT classifications to provide estimates for 1985. These provide rough points of comparison with the 1997 estimated areas, shown graphically below.

In the case of Sumatra (Figure 2.1), the dry lowland plains will lose essentially all of their forest cover soon after 2005. Land clearing pressure will continue in the swamp forests and is likely to increase in the hill and mountain forest as the area of the other types diminishes. In Kalimantan (Figure 2.2), there will be very little forest remaining on the lowland plains by 2010 if present rates of conversion and damage continue. The heath forests may disappear entirely, because forest rarely becomes re-established after an initial clearing, and the fire risk in the resulting acid scrub is extremely high. Thus, as in Sumatra, within a decade or so, most of the remaining forests in Kalimantan will be confined to the hills and mountains.

Table 2.1. Rates of Forest Loss, 1985 (approx.) - 1997 (approx.)

Province	RePPProT (1985)			MoFEC (1997)				Ha/p.a.		
	Total	Forest	%	Total	Forest	%	No data			
Aceh	5,674,800	3,882,300	68.4	5,669,345	3,611,953	63.7	13,533	270,347	7.0	22,529
N. Sumatra	7,250,100	2,812,000	38.8	7,113,131	1,891,819	26.6	100,508	920,181	32.7	76,682
W. Sumatra	4,169,000	2,590,400	62.3	4,153,618	1,944,015	46.8	597,757	646,385	25.0	53,865
Riau	9,859,700	5,936,500	60.3	9,661,817	5,071,891	52.5	2,506	864,609	14.6	72,051
Jambi	4,873,900	2,765,800	56.7	4,855,923	1,603,079	33.0	232,890	1,162,721	42.0	96,893
S. Sumatra	10,226,300	3,562,100	34.8	10,149,068	1,248,209	12.3	913,789	2,313,891	65.0	192,824
Bengkulu	2,090,400	1,126,600	53.8	2,096,606	899,858	42.9	0	226,742	20.1	18,895
Lampung	3,386,700	647,800	19.1	3,359,906	361,319	10.8	237,929	286,481	44.2	23,873
SUMATRA	47,530,900	23,323,500	49.1	47,059,414	16,632,143	35.3	2,098,912	6,691,357	28.7	557,613
W. Kalimantan	14,753,000	8,700,600	59.0	14,546,318	6,713,026	46.1	243,571	1,987,574	22.8	165,631
C. Kalimantan	15,360,400	11,614,400	75.6	15,249,222	9,900,000	64.9	526,643	1,714,400	14.8	142,867
S. Kalimantan	3,749,000	1,795,900	47.9	3,703,550	999,182	27.0	288,120	796,718	44.4	66,393
E. Kalimantan	19,721,000	17,875,100	90.6	19,504,912	13,900,000	71.3	177,707	3,975,100	22.2	331,258
KALIMANTAN	53,583,400	39,986,000	74.6	53,004,002	31,512,208	59.5	1,236,041	8,473,792	21.2	706,149
N. Sulawesi	2,655,500	1,553,600	58.5	2,645,243	1,300,000	49.1	441,617	253,600	16.3	21,133
C. Sulawesi	6,032,900	4,359,100	72.3	6,001,253	3,400,000	56.7	645,100	959,100	22.0	79,925
S. Sulawesi	6,245,100	2,879,200	46.1	6,139,434	2,300,000	37.5	349,119	579,200	20.1	48,267
SE Sulawesi	3,681,000	2,477,500	67.3	3,676,422	2,000,000	54.4	305,266	477,500	19.3	39,792
SULAWESI	18,614,500	11,269,400	60.5	18,462,352	9,000,000	48.7	1,741,102	2,269,400	20.1	189,117
3 ISLANDS TOTAL	119,728,800	74,578,900	62.3	118,525,768	57,144,351	48.2	5,076,055	17,434,549	23.4	1,452,879
Maluku	7,801,900	6,348,000	81.3	Nd	Nd	nd	nd	nd	nd	nd
Irian Jaya	41,480,000	34,958,300	84.3	40,871,146	33,160,231	81.1	7,710,915	1,798,069	5.1	149,839
Java & Bali	13,820,400	1,345,900	9.7	Nd	Nd	nd	nd	nd	nd	nd
Nusatenggara	8,074,000	2,469,400	30.6	Nd	Nd	nd	nd	nd	nd	nd
INDONESIA	190,905,100	119,700,500	62.7	189,702,068	100,000,000	50.1	nd	19,700,500	16.5	1,641,708

All figures are in ha.

Ha/p.a. = approx. annual rate of forest loss assuming a period of 12 years (this actually varies from 10 - 14 years).

Figures in italics are estimates based on assumptions for the areas not mapped in 1997

No data = Cloud cover on MoFEC map, or no satellite imagery available. Except where mentioned below, the total is not included in the forest cover but should be taken into consideration. The RePPProT figure for 'no data' also has not been included here.

In the following provinces, adjustments have been added to the area of forest cover to allow for an estimate of forest within the 'no data' zones:

	Measured forest	Area of no data	Adjusted forest area
Central Kalimantan	8,543,384	1,883,359	9,900,000
East Kalimantan	13,361,195	716,512	13,900,000
North Sulawesi	1,106,031	635,586	1,300,000
Central Sulawesi	2,892,697	1,152,402	3,400,000
South Sulawesi	2,114,703	534,416	2,300,000
SE Sulawesi	1,975,726	329,540	2,000,000

Table 2.2. Forest Status, Forest Cover and Forest Use

Province	Total land area	Forest status						Forest cover			Forest use		
		Conservn Forest	Protection Forest	Limited Prod. Forest	Production Forest	Permanent Forest	Conver-sion	1997 Forest cover ¹	Ha	%	Logging	Timber estates	Total allocated for forest
		Forest	Forest	Forest	Forest	Status	Forest	concessions			allocated		
Aceh	5,674,800	852,421	1,844,500	37,300	601,392	3,335,613	0	3,611,953	-276,340	-8	1,087,500	376,564	1,464,064
N. Sumatra	7,250,100	253,885	1,924,535	760,958	871,183	3,810,561	37,797	1,891,819	1,918,742	50	710,600	486,640	1,197,240
W. Sumatra	4,169,000	846,175	910,533	246,383	407,849	2,410,940	189,346	1,944,015	466,925	19	152,830	0	152,830
Riau	9,859,700	560,237	1,057,841	0	2,649,608	4,267,686	334,521	5,071,891	-804,205	-19	2,719,603	684,312	3,403,915
Jambi	4,873,900	676,120	191,130	340,700	971,490	2,179,440	0	1,603,079	576,361	26	651,350	189,941	841,291
S. Sumatra	10,226,300	822,300	879,390	298,600	2,269,400	4,269,690	774,100	1,248,209	3,021,481	71	1,231,850	590,069	1,821,919
Bengkulu	2,090,400	444,882	252,042	182,210	41,830	920,964	70,360	899,858	21,106	2	198,900	5,000	203,900
Lampung	3,386,700	422,500	331,531	44,120	192,902	991,053	153,459	361,319	629,734	64	0	282,835	282,835
SUMATRA	47,530,900	4,878,520	7,391,502	1,910,271	8,005,654	22,185,947	1,559,583	16,632,143	5,553,804	25	6,752,633	2,615,361	9,367,994
W. Kalimantan	14,753,000	1,435,480	2,355,045	2,421,950	2,235,700	8,448,175	582,320	6,713,026	1,735,149	21	3,139,810	876,749	4,016,559
C. Kalimantan	15,360,400	680,580	1,014,130	4,593,003	4,448,222	10,735,935	0	9,900,000	835,935	8	4,085,000	391,843	4,476,843
S. Kalimantan	3,749,000	176,615	554,139	155,268	687,834	1,573,856	265,638	999,182	574,674	37	174,000?	549,474	723,474
E. Kalimantan	19,721,000	2,166,212	2,935,478	4,755,494	4,727,488	14,584,672	0	13,900,000	684,672	5	4,602,000	1,290,113	5,892,113
KALIMANTAN	53,583,400	4,458,887	6,858,792	11,925,715	12,099,244	35,342,638	847,958	31,512,208	3,830,430	11	11,826,810	3,108,179	14,934,989
N. Sulawesi	2,655,500	429,065	341,447	552,573	168,108	1,491,193	34,812	1,300,000	191,193	13	408,650	0	408,650
C. Sulawesi	6,032,900	676,248	1,489,923	1,476,316	483,034	4,125,521	269,411	3,400,000	725,521	18	1,440,925	31,392	1,472,317
S. Sulawesi	6,245,100	843,966	1,928,597	828,255	186,666	3,787,484	102,073	2,300,000	1,487,484	39	352,000	135,706	487,706
SE Sulawesi	3,681,000	274,069	1,061,270	419,244	633,431	2,388,014	212,123	2,000,000	388,014	16	491,500	61,594	553,094
SULAWESI	18,614,500	2,223,348	4,821,237	3,276,388	1,471,239	11,792,212	618,419	9,000,000	2,792,212	24	2,693,075	228,692	2,921,767
3 ISLANDS TOTAL	119,728,800	11,560,755	19,071,531	17,112,374	21,576,137	69,320,797	3,025,960	57,144,351	12,176,446	18	21,272,518	5,952,232	27,224,750
Java & Bali	13,820,400	468,233	728,651	394,316	1,633,383	2,756,350	0	?	?	?	0	0	0
Nusatenggara	8,074,000	567,714	1,571,418	651,257	676,326	2,899,001	352,667	?	?	?	60,500	170,307	230,807
Maluku	7,801,900	443,345	1,809,634	2,252,979	2,706,796	4,959,775	2,034,932	?	?	?	2,547,425	188,689	2,736,114
Irian Jaya	41,480,000	7,539,300	11,452,990	18,992,290	13,745,159	32,737,449	2,671,275	33,160,231	-422,782	-1	11,582,673	?	11,582,673
INDONESIA	190,905,100	20,579,347	33,938,350	54,517,697	58,495,748	113,013,445	8,084,834	?	?	?	35,739,486	6,311,228	42,050,714

1. Source: Table 2.1.

2. Source: advance draft based on *Pemaduserasian TGHK dan RTRWP, October 1999, Sekretaris Badan Planologi Hutbun.*

3. Source: MoFEC website for concessions, *Statistik Perusahaan Htuan Tanaman Industri 1996* for HTI (BPS).

See footnotes to Table 2.1 concerning forest area data.

The apparent "surplus" in Aceh and Riau disappears when the consultant's area measurements for forest cover are adopted

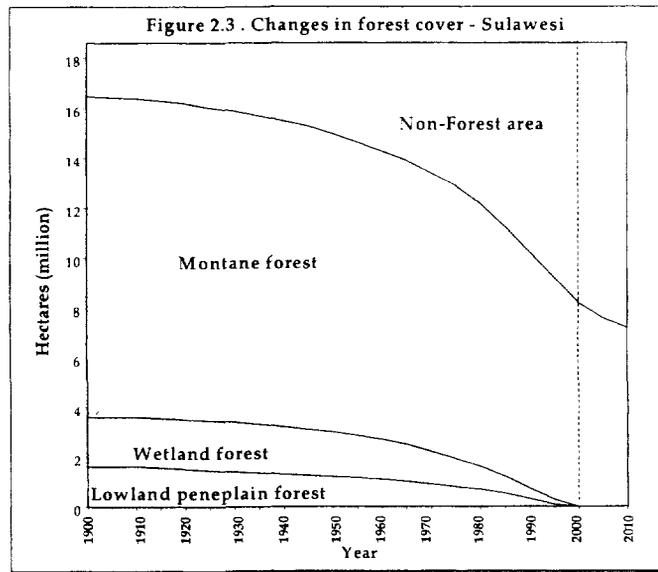
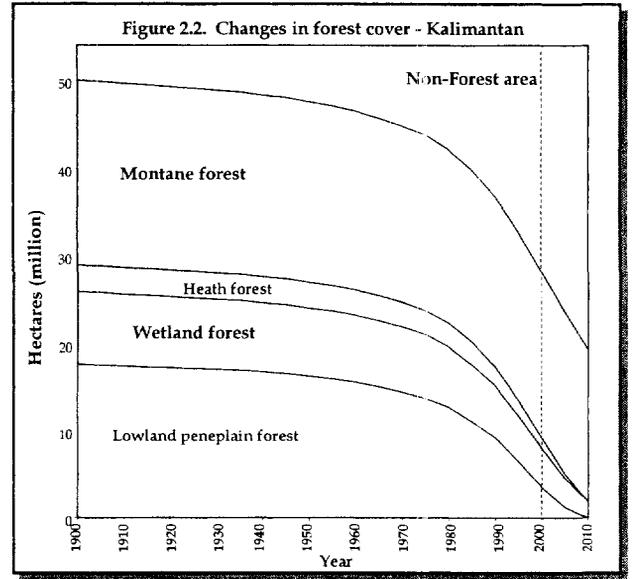
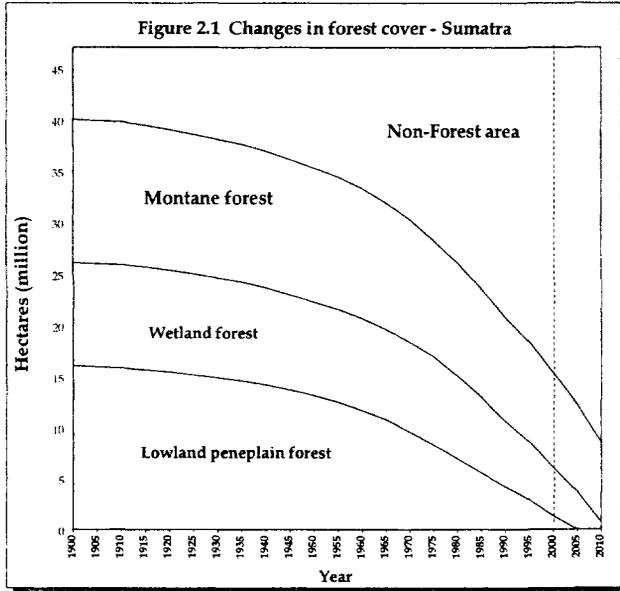
Table 2.3. Forest Cover Within Forest Status Boundaries (Old TGHK)

	Protection forest			Conservation forest			Production forest			Permanent forest estate			Total Protected area		
	TGHK	Forest	%	TGHK	Forest	%	TGHK	Forest	%	TGHK	Forest	%	TGHK	Forest	%
Aceh	972,290	904,813	93	832,453	811,498	97	1,812,050	1,425,684	79	3,616,793	3,141,995	87	1,804,743	1,716,311	95
N. Sumatra	1,543,337	689,618	45	253,557	213,219	84	2,251,312	894,438	40	4,048,206	1,797,275	44	1,796,894	902,837	50
W. Sumatra	1,242,256	901,199	73	539,915	376,098	70	1,098,571	699,623	64	2,880,742	1,976,920	69	1,782,171	1,277,297	72
Riau	426,017	308,875	73	378,437	335,531	89	4,125,048	2,907,930	70	4,929,502	3,552,336	72	804,454	644,406	80
Jambi	204,642	170,677	83	645,720	509,910	79	1,492,791	802,905	54	2,343,153	1,483,492	63	850,362	680,587	80
S. Sumatra	775,680	376,867	49	605,836	278,644	46	2,615,506	648,930	25	3,997,022	1,304,441	33	1,381,516	655,511	47
Bengkulu	459,612	382,616	83	307,721	267,907	87	249,235	172,633	69	1,016,568	823,156	81	767,333	650,523	85
Lampung	341,243	117,139	34	388,743	264,035	68	309,448	18,383	6	1,039,434	399,557	38	729,986	381,174	52
SUMATRA	5,965,077	3,851,804	65	3,952,382	3,056,842	77	13,953,961	7,570,526	54	23,871,420	14,479,172	61	9,917,459	6,908,646	70
W. Kalimantan	2,296,136	1,860,959	81	1,279,467	1,129,627	88	4,814,921	2,447,580	51	8,390,524	5,438,166	65	3,575,603	2,990,586	84
C. Kalimantan	840,176	804,564	96	632,708	584,769	92	9,397,431	7,181,488	76	10,870,315	8,570,821	79	1,472,884	1,389,333	94
S. Kalimantan	441,148	263,794	60	127,962	65,174	51	1,375,640	793,315	58	1,944,750	1,122,283	58	569,110	328,968	58
E. Kalimantan	2,866,921	2,741,102	96	1,783,624	1,525,213	86	9,887,197	7,643,158	77	14,537,742	11,909,473	82	4,650,545	4,266,315	92
KALIMANTAN	6,444,381	5,670,419	88	3,823,761	3,304,783	86	25,475,189	18,065,541	71	35,743,331	27,040,743	76	10,268,142	8,975,202	87
N. Sulawesi	327,609	287,167	88	416,727	383,530	92	832,523	648,911	78	1,576,859	1,319,608	84	744,336	670,697	90
C. Sulawesi	1,322,124	1,143,232	86	633,160	549,035	87	2,206,506	1,658,344	75	4,161,790	3,350,611	81	1,955,284	1,692,267	87
S. Sulawesi	2,029,571	1,391,288	69	125,019	97,914	78	1,209,838	717,529	59	3,364,428	2,206,731	66	2,154,590	1,489,202	69
SE Sulawesi	529,478	457,826	86	291,016	223,497	77	1,551,231	1,194,109	77	2,371,725	1,875,432	79	820,494	681,323	83
SULAWESI	4,208,782	3,279,513	78	1,465,922	1,253,976	86	5,800,098	4,218,893	73	11,474,802	8,752,382	76	5,674,704	4,533,489	80
TOTAL	16,618,240	12,801,736	77	9,242,065	7,615,601	82	45,229,248	29,854,960	66	71,089,553	50,272,297	71	25,860,305	20,417,337	79

Note: areas having cloud cover, or without data, are assumed to have forest cover.

Source: Badan Planologi, 1999

The graph for deforestation in Sulawesi (see Figure 2.3) demonstrates that Sulawesi is a mainly mountainous island, with lowlands occupying only 25% of the area. Already by 1985 only a quarter of these lowlands still carried forest, with rapid clearance occurring in the transmigration areas, and only a fraction of this remains now, mostly on the west coast. Sulawesi's remarkable biodiversity and endemism are mainly found in the upland forests, but this should not preclude effort to protect the last lowland remnants.



MoFEC's current mapping of forest cover is at too small a scale to provide useful information on conversion of mangroves. The only estimate of total mangrove area based on remote sensing imagery was that made by RePPPProT from mid-1980s sources, listed below. No reliable measurement of current mangrove area is available, but one estimate⁹ suggests that one third of the total area of mangroves, or 1.3 million ha, had been cleared by 1993 (see Table 2.4).

This would be equivalent to over 160,000 ha/yr. The main reason for mangrove clearance is conversion to brackish-water fishponds (*tambaks*), and other activities are minor in comparison (logging, and industrial or urban development). The most disturbing aspect of *tambaks* is that many become non-operational after just a few years, or are able to support the growth of milkfish only, and not the higher value prawns.

Table 2.4. Mangrove areas by island (ha)

	RePPPProT (mid-1980s)	1993 Estimate	Decrease	% decrease
Sumatra	681,700	485,025	196,675	29
Kalimantan	1,014,200	393,450	620,750	61
Sulawesi	237,400	84,833	152,567	64
Java and Bali	34,300	19,577	14,723	43
Nusatenggara	27,500	25,300	2,200	8
Maluku	212,100	100,000	112,100	53
Irian Jaya	1,583,300	1,382,000	201,300	13
TOTAL	3,788,520	2,492,178	1,296,342	34

Causes of deforestation. The main causes of deforestation (defined here as the permanent loss of forest cover) can be grouped into three broad categories: large-scale conversion for timber or estate crop plantations (in particular, oil palm), smallholder conversion, and unsustainable and illegal logging. The smallholder category has been overrated as a cause of deforestation.¹⁰

Whereas formerly the Government tended to attribute deforestation, and especially the forest fires, to "shifting cultivators", there are now very few genuine examples of these traditional farmers who practice rotational swidden farming. They are likely to be restricted to the inner regions of the forest that are remote from the market economy and population pressures. The overall impact of swidden farming on forest cover is relatively small. Elsewhere, it is the pioneer farmers, spontaneous transmigrants, and farmers who have been displaced by large-scale estate developments, who have replaced the swidden farmers as an actors in deforestation. They are *not* shifting cultivators. During the 1997 fires the government at last acknowledged, in the light of the evidence from satellite imagery, that the large plantation companies, forestry conglomerates and transmigration contractors were primarily responsible for setting the fires in the course of clearing land. Commercial development, especially for oil palm plantations, has become the main agent in accelerating the process of deforestation during the 1990s.

⁹ (Gieson, 1993)

¹⁰ "Underlying causes of deforestation in Indonesia" presented at Post-CGI Seminar by Dayu Pradnja Resosudarmo, CIFOR.

Table 2.5 attempts to summarize data on forest conversion by large investors, but the figures are only approximations. Every data source tends to give different area figures, and in many provinces the gross area under application for plantations (*Hak Guna Usaha* or *HGU*) exceeds the area that would be available for conversion, as a result of overlapping claims. Many applications have probably now lapsed, been withdrawn, or been revoked. Column C gives the total areas allocated for timber estates (*Hutan Tanaman Industri* or *HTI*), but the area actually realized up to 1998 (Column D) is only 37% by the most generous estimates.

Table 2.5. Data on Forest Land Allocations and Uses

A	B	C	D	E	F	G	H	I
Province		Timber estates		New estates (mainly Oil Palm) ³				
	Deforested since mid-80s	Allocated ¹	Realized to 1998 ²	Oil palm area 1984	Oil palm Area 1998	New oil palm	Conversion for estates agreed in principle (1995)	Conversions approved for estates and transmigration 1994-98
Aceh	270,347	376,564	81,799	32,692	206,405	173,713	315,851	164,762
N. Sumatra	920,181	486,640	100,190	387,146	612,617	225,471	172,829	37,352
W. Sumatra	646,385	0	11,371	4,560	137,952	133,392	162,162	105,571
Riau	864,609	684,312	291,859	39,793	606,165	566,372	1,650,187	518,259
Jambi	1,162,721	189,941	98,740	500	236,059	235,559	345,142	105,890
S. Sumatra	2,313,891	590,069	252,832	6,767	309,761	302,994	127,829	102,045
Bengkulu	226,742	5,000	2,290	0	57,006	57,006	47,500	67,732
Lampung	286,481	282,835	54,385	17,590	74,530	56,940	90,572	88,955
SUMATRA	6,691,357	2,615,361	893,463	489,048	2,240,495	1,751,447	2,912,072	1,190,566
W. Kalimantan	1,987,574	876,749	148,733	13,044	279,535	266,491	257,059	66,080
C. Kalimantan	1,714,400	391,843	102,006	52	110,376	110,324	257,250	353,731
S. Kalimantan	796,718	549,474	208,420	0	93,902	93,902	257,250	118,407
E. Kalimantan	3,975,100	1,290,113	497,103	44	78,938	78,894	295,395	262,061
KALIMANTAN	8,473,792	3,108,179	956,261	13,140	562,751	549,611	1,066,954	800,279
N. Sulawesi	253,600	0	9,343	0	0	0	10000	25,402
C. Sulawesi	959,100	31,392	29,053	0	18,036	18,036	82,790	43,898
S. Sulawesi	579,200	135,706	28,002	1,160	83,215	82,055	107,915	52,938
SE Sulawesi	477,500	61,594	19,057	0	0	0	19750	21,028
SULAWESI	2,269,400	228,692	85,455	1,160	101,251	100,091	220,455	143,266
3 ISLANDS TOTAL	17,434,549	5,952,232	1,935,179	503,348	2,904,497	2,401,149	4,199,481	2,134,111
Maluku		188,689	77,656	0	0	0	25,780	16,224
Irian Jaya	1,798,069	153,250?	39,996	563	31,080	30,517	126,389	132,979
Other		170,307	352,215	8,110	21,502	13,392	643	1,505
Indonesia		6,464,478	2,404,364	512,021	2,957,079	2,445,058	4,352,293	2,284,771

Sources: RePPProT (for 1980s data), Potter & Lee 1998 (for data on conversions, 1995), remainder from MoFEC.

1: Statistik Hutan Tanaman Industri 1996/97, Direktorat Jenderal Pengusahaan Hutan.

2: MoFEC sources, updated from Statistik Pengusahaan Hutan 1997/98. The total area of HTI realized nationwide during Pelita V (1989-1994) and Pelita VI (1994-1999) is 2,471,527 ha.

3: DG Estates, Potter & Lee 1998.

Between 1984 and 1998, 2.3 million ha of oil palm have been planted, especially in Sumatra, Kalimantan and Sulawesi (column G). However, over 4.3 million ha had been approved in principle by 1995 (column H). These are not the only major tree crops planted by the large

investors, but total areas of other crops such as rubber, cocoa and coconut are relatively small by comparison. The "conversions" in the final column (column I) represent approved change of status from forest to agriculture. These include conversion for transmigration, but well over 80% of the total area was for plantation.

Table 2.6 indicates that out of the 17 million ha of forest loss in Sumatra, Kalimantan and Sulawesi, only some 4.1 million have actually been replaced by other tree crops in the large investor sector. Part of the difference is undoubtedly forest that has been allocated for clearance and not planted but already clear-felled (4.0 million ha of HTI, and over 2.0 million ha for oil palm). Evidence that this is the case comes from a report from the Indonesia-UK Tropical Forest Management Programme,¹¹ where it is noted that 40% of the country's legal supply of timber comes from land clearing, and that the output from this source had doubled between 1994 and 1997. Yet the timber estate concessionaires (HTI) have only planted 25% of the land under their control, according to this analysis. The area that has been licensed for oilpalm and cleared, but not yet developed, may be equally extensive.

In Table 2.6, the area of new plantings by the large investors in timber and agricultural estates is combined (column E), while the recorded growth of smallholder plantations is listed in column F. The latter figure actually covers 14 years, rather than the 12 used in this analysis, but the smallholder figures may be understated. However, with no better information than that in Table 2.6, 9.9 million hectares of forest cover loss remains unaccounted for by tree crop and timber plantation development.

There is anecdotal evidence of an additional agent in deforestation, the small investor, generally an urban-based businessman or civil servant, who seeks to expand income through acquisition of farmland and cash crops. Small investors hire rural labor to clear and manage plots of a few hectares of tree crops, perhaps only one or two hectares at a time. This could be oil palm where processing facilities are readily available, but more often it will be a less demanding crop such as rubber, coffee or cocoa, or local specialties such as cinnamon. The small investors probably acquire their holdings informally, thus their activities are not fully reflected in government statistics on permits for forest conversion, hence not in Column G of Table 2.6 either. This would be the case especially in protection forest areas.¹²

A recent study (Angelsen & Resosudarmo 1999) of sample areas of Riau, West and East Kalimantan and Central Sulawesi discovered considerable variability among provinces but concluded in general that better-off farmers, immigrants and urban dwellers with capital are more likely to have utilized the opportunities created by the monetary crisis and have converted forests to high profitability crops. In Central Sulawesi, close to Lore Lindu National Park, the indigenous people are still mostly clearing for subsistence farming, and it is the migrants from elsewhere in Sulawesi who are opening cocoa gardens. It was found that demands from these migrants and city dwellers were putting an upward pressure on land prices, so that indigenous farmers are tempted to sell, and are then forced to open new lands or become laborers.

¹¹ (Brown, 1999)

¹² A very common instance of such acquisitions lies in the brackish-water fishponds sector; small farmers mostly lack the resources to develop these by themselves, and probably the majority of mangrove conversions have been through outsiders.

Table 2.6. Results of Forest Conversion

A	B	C	D	E	F	G	H
Province	Forest loss	Development of cleared land					
		Large investors			Smallholder estate crops	Total tree crops	Balance of cleared land
		HTI	Oilpalm	HTI+HGU			
Aceh	270,347	81,799	173,713	280,000	153,857	433,857	-163,510
N. Sumatra	920,181	100,190	225,471	360,000	136,994	496,994	423,187
W. Sumatra	646,385	11,371	133,392	165,000	87,317	252,317	394,068
Riau	864,609	291,859	566,372	950,000	441,759	1,391,759	-527,150
Jambi	1,162,721	98,740	235,559	360,000	255,680	615,680	547,041
S. Sumatra	2,313,891	252,832	302,994	590,000	323,227	913,227	1,400,664
Bengkulu	226,742	2,290	57,006	80,000	67,675	147,675	79,067
Lampung	286,481	54,385	56,940	138,000	128,141	266,141	20,340
SUMATRA	6,691,357	893,463	1,751,447	2,923,000	1,594,650	4,517,650	2,173,707
W. Kalimantan	1,987,574	148,733	266,491	470,000	214,794	684,794	1,302,780
C. Kalimantan	1,714,400	102,006	110,324	260,000	105,254	365,254	1,349,146
S. Kalimantan	796,718	208,420	93,902	330,000	46,975	376,975	419,743
E. Kalimantan	3,975,100	497,103	78,894	610,000	100,275	710,275	3,264,825
KALIMANTAN	8,473,792	956,261	549,611	1,670,000	467,298	2,137,298	6,336,494
N. Sulawesi	253,600	9,343	0	35,000	47,791	82,791	170,809
C. Sulawesi	959,100	29,053	18,036	60,000	68,407	128,407	830,693
S. Sulawesi	579,200	28,002	82,055	130,000	207,062	337,062	242,138
SE Sulawesi	477,500	19,057	0	60,000	69,682	129,682	347,818
SULAWESI	2,269,400	85,455	100,091	285,000	634,341	919,341	1,350,059
3 ISLANDS TOTAL	17,434,549	1,935,179	2,401,149	4,878,000	2,696,289	7,574,289	9,860,260

Definitions:

HTI+HGU: All large investors (includes timber estates, oil palm, rubber, cocoa, sugarcane, etc.)

Smallholder estate crops: areas as listed by DG Estates, showing growth between 1984 and 1997.

Clearly it is important to investigate further the agents and processes of land conversions, including:

- officially approved conversions by large investors for tree crop development in the last remaining lowland forests;
- approved conversions which have been used as covers for clear felling to supply the timber industry,
- conversions by small investors, both formal and informal, and the scale of this activity;
- development of tree crops by owner-farmers compared with absentee landlords;
- pressures that result in pioneer farmers moving into marginal lands;
- ownership of rights to the "wasteland" category and the formulation of plans to optimize use of this new "asset" that replaces the original forest cover.

Forest Fires of 1997 and 1998. During 1997 and 1998, many parts of Indonesia were affected by drought and fire. While the drought conditions brought on by an El Niño-Southern Oscillation (ENSO) event increased forest fire risk, nearly all of the burning was related to human activities. Large-scale land conversion caused 34 percent of the number of fires, shifting cultivation 25 percent, permanent agriculture 17 percent, arson and social jealousy 14 percent, and transmigration projects 8

percent. Only one percent was attributed to natural causes. The total area burned was 9.7 million hectares, of which 4.8 million hectares were forest, as shown in Table 2.7. Economic losses of these fires are estimated at \$9.3 billion -- \$7.9 million in costs to the citizens and businesses of Indonesia, and \$1.4 million in carbon emissions which contribute to global climate change (Table 2.8).¹³

Table 2.7. Estimated Extent of Spatial Damage by Fire in Indonesia in 1997-1998
(areas in hectares)

Island	Montane Forest	Lowland Forest	Swamp Forest and Peat	Scrub and Grass	Timber Plantation	Agriculture	Estate Crops	Total
Kalimantan		2,375,000	750,000	375,000	116,000	2,830,000	55,000	6,501,000
Sumatra		380,000	300,000	260,000	70,000	670,000	60,000	1,740,000
Java		25,000		25,000		50,000		100,000
Sulawesi		200,000				200,000	1,000	401,000
Irian Jaya	100,000	300,000	400,000	100,000		100,000	3,000	1,003,000
Total	100,000	3,280,000	1,450,000	760,000	186,000	3,850,000		9,745,000

Source: BAPPENAS, 1999

Table 2.8. Summary of Economic Losses from Forest Fires in Indonesia, 1997-1998

Sector	Estimated Economic Losses (US \$ millions)		
	Minimum	Maximum	Mean
Agriculture:			
farm crops	2,431	2,431	2,431
plantation crops	319	319	319
Forestry:			
timber from natural forest (logged and unlogged)	1,461	2,165	1,813
lost growth in natural forest	256	377	316
timber from plantations	94	94	94
non-timber forest products	586	586	586
Environmental Services of the forests:			
flood protection	404	404	404
erosion and siltation control	1,586	1,586	1,586
carbon sink	1,446	1,446	1,446
Health	145	145	145
Transmigration projects, buildings and property	1	1	1
Transportation	18	49	33
Tourism	111	111	111
Fire-fighting cost	11	12	12
Total	8,870	9,726	9,298

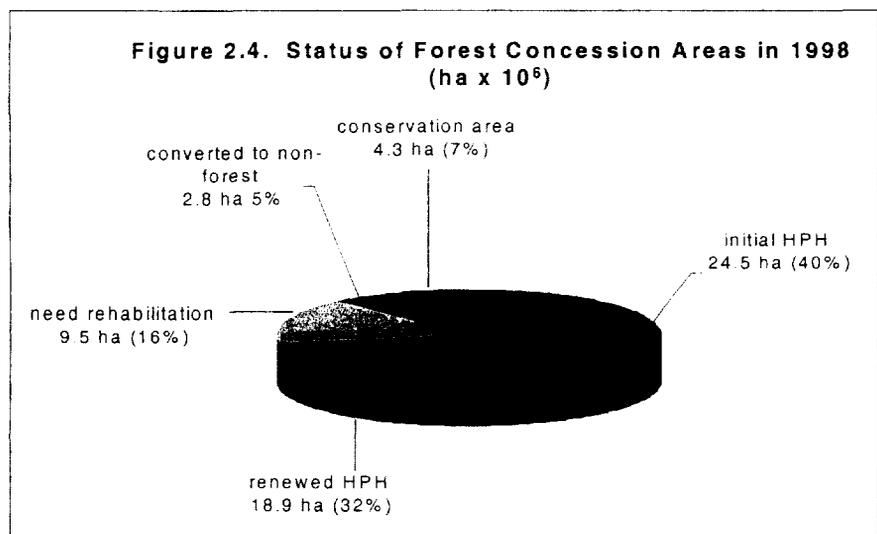
Source: BAPPENAS, 1999

A detailed study based on radar satellite imagery of land burned in the province of East Kalimantan showed that fire damage is not uniform. There were more than 2,000 separate fires in the province during 1997-98. They affected 5.2 million hectares, including logging concessions (2.3

¹³ "Extent and costs of the 1997-98 fires and drought in Indonesia" presented at Post-CGI Seminar by Anang Noegroho, Bureau of Marine, Aerospace, Environment, Science and Technology, BAPPENAS.

million), protection forest (0.4 million), timber plantations (0.9 million), and tree crops estates (0.7 million). Degraded forest, *alang-alang* grassland, and peat swamp were apparently most vulnerable: a total area of 1.8 million hectares in these categories suffered more than 80 percent destruction of vegetation. Destruction in the range of 50 to 80 percent was experienced on 2.2 million hectares of mostly forest land, while another 1.2 million hectares sustained 25 to 50 percent damage.¹⁴ As noted in the previous chapter, the fires have been an important factor encouraging reform in the forest sector.

As the 1997-98 fire disaster exemplified, forest fire control in Indonesia has tended to be reactive and *ad hoc*. It has taken the form of uncoordinated efforts, which have proven to be both inefficient and ineffective. In 1998, a working group of stakeholders began to develop the basics of an Integrated Action Plan, with support from ADB. The members of the group were BAPPENAS, BAKORNAS-PB, BAPEDAL, Department of Home Affairs, and WALHI. The plan covers six core fire control programs: advocacy, prevention, early warning, detection, suppression, and coordination and command. Stepwise implementation is envisioned, coordinated by three agencies identified as having lead responsibility for fire management. BAKORNAS-PB is the focal point for formulation and coordination of national policies. BAPEDAL and Ministry of Environment have the lead responsibility for monitoring and evaluating all types of fire and associated environmental impacts (early warning, detection, and advocacy). MoFEC is the lead agency for fire control operations; it shares responsibility with counterpart provincial agencies. The plan identifies resource needs to strengthen existing activities and develop new ones, and indicates which actions require international donor support.¹⁵ It has not been implemented, however, and there is no mention of forest fire management in the Government Regulation on Government and Provincial Authority (PP No. 25 of 2000) issued on May 6, 2000.



¹⁴ "Fire damage in East Kalimantan in 1997/1998 related to land use and vegetation classes" presented at Post-CGI Seminar by Ir. Uuh, Head, KanWil MoFEC.

¹⁵ "Integrated action plan for land and forest fire control" prepared by Abdul Malik, Bureau Chief IPTEK, BAPPENAS. This paper could not be presented at the Post-CGI Seminar but deserves a place in this summary because of the persistence of the serious fire problem in Indonesia.

Forest Management by Concessions (Hak Pengusaha Hutan or HPH). The management of production forest by concessions and the oversight of that management by Government have not achieved the goal of sustainability. The status in 1998 of 60 million hectares of land currently or formerly under HPH is revealing (see Figure 2.4): Sixteen percent of the land placed under management by concessionaires has been so mismanaged as to require rehabilitation. Nearly 5 percent has been converted to other uses than natural production forest.

The fact that the HPH for 40 percent of the area has been renewed is better news, provided that the concession operations are inspected adequately and evaluated objectively. However, another finding casts doubt on these presumptions. A comparison of reported log production and conservative estimates of potential production from concessions indicates that HPH operators routinely cut substantially more than they report – 12.8 million m³ annually on average since 1997. This occurs despite GOI rules and procedures, which, if followed to the letter, would subject each concession to as many as 58 separate site visits or other control actions every year. Most concessionaires claim not to know what is expected of them (see Box 2.1). Clearly the present system of forest management does not foster resource conservation, and the interventions of the Government in controlling HPH operations are not effective.¹⁶

On the positive side, the Ecolabeling Institute (Lembaga Ekolabel Indonesia, or LEI) is carrying out ecolabeling. LEI's program can encompass natural forest concessions, plantation forests, mangrove forests, community-based forest management, wood-based industry, and timber tracking (chain of custody). LEI's criteria and indicators have been recognized internationally through a memorandum of understanding with FSC. Eleven timber concessions covering about 1.5 million hectares are scheduled for certification during 2000, and 20 more concessions are preparing for certification.¹⁷

Illegal Logging and Damage to National Parks and Protected Areas. Illegal logging takes several forms, including cutting in protection forests, overcutting or cutting by third parties in concessions, violation of GOI regulations regarding concession operations, and using clear felling permits (IPK) that were issued for other locations. A study of the timber industry (Brown, 1999) has shown that during the period from 1994 to 1997, illegal logging necessary to maintain the operations of the nation's sawmills and plywood mills was 20 million m³/year. Further analysis which also took into account the pulp and paper industries, demonstrated that the shortfall supplied by illegal logging was 37 million m³ in 1997, rising as high as 56.6 million m³ in 1998.¹⁸ The verity of these figures is supported by abundant anecdotal evidence, which suggests that illegal logging became even more rampant in 1999.

¹⁶ "Forest management by concessions" presented at Post-CGI Seminar by Hariadi Kartodihardjo, Lecturer, Bogor Agricultural Institute.

¹⁷ *Ibid.*

¹⁸ Scotland, Fraser & Jewell, 1999

Box 2.1. Survey of Environmental Behavior of Forest Concessionaires in the Outer Islands

To learn more about concessionaires' knowledge and opinions about environmentally sound logging practices, the World Bank surveyed HPH forest concessions in Indonesia's Outer Islands in 1999. The questionnaire was administered to 81 HPH forest concession managers in East and West Kalimantan and in Riau on Sumatra. These 81 concessions account for 30% of all concessions in East Kalimantan, 70% of all concessions in West Kalimantan and Riau, and 28% of all HPH concessions in the outer islands.

The survey focused on a handful of key environmental management practices, including MoFEC requirements regarding selective cutting, replanting, and Bina Desa. It also included questions about the degree to which concessions were engaged in reduced or low impact logging.¹⁹ Local HPH managers were asked to define each practice and to state whether or not their concessions engaged in it. The survey also collected data that enabled calculation of whether concessions were limiting their annual harvest to the annual allowable cut approved by the MoFEC, as well as data on concession characteristics and exposure to formal and informal environmental regulatory pressures.

Sampled HPHs held concessions that averaged 117,000 hectares and employed an average of 219 manual laborers. The time in operation of concessions in the sample averaged nearly 16 years. Fifty-eight percent of the concessions reported that they were operating under their first twenty-year concession leasehold, while 42% reported they were in their second leasehold. Forty-three percent stated that they owned or operated wood processing facilities.

Most concession managers stated that their concessions engaged in environmental management practices: 81% stated that they followed the selective cutting system as stipulated in concession agreements, 84% stated that they engaged in low or reduced impact logging, 91% stated that they engaged in replanting as required by MoFEC, and 95% stated that they engaged in Bina Desa. Yet when asked to define these practices, few could. Only 34% correctly described MoFEC's requirements for replanting. Even fewer correctly described requirements for selective cutting (27%) and Bina Desa (31%). Very few (11%) could adequately define low or reduced impact logging.

This pattern of responses suggests that concessionaires fall into three groups. One group consists of those who know what is expected and claim they do it (about 25% of the sample). A second is a group that claims not to know what is expected and consequently does not do it (about 20%). A third is a group that does not quite know what "it" is but does know, or is aware, that some form of environmental management is expected (about 55%). In other words, by their own admission, some 75% of concessionaires do not follow the law.

Further statistical analysis determined that concession managers are more likely to claim that their concessions engage in selective cutting if government warnings and sanctions imposed on concessions (including other concessions) and government monitoring of concessions' cutting practices are more frequent. This suggests that efforts to strengthen monitoring and enforcement might indeed yield substantial environmental benefits. The probability that a concession claims to engage in selective cutting falls if the concession has a HTI (industrial timber plantation) in or near the concession and rises if it operates sawnwood processing facilities. The probability that a concession claims to engage in selective cutting, replanting, and low impact logging is higher if a concession is privately owned; joint ventures and sole ownership by INHUTANI (state owned forestry enterprise) lower the probability. Privately owned concessions also have lower ratios of harvest to allowable cut. Finally, even though exposure to environmental market pressures and negative media pressures are low in Indonesia, those concessions that report such exposure also report that they are more likely to engage in selective cutting and replanting.

¹⁹ See the definition of low or reduced impact logging in R. Ulbricht, "Reduced Impact Logging: Directional Felling in Selected Managed Forest in East Kalimantan" (1996).

When a logging concessionaire withdraws from an area, or when the permit has expired, there is little incentive to control the forest further, and legions of small sawmills spring up. A non-HPH sawmill is required to have a permit (*Surat Tanda Pendaftaran Industri Kecil* or STPIK) from the Department of Industry at kabupaten level. It is also required to have an authorized plan for acquiring the timber (*Rencana Pemenuhan Bahan Baku Industri* or RPBI) from the Department of Forestry, from the *kanwil* if the capacity is less than 6000 m³, otherwise from Jakarta. Inevitably there is a lack of coordination among these institutions. Even when the sawmills have the STPIK, they may either not hold the RPBI or not observe it. The sawmills proceed to remove all the remaining timber (below the requisite diameter) left by the concessionaire. They then turn their attention to any protection forest or conservation forest that exists within reach.

There are at least 25 sawmills operating in the neighborhood of Bukit Tigapuluh National Park in Sumatra, for example (WWF/DFID 1998). Wetlands International (1997) reports on the sawmills in Muara Kendawangan and Sungai Jelai in West Kalimantan. Illegal operators felt no compunction about logging in the Natural Laboratory for the Sustainable Management of Tropical Peat Swamp Forests, opened by the provincial governor in July 1998 as an international field research facility allied to the University of Palangkaraya.

"The Final Cut", a documentary film produced by TELAPAK and EIA that exposes the illegal logging businesses in Gunung Leuser and another Indonesian national park, Tanjung Puting.²⁰ Focusing primarily on Tanjung Puting, the film shows that illegal logging and sawmilling takes place on a commercial scale, with large companies such as Tanjung Lingga Grup paying illegal loggers to bring ramin out of the park via the river system or by truck. Tanjung Lingga Grup operates a number of factories along the Arut River, producing moldings, wooden blinds, and furniture for export to Singapore, Hong Kong, Taiwan, and the United States. Profits are exorbitant – a logger may be paid \$1 per cubic meter for wood which, after processing, can bring up to \$1,000 per cubic meter. The companies operate with impunity, having evidently obtained protection from police and military officers and local and provincial officials.

The construction of a new road through protection forest acts as an open invitation for illegal logging. For example, a road has been constructed from Wamena, in the Baliem Valley of Irian Jaya, up to Danau Habbema in the alpine zone and beyond. The professed objective is to bring the benefits of development to very isolated tribal communities, but besides the colossal capital costs of construction (air transport would be cheaper), there are the very high direct and indirect impacts of a road in such hyper-sensitive terrain. In January 1995, the low quality timbers that make up the montane forest in very steep and erodible terrain at 3,000 m altitude were being systematically removed.

The Wood-processing Industry: Overcapacity. Excess capacity is one of the main drivers of illegal logging. The Indonesian wood-processing industry has expanded without regard to the available supply of timber (see Table 2.9). Its log consumption now greatly exceeds the sustainable yield of the forests, and the firms in the pulp and paper industry have only developed 20 percent of the area identified for timber plantations to help make up the difference. The shortfall is being met largely by permits for clear felling (IPK), under-reporting by concession operators, and illegal

²⁰ "The Final Cut," which was presented at the Post-CGI Seminar by Ambrosius Ruwindrijarto, Executive Director of TELAPAK, was produced by TELAPAK and the Environmental Investigation Agency (EIA), a UK-US environmental NGO.

logging. For example, in 1997 total consumption of roundwood was an estimated 86.5 million cubic meters. The official reported harvest was 30 million cubic meters, one-third of which was from IPK and thus not sustainable. Pulp imports and domestic wastepaper recycling provided the equivalent of a further 10.5 and 5.0 million cubic meters, respectively. The shortfall of 41 million cubic meters must have been met by illegal logging – a mixture of unrecorded harvesting by concession operators and outright theft. In 1998, official log production declined and the shortfall increased to 57 million cubic meters, which coincides with reports from the field of a sharp increase in illegal logging.²¹

Table 2.9. Timber Supply and Demand, 1998

Sources and Uses of Wood in 1998	Volume (m ³ millions)	
Demand:		100.0
Export production	48.9	
Estimated domestic consumption	51.1	
Supply:		43.3
Imports and recycling (primarily pulp)	21.9	
Officially reported harvest:		
11.2 from natural production forest	21.4	
7.1 from clearcutting (forest conversion)		
0.2 from timber plantations		
2.9 community forestry and other		
Shortfall		57.7

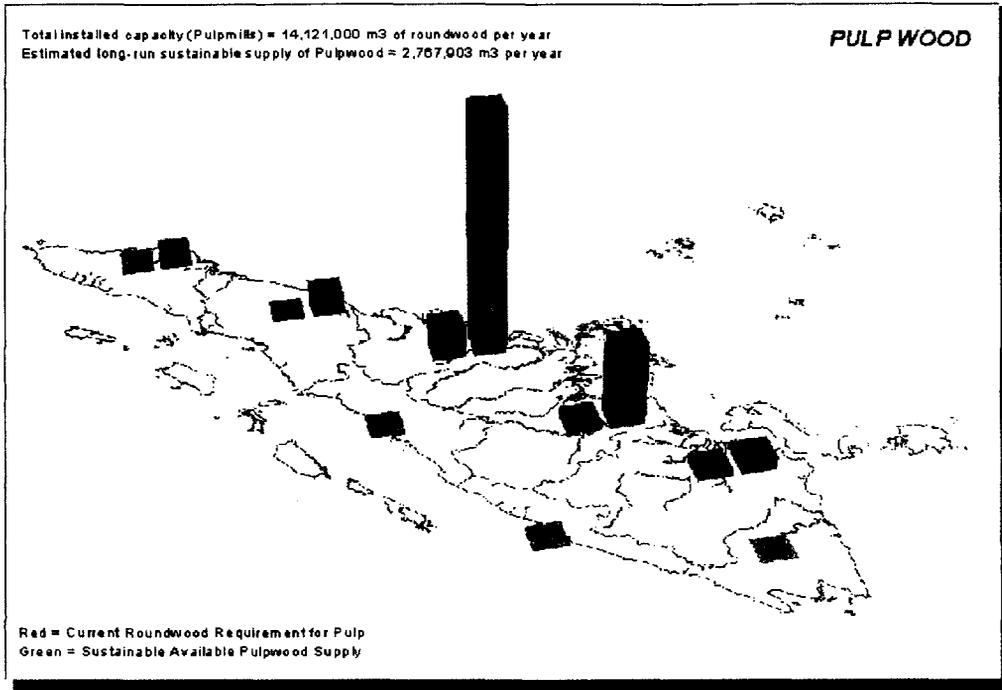
The gap between supply and demand has a regional dimension, because the cost of transportation limits the size of the area from which wood processors are willing to purchase raw materials, especially in the pulp and paper industry. As an example, Figure 2.5 shows the excesses of demand for pulpwood over sustainable local supply to feed mills in Sumatra, by province.

The pulp and paper industry continues to expand, from 1 million tons aggregate capacity in 1990 to 6.5 million tons in 1999, at the same time falling far short of its obligations to establish pulpwood plantations. Out of roughly 5 million ha that should have been planted, only 1 million ha have been, and the industry continues to depend heavily on natural forest and on imports. These are indications of serious market distortions – increasingly scarce raw materials should be rising in price and diminishing the attractiveness of further investments in the industry – and a complete lack of connection between those who manage the forest and those who issue approvals for industrial development.²²

²¹ "Roundwood supply and demand in the Indonesian forest sector" presented at Post-CGI Seminar by Dr. Muljadi A T, Indonesia-UK Tropical Forest Management Program (DFID).

²² *ibid.*

Figure 2.5. Shortfall in Pulpwood Supply in Sumatra



The Wood-processing Industry: Indebtedness. Of the US \$51.5 billion in private debt owed to IBRA (The Indonesia Bank Restructuring Agency), \$4.1 billion is in loans to the forest industry. \$2.7 billion of the forestry debt is classified as non-performing, and IBRA holds an additional \$2.4 billion in non-performing loans to the non-forestry businesses of conglomerates that operate in the forestry sector. The offshore debt of those conglomerates amounts to another \$15 billion.

Standard and Poor's has estimated that as much as 70 percent of total bad corporate debt may eventually be written off in Indonesia. In the forestry sector, this would amount to \$1.9 billion related to forest-based investments, or \$3.6 billion in total debt of the conglomerates. Such write-offs would amount to subsidies for the firms in the industry, many of which have taken unwise investment risks, pursued unsustainable logging practices, created markets for illegal timber, delayed in establishing plantations to meet their future needs, and enjoyed large profits from low rent capture, low-interest loans, and tax advantages. The write-offs would also support existing overcapacity in the processing industry and encourage further expansion, leading to still more pressure on the natural forests.²³

Spatial Planning: Revisiting State Forest Delineation and Management. In Indonesia, all land officially classified as forest falls under the control of MoFEC. Despite efforts to harmonize the forest boundary with provincial spatial plans since 1992, sectoral officials alone made virtually all the decisions regarding the designations of land as state forest districts. Even in the 1999

²³ *Ibid.*

harmonization effort, the decisions rarely took into account the views of local communities located in or near the forest. Whether a district was designated for production, conversion, or conservation, the rights to manage it were given to parties from outside the local communities, causing confusion, anxiety and dissatisfaction. Unfortunately, previous Governments did not take the dissatisfaction seriously, and it grew into conflicts between local communities and the Government or the holder of the rights to the forest. Experience is that such conflicts will continue until the forest district decision-making process is fully participatory.²⁴

Community and Traditional Forest Users, and Land and Forest Use Conflicts. Land use plans and policies implemented in a "top-down" fashion by central agencies are not based on appropriate information from the field, and they are based on decisions made without consulting local communities. This disregards the benefits of socially and ecologically sustainable forest management being practiced by those communities, threatens those practices with extinction, and endangers the social, economic, and cultural welfare of the forest dwellers. Poverty is exacerbated, not alleviated, when the communities are denied access to their customary natural resource assets. The experience of the Dayak Bentian community in East Kalimantan is an example. An established land use management system under which the community derived cash income from fruit trees, rattan gardens, honey, and timber was eradicated in 1993 when the land was graded and developed as an industrial timber plantation and transmigration colony (HTI-Transmigrasi). When there were protests, police and military authorities intervened on the side of the developer, interrogating and threatening the Dayak residents.²⁵

The Moronene people in Southeast Sulawesi experienced similar mistreatment at the hands of the Government, but in this case the reason was the designation of their traditional land as Rawaopa Watumohai National Park. Rather than accepting the Moronene residents as part of the park's assets, the park management and local authorities proceeded to evict them, burning villages and arresting and prosecuting those who did not obey the eviction orders. The Moronene found themselves in a situation in which the world had turned upside down: their traditional way of life was suddenly criminalized, whereas violent acts that would have been considered criminal under any reasonable definition were carried out against them by government authorities.²⁶

These difficult issues can no longer be ignored. Communities that believe they have claims for compensation or return of land use rights against the Government or logging or plantation companies are becoming vocal and recognizing that they do have power. They have disrupted commercial operations, and industries are asking the Government for help. Meanwhile, potentially productive cleared land that was formerly under forest cover is not being put to optimal use. Rural poverty is widespread – the number of rural poor still exceeds that of their urban counterparts – and poverty and community resentment are surely two other main drivers of illegal logging, as well as encroachment. New policies, conflict resolution skills, and a real and rapid commitment to expanded roles for local communities in forest management are essential and overdue.

²⁴ "A review of decisions concerning the national forest estate" presented at Post-CGI Seminar by Mirna Safitri, Anthropologist, P3AE, University of Indonesia.

²⁵ "Rattan gardens in conflict with HTI" presented at Post-CGI Seminar by Niel Makinuddin, Executive Director, PLASMA -- Institute for Environment and People Empowerment.

²⁶ "The case of the Moronene people in Rawaopa National Park, Southeast Sulawesi" presented at Post-CGI Seminar by Bediona Philipus, P3AE, University of Indonesia.

There have been some successful pilot projects in forest management by communities and traditional user groups in Indonesia, but they have not been taken up and replicated by MoFEC and other concerned agencies on a large enough scale to make a difference to the forests. They remain small, isolated projects, even though MoFEC has established its own Social Forestry Program (HKM). Although the successful models thus remain no more than indicators of promising new directions, they deserve increased attention.

Forestry Policy Dialogue

1994 – An Interrupted Policy Agenda. In its work with the Government of Indonesia in the early 1990's, the World Bank pressed for substantial institutional and policy changes. This pressure for change caused the Government to terminate forestry borrowing in 1995, effectively interrupting the Bank's working relationship with MoFEC except in the area of protected area management and biodiversity conservation. The changes the Bank had hoped to promote were developed in several forestry sector studies and are described in *Indonesia: Environment and Development* (World Bank, 1994).²⁷ As discussed in the next section, the Government subsequently agreed to implement reforms similar to many of these recommendations as part of Bank/Fund adjustment operations that began in 1998.

1998 -- Return to Policy Dialogue. The Government's request for budget support from the International Monetary Fund (IMF) and the Bank in early 1998 provided an opportunity to attempt some policy changes in the environmental and natural resources management fields (see list of reform elements and their status as of mid-2000 [in brackets] in Table 2.10). Given limitations on how many conditionalities can be accommodated without overloading an adjustment operation and the importance of the forests to the Indonesian economy in general and to its eventual recovery in particular, most of the emphasis went to forestry.

Table 2.10. Forestry Policy Reform Elements in the IMF Letter of Intent of January 1998

Based on the 1994 Reform Agenda, the World Bank prepared the following reform elements for the IMF Letter of Intent of January 1998:

- Move Reforestation Fund on budget and ensure it is used only for originally intended purposes. [completed]
- Phase out punitive export taxes on logs and sawn timber and rattan and replace with resource rent tax on logs. [see PRSL-I]
- Dissolve restrictive marketing arrangements for exports including APKINDO for plywood. [completed]
- Raise stumpage fees (i.e., resource rent tax), permit auction of concession licenses, lengthen concession period and allow transferability of concessions by sale. [completed; see PRSL-I and II]

Within MoFEC, limited ownership of the reform agenda below the ministerial level constrained the reforms' effectiveness and slowed their progress. In part this resulted from inadequate consultation. There was virtually no interaction between the Bank or IMF and MoFEC on the January 1998 reforms, primarily because the Bank had not had a working relationship with MoFEC outside of the field of biodiversity conservation and protected areas management since 1994. There was limited consultation on the conditionalities of the next operation, Policy Reform

²⁷ For a complete description of the 1994 World Bank recommendations, see <http://eap.worldbank.org/indonesia/environment>.

Support Loan I (see Table 2.11), mostly through BAPPENAS and the offices of the donors in the Consultative Group on Indonesian Forestry.

Table 2.11. World Bank Conditionalities For the Policy Reform Support Loan I

The following elements were incorporated as conditionalities in the Policy Reform Support Loan I, in April 1998. GOI agreed to (** indicates second tranche release conditionality):

- Introduce system of resource royalties on forestry products, linked to world market prices and operating costs, independent of end use. [completed]**
- Reduce export taxes on logs, sawn timber and rattan to maximum of 30% by 12/31/98 and adopt and announce a program to reduce this to 20% by 12/31/98 and 10% by 12/31/00. [completed]**
- Allow transferability of concession permits by sale. [completed]*
- Remove requirement to have a processing facility in order to hold a concession permit. [completed]**
- Lengthen concession period. [completed]
- Reduce land conversion targets to environmentally sustainable level. [no progress]
- Authorize a performance bonding system for concessions. [regulation issued authorizing system]

By the time of Policy Reform Support Loan II, some connections had been reestablished between Bank staff and MoFEC. Genuine ownership within MoFEC was still weak, however. There was also some resentment in the donor community about the Bank's reappearance in the sector with "the answers" to problems that had been vexing all of them for years. NGOs too complained; they argued against any support being given to MoFEC, an agency that many of them regarded as ineffective at best, and complicit in mismanagement of the forests at worst. Looking ahead to the possibility of a Bank financed sectoral adjustment loan in forestry (ForSAL), further conditionalities were included in PRSL II (see Table 2.11). Furthermore, the Bank publicly committed itself to a consultative process leading to consensus on the reforms such an operation would support, to a more protracted process of policy dialogue associated with preparation of a National Forest Program (NFP), and to working within the partnerships that were developing between itself and donor agencies active in forestry.

The CGI Seminar and Results of the Dialogue: Commitments by the Government to the CGI Donors. The January 26, 2000 seminar was a significant step in both stakeholder consultation and policy dialogue. In an address to CGI on February 1, 2000, MoFEC acknowledged that management of Indonesia's forests has for the past 32 years emphasized timber extraction and that the "alarming rate of deforestation" that has been one of the results is a matter of national and international concern. The Ministry highlighted illegal logging, overcapacity in wood-processing industries, conversion for non-forest uses, conflict in forest areas between Government control and *adat* rights, and forest fire as critical problems that cannot be resolved without interdepartmental cooperation within the Government and participation from all forest stakeholders. Stating that sustainable development in Indonesia cannot be achieved without sustainable forest management, the Ministry issued a "long-term commitment to put our forest resources back to their functions, i.e., as a 'life supporting system'... and [a resource to] provide forest products, in terms of tangible and intangible services." Specifically, MoFEC made three groups of commitments, which were confirmed by MenKo EKUIN (Coordinating Minister for the Economy, Finance and Industry) as head of the Indonesian delegation.

- **Establish an Interdepartmental Committee on Forestry.** MoFEC proposed the immediate creation of an Interdepartmental Committee on Forestry (IDCF) to coordinate multi-sectoral actions to return the forests to sustainable management. The IDCF will have two main tasks: to ensure the complete development of the NFP, and to coordinate and support the immediate actions that MoFEC agrees need to be taken to address urgent issues raised at the Post-CGI Seminar.
- **Proceed with Formulation of the National Forest Program.** The NFP is intended to be an Indonesia-specific policy, strategy, and action plan to achieve sustainable use of forest resources, formulated in a transparent manner and in consultation with all stakeholders. Considering the number of issues that are outside the responsibility or authority of MoFEC, a fully satisfactory process for preparing the NFP requires participation by many other agencies.²⁸ The Government committed to elevating the NFP process to a higher, interministerial level. It proposed that the NFP would go forward under a temporary statutory body to be established within 60 days by Presidential Decree (KepPres), and that this body would involve representatives of all stakeholders at district, provincial, and national levels.
- **Take immediate action to address urgent issues raised at the Post-CGI Seminar:**
 - Invite cooperation and coordination of other Ministries to impose strong measures against illegal loggers, especially those operating within national parks, and to close illegal sawmills.
 - Speed up forest resource assessment as a basis for NFP formulation.
 - Evaluate the policy in conversion forest and put a moratorium on all natural forest conversion until the NFP is agreed upon.
 - Downsize and restructure the wood-based industry to balance supply and demand of raw material and to increase its competitiveness.
 - Close heavily-indebted wood industries under control of IBRA and link proposed debt write-offs to capacity reduction.
 - Connect the reforestation program with the existing forest industries and those under construction.
 - Recalculate the real value of timber.
 - Use decentralization processes as a tool to enhance sustainable forest management.

Several ambassadors stated that their countries' decisions on whether to increase, maintain, or diminish funding assistance in forestry will depend on the extent to which the Government's proposed actions have been implemented by the time of the next CGI meeting (October 2000) and the results of those actions. The donors asked the Government to attach some target dates to the key actions. They proposed (and GOI accepted) to have a small group of donor agencies established as a "forum" to assist GOI in carrying out its proposed actions and monitoring progress leading up to the next CGI meeting. Accordingly, the CGI Donor Forum on Forestry has been established.

²⁸ "Towards a new National Forest Program – CGIF-MoFEC Working Groups" presented at Post-CGI Seminar by Togu Manurung, lecturer, IPB.

Table 2.12. World Bank Conditionalities For the Policy Reform Support Loan II

Gov agreed to include the following conditionalities in the Policy Reform Support Loan II of April 1999 (* indicates condition for Board presentation):

- Audit the Reforestation Fund. [completed]
- Reduce export tax on logs, sawn timber and rattan to maximum 20% by 3/31/99 and 10% by 12/31/00. [on schedule]
- Draft design for area-based collection system for timber concession revenues by 6/30/99 [incomplete]
- Prepare draft implementing regulations for performance bonding system and submit for stakeholder consultation by 6/30/99 [draft prepared; consultation not completed]
- Establish system for independent inspection teams in concession areas by 6/30/99 [incomplete]
- Establish outcome-based criteria and performance bond implementing regulations 6/30/99 [incomplete]
- Review and refine the resource rent royalty to ensure that it captures at least 60% of economic rent [1998 review completed*; 1999 rev incomplete]
- In cooperation with the Bank, determine financial arrangements to utilize the Reforestation Fund. Use findings of audit. [incomplete]
- Initiate a multi-stakeholder consultation process by which all proposed regulations and legislation will be publicly reviewed and discussed up to the final drafting stage [process initiated* but performance inadequate]
- Using the consultative process, prepare draft forest legislation that defines a transparent and consultative process for changing the nature of forest land and accommodates rights and responsibilities for traditional use areas. [consultation on the forest bill inadequate]
- Map existing forest cover for all of Indonesia using recent satellite imagery – 5 provinces by 6/30/99, the remainder thereafter. [Kalimantan, Sumatra, Sulawesi and Maluku finished, good progress and quality on Irian Jaya]
- Locate priority conservation areas on the maps [incomplete]
- Provide an acceptable timetable for completing designation and gazettement of these areas. [incomplete]
- Make the maps publicly available as they are completed [maps available on MoFEC website]
- Until maps are in place, implement and maintain a moratorium on new conversion of state forest land and alteration of main land use patterns. Any future conversion or land use status change is to be reviewed through a transparent and consultative process. [Minister asserts he is maintaining moratorium but conversions continue, perhaps with Governors' or other authorization.]
- Implement a mechanism for rationalizing state forest boundaries, taking into account existing forest cover.
- Revise concession boundaries in accordance with new permanent production forest boundaries and regulatory requirements. [not yet due]
- Using the consultative process, draft a community forest participation regulation defining clear and transparent procedures which: establish equitable representative organizations; establish terms and conditions for community participation in benefits from and management of forests; and protect the interests of local communities in forest use programs. [consultative process not yet operating properly]

Status and Outlook

Despite the formidable list of challenges to be overcome, there does appear to be a real foundation for forest policy reform. It consists of three elements.

- There is general agreement among a wide range of stakeholders on the agenda that needs to be tackled (although the wood industry's voice has not been adequately heard yet – they must become involved).
- The Government at a high level has acknowledged the serious nature of the forest problems.
- New partnerships have formed, among the donors and among the NGOs, and new lines of communication have been opened, to the Forest Workers' Union, for example, and individual companies in the wood industries.

Progress on the CGI commitments has been initially slow. The Government wasted some of its precious few months between the February 2000 and October 2000 CGI meetings. The key first step, establishment of the Interdepartmental Committee on Forestry, occurred on June 7, and the IDCF's initial meeting was not held until July 23. As a consequence, one of the IDCF's first tasks, setting up the multi-stakeholder body for the NFP, remained undone at the end of August. Moreover, the delay has impeded progress on a number of the urgent issues.

While the formulation of the National Forest Program is clearly the most important of the actions GOI has proposed to undertake, progress on "the eight points" as the urgent issues listed at CGI have come to be known, would be visible indicators of the seriousness of its commitment. And the most visible indicator is gaining control over illegal logging in national parks. To many, especially among the international NGOs, if GOI fails to make some progress here, it will have failed altogether on the CGI agenda. Under the leadership of the Secretary General of MoFEC, field investigations have been undertaken at some of the trouble spots, such as Tanjung Puting National Park. The Secretary General's teams have verified the presence of illegal activities and attempted to close at least one large sawmill heavily engaged in processing wood from Tanjung Puting. They have also raided illegal logging camps near the Indonesia-Malaysia border. They have not met with success, however. Due to the existence of rural poverty, diminished sources of income, and pent-up frustration at being excluded from the forests, local people are relatively easily convinced by illegal loggers to cut trees for them. Local citizens prevented the sawmill's closure, and its owner is one of the region's appointed representatives to the People's Consultative Assembly (MPR), which sets national policy and elects the president. Failure of the rule of law, corruptible officials, and fractious attitudes in many districts that are in the process of decentralization make it easy for the organizers of illegal operations to avoid consequences. It is difficult to see how further progress can be made without the active inter-agency collaboration via the IDCF that has been lacking. In the meantime, reports from the field indicate that the pace of illegal timber removals has dramatically increased in recent months.

Mapping of the forest, an important step toward reassessing forest resources, is proceeding well in the Planning section of MoFEC. The Bogor Agricultural Institute (IPB) will carry out the recalculation of the value of timber by December 2000. The moratorium on forest conversion is in place at the national level, but the authority of governors and mayors to award clear-cutting permits for small amounts of forest and the likelihood that land is being cleared without

permission cast doubt on the prospects of it being effective. The Minister of Forestry and Estate Crops has written to all bupati and governors informing them of the moratorium.

Industry overcapacity and debt have not received sufficient attention. More than any of the other issues, these require first a comprehensive understanding of the problems' sources and possible solutions, and second an interagency effort to resolve them. One indication that neither has been achieved is the positive response of the Minister of Forestry and Estate Crops to a request from the wood processing industry for reinstatement of a log export ban. A second is IBRA's announcement of the restructuring of Barito Pacific's domestic debt in July 2000 – something evidently carried out without meaningful dialogue with MoFEC and Ministry of Industry and Trade. The Barito Pacific group as a whole is Indonesia's largest logging concessionaire, holding about 10 percent of the total area of HPH, yet the capacity of the group's mills substantially exceeds the sustainable yield of its concessions. The restructuring of its debt without consideration of the capacity and illegal timber trade issues is a major opportunity lost.

MoFEC continues to announce the need for a massive program of reforestation of damaged forest land, requiring financial resources well beyond the capacity of the Reforestation Fund. However, thus far it appears to see a Government-implemented (or INHUTANI-implemented) program as the only alternative. Not only is this unlikely to succeed, if past experience in Indonesia and elsewhere is any example, but it neglects the potential of private sector and community participation and ignores the fact that decentralization of authority away from the center is proceeding. The Minister of Forestry and Estate Crops has publicly stated his acceptance of the Reforestation Fund audit report and his intention to follow its recommendations. The Secretary General has already initiated action against some of the individuals named as having obtained or used reforestation funds wrongfully.

Decentralization is proceeding, but the new regulation (PP 25/2000) is not comprehensive or unambiguous on the location of responsibilities and authority for forest resource management. Given the situation, and the severe human resource shortages at provincial and district levels, it is difficult to imagine that decentralization will bring about improvements in the short run. There is a high risk that forest management will become even worse. The Government needs to work on outcome-based standards and on incentives to promote sustainable forest management by provincial and local governments and down to the village level. It also should take advantage of the many changes involved in decentralization to facilitate sustainable management of forests by local communities – for which they have already demonstrated ample capacity when conditions are made favorable for them. The implications of decentralization for natural resource management are taken up in more detail in the final chapter of this report.

The way forward depends on dialogue, consultation and partnership. This applies to the formulation of the National Forest Program and to efforts to address urgent issues in the short term. It is therefore incumbent on the Bank *not* to follow its traditional approach – to give its prescription for the sector – as that would undermine the dialogue process. It is possible, however, to articulate a Bank vision for the sector. And, it is necessary for the Bank and other donors to have alternative strategies for the post-CGI year or two – one for a successful outcome, and one for failure.

The vision. If Indonesia wants to keep forests, other than those on land too steep to be accessible, the government must formulate a new approach to managing them. It should do so in a way that invites the participation of all the agencies and stakeholders concerned, and gains their commitment and support. Indonesia needs a National Forest Program that will contain an overall strategy, a policy reform agenda, and specific action steps. The details should be left to the stakeholders, but whatever they agree on will surely need to include at least these nine elements:

- An interagency, multi-stakeholder body responsible for forest policy.
- A freeze on conversion of natural forest for any purpose until the National Forest Program is in place and a transparent mechanism for forest land-use decisions is functioning.
- A system to broaden and guarantee access to forest benefits for forest dwellers and local communities, through ownership or secure, long-term use rights, in return for responsible forest management.
- Environmental education and awareness programs to build a local and national constituency for forest conservation and sustainable management.
- Incentives and penalties to improve forest concession management, including some form of independent inspection.
- Rigorous and consistent enforcement of the laws concerning illegal logging, burning and encroachment, and aggressive disciplinary action in case of corruption in forest management.
- Restructuring the wood processing industry so that its raw material needs are balanced with sustainable yield of the forests, supplemented by plantation timber. This includes strict enforcement of pulpmill and papermill licensing requirements to establish plantations, and requirements for prospective licensees to demonstrate that they can obtain legal timber. An open market for logs would allow market forces to work in balancing supply and demand.
- Renewed commitment to conserving Indonesia's world-class biodiversity heritage by establishing a national network of parks and protected areas that can be effectively managed by the government in partnership with local communities and other stakeholders.
- Aggressive replanting programs to return damaged forest land to productive use and relieve industry pressure on natural forest, while generating rural employment and income. This should not be seen purely as a central government program; regional government, communities, NGOs and industry all have much to contribute. Nor should it be seen as simply reforesting mismanaged or burned timber concession areas; releasing deforested land from the forest estate for community-managed agroforestry should be considered as one element of the program.

3. Biodiversity Protection and Management

Introduction

With its wealth of forests, marine and freshwater ecosystems, Indonesia is the world's most biologically diverse country²⁹. It spans two of the world's major biogeographic regions, Australasia and Indo-Malaya, as well as a large transition zone, Wallacea (Sulawesi, Maluku, and Nusa Tenggara). Indonesia is recognized as one of 17 'megadiversity' countries, with two of the world's 25 'hotspots'³⁰ as identified by Conservation International. It has 18 of the World Wildlife Fund's 'Global 200' ecoregions.³¹ It also has 24 of the world's 218 'Endemic Bird Areas' determined by BirdLife International, and its importance as a repository of cultivars and domesticated livestock (and their wild relatives) makes it one of the world's centers for agrobiodiversity. The reasons for Indonesia's unusually high species-richness and endemism are its archipelagic nature and its complex geological history. The country ranks first in the world for the number of mammal species, palms, swallowtail butterflies, and parrots. Almost every biological expedition to natural habitats reveals new species in almost all taxonomic groups.

Current Situation and Developments Since 1994

The situation is dire. Although there has been increasing attention to biodiversity conservation and protected area management since publication of the 1994 *Environment and Development* report, overall there has been a dramatic loss in natural habitats and the country is almost certainly undergoing a species extinction spasm of planetary proportions. The richest habitats, especially lowland forests, across almost the whole country are under the greatest pressure, with lowland forests outside protected areas likely to be completely cleared in Sumatra by 2005 and in Kalimantan by 2010 (Chapter 2). Timber, rattan, fisheries and other biological resources have made major contributions to the national economy, but this has been achieved only under grossly unsustainable regimes of resource management. The consequent impacts of biodiversity loss, both goods and ecosystem services, are felt most keenly at the local level by the poorer communities who are most dependent on biological resources for their livelihoods and welfare. It is estimated that the livelihoods of some 40 million Indonesians are directly dependent on forest resources with many others benefiting indirectly.

Indonesia was among the first countries to sign the Convention of Biological Diversity (CBD), which it ratified in August 1994. In 1995, Indonesia hosted the Second Conference of the Parties to the CBD, which culminated in the Jakarta Mandate, which endorsed conservation and sustainable use of biodiversity in coastal and marine areas. Indonesia was one of the first countries to prepare a *National Biodiversity Strategy and Action Plan*³² and many of the priorities identified

²⁹ Whitten et al. 1997

³⁰ Areas with high numbers of endemic species and threatened by human activities and human population growth. Whitten et al. 1999, Myers et al. 2000

³¹ These are the Earth's 200 most outstanding and diverse terrestrial, freshwater, and marine habitats: areas where the Earth's biological wealth is most distinctive and rich, where its loss will be most severely felt, and which deserve the highest priority for conservation effort. Wickramanayake et al. 2001

³² BAPPENAS, 1993.

in that plan have been implemented. These include financing of priority PAs by the government and donors and expansion of the PA system, with creation of several new conservation areas, including Bukit Tigapuluh National Park in Riau, various important extensions to Gunung Leuser (such as Singkil), and two significant national parks in Nusa Tenggara: Manupeu-Langgaliru and Laiwangi-Wanggameti. Even so, less than 10% of Indonesia's land area is designated as conservation areas, and of the nearly 40 national parks, *only one* has so far been fully gazetted: Kerinci-Seblat National Park. Moreover, even after massive inputs of donor financing, Indonesia's parks, protected areas and remaining forests have never been under greater pressure. Unfortunately decentralization of resource management authority to the provincial and district levels, is likely to lead to increased resource exploitation of natural resources and have significant impact on biodiversity and protected areas. From a biodiversity point of view Indonesia is at crisis point.

Box 3.1. Megadiversity Country with a Mega Crisis

The main causes of biodiversity loss and species extinction in Indonesia are: habitat loss and fragmentation; habitat degradation; overexploitation; and secondary extinction. An additional factor likely to have increasing impact in the future is climate change; already the effects of global warming are being reflected in coral reef die-off.

1. Habitat loss and fragmentation

- Between 1985 and 1997 some 20 million ha of forest was lost (about 1.5 million ha per year), most of it lowland forest below 300m where more than 60% of all rainforest species occur.

2. Habitat degradation

- 5 million hectares of forests lost and degraded by fires in 1997-98
- 60% of Indonesian coral reefs degraded
- Pollution impacting on fresh and coastal water ecosystems

3. Overexploitation

- Many species of mammals, birds, reptiles and fish are being harvested to local extinction, and many of these go to supply medicinal and specialist-food markets elsewhere in Asia.
- Given the importance of terrestrial animals and plants, and of freshwater (and marine) fisheries, in providing subsistence and livelihoods for poor rural communities, the conservation and sustainable use of biodiversity should be a major plank in strategies to alleviate poverty and encourage sustainable development.

4. Secondary extinction

- Many species dependent on lowland forests are on the verge of extinction. Only a tiny number of species are the focus of monitoring programs

Trends in Habitats, Species and Populations

The four key factors leading to continued biodiversity loss in Indonesia are habitat loss, forest fragmentation and degradation, overexploitation of species and secondary extinctions (see Box 3.1). Habitat loss remains the primary threat to Indonesia's biological diversity. The loss of 20 million hectares of forest between 1985-1997, mainly the most species-rich and most valuable lowland forests, translates into a tremendous reduction in the populations of plants and animals found in that habitat, and has led to accelerating local extinctions of species. Remnant forest habitats, both inside and outside, PAs have suffered severe and likely irreparable degradation.

Similar degradation is occurring in coastal and marine ecosystems. Sixty percent of Indonesian coral reefs are badly degraded and coral reefs are being overfished and damaged by practices such as cyanide poisoning and bombing even in the remotest parts of the archipelago. Freshwater ecosystems too have been subjected to intense and destructive pressures. To stem this tide of destruction will require a concerted effort of cooperation and collaboration among a wide group of stakeholders with multiple interests in the resource base.

Forest Loss and Illegal Logging. The economic crisis, political upheaval, devolution of decision making to the provincial and kabupaten level and breakdown in law and order have led to increased pressures on forests throughout the archipelago. Rampant illegal encroachment and logging is often sponsored by powerful military and local political figures and encouraged in the name of development. Forest loss has occurred even in well-known, major PAs with important donor programs—some 30,000 ha of forests in the northern area of Bukit Barisan Selatan National Park (Sumatra) have been lost in the last few years—and, there are major problems with illegal logging in Gunung Leuser, Bukit Tigapuluh (Sumatra) and Tanjung Puting and Gunung Palung (Kalimantan). Such illegal logging makes these national parks especially vulnerable to the next round of El Nino fires; peat areas such as Tanjung Puting and Berbak are especially prone to wild fire damage (see Chapter 2 on Forest Resources for more details).

It is not just the reduction in total area of natural habitat which leads to biodiversity loss. When the remaining habitat is broken into ever smaller fragments, species populations are reduced until they are no longer viable. As habitats become more fragmented, by clearance along new roads or agricultural conversion, PAs will increasingly become islands and more and more species populations are fated for extinction at the local level. Since very few PAs are large enough to maintain viable populations of all their constituent species, conservationists increasingly are proposing a landscape approach to conservation focussing on both the PA and surrounding areas. For Indonesian parks this requires managing production forests as buffer zones to PAs to maintain both permanent forest cover and biodiversity, with production forests effectively extending and supplementing the conservation estate.

Overexploitation. Forest cover, or its absence, is a surrogate measure of the status of biodiversity in an area, both within and outside PAs. But it is not a complete measure. In addition to forest loss there has been unrelenting hunting of wildlife leading to many "empty forests" in which the larger mammals and birds are effectively absent. For wildlife populations already threatened and stressed by forest fragmentation and habitat conversion, hunting can be the last straw, causing local extinction of some species³³. People hunt for subsistence, to control agricultural pests and for commerce (game meat and live animals for local markets or specialized trade in certain animal parts). Many forest-edge people, such as those on Siberut Island off the west coast of Sumatra and the Kubu on the mainland, have always hunted but, with access to new markets and new technologies, this hunting has become less sustainable. Hunting is illegal within most PAs (other than hunting reserves); outside reserves it is illegal to hunt "protected" animals such as rhinos and tigers. Nevertheless, hunting of wildlife has become a major threat throughout Indonesia, to the point where even some previously common species are now on the verge of local extinction and local people are ultimately deprived of an important and potentially sustainable supply of protein.

³³ Bennett and Robinson 2000

Overharvesting of non-timber forest products (NTFP) is also changing forest composition and structure. Harvesting of rattans (especially the large *manau*), and the fungus-infested incense wood (*gaharu*) from *Aquilaria* trees has led to local extinction of some species. About one million birds each year are trapped in forests, wetlands and coastal habitats and sold in the bird markets of Java and Bali for cage birds or food. Many fruit doves, parrots and other species are exported but much of the trade feeds a strong domestic market. Coral reef fishes are captured for status food and the ornamental fish trade (Box 3.2), while sharks and other marine organisms (trepan, pearls) are being overharvested for overseas markets. Freshwater fishes such as arowana (*Scleropages formosus*) have also been harvested to meet the demand for ornamental fish.

Box 3.2. Live Fish Trade³⁴

Over the last decade, coral reefs in Indonesia and beyond have been severely plundered and degraded in the quest for live reef fish to supply a lucrative market. Centered in Hong Kong, and spreading to other Chinese centers, the demand for living reef-dwelling groupers, humphead wrasse, and other reef fish has encouraged some devastating fishing practices. The worst of them involves pumping hundreds of tons of cyanide per year into coral reefs; this stuns the target fish which are captured (sometimes by dismantling the reef around them), revived, and held in floating pens until they are shipped to market by air or in specially-designed ships carrying up to 20 tons of live fish. Another destructive fishing method targets spawning aggregations. Here, fish gather in large numbers at known locations, seasons, and moon phases in order to spawn. At this time, the fish are highly vulnerable to severe depletion or even total elimination. Conservative estimates of the annual export/import of wild-caught live reef fish in the region range between 20,000 and 25,000 tons. Cyanide affects far more than just the target species. Smaller fish and invertebrates are less resistant to cyanide than are fish, and many die for each target fish captured. Most importantly, the living coral habitat upon which the rest of the reef community depends is killed. Under ideal conditions, the recovery of such communities could take several decades.

If fisheries enforcement in Indonesia were more rigorous then there would be significant steps which could be taken concerning licensing. Meanwhile actions that could be taken by governments, NGOs, or researchers include:

- Establishing cyanide detection laboratories in both exporting and importing countries, where practical;
- Supporting research on the effects of cyanide on corals;
- Banning the possession of cyanide on boats;
- Carrying out reconnaissance of isolated banks and reefs to determine the extent and impacts of destructive fishing;
- Designing a model contract for use by governments and resource owners to help regulate live reef fish operations;
- Working with relevant government authorities to provide villagers with the incentive to protect their marine resources by giving them the legal right to exclude outsiders from their fishing grounds; training, deputizing, and supporting selected village fishermen as fish wardens.

Non-timber forest products, including wild game and fish may have a value to local and national economies far in excess of the value of standing timber. Because many of these resources have been harvested for centuries, for subsistence and sale, it is often assumed that commercial harvesting has little or no ecological impact on tropical ecosystems. In fact there is a very high

³⁴ Johannes and Riepen 1995

probability that intensive resource extraction will lead to depletion of these resources over time³⁵. The loss of species will ultimately be reflected in changes in species composition within the habitat and may lead to loss or reduction in species of key economic and social importance. Ecologically-based management is the key to sustainable resource exploitation; it is critical to understand what happens to the plant (or animal) populations being exploited and what levels of harvesting they can sustain. Indonesia will need to develop greater institutional capacity to undertake ecological research, monitor and to adjust management and harvest levels accordingly. This capacity needs to be built both centrally and provincially to support the increased management responsibilities associated with decentralization.

Marine ecosystems. The National Conservation Plan³⁶ (1982) was complemented in 1984 by a Marine Atlas³⁷ that identified top priority areas for establishing marine PAs throughout the archipelago. Subsequently the Environmental Management Development in Indonesia Program (EMDI) project worked with Ministry of Environment to develop a Strategy for Coral Reefs and key marine species, including turtles. The target for marine PAs for the year 2000 was 30 million hectares but so far only 4.4 million hectares of marine reserves have been established, many as marine extensions to terrestrial parks, for example, Ujung Kulon and Komodo.³⁸ Six marine national parks – Pulau Seribu, Karimun Jawa (Java), Cendrawasih (Irian Jaya), and Bunaken, Taka Bone Rate and Wakatobi (Sulawesi) – have been established and responsibility for their management has recently been assigned to Ministry of Marine Exploitation.

Overall government and donor spending on marine PAs has been considerably less than on terrestrial parks. Several of the marine national parks have benefited from external donor financing. Like freshwater areas, marine PAs are often heavily utilised by poor coastal communities and are also impacted by land-based activities far from their boundaries. The most appropriate models for marine conservation probably require integration of the PA within a regional integrated coastal zone management strategy and depend on local support and community stewardship to protect and sustainably use marine resources. Bunaken has developed some exciting models for engaging provincial government as an active and committed partner in conservation of the reefs. Komodo, which has benefited from a long-time partnership between the Directorate-General of Nature Conservation and TNC on marine management, is experimenting with new models of park management and sustainable financing, engaging the provincial government and private sector tourism companies. Outside PAs COREMAP is providing support for community management and stewardship of coral reef resources, including neighborhood watch schemes and partnerships between local communities, local government agencies and the Indonesian navy.

Freshwater ecosystems. Although the National Conservation Plan and several subsequent plans have recommended fresh waterbodies as PAs, few such areas have been afforded full conservation status. A few existing PAs, such as Danau Sentarum in the Kapuas Lakes of West Kalimantan were created to protect freshwater habitats and many other reserves incidentally also protect important habitats for freshwater biodiversity. In general, however, the major characteristics of freshwater systems – linear, upstream/downstream linkages – do not lend

³⁵ MacKinnon 1998, Bennett and Robinson 2000

³⁶ MacKinnon and Artha 1982

³⁷ Salm and Halim 1984

³⁸ The 4.4 million hectares of marine reserves as of March 1997 included 3.6 million hectares of marine national parks.

themselves to conventional PA planning. Moreover many freshwater systems are heavily utilized by local communities so that protection as a PA may not be the most socially appropriate form of management. In addition to their multiple use functions, freshwater systems are often affected by activities outside their immediate boundaries, such as pollution, water management and introduction of alien species, which poses an additional challenge to establishing and effectively protecting freshwater PAs.

Trends in Public Awareness

Concern among the Indonesian people for their natural heritage has grown during the past decade, with the result that an enthusiastic cadre of qualified young Indonesians is now pursuing careers in conservation inside and outside government. Several local and national conservation NGOs have been created e.g. Kompas-Borneo, Plasma and Telapak, and Indonesians are taking over management of the country programs of most international conservation NGOs. The establishment of the National Biodiversity Foundation (*Yayasan Kehati*), chaired by a former minister for the environment, has given biodiversity conservation a higher national profile. To date the Foundation has focused its grant making activities in Kalimantan, Java and Sumatra, but plans to expand into Eastern Indonesia. Kehati has primarily targeted local NGOs, community groups and researchers for capacity building and small scale pilot activities (less than \$5000 per grant), and is also preparing a national biodiversity awareness campaign.

The Ministry of Education and Culture has initiated a project to increase environmental awareness through the formal school program. Conservation NGOs have also been active in awareness programs which build pride in local ventures, as well as producing books, pamphlets, posters, magazines, TV programs, and so forth for a range of audiences. In addition, in recent years a number of Indonesian-language publications related to biodiversity have appeared³⁹.

Actions and Funding by the Government, Donors, and NGOs

National conservation planning dates from the early 1980s in Indonesia. Programs for support of biodiversity have included conservation planning, participation in international conventions, expansion of the PAs system, donor supported projects and conservation awareness programs. Between 1980 and 1982, the Government undertook a comprehensive conservation planning exercise which covered all islands and provinces⁴⁰. The objectives were to review all existing PAs, propose new conservation areas to establish a representative PA system across all biogeographic regions, and to prioritize reserves for management interventions and funding. Indonesia is still one of the few countries in the world to have such a comprehensive PAs system plan. Many of these PAs can be justified for their environmental protection functions and provision of ecosystem services, such as watershed protection and flood control.

The first Indonesian *Biodiversity Strategy and Action Plan*⁴¹ (BSAP) was prepared during 1991-93 with the help of the World Bank. It was adopted as part of the Government's *25-year Development Strategy for 1991-2015*. It listed 75 high-priority areas for the protection of biodiversity. Of these 15 proposed PAs had no legal conservation and only 26 of the designated PAs had well-

³⁹ e.g. KONPHALINDO 1993; MacKinnon 1990; Iskandar 1998; Primack et al. 1998; Coates and Bishop 2000; MacKinnon, J. 1989, 1999; MacKinnon, K. et al. 2000; Monk et al. 2000; Noor 2000; Whitten et al. 1984, 1987, 2000; and two series of fieldguides

⁴⁰ MacKinnon and Artha 1982

⁴¹ BAPPENAS 1993

defined management plans (not all of which were being fully implemented). Several of these priority areas have subsequently been designated as conservation areas and many have received priority government and donor financing, including major contributions from the Global Environment Facility (GEF) (Box.3.3).

Nine years after the first BSAP, the time has come to take stock, reassess conservation priorities and options and prepare new strategies consistent with the recent political, institutional, social, and economic changes in the country and increasing decentralization of responsibility for natural resource management. The GEF is financing the preparation of a second national BSAP to conduct a stocktaking to determine which of the priority needs and actions identified in the first conservation plan have been achieved, what is still outstanding and why, and to reassess conservation priorities. The new BSAP will be prepared in a participatory fashion and guided by a steering committee representing all major stakeholders in biodiversity conservation and management, including relevant government agencies, national NGOs, scientific institutes, and the private sector. BAPPENAS will provide a small secretariat to coordinate the process to identify new conservation priority needs consistent with a decentralised institutional environment. It is anticipated that several key provinces and kabupatens will prepare individual strategies and action plans that reflect local priorities.

There is a great disparity in funding and staffing levels in different PAs in Indonesia (table 3.1). Designated national parks are eligible for relatively large government budgets through their Technical Execution Units (*UPT*). Because of this, several PAs that were receiving external donor support became national parks as a way to ensure sustainability of recurrent cost financing. Both the number of parks and the amount of funding increased through the late 1980s and 1990s, until the economic crisis struck. Although more money was allocated to national parks, these budgets were not always well spent. Impressive new park buildings and other infrastructure were erected but poorly maintained and inadequate funding for vehicle maintenance and fuel has restricted essential patrolling activities. Since the onset of the crisis, government funding for conservation has been seriously reduced (see Chapter 5). Many designated PAs had small or nonexistent government budgets and little effective management even before the crisis. International NGOs were some of the main providers of external technical and financial assistance in 1994. Several, including World Wide Fund for Nature (WWF), The Nature Conservancy (TNC), Conservation International (CI), BirdLife International, Wetlands International and Wildlife Conservation Society (WCS), still maintain diverse conservation programs in Indonesia, with a primary focus on PAs, both terrestrial and marine.

Funding by multilateral development banks and bilateral donors has increased significantly over the past six years, stimulated by a desire to assist the Government with implementation of the conservation priorities identified in the BSAP. Since most donors require a commitment of substantial government counterpart funding, parks and other PAs receiving outside assistance have generally received increased government funding, which may partially explain the overall increase in government funding for conservation. This insistence on adequate counterpart budgets makes good sense in attempting to ensure sustainability of activities beyond a project lifetime but does mean that both government and donor funds are concentrated in just a few areas. (It has been estimated that, in 2000, about 40% of the budget of the Directorate-General of Nature Conservation development went to just two donor-assisted parks, Gn. Leuser and Kerinci - see Table 3.1)

Table 3.1. Budgets and Staffing Levels for National Parks

National Park	Biogeographic region	Area (Ha)	Budget 2000 (US\$)	\$/Ha	Staff	Area/guard
A. National Park						
Gunung Leuser	Sumatera	1,094,692	141,309	0.13	201	5,446
Siberut	Sumatera	190,500	43,356	0.23	60	3,170
Kerinci Seblat	Sumatera	1,368,000	710,320	0.52	154	8,833
Bukit Tigapuluh	Sumatera	127,698	32,776	0.26	45	2,830
Berbak	Sumatera	162,700	41,746	0.26	45	3,610
Bukit Barisan Selatan	Sumatera	365,000	78,499	0.22	104	3,510
Way Kambas	Sumatera	130,000	139,756	1.08	274	470
Ujung Kulon	Jawa Barat	122,956	91,902	0.75	109	1,120
Gunung Halimun	Jawa Barat	40,000	45,531	1.10	65	610
Gn. Gede Pangrango	Jawa Barat	15,000	74,404	4.96	95	150
Bromo Tengger S.	Jawa Timur	50,276	55,524	1.10	75	670
Meru Betiri	Jawa Timur	58,000	48,702	0.84	75	773
Alas Purwo	Jawa Timur	43,420	46,944	1.08	100	430
Baluran	Jawa Timur	25,000	97,505	3.90	83	300
Bali Barat	Bali	19,003	87,439	4.60	124	153
Gunung Rinjani	Lombok, NTB	40,000	43,859	1.10	44	900
Komodo	Komodo, NTB	173,300	67,085	0.39	96	1,800
Kelimutu	Flores, NTT	5,000	39,948	7.99	25	200
Laiwangi-Wanggameti	Sumba, NTT	47,014	-	-	-	-
Manupeu-Tanah Daru	Sumba, NTT	87,984	-	-	-	-
Danau Sentarum	Kalimantan Barat	129,700	-	-	-	-
Gunung Palung	Kalimantan Barat	90,000	35,707	0.40	43	2,090
Betung Kerihun	Kalimantan Tengah	800,000	36,093	0.05	29	27,580
Bukit Baka-Bukit Raya	Kalimantan Tengah	181,090	36,727	0.20	38	4,760
Tanjung Puting	Kalimantan Tengah	415,040	59,957	0.14	61	6,800
Kayan Mentarang	Kalimantan Timur	1,360,500	-	-	-	-
Kutai	Kalimantan Timur	198,629	74,812	0.38	74	2,680
Bogani Nani Wartabone	Sulawesi Utara	287,115	92,450	0.32	31	2,190
Lore Lindu	Sulawesi Tengah	229,000	47,970	0.21	75	3,050
Rawa Aopa Watumohai	Sulawesi Tenggara	105,194	46,444	0.44	48	2,190
Manusela	Maluku	189,000	40,988	0.22	60	3,150
Lorentz	Irian Jaya	2,505,600	-	-	-	-
Wasur	Irian Jaya	413,810	51,351	0.13	43	9,623
Subtotal (A)		11,070,221	2,412,104	0.22	376	4,659
B. Marine Park						
Kepulauan Seribu	Jawa Barat	108,000	51,211	1.48	90	1,200
Karimunjawa	Jawa Tengah	111,625	23,220	0.82	60	1,860
Bunaken	Sulawesi Utara	89,065	36,429	1.33	39	2,280
Taka Bonerabe	Sulawesi Selatan	530,765	36,854	0.26	71	7,476
Kepulauan Wakatobi	Sulawesi Tenggara	1,390,000	27,334	0.09	64	21,719
Teluk Cenderawasih	Irian Jaya	1,453,500	46,861	0.09	59	24,630
Subtotal (B)		3,682,955	221,909	0.06	383	9,616
Total		14,753,176	2,634,013	0.18	2,759	5,347

Box 3.3. GEF Biodiversity Projects

In 1992 new and additional international financing for biodiversity conservation and sustainable use became available through the Global Environment Facility. Indonesia already has a healthy GEF portfolio across several islands and different ecosystems, both through full and medium-size projects. Most of these projects take an ecosystem approach to conservation and are focusing on biodiversity management both within PAs and beyond their boundaries into the production landscape. The GEF is also providing resources to review and update the Indonesia Biodiversity Strategy and Action Plan. Most GEF activities in Indonesia are being implemented by the World Bank but UNDP is also managing a GEF small grants program and preparing PA projects in East Kalimantan and Sulawesi.

1. Full Projects – World Bank

Biodiversity Collections Project

\$7.2 million GEF, \$4.2 million GoI

The first GEF grant to Indonesia under its pilot phase was for \$7 million over six years to allow the unique and priceless biodiversity collections of the Bogor Herbarium and Zoology Museum to be upgraded.

Kerinci-Seblat National Park Integrated Conservation and Development Project

\$15 million GEF, \$19 million IBRD, \$13 million GoI

An ambitious six year integrated conservation and development project in Sumatra aims to secure the biodiversity of Kerinci-Seblat National Park (KSNP) by increasing the ownership and participation of local communities and other stakeholders in park management and biodiversity conservation through consultation over boundary demarcation, mapping of community lands; conservation agreements and area and village development activities designed to improve livelihoods yet reduce pressure on park and forest resources. The project takes a landscape approach with conservation planning extending into buffer zone forests and logging concessions.

Coral Reef Rehabilitation and Management Project (COREMAP)

\$4.1 million GEF, \$6.9 million IBRD, \$1.8 million GoI

Indonesia has some of the richest coral reef systems in the world. Supported by a multi-donor group, COREMAP is establishing a coral reef management system in priority areas in five eastern Indonesian provinces. It is expected that COREMAP will develop useful models for greater involvement of communities in reef protection and management.

2. Full Projects – UNDP

Asian Rhinos

The GEF is supporting a two nation project for rhino protection in Malaysia and Indonesia, with the primary focus on the rare and threatened Sumatran rhinoceros *Dicerorhinus sumatrenis*. The project has carried out surveys to establish the status of remaining rhino populations in Sumatra and has established special rhino protection forces to protect viable populations of rhinos in their native habitats.

3. Full Project – UNEP

Forest Fires Prevention and Capacity Building

GEF funded an Emergency Response Measure to combat fires in Indonesia and prevent regional haze in South East Asia. This project built capacity at the provincial level for monitoring and mapping fire hot spots.

4. Medium Size Grants

The creation of the GEF Medium-Sized Project (MSP) window provides an opportunity to channel GEF resources directly to NGOs, universities, local communities and indigenous groups for conservation activities. Indonesia is developing a strong pipeline of MSP projects (for Berbak-Sembilang (Sumatra), Sangihe (Sulawesi), Mamberamo (Irian Jaya); all involve partnerships between the Directorate-General of Nature Conservation and international NGOs.

Aceh Elephant Landscapes

\$750,000 GEF, \$ 295,000 Cofinancing

In northern Sumatra, a GEF MSP is assisting an international conservation NGO Flora and Fauna International (FFI), government agency and local student groups in their efforts to protect Indonesia's largest remaining population of Asian elephants. Conservation awareness programs are an important component of the project and build on traditional Acehese respect and folklore about the province's elephants.

5. **UNDP Small Grants program:** provides grants up to \$50,000 for NGOs and for community-based environmental conservation efforts.

But is it enough? Although the Government, donors, and NGOs are spending and doing more than ever, the only question that ultimately matters is whether these efforts are sufficient to slow, and ultimately stop, losses in the country's biological diversity. The answer is clearly "no". Projects often suffer from a lack of local support, social and political opposition, problems with capacity among the executing partners, and corruption (petty or otherwise). There is also the crucial issue of sustaining protection efforts, including financing, beyond the life of targeted projects.

The 30 PAs with major donor financing represent only 10% of the total number of PAs in the country but just over half of the total land area of terrestrial PAs, that is, donor funding has focused on some of the largest PAs. While this picture is encouraging, Indonesia's unique biodiversity is far from being secure. Current PA projects have tended to focus primarily on the western islands and on forest habitats rather than coastal, marine and freshwater ecosystems. There is still no designated PA network in Maluku (an area of very high endemism) and marine conservation efforts are currently limited to relatively few sites (e.g. Bunaken, Komodo, Take Bone Rate).

Conservation funding has been concentrated in priority areas but not always allocated to secure maximum biogeographical representativeness and diversity. Many of the smaller PAs may contain unique habitats, such as limestone, sites of special interest, such as caves, feeding and nesting grounds for turtles and migratory birds. As responsibility for conservation devolves increasingly to the provincial and kabupaten levels, it will be important to inform local government and communities of the important and unique biodiversity that such sites preserve. Engaging local support for these PAs will require greater emphasis and understanding of the ecosystem services they provide and innovative ways of either financing PAs or providing district development assistance linked to environmental performance.

Large areas of species-rich lowland forests, an under-represented habitat in conservation areas, were originally included within designated national parks but have subsequently been excised for logging concessions (e.g. Kerinci, Leuser, Lalobata, Yamdena). Many of the PAs in Indonesia, and indeed in most other countries, cover typically marginal lands: areas with extremely rugged terrain, or with predominantly steep slopes unsuitable or too high for agriculture. As a result the densities of fauna are already lower than 'natural' for many species and will decline even further unless corridors of natural habitat are retained to allow altitudinal migrations and recolonization⁴². Current PAs must therefore be supplemented by a landscape approach to conservation, involving management of forests and other natural habitats outside PAs in a manner consistent with conservation objectives. In this context watershed and production forests can play an important role provided that they remain as forests.

Management Issues

Management responsibilities. The Directorate-General of Nature Conservation (PKA) in the Ministry of Forestry is responsible for managing PAs and for preparing and implementing regulations, in accordance with legislation that came into effect in 1990. *Even with decentralization of management responsibilities for most forest types to the district level, the Directorate-General of Nature Conservation will retain responsibility for management of all categories of terrestrial protected areas*

⁴² MacKinnon, J. et al. 1999

(national parks, nature reserves, wildlife reserves, hunting reserves). The new Ministry of Marine Exploitation may assume for marine areas including six marine parks. Parks with both terrestrial and marine areas, such as Komodo, would likely remain under the management of the Directorate-General of Nature Conservation. Both institutions need strengthened capacity for reserve management and for engaging effectively in multi-sectoral negotiations on proposed developments likely to impact on PAs.

The current management structure: of the Directorate-General of Nature Conservation (DG-PKA) involves a system of regional (*Balai KSDA*) and provincial (*Sub-Balai KSDA*) nature conservation offices. The SBKSDA is responsible for overseeing and managing nature reserves (*Cagar Alam*) and wildlife reserves (*Suaka Margasatwa*) and issuing permits and monitoring species trade. The SBKSDA plays a critical role in identifying and managing the gazettement process for new PAs. The national parks themselves have a separate management structure (*UPT*) headed by a park director, who reports directly to the Director-General of Nature Conservation in Jakarta. Most UPTs typically have a complement of staff ranging from 25-274 (see Table 3.1) depending on the size of the park and the threats. Coordination between these different units responsible for conservation in the province is often poor, particularly if a national park covers more than one kabupaten or province. Furthermore protected area managers need to work collaboratively with a range of partners, including local governments, NGOs and the private sector. Relationships with local government will become increasingly important as responsibility for forest management outside conservation areas is devolved to district administrations.

The Directorate-General of Nature Conservation is experimenting with some innovative new management models involving the private sector (ecotourism concessions at Komodo) and NGOs (overall management authority at Leuser). These experiments have met with mixed success so far (Box 3.4). The Directorate-General of Nature Conservation is nevertheless now suggesting that management at several parks with tourism potential could be contracted out to the private sector.

Box 3.4. The Leuser Development Program

The Leuser Development Program (LDP) is a unique partnership project between GoI, a private foundation, Leuser International Foundation (LIF), and the European Union in conserving the Leuser Ecosystem, an area of approximately 2.5 million ha of tropical rain forest, encompassing 890,000 hectares of the designated Gunung Leuser National Park, as well as extensive areas of protection and production forest in the border of North Sumatra and Aceh. GoI has taken a new approach in conservation management by assigning management authority to an NGO, the Leuser International Foundation (LIF), for seven years, recently extended to 30 years. Because the LIF does not yet have the necessary technical expertise, the Government of Indonesia and the European Union are jointly funding a management unit (the Leuser Management Unit, LMU). During its seven years duration the LDP manages the day to day work of management of the Ecosystem and strengthens the necessary technical expertise of the LIF to ensure a smooth handover of the management to the NGO.

Despite this innovative management approach, the Leuser Ecosystem is experiencing very high levels of damage. The increase in illegal logging over the past two years has been dramatic. The army, police, national park staff, and other members of the local elites are usually involved. The best estimates are that the area's most famous animals – the orang utans – have about five to ten years before they become extinct due to habitat loss. In addition, elephant habitat has become so diminished and fragmented that herds are small and isolated, and most are now below the threshold for long-term population survival.

PA Effectiveness. One of the major concerns for biodiversity conservation in Indonesia is how to make management of PAs more effective. Generally national parks are better resourced than other conservation areas but even parks are often understaffed (on average one guard for 5000 hectares) and have limited budgets (see Table 3.1), with most parks spending on average \$0.18 per hectare. Even parks which are relatively well financed through donor projects, such as Kerinci-Seblat and Leuser, face a number of generic management problems including: poor staff morale and discipline; lack of incentives for good performance; capacity constraints and limited training; emphasis on spending on park infrastructure such as civil works, rather than enforcement or awareness building activities; budget allocations according to previous budgets not according to threats or needs on the ground; and multiple responsibilities of park managers so that they spend a lot of time meeting other government officials and little time in the field. In addition to these internal management problems most parks have little support from local communities and decision makers. These constraints were all identified in the Bank's 1994 report and still remain in spite of considerable efforts in some areas to improve public awareness, government and donor financing, and increase involvement of local communities in management decisions. The fundamental underlying constraint is limited government commitment to the conservation agenda at both the national and local levels.

Strengthening PA management capacity. Several donors have worked with the Directorate-General of Nature Conservation (Dutch, ADB, WB, USAID) to improve park planning and management activities. Ideas that have emerged from this experience, include establishment of a senior "swat-team" of managers who would provide on-the-ground advice and expertise; upgrading the status of several large parks to echelon II to encourage senior, competent the Directorate-General of Nature Conservation officials to stay in the field; improve training and networking between parks through study-trips and internships, and contracting out aspects of park management, such as awareness activities, monitoring, and enforcement, to local and international NGOs and university consortia. Several experiments along these lines are currently underway in Komodo, Leuser, Lore Lindu, Bunaken and other national park sites.

Demarcation of Boundaries. There are many overlapping and conflicting claims to lands within PAs; this situation will get worse with decentralization and new perceptions of local and *adat* land rights. Due to the slow and often confusing process of demarcating forest boundaries, many PAs are still in a proposed or declared status; that is, the purpose and intention has been noted on the provincial spatial plan or forest land use map. It is only when the local governments (governor, bupati) have passed decrees (SKs) based on field-level consultations with local communities, that the area is legally gazetted, based on a final decree issued by the Minister of Forestry. Because of this legal quagmire, areas may be excised from PAs and given out for other land use (mining, oil palm), or converted to agriculture before the gazette process has been completed. Legal prosecution of illegal activities within PA boundaries is also difficult to prove in the absence of boundary markers (usually concrete posts placed 100m apart). There is an urgent need to develop an improved, consultative forest boundary demarcation process that involves local communities in demarcating agreed boundaries and requires them to share the responsibility for protecting those agreed forest boundaries.

Box 3.5. Voices from the Field: A Survey of National Park Managers⁴³

In late 1998 (after the onset of the economic crisis) a survey of 70 national park managers was conducted for the World Bank, USAID's NRM/EPIQ project and the Directorate-General of Nature Conservation. The survey showed that while managers were highly motivated and committed to conservation, they were also realistic about the many challenges they faced in achieving effective management: shortages of financing and staff; the difficulties of collaboration with local authorities and competing development agendas; lack of political support for conservation and lack of incentives for field staff working in difficult conditions.

"Only when they knew we had ADB funds did local government come and pay attention to our projects."

"When the bupati placed the transmigrants in the buffer zone, they did not mention to us that they had allowed the people to bring in plants which might have had an impact on the park."

"The total area of national parks in the province is only 10 percent. Why should people expect so much from a tenth of the area when they have 90 per cent which has other sorts of productive land."

For local government, a national park is considered as stealing the people's land.

Enforcement. There is an urgent need to strengthen the enforcement of conservation laws and to ensure prosecution of offenders. Out of more than 197 offenders apprehended for illegal activities in Leuser NP over the last three years, not one has been successfully prosecuted. It is essential that the judiciary, police and others entrusted with enforcing national laws are better informed about conservation laws and required to implement them. Much of the current forest loss within PAs is the result of illegal activity. The argument against enhanced enforcement is that most of the damage is being caused by defenseless poor people. Analyses show that this is often not the case. Immediate action needs to be taken at the highest level to ensure that high officials and politicians, known to be actively engaged in illegal logging in national parks, are not immune from prosecution actions.

Community participation and ICDPs. Community management of PAs is often touted as an answer to conservation problems, but while there is undoubtedly a need to involve surrounding communities in management decisions relating to PAs, there is very little empirical evidence suggesting that management devolved entirely to communities will succeed. The concept of an Integrated Conservation and Development Project (ICDP) has emerged as a specific model to link the conservation of biological diversity in parks with local social and economic development⁴⁴. Most ICDPs in Indonesia have been local efforts to relieve pressure on parks and reserves by offering small-scale economic activities to surrounding communities. Some of the most successful have empowered local communities to take an active role in demarcation, protection and stewardship of the PA and its resources e.g. Arfak and Wasur National Park in Irian Jaya. Several more ambitious projects, for example at Kerinci and Leuser, attempt to integrate the parks fully with regional development. The World Bank and many donor organizations have provided support to ICDPs in Indonesia. However, a recent World Bank review found the impact of ICDPs to be mixed, with many projects not addressing the major threats to PAs (Box 3.6).

⁴³ A.C. Nielsen 1998

⁴⁴ Wells and Brandon 1992

The current PA management structure can lead to tension between local governments and park administrators (see Box 3.5). National parks rely heavily on the support of the local police and bupati to assist with law enforcement activities in the park and bufferzone. In return many bupati expect to have a role and say in park boundary delineation, zonation and development of eco-tourism activities. Furthermore they often expect protected areas to support development programs and activities for bufferzone communities, an expectation which has been nurtured by the ICDP concept even though PKA generally has neither the expertise nor financial resources to deliver on such obligations. A few parks have successfully initiated activities to allow local governments to more effectively coordinate with PA management authorities. Examples of these initiatives include:

- The Inter-Provincial Coordinating Committee for Kerinci-Seblat National Park which meets on a quarterly basis and coordinates local government activities between the nine kabupatens and four provinces covering the park and the National Park Authority. The Inter-Provincial Coordinating Committee (IPCC) provides a forum for information exchange and development of shared work-plans and vision for the park and its bufferzone.
- The Stakeholder Forum for Lore Lindu National Park.
- The Consortium at Gunung-Gede Pangarango National Park which consists of NGOs, local universities, the local government and the Park, and provides a forum for fund raising and planning of activities within the park and its bufferzone.

Box 3.6. Experience with Integrated Conservation Development Projects (ICDPs)

A recent review of the range of ICDP initiatives in Indonesia suggests that most have met with only limited success⁴⁵. They are often not addressing the main threats to PAs, which are often government-sponsored development activities rather than illegal actions perpetrated by local communities. Moreover the very limited development opportunities such projects provide to local communities are generally insufficient incentive for those communities to change their behaviors and stop destroying PAs. Consequently they are often satisfying neither the conservation agenda nor the rural development agenda. The study concluded that ICDPs work best where conservation and development are explicitly linked and there is strong local support (at government and/or community level) for the PA. Increased domestic support for conservation through urban parks and recreation areas, school curricula and increased accessibility for domestic visitors to nature reserves could do much to build a constituency for conservation and protect Indonesia's biodiversity over the long term. Another way in which the menu of conservation measures could be expanded is to give consideration to more radical models such as providing incentive grants to local governments or NGOs in return for PA protection subject to independent performance reviews. It might also be possible for GoI to invite tenders for the management of PAs from NGOs, development agencies, or private sector bodies.

Conservation Financing

Irregular and inadequate financing for recurrent costs is a generic and global problem for protected areas. Most Indonesian parks are poorly resourced and some receive no regular budgets at all; most are reliant on supplementary donor financing, which covers only a limited project period. The Government is aware that it remains very reliant on donor aid, and is exploring options to ensure adequate financing to cover recurrent costs of PA financing through new

⁴⁵ Wells et al. 1999

mechanisms for raising conservation revenues. Pilot projects in Leuser and Komodo are looking at new management models for PAs, including financing from private organizations. A consortium of NGOs is working with GoI to assess the prospects for conservation trust funds (Cendrawasih Fund with CI; Park Rescue Fund with TNC, WWF, and CI) and a potential debt-for-nature swap. All such initiatives would have PAs as a primary focus. The Indonesian Biodiversity Trust Fund, capitalized by USAID at \$20 million and administered by the Kehati Foundation, provides small grants to local communities and local NGOs for conservation activities. Additional financial resources for forest protection might also be generated by the Clean Development Mechanism of the Kyoto Protocol, under which Indonesia would be compensated for carbon sequestered by maintaining forest cover and allowing natural regeneration of forests.

Nature tourism as a financing tool. Nature tourism is repeatedly mentioned in the context of financing for conservation in Indonesia, both to support PA financing and as a means of supporting local economic development. In Indonesia and globally, nature tourism accounts for only a small proportion of tourism, but it is one of the fastest-growing tourism sectors. It appears to offer the potential of mobilizing resources through the private sector that can contribute to local and national economic development while providing an incentive for conservation land uses and helping to finance biodiversity conservation. To date experiences in Indonesia, and elsewhere show that there is a significant gap between the potential of nature tourism and its actual contribution to PA financing.

With the exception of a few marine parks and scenic parks close to major urban centers, most of Indonesia's PAs have rather limited tourism potential. Rainforest parks, for example, do not offer the wildlife spectacle that has made the African parks so profitable. Moreover, most of the economic benefits of tourism tend to be captured by commercial operators in the countries where the tourists originate and in the larger cities of the host countries. As a result, nature tourism generally does little to support social and economic development in the remote rural areas where the nature tourism destinations are located. Thus relatively few local communities have realized significant benefits from nature tourism on their own lands or in nearby PAs.

PAs generally supply the most valuable part of the nature tourism experience, yet they charge relatively low entry and use fees. All parks charge visitor fees, ranging from Rp1,000 – 2,500 for domestic visitors and Rp 10,000 – 20,000 for foreigners but they capture little of the revenues generated by tourists. The number of foreign and domestic tourists visiting national parks and other areas in Indonesia has risen (indeed, the growth in reef diving over the last decade has been meteoric), but few PAs have benefited in terms of revenues. Moreover increasing visitor use has exposed sensitive sites to degradation from unregulated tourism development, too many visitors, and immigrants drawn to new jobs and business opportunities. A new initiative in Komodo will attempt to engage the private sector in park management activities and park financing as well as institute best practices for marine ecotourism. Private voluntary associations, like the North Sulawesi Watersports Associations are emerging to promote environmentally sustainable commercial uses of biodiversity (Box 3.7).

Box 3.7. North Sulawesi Watersports Association

Formed in mid 1998, the North Sulawesi Watersports Association (NSWA) has adopted as its primary goal the promotion of North Sulawesi as a world-class marine tourism destination through fostering high standards of service and safety and especially by promoting more environmentally-friendly watersports activities within the Bunaken National Park, Lembeh Strait and all marine areas of the North Sulawesi province. During its two year history, the NSWA has made significant strides in improving the management and conservation of Bunaken National Park and surrounding marine ecosystems and in conferring concrete benefits of tourism to the villagers living within the park. These achievements include:

- Instituted a voluntary but strict ban on all anchoring within the park by members' boats;
- Sponsored a village handicrafts program whereby local villagers have been encouraged to produce a variety of reef-friendly handicrafts for sale to diving tourists;
- Initiated a scholarship donation fund that will support one 5-year university scholarship in marine sciences and five 3-year tourism vocational school scholarships for villagers living within the Bunaken National Park and Lembeh Strait;
- Designed a reef-friendly marine tourism practices brochure to be distributed to all arriving guests;
- Instituted a night patrol system whereby members' boats, fuel and boat personnel were donated for use on alternate nights to patrol the Bunaken National Park with park rangers;
- Initiated a "Bunaken Preservation Fund" user fee of \$5/person to be collected from all diving and snorkelling guests of member businesses and to be used to support enforcement activities throughout the park.

NSWA has also represented the united voice of dive operators in North Sulawesi in calling to the attention of local and national government officials the current primary threats to the sustainable use of Bunaken National Park and Lembeh Strait ecosystems.

Looking Forward

While much can be achieved within Indonesia using Indonesian resources, it is clear that outside funding for conservation is going to be needed for a good many years yet to come. The Government of Indonesia made commitments to the special Consultative Group meeting on forestry issues in January 2000 including one to impose strong measures on illegal loggers, especially those operating within national parks. A clear test of political will on this matter will be whether the central government will take strong actions against such illegal loggers especially in PAs. Unless it can deal effectively with this issue, at the political and enforcement levels there is little point in assisting with area-based conservation efforts, and there is small likelihood of major conservation funding at least from the major donors.

Protected Areas

Assuming that this will is demonstrated it is clear that PAs will remain the cornerstone of Indonesian biodiversity conservation⁴⁶ and a variety of issues will need to be addressed.

Strengthening PA Management. Given the current rates of habitat loss, a top priority must be to establish PAs and management systems that together encourage long-term conservation and

⁴⁶ Bruner 2001

sustainable use of biodiversity across all major habitats and all biogeographic regions. To maintain as much as possible of Indonesia's rich biodiversity it will be essential to ensure that:

- the Directorate-General of Nature Conservation and other conservation agencies seek new partnerships at the provincial and local level to secure important PAs and integrate conservation fully within regional development strategies;
- the national PA network represents all major habitat types in all biogeographic realms;
- existing priority PAs are effectively protected and managed;
- PAs do not become non-viable "islands" within a sea of agriculture; and
- new and appropriate models for management for freshwater and coastal ecosystems, involving local stewardship as well as traditional PA models are developed.

Developing Mechanisms for Decentralized Management. The first priority is to manage the existing PAs with support and ownership from local government; and then establish a fully representative national PA system. Many of the top priority areas have already been designated, especially in western Indonesia, but designation, and support for, PAs has been uneven across all biogeographic regions. Maluku for instance has very few legally designated areas. Other islands, such as Kalimantan and Sumatra, have a partial system established, which would be greatly strengthened with a few additional areas, especially of remaining lowland forests and other threatened habitats.

Supporting the PA network. In determining areas where limited funding and resources should be applied from national and donor funding, a pragmatic, "triage" approach would be to divide PAs into three categories:

- those where conservation values have been so severely compromised that the costs of conservation and restoration are so great that the sites should be turned over to local management and financing;
- those that are so remote and are experiencing so few problems that they will look after themselves to a large extent for the short and medium term futures; again the primary source of funding could be at the local level; and
- those under medium threat where the chances for conservation success are good with appropriate active assistance.

Within the third category of PAs above, the incremental conservation gain from any additional area (known as 'complementarity'), could be used to determine which priority areas should receive new and additional conservation funding to give better biogeographic coverage throughout the national system. This would imply both greater coordination between donors and a system whereby the majority of GOI counterpart funding was not also concentrated in those PAs receiving maximum external aid. Under such a system PAs not included in the top priority list would receive little, if any, funding from a central Directorate-General of Nature Conservation source. Many of these reserves may still be sites of special biological interest at a local level or have high values for recreation, watershed protection or other benefits to the province. In such cases there would be a strong incentive for provincial governments or other local groups to assume more of the responsibility for their management.

Expanding the PA network. Based on complementarity the existing PA network for Indonesia as a whole, and for each biogeographic region, would be strengthened most by designation and gazettement of the following proposed PAs:

- **Kalimantan:** Sebuku-Sembakung, Sangkulirang
- **Sulawesi:** Gunung Sahendaruman, Malili Lakes
- **Maluku:** Lalobata, Aketajawi, Pulau Taliabu, extension of Yamdena, Gunung Kelapatmuda, Kai Besar, extension of Aru National Park.
- **Nusa Tenggara:** Gunung Arnau, Manupeu, Selalu Leginin, Puncak Ngenges (Olet Sangenges), Tambora Utara, Tanjung Karitamese, Egon Iliwuli, Gunung Timo, Gunung Tamailu
- **Irian Jaya:** Mamberamo-Foja

Impacts of Decentralization

Under the Decentralization Law No. 22/1999 and its implementing guidelines, Ministry of Forests continues to administer and manage all nationally important PAs (national parks, nature reserves, wildlife reserves and hunting reserves). Decisions on allocation and management of other forest areas including watershed and protection forests, production forests and local protected areas of limited conservation value such as recreational parks (*Tahura* and *Taman Wisata*) have now devolved to the local level. However many PAs are very large (Lorentz for example is 2.5 million hectares) and in some cases can cover 40-60% of the administrative area of a kabupaten. With decentralization, the onus is now on local governments to supplement block grants by raising revenue from within their kabupatens. This creates tension between local governments and conservation officials as PAs occupy land for which they do not contribute any land tax (PAD). As yet ecotourism in national parks has not contributed sufficient revenues to offset this potential loss in taxes. The central government needs to revisit its general block grant allocation to allow some means of compensating kabupatens with large PAs within their administrative boundaries.

Promoting Conservation Issues in the Wider Environment

Landscape management. The adoption of an ecosystem approach which embraces a continuum of different land uses from strictly PAs to production landscapes is a more effective way in the long run to maintain and maximize biodiversity. This means:

- retaining a permanent forest estate including natural lowland forests as well as hill and montane forests;
- creating new PAs to maintain remaining fragments of natural forest and protecting forest corridors that link remaining forest blocks;
- managing production forests for sustained forest production and as buffer zones around, and corridors between, PAs to maintain as large an area of forest as possible, thereby effectively increasing the conservation value; and
- seeking new options for managing forests after logging, rather than allowing conversion to inappropriate forms of agriculture. Such forest management could involve various management systems e.g. agroforestry, community management of production forests, and reforestation of degraded lands but should be designed to encourage natural regeneration, maintain native species and maximize biodiversity benefits (see Chapter 2).

Mainstreaming. In an even broader context, biodiversity conservation in Indonesia requires *mainstreaming*; that is, the incorporation of biodiversity issues, options and objectives into sectoral policies, sustainable national and regional development programs, and project impact assessment and mitigation/management plans in order to promote conservation management within the production landscape. Much of the necessary change must occur at the level of individual development projects. In effect, projects in traditional sectors such as water, urban, agriculture, infrastructure, industry, energy, rural development and tourism need to become more 'biodiversity-friendly'. The multi-sectoral steering committee coordinating the BSAP exercise and interdepartmental committee coordinating forestry issues should provide exciting new opportunities for establishing institutional and inter-ministerial collaboration to encourage such strategies.

4. Mining and the Environment

Introduction

During the period of rapid growth that preceded the economic crisis, Indonesia's mining sector averaged 5.1 percent annual expansion from 1990-96. However, while non-oil, non-gas mining has been a growth sector and supplier of energy for export and domestic use, the environmental scale effects accompanying its growth have been substantial. These effects have included extensive land disturbance, loss of forest cover and habitat, contamination of rivers used for drinking water and food supplies, and increasing social conflict over access to mineral resources.

Several hypotheses have been offered to explain the potential impact of the East Asia economic crisis on the mining sector in Indonesia. Impacts of the economic crisis were expected to vary by scale of operations. For the large-scale multinational mining firms, whose profitability is judged in dollars and not the local currency, the currency devaluation and fall in real wages (in U.S. dollar terms) induced by the crisis would mean a significant drop in the cost of mining production. This would create a supply-side incentive for mining firms to invest and produce more.

At the level of artisanal and small-scale mining (ASM), during economic crises, people experiencing loss of income and those already living in poverty would be expected to be attracted to ASM, because entry requires little capital or skills. In the short term, the most significant changes in production levels therefore would be in ASM.

Under crisis conditions, Government might be expected to look to mining exports at global market prices to generate additional foreign exchange and tax revenue, stabilize the failing exchange rate, and keep the fiscal deficit under control. However, the contract of work (COW) system used in Indonesia makes it difficult, if not impossible, to increase tax rates on existing operations. Hence, tax revenues can only increase in the short run if existing operations increase production or profits.

These potential economic impacts of the crisis suggest several environmental implications. First, an increase in mining activities would result in more environmental damage, even if accompanied by similar environmental investments and precautions as has been the case in the past. Second, ASM operations tend to be heavy polluters relative to their output, are ordinarily difficult to monitor, and rarely comply with environmental regulations. Third, there is the possibility of significant budget cuts to the departments responsible for environmental monitoring and enforcement, which could result in reduced monitoring and relaxation of environmental requirements.

Community benefits from mining are a major issue in Indonesia, often superseding environmental concerns. On one hand, communities often tend to ignore environmental damage from mining if there are significant economic benefits. On the other hand, the economic benefits to the community, especially in the long term, can be greatly diminished by environmental damage.

The chapter is organized in seven sections. Section 2 contains a brief description of the Indonesian mining industry. Section 3 discusses the pre-crisis and current situations of large-scale mines in Indonesia, including the changing social landscape. Section 4 analyzes medium-sized

mining, with an emphasis on coal mines. Section 5 discusses ASM with findings from two surveys undertaken for this study. Section 6 examines the institutional situation in Indonesia with respect to the mining sector, especially environmental management. The last section wraps up with conclusions and recommendations.

Overview of the Mining Sector in Indonesia

The mining sector in Indonesia consists of three mine types: large-scale, medium-scale, and artisanal and small scale. Each has distinct characteristics and has been affected differently by the economic crisis. Small-scale mining uses mechanization and at times heavy equipment, but artisanal mining relies mostly on hand tools and no mechanization. This study refers to these two types of mines jointly as ASM.⁴⁷ The three mine types need to be treated separately from both production and environmental viewpoints.⁴⁸

The economic crisis in Indonesia has not led to a significant change in levels of mining investment and production in large-scale mining, largely due to a drop in prices of the important metals produced in Indonesia, (Table 4.1). This drop in prices has been due to a decrease in global demand for metals, as supplies have been roughly stable (Table 4.2). As a consequence, global investment in mineral exploration fell from US\$4.0 billion in 1997 to US\$2.8 billion in 1998.

The main products of mineral mining in Indonesia from 1990 to 1998 were gold, silver, copper, nickel, tin, and coal (Table 4.3). Large-scale mines produce all minerals except tin, while medium-scale mines produce all minerals except copper. The dominant product of artisanal and small-scale mining is gold, although coal production has become more prevalent in recent years. The mining sector provided 8.2 percent of Indonesia's export revenues in 1996, 7.9 percent in 1997, and 14.0 percent in 1998.⁴⁹

⁴⁷ Industrial minerals such as sand, gravel, and limestone also have important environmental impacts, but they are not discussed in this study as the production, pricing, processing, and environmental characteristics are different from coal and metallic minerals.

⁴⁸ Type of technology and throughput of ore are most commonly used to define the different scales of mining. An ASM metallic mine has a throughput of less than 1,000 tons per day, a medium-scale mine produces 1,000 to 5,000 tons per day, and a large-scale mine has a throughput greater than 5,000 tons per day. Alternatively, a small-scale mine has annual sales of less than US\$10 million and a medium-scale mine has annual sales of between US\$10 million and US\$100 million (World Bank, 1996: 48). In the coal sector, less than one million tons of coal production per year is considered small-scale, one million to five million tons per year is medium scale, and more than five million tons per year is large scale. Indonesia's Ministry of Mines and Energy does not classify mining activities by the scale of operations but by the type of mineral/s produced, and a letter system: "A" for minerals vital to the economy (gold, uranium); "B" for energy-related products (coal; oil, gas); and "C" for industrial minerals (sand, gravel, limestone) and small scale gold mining.

⁴⁹ The large increase in 1998 was due to the lower dollar value of exports whose prices are determined in rupiah in contrast to commodities (including minerals) whose prices are determined in U.S. dollars on global markets. The national accounts in Indonesia do not distinguish between oil, gas, and other minerals, so the contribution of non-oil, non-gas mining is not clear, although in dollar terms, this would also have increased substantially after the economic crisis.

Table 4.1. Prices of Metals Produced in Indonesia, 1980-1999 (Unit: U.S. dollars)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Gold/oz.	845	463	384	354	322	345	348	322	333	306	282	276
Copper/ton	3,032	2,066	2,662	2,288	2,139	1,836	2,094	2,459	1,971	2,101	1,588	1,336
Nickel/ton	6,519	4,899	8,864	8,156	7,001	4,978	5,752	6,891	6,443	6,392	4,443	4,198
Tin/kg	16.4	11.5	6.1	5.5	6.0	5.1	5.0	5.2	5.3	5.2	5.3	4.8
Coal/ton	43	47	42	42	41	36	33	33	32	34	33	32

Source: Global Commodity Markets, World Bank, Washington, D.C.

Table 4.2. Global Metal Production, 1994-1998 Unit: 1,000 tons

	1994	1995	1996	1997	1998
Gold	2.140	2.097	2.130	2.249	2.254
Copper	9,576.0	10,175.0	11,100.0	11,449.0	11,772.0
Nickel	867.0	974.0	1,027.0	1,024.0	1,020.0
Tin	190.0	202.0	223.0	212.0	206.0
Coal	3,551,000.0	3,699,000.0	3,755,000.0	3,775,000.0	N/A

Source: London Metals Exchange, London, U.K.

Table 4.3. Mineral Production in Indonesia, 1990-1998 (Unit. 1,000 tons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998 e/
Gold	.011	.0169	.017	.0416	.0425	.0633	.0836	.0898	.124
Silver	.0673	.0803	.0900	.0903	.1060	.2605	.2280	.2571	n/d
Copper	169.1	219.5	290.9	309.7	333.9	461.7	525.9	548.3	682.6
Nickel	68.6	66.1	78.1	65.8	81.2	86.6	87.9	75.3	76.4
Tin	31.7	30.1	29.4	36.1	38.5	46.1	51.0	55.2	52.2
Bauxite	1,205.7	1,406.1	803.5	1,320.4	1,342.4	899.0	842.0	808.7	804.0
Coal	11,000.0	14,000.0	16,000.0	28,000.0	32,000.0	41,000.0	50,000.0	55,000.0	n/d
Numbers of companies	n/d	n/d	n/d	n/d	15	21	47	37	32
Exploration expenditure (US\$ millions)	n/d	n/d	n/d	n/d	69.6	108.2	191.3	227.1	136.4
Worldwide allocation (%)	n/d	n/d	n/d	n/d	3.27	4.02	5.43	5.64	4.82

The mining sector is regulated principally by the Basic Mining Law⁵⁰ whose most important provisions concern the classification of minerals, the form of organizations eligible to engage in mining, and the legal basis on which mining can be undertaken. To obtain a concession to explore and develop a medium-scale or large-scale mine in Indonesia, a company must apply for and receive a contract of work (COW) from the Ministry of Mines and Energy. The Government of Indonesia has changed the format of the contracts several times and mining companies entering into new contracts now use a seventh generation COW.⁵¹ Although each company enters into a partnership agreement with the Government, the company operates the mine independently of the Government.

⁵⁰ For a more detailed discussion of the legal and regulatory framework, see Section 6.

⁵¹ Currently, the eighth generation of Contracts of Work is under negotiation. The new COW will include significant changes in the socio-economic investments to be guaranteed by the mining companies and the percentage of revenues going directly to the communities residing within the boundary of the concession area.

Large-Scale Mining

Five large metallic mines and four large coal mines operate in Indonesia. Since the onset of the crisis, only one new mine – the Newmont copper and gold mine – has opened, the Freeport copper and gold mine (Irian Jaya) has almost doubled its size, and the Inco nickel mine (Sulawesi) started enlarging its operations.

Until the mid-1980s the only large-scale mines in Indonesia were the Inco nickel mine in Sulawesi and the Freeport copper and gold mine in Irian Jaya. Due to both declining oil reserves and the enormous capital needed to develop a large mine, the Government took steps to make mining more attractive to foreign investment in the 1980s. During the mid-1990s, mining contributed significantly to exports and tax revenues. Table 4.4 shows the recent evolution of export production and export revenues for the main metals from Indonesia, mostly from large mines. From 1994 to 1998, export revenues from non-oil, non-gas mining increased by 74 percent compared to a 22 percent increase in exports for all sectors.⁵²

However, following the onset of the crisis, exploration investment dropped from US\$227 million in 1997, to only US\$136 million in 1998. COW applications declined from 286 in 1996-97, to 16 from October 1997 to April 1999. The exception to these downward trends is the number of contract of work applications for coal. Besides the economic crisis there are at least two other reasons for the decline in mineral investments. First, the Busang (or Bre-X) scandal greatly reduced risk capital for the sector in Indonesia.⁵³ Second, the political instability accompanying the economic crisis has dampened interest in investment. Given the substantial investments needed to develop a large mine—often over US\$1 billion—companies are hesitant to invest in a country in political transition, where rules of the game can change unexpectedly, from relatively simple changes such as higher royalties to dramatic changes such as partial nationalization.

Production costs for foreign companies have fallen due to the decrease in domestic labor costs in U.S. dollars. However, the removal of a diesel subsidy has offset this saving to some extent. The costs to domestic-owned mines—both large- and medium-scale—have fallen in a much more dramatic fashion as they are more labor intensive and rely exclusively on domestic labor. There are reports of operating costs having fallen over 30 percent. However the price of coal has not been affected much by the crisis. Coal mining is the main activity for domestic-owned, medium-scale and large-scale mines. Given that there are only two large-scale domestic-owned mines, the economic impact on domestic-owned mines has been greater in medium-scale mining.

Environmental Effects

Given the area under exploitation, relative to the country's land area, the brief history of large-scale mining in the country, and relatively new technology, large-scale mining has had a relatively limited impact on the environment in Indonesia.⁵⁴ Less than one-quarter of one percent of Indonesian territory is dedicated to medium-scale and large-scale mining. Even including ASM,

⁵² As noted above, Indonesia national accounts do not distinguish between oil and gas and other minerals, and therefore the precise contribution of coal and metallic minerals is not known.

⁵³ Gold samples in Kalimantan were falsified and left a negative impact on the sale of stock offerings by junior mining companies around the world and, in particular, for Indonesia-related investments.

⁵⁴ For in-depth discussion of environmental concerns and potential solutions of large-scale mining, see Ripley et al (1996).

this figure is still well below one-half of one percent, the global average. Much of this land has minimal agricultural value, although there could be serious biodiversity concerns. Nevertheless, without proper risk assessment at the beginning of a project, mining operations can be vulnerable to catastrophic accidents with irreversible or long-term negative environmental consequences, especially via river systems.

Table 4.4: Exports of main metals from Indonesia, 1994-1998 (US\$ in millions; 1,000 tons)

Commodity	1994		1995		1996		1997		1998	
	Tons	US\$	Tons	US\$	Tons	US\$	Tons	US\$	Tons	US\$
Coal	24,100	516.0	30,900	1,005.0	36,400	1,248.0	41,700	1,336.0	46,300	1,142.0
Tin	43.6	183.0	45.0	253.0	48.8	290.0	53.0	273.0	43.1	271.0
Nickel ore	1,800	25.3	2,100	40.4	2,100	36.1	2,400	37.5	2,300	24.1
Ferronickel	26.2	35.3	54.3	83.8	46.7	73.0	48.7	64.8	31.7	38.3
Nickel matte	46.0	217.3	46.1	301.8	39.5	247.5	32.4	174.9	32.7	145.1
Copper conc.	1,000	1,112.0	1,500	1,782.0	1,700	1,724	1,900	2,033.0	2,600	2,103.0
Gold	43,500	208.0	63,300	195.0	83,000	315.0	89,100	293.0	118,200	263.0
TOTAL		2,300.0		3,500.0		4,000.0		4,200.0		4,000.0

Source: Directorate General of Mines, Jakarta, Indonesia.

The greatest risk arising from a medium-scale or large-scale mining operation is a major tailings spill. According to data from the United Nations Environmental Program, the United States Committee on Large Dams, and other sources, there have been 28 major tailings spills in the last 30 years, or approximately one per year worldwide.⁵⁵ Approximately 50 of the world's 10,000 active medium-scale and large-scale mines are in Indonesia; one tailings spill could cost Indonesia an estimated US\$100 million for cleanup and compensation (not including the cost of a possible loss of biodiversity or other ecological functions).⁵⁶

The Freeport mine in Indonesia recently increased the amount of ore processed from about 125,000 tons per day to over 200,000 tons per day. After a spill in 1990 with an impact covering an area of about 30 square kilometers (3,000 hectares), the company constructed levees of 35 and 40 kilometers in length to contain the tailings in a large delta down river from the mine. However, even if the tailings disposal area is being successfully revegetated,⁵⁷ none of the mine's options for tailings disposal and land reclamation practices are entirely satisfactory, as the potential long-term impacts of such practices are not entirely known.

The new Newmont mine also claims to be following good environmental practice; its tailings will be dumped into the ocean 3.2 kilometers offshore—submarine disposal—via a 42-inch diameter pipe at a depth of 120 meters. After dumping, the tailings will flow by gravity into the adjacent ocean trench that has a depth of over 3,000 meters. The tailings from the Newmont Minahasa gold mine in Sulawesi are deposited in the ocean at a depth of 25 meters. The tailings then flow to a depth of about 80 meters. There is concern that the tailings are mixing with surface

⁵⁵ "Chronology of Major Tailings Dam Failures" is available on the internet at <http://antenna.nl/wise-database/uranium/mdaf.html>. Although the author does not classify them as such, the large majority of these mines are likely medium-scale mines.

⁵⁶ Estimate is based on the US\$100 million spent by Placer Dome for the medium-scale Marcopper mine spill in the Philippines.

⁵⁷ As confirmed by an audit by Dames and Moore (1996) and, more recently by the Bank-financed BLT-OSM technical assistant (TA) project.

water and killing aquatic life rather than moving further out to sea. However, an inspection by the director of the BLT-OSM project revealed no evidence of tailings in surface water, even at a depth of 75 meters (Hamilton, 1998a: 21). Nevertheless, tailings deposits at such relatively shallow depths remain controversial issue in mine environmental management.

Second to a tailings spill, acid rock drainage (ARD) is the most serious environmental concern for a mine operation, as its effects can last for decades or even centuries.⁵⁸ The cost of ARD prevention and associated risks are significant within the cost-benefit evaluation of a mining operation. In Indonesia, waste rock from the Freeport mine has been dumped in a mountain lake near the pit and has generated significant acid rock drainage. However, Freeport has recently taken strong measures to reduce and neutralize the ARD. It has built a new plant to treat and recycle acid water, and eventually will drain the lake and treat the soil.

The cost of large spill clean-ups can be imposing. By examining some recent cases, it is possible to get an idea of the magnitude of the clean-up costs and (generally much lower) indemnization costs. The 1998 spill at the Los Frailes lead-zinc mine in Spain could cost US\$100 million to US\$200 million in clean-up. In the Philippines, a spill at the medium-scale Marcopper mine under domestic management has cost its financial partner, Placer Dome, nearly US\$100 million in clean-up and indemnization payments. There is currently a court case against the Omai gold mine in Guyana asking for US\$47 million in damages for the 1995 spill in the Essequibo River. Without available figures, the clean-up and indemnization costs of the spill at the El Porco lead-zinc mine in Bolivia and the Surigao del Norte gold mine in the Philippines are estimated at less than US\$10 million. None of these estimates includes values for actual or probable loss of biodiversity.

To date, there is no evidence that environmental problems in large-scale mining have significantly worsened since the onset of the crisis. Due to the pressure of NGOs and new environmental procedures, possibly environmental conditions in large-scale mining have improved. However, a recent assessment of environmental practices of medium-scale mines indicated that many medium-scale mines, especially in domestically owned mines, were operated in a haphazard way, leading to production losses and significant environmental damage.⁵⁹

⁵⁸ Acid rock drainage is water from mine waste and tailings which is made acidic by the oxidization of sulfide materials. It kills most forms of plant and animal life. To avoid ARD the waste must be covered by water or soil in an impermeable site.

⁵⁹ Hamilton, 1998 b.

Table 4.5. Environmental and Social Problems by Mine or Mine Type in Indonesia

Name/ mine type Production/value ^a	Environmental problems			Social problems
	Land	Water	Other	
Large Scale				
<p>Freeport: gold and copper 57,665 kg gold, US\$188 million</p> <p>1.8 million tons copper concentrate, US\$1.9 billion</p>	<ul style="list-style-type: none"> • Large amounts of overburden and waste material deposited 	<ul style="list-style-type: none"> • Tailings management, following 1990 spill, control is improving • Risk of ARD from overburden management 	<ul style="list-style-type: none"> • Waste management • No significant risk of biodiversity loss but further studies needed • Introduction of exotic species (cats, dogs, fish) 	<ul style="list-style-type: none"> • Conflicts among different ethnic groups, including cultural conflicts and upsetting of traditional power structures • Land conflicts • Demand by local government and local communities for a greater share in the benefits and management of mines • General social problems of large-scale mines (prostitution, alcoholism, violence, drug abuse) • Violence by Irianese (local) people toward other Indonesians and Westerners (March 96)
<p>Minahasa: gold 6,414 kg gold, US\$21 million</p>		<ul style="list-style-type: none"> • Risk to aquaculture from submarine tailings deposits • ARD risk 		<ul style="list-style-type: none"> • Ethnic tensions • General social problems of large-scale mines • Regional government claiming revenue benefits for itself in direct contravention to Jakarta
<p>Kelian: gold 15,050 kg gold, US\$49 million</p>		<ul style="list-style-type: none"> • ARD problems being addressed • High levels of manganese in water 	<ul style="list-style-type: none"> • Main mine pit difficult to reclaim; reclaiming alternative deforested area 	<ul style="list-style-type: none"> • Creation of short-term cash economy • Uncertain sustainability after mine closure in 2 or 3 years • Demand that disputes and land claims are settled by customary law • Company is the main source of revenue for the newly formed regional government of West Kutai • Squatting by ASM miners and related problems (see ASM below)
<p>Aneka Tambang (Pomalaa and Gebe Island): Nickel 2,830,000 tons of nickel ore, US\$40 million</p>	<ul style="list-style-type: none"> • Soil erosion--3 years of exposure before land reclamation • Until recently top soil mostly lost 	<ul style="list-style-type: none"> • Sedimentation • Risk of ARD, need to contain acid generating materials for long time 	<ul style="list-style-type: none"> • Poor practices for revegetation, including with tree planting, no cover crops • Sulfur-dioxide emissions from smelting 	

Table 4.5. Continued

<p>Inco: nickel 32,406 tons of nickel matte, US\$175 million</p>		<ul style="list-style-type: none"> • Risk of ARD, need to contain acid generating materials for long time 		<ul style="list-style-type: none"> • Cultural conflicts as tribal area • General social problems of large-scale mines
<p>Coal (4 mines) 37 million tons, US\$925 million</p>	<ul style="list-style-type: none"> • Large amounts of solid waste • Risk of land subsidence 	<ul style="list-style-type: none"> • Sedimentation of fine particles • Heavy water use in cleaning • Risk of ARD in tailings • Drainage problems in reclamation due to large extent of operations 	<ul style="list-style-type: none"> • Fine particles in air • One mine borders on national park; important orangutan reserve; also problems of illegal forestry 	<ul style="list-style-type: none"> • General social problems of large-scale mines (prostitution, alcoholism), • In one case large frontier community was established in very lightly populated area; great need for social services. • In the case of Kaltim Prima Coal, the provincial government is attempting to gain a majority stake and there is growing pressure from the community for a more participatory role in management of the company.
<p>Medium-Scale</p>				
<p>Medium-scale coal mines 17 million tons, US\$425 million</p>	<ul style="list-style-type: none"> • Catchment areas are poorly designed • Companies often do not use back filling for open pit coal mines • Top soil is poorly managed so not reclaimable 	<ul style="list-style-type: none"> • Coal preparation plants often on river banks • Significant ARD • Sediment ponds inadequate, often overflow • Loss of fine coal particulates to water 	<ul style="list-style-type: none"> • Fine coal particulates in air 	<ul style="list-style-type: none"> • Usually not serious due to relatively small work force unless in culturally sensitive area
<p>Mines: non-coal^b 808,000 tons of bauxite, US\$9 million 55,200 tons of tin, US\$273 million 10 tons of gold, US\$33 million</p>	<ul style="list-style-type: none"> • Soil erosion • Delayed reclamation; no ground cover 	<ul style="list-style-type: none"> • Inadequate, poorly maintained tailings dams • Sedimentation control poor, significant impact on sea and river life • Discharges of untreated mine water to rivers • Presence of heavy metals 	<ul style="list-style-type: none"> • Poor management practices in chemical handling and storage with many leaks and limited spill prevention 	<ul style="list-style-type: none"> • Usually not serious due to relatively small work force unless in culturally sensitive area • Squatting by artisanal miners and resulting social problems (see ASM below)

Table 4.5. Continued

ASM				
ASM gold N/A	<ul style="list-style-type: none"> • Soil erosion • Loss of top soil 	<ul style="list-style-type: none"> • Mercury pollution • Sedimentation and siltation 	<ul style="list-style-type: none"> • Mercury vapors • Deforestation • Loss of biodiversity 	<ul style="list-style-type: none"> • Land squatting • Ethnic conflicts • Prostitution, alcoholism, drug abuse, school absentees • Health problems, spread of disease • Loss of traditional hunting and fishing areas • Cultural destruction
ASM coal N/A	<ul style="list-style-type: none"> • Soil erosion • Loss of top soil 	<ul style="list-style-type: none"> • ARD • Sedimentation 	<ul style="list-style-type: none"> • Coal dust in air • Road damage 	<ul style="list-style-type: none"> • Prostitution, alcoholism, drug abuse. • Health problems

Source: Study team

^a Value is calculated using average prices received in Indonesia for exports of the commodity in 1997.

^b The entries in this row on environmental damage are based on reports of two medium-scale mines belonging to Aneka Tambang, Kijang Bauxite and Pongkor Gold.

Table 4.5 summarizes the most important environmental and social risks and problems caused by the large, medium, artisanal and small mining operations.⁶⁰

Estimates of the Economic Cost of Environmental Damage

While it is difficult to quantify environmental damage due to large-scale mining in Indonesia, it is possible to obtain an empirical perspective on the environmental performance of large-scale mining. A World Bank-supported technical assistance project⁶¹ estimates that most environmental problems in large-scale mining could be rectified for minimal cost. In some cases, such as coal, better production methods would pay for most or all of the environmental investments. What follows is an estimate of the economic costs for environmental protection and reclamation for coal and other metals for large-scale mining.

Coal mining estimates. In Indonesia, there are four large coal mines that produce more than five million tons of coal per year. The largest mine, Kaltim Prima Coal spends approximately US\$3 million per year on environmental protection and land reclamation, or US\$0.23 per ton of coal, and has a well-developed environmental management program, which also includes an ongoing reclamation plan (Box 4.1). Using this figure as an indication of what the other companies should spend, the approximate environmental budget for large-scale coal mining should average US\$10 million per year, which is much less than one percent of the gross revenues of the major four coal mines in 1998.

In comparison, Aneka Tambang, the gold and nickel mining company, has estimated land reclamation costs of US\$600 per hectare for nickel and US\$500 for gold. The Indonesian Mining Association reports that reclamation of tin mines without prior treatment costs US\$400 per hectare.

⁶⁰ The study does not evaluate the damage caused by downstream mining activities, of which the most important is smelting, as most metals mined in Indonesia are smelted in other countries. However, this could become a future issue. Inco is building a nickel smelter in Central Sulawesi. As the industry expands, the likelihood of downstream activities taking place in Indonesia will increase.

⁶¹ The Biro Lingkungan Teknik-Office of Surface Mining (BLT-OSM) project is described in Box 4.3.

Given the more complex nature of the mining of these metals, one would expect a significantly lower figure for coal. The total concession area of the three private large-scale coal mines is 260,000 hectares.⁶² Assuming that 20%-30% of the 260,000 hectares need to be reclaimed at a cost of US\$500 per hectare, the total cost would be US\$26-39 million, which would be spread over a period of 10 to 20 years.

Metal mining estimates. Existing data on four of the five large metallic mines allow an estimate of reclamation costs, with the caveat that the estimate understates environmental damage by at least the cost of annual preventive measures.⁶³ In three of the four cases (Freeport, Kelian, and Inco), there are data on annual expenditures. In the case of the Freeport copper and gold mines in Irian Jaya, planned environmental expenditure for 1999 is US\$42 million. The Kelian gold mine in East Kalimantan spends about US\$2 million per year and is considered to be a good environmental performer, recently receiving an accolade from an NGO, Community Aid Abroad. The Inco nickel mine spends about US\$1 million per year. It is likely that expenditures for the Minahasa gold mine would be of the same order of magnitude as the Kelian mine, given that the mines are approximately the same size. If environmental expenditures are used as a lower bound estimate of annual environmental damage that has been prevented, the annual environmental cost of the large-scale mining is in the order of US\$50 million to US\$60 million. This figure should be compared against the value of annual production of the mines, which in 1998 was approximately US\$3.5 billion.

Aneka Tambang has estimated reclamation costs for its Pomalaa and Gebe Island nickel mines at US\$500 per hectare. The total cost of reclamation would be US\$4.4 million using this figure. However in the environmental audit undertaken by Morgan Worldwide Consultants (1977), reclamation practices at Aneka Tambang's nickel mines were considered inadequate. Inco spent about US\$2,500 per hectare for land reclamation from 1996 to 1998. If Inco eventually mined half of its concession area, the cost of reclamation would be US\$272 million, spread over 30 to 40 years. Kelian has estimated that the total reclamation cost for its mine will be about US\$25 million; reclamation cost for Minahasa is likely to be in the same order of magnitude. Freeport expects to spend about US\$200 million to reclaim its mine site and tailings deposit, at an average cost of about US\$7,000 per hectare. Consequently, the total reclamation amount for these five mines is about US\$525 million.⁶⁴ This figure is much less than one percent of a conservative estimate of the expected value of the output of these mines, which could easily be more than US\$100 billion based on past output and current reserves.

⁶² It has not been possible to obtain data on the size of the concession of the state-owned coal mine, Tambang Batubara Bukit Asam.

⁶³ Theoretically, if environmental costs are fully internalized, then at the margin, a firm's environmental expenditures would be enough to mitigate the true environmental damage caused by its activities. However, in practice, for a variety of reasons (such as market and institutional failures, incomplete information and time lags involved in identifying environmental damage) environmental costs are not fully internalized and, therefore, environmental expenditures by mines should be considered at best lower bounds.

⁶⁴ If it is assumed that the reclamation costs per hectare for Aneka Tambang are the same as Inco, the total amount for reclamation for the large mines would be about US\$550 million.

Box 4.1. Rehabilitating Kaltim Prima Coal Mine

Kaltim Prima Coal, a joint venture of Rio Tinto and British Petroleum, is located in East Kalimantan. It is the largest coal mine in Indonesia, producing over 13 million tons of coal each year. It has a successful, ongoing program of land rehabilitation that includes land preparation, nurseries, planting, and field maintenance. Kaltim Prima's environment department spends about US\$3 million per year, with another US\$1.5 million being spent on environmental efforts by the individual pits. Efforts by Kaltim Prima are divided into permanent and temporary rehabilitation.

Temporary rehabilitation involves the stabilization of an area that will be disturbed again at a future date, either due to further mining or road construction. It prevents soil erosion and arrests any possible shifting of overburden dumps, which could result in the production of ARD. Given that the mine must move, store, and stabilize more than 40 million tons of overburden per year, failure to temporarily rehabilitate the overburden dumps could easily lead to an environmental catastrophe. Kaltim Prima temporarily rehabilitates and stabilizes over 300 hectares per year.

Permanent rehabilitation takes place on land that will not be disturbed again. It is top soiled and planted with mostly native species of plants and trees. Usually, there is a first line planting to stabilize the soil followed by a final planting. Kaltim Prima permanently rehabilitates over 200 hectares of land per year.

Nevertheless, it is important to stress that reclamation standards are not clearly defined in Indonesia. For example, if reclamation is defined as restoring the original ecosystems, the estimated cost of environmental damage would likely be significantly higher. At the other extreme, if reclamation only means planting enough vegetation to stabilize the soil, the costs would be significantly lower. Accordingly, it is important to determine acceptable standards and to include detailed reclamation measures in mine closure plans, including a final end use acceptable to the Government and local communities. The plans might include the option of choosing a compensatory reclamation site to substitute for the mined area in some cases. In addition, there should be provision for future negotiation of reclamation plans if a community rethinks the end use of the land beyond the life of the mine. Rio Tinto's Kelian gold mine in East Kalimantan will be the first major mine to close in Indonesia (see Box 4.2).⁶⁵

Government Oversight

The current budget of the Mining Environmental Unit of the Directorate General of Mines (DGM) only allows fulfilling about 20 percent of its responsibilities, which include environmental monitoring of large- and medium-scale mines. However, there is no evidence of diminished government pressure on the environmental performance of large mines. Despite budget cuts, the number of inspections has remained the same or increased since the onset of the crisis. The Ministry of Mines and Energy has taken a stronger environmental stance and is currently putting more emphasis on environmental performance than before the economic crisis. The most prominent indication of the interest of the Ministry of Mines and Energy in environmental protection has been the World Bank's BLT-OSM TA project. The objectives and main accomplishments of the project are discussed in Box 4.3.

⁶⁵ For further discussion of reclamation bond issues, see Section 6.

Box 4.2. Mine Closure and Reclamation at Kelian Gold Mine

Rio Tinto's Kelian Gold Mine is scheduled to close in 2003 after 11 years of operation. The environmental performance of the mine has been good, with only one minor incident. Nevertheless, at times, the Kelian mine's performance has been compromised by the activities of illegal artisanal and small-scale miners who operate near or within the large mine's concession area. It is also likely that these miners will occupy the site once Rio Tinto leaves. In such a situation the best efforts of Rio Tinto to undertake a proper reclamation may be jeopardized as the small-scale miners generally operate without environmental controls or government supervision.

Rio Tinto will rehabilitate 800 hectares at the mine site at a cost of US\$25 million. The 450 hectare pit and dam area will not be rehabilitated due to the large cost involved. However, in compensation the company will rehabilitate 500 hectares of land that has been logged in Samboja, East Kalimantan. Although the alternative site has been accepted by the Government, it does raise the issue of what is considered adequate rehabilitation of a mine area.

Rio Tinto is also working with the World Bank under the Business Partners for Development project to develop a plan that will minimize environmental and social damage associated with the mine closure. First, the participants are working together to formulate training programs and social service delivery mechanisms which will mitigate the socio-economic impact of the mine closure. Second, they are attempting to formulate a plan to prevent or mitigate environmental damage by illegal miners. In particular, they are working with the regional, provincial, and central governments to regularize ASM, including proper monitoring and enforcement by government authorities.

Mining and the Community in the Era of 'Reformasi'

Most of the large foreign investment mining projects were established in the 1980s under the Suharto regime. During that time the company's relationship was essentially with the center, and revenues derived from foreign enterprises flowed mainly to the center. While community development programs were undertaken, these were largely done as "add-on" measures by the company, with the view to establishing a positive relationship with the local communities. Until recently, by all standards, socio-economic expenditure by the mining companies was minimal.

The end of the Suharto era has brought Indonesia into a new period of democratic reforms, commonly known as *reformasi*. The new decentralization laws will eventually change the way in which all businesses operate in Indonesia. With regard to the mining sector they have started to have an impact even before formal implementation begins in 2001. Since the fall of the New Order, community expectations about political reform have escalated though the legal reforms to address these expectations have hardly begun.

In many parts of Indonesia, poverty and dissatisfaction with the rate of reform has fueled religious and ethnic divisions and violence. In this changing social landscape, communities strongly resist the involvement of government or the judiciary in the resolution of disputes with the companies. This is both an expression of distrust of state structures and a genuine desire to develop a direct social and economic relationship with an institution living amongst them – something that was impossible during the Suharto period.

Box 4.3. Joint BLT-OSM Technical Assistance Mining Environmental Project

As part of the US\$261 million Sumatera and Kalimantan Power Project, the World Bank financed a three-year, \$3.2 million TA project for environmental protection for medium- and large-scale mines from 1996 to 1998. Phase I objectives included policy development, organizational improvement, development of institutional capability, improvement of mining practices with respect to environmental management, and the improvement of review procedures for environmental impact assessment (EIA). The project included reviews and recommendations by experts from OSM and the U.S. Environmental Protection Agency on the state of affairs of the Indonesian mining industry from policy and institutional perspectives, as well as by on-the-ground inspections of mines. Training focused on improving the ability of relevant agencies, including authorities from 12 regions and mining company personnel, to monitor and enforce environmental requirements in the mining industry.

Many of the policy recommendations suggested by the project team have been taken up by the Ministry of Mines and Energy. These have included the adoption of a reclamation bond guarantee procedure for medium- and large-scale mines, guidelines for EIA preparation, and a schedule of penalties for environmental violations to replace the existing shut-down only option. In addition, the Ministry of Mines and Energy has accepted nearly all of the recommendations made by the project director on changes in policy, procedures, and organization (Whitehouse, 1998). The Ministry is currently developing a plan to implement these changes, which would result in a substantial reform of environmental management policy, procedures, and organization.

Large-scale mining companies are responding to the changing social landscape and increased uncertainty in three ways. First, they have increased spending on local socio-economic programs. For instance, Freeport expects to invest nearly US\$47 million in 1999 on local socio-economic programs (Box 4.4.), which is much more than what the most profitable gold mine and some of the largest copper mines in South America spend per year on socio-economic programs. Even before starting its mining operations, Newmont spent US\$1 million on community projects in 1998 and is expected to spend US\$1.4 million in 1999. Furthermore, it also spends close to US\$6 million per year on physical infrastructure, and makes substantial investments in a training program for potential employees and small business development. PT Kelian Equatorial Mining spent over US \$2 million on community projects in 1999.

Second, given that companies and communities cannot rely on the judiciary or any other branch of government to resolve day to day or accumulated problems between themselves and the community, they are seeking other options that can define workable processes to the satisfaction of all parties – which is a daunting task. One option could be to negotiate modus operandi or rules with NGOs that represent community interests. This is difficult because there are no statutes for the interpretation of negotiated procedures. Another option is to encourage communities to invoke their own customary law so as to resolve matters to the community's satisfaction. This initiative would be in step with current proposals to devolve certain powers to the regions. A third option would be to establish a Joint Development Task Force, composed of representatives from the different levels of government, industry and NGOs who through their resources have capacity to plan and can jointly address any emerging issues.

Box 4.4. Community Issues at Freeport Indonesia

PT Freeport Indonesia operates one of the world's largest copper and gold mines in the Timika area of Irian Jaya. In 1968 Freeport began operation as a medium-scale mine. A major ore discovery was made in the late 1980s near the original deposit. Currently Freeport processes about 220,000 tons of ore per day. It is the largest corporate taxpayer in Indonesia, as well as the largest purchaser of goods and services in Irian Jaya.

The social situation in the mine's work area is extremely complex. Before the mine development began in 1968, local people had little experience with outsiders. While the mine is in the area of highland tribes, the main settlement is located inside the region inhabited by lowland tribes. The various tribes are often in conflict, adding to the conflict among Freeport, the local people, and the Government. In March 1996, violent demonstrations took place, resulting in property damage, two hostage takings, and fatal injuries. Although the incidents were partly due to issues of recognition, respect, and justice, the most important motivators were money and land rights. Before the demonstrations, Freeport had begun major efforts to address the social problems in the area and after the protests, they intensified their efforts in this regard. Key elements in Freeport's community benefits plan included the following:

- One percent of profits go into a social and community development fund;
- Programs to build institutional capacity for local communities and activity-based organizations; proposal to create a land rights trust fund to address compensation claims;
- Commitment to bring the proportion of Irianese employees to between 35 percent and 45 percent of the total within 10 years;
- Improvement in quality and quantity of education programs;
- Continued commitment to health programs; and
- Creation of community action teams to liaison with local people.

Except for the development fund, most of the Freeport initiatives have met with significant success. In 1999 Freeport planned to spend approximately US\$47 million on social programs. There is still a great need to develop local capacity in order to make the process more participatory and, just as important, to allow Freeport to distance itself somewhat from the various initiatives. In particular, there is a need to outsource many of the programs to independent development and social service agencies, including NGOs and churches.

Third, where conflict and uncertainty have become intractable, some mines have temporarily closed down, as detailed in Box 4.5. Under these circumstances, in which continued conflict and uncertainty could lead to early termination of large mining companies' operations, some of the large-scale sites could be entirely taken over by ASM operations, with the attendant increased environmental and social risks.

Recent events in Indonesia and the changing social landscape has shown that successful projects are a result of "partnership not "ownership". Both communities and local government need to feel that they have a direct stake in the project and there is a direct benefit to them in securing the project. There is a need to build local capacity both at a local government and community level, to enable both the region and the local community to absorb a project, integrate

it into a regional development planning at the earliest opportunity, and mitigate the impacts with regard to planning and preparation for closure.

Box 4.5. Conflict and Uncertainty Facing Large Scale Mines

PT Newmont Minahasa Raya – This subsidiary of the US based Newmont Mining Corporation was ordered by a district court to close its gold mine in North Sulawesi, unless the company paid taxes on its overburden (waste rock and soil classified as local building materials) although its contract with the central government exempted it from such taxes. The mine resumed operations only after Newmont agreed to contribute US\$3m to the region's coffers.

PT Kelian Equatorial Mining – This Rio Tinto-owned gold mine was forced to cease operations for over 4 weeks in May 2000, due to community blockades of its access road, based on claims for unsettled compensation payments (part of the protest was that the previous government did not recognize land tenure under customary law). The community claimed that the military had forced people to move from the current lease areas in 1990, and they were therefore compelled to accept payments for less than their value.

PT Freeport Indonesia – The local government of West Papua is demanding half of the central government's 8% equity in Freeport Indonesia, and has indicated that Freeport might have to divest further equity to the local government after the autonomy laws take effect. The province's deputy governor has also demanded that a local be given a senior post at PT Freeport.

PT Kaltim Prima Coal – Situated in the Sangatta District in East Kalimantan, this coal mine, jointly owned by BP and Rio Tinto, has been forced to halt production for over 4 weeks due to industrial unrest. The downturn of the local economy due to the mine shutting down resulted in a situation where the local community were attempting to storm the mine, and force the striking workers off the premises so that the mine could resume operations.

Source: The Economist Intelligence Unit – April 3rd, 2000; The Economist Intelligence Unit - July 10th, 2000; Far Eastern Economic Review – July 13th, 2000

Medium-Scale Mining

There are four main medium-scale coal groups at work in Indonesia:

- The state-owned enterprise, PT Tambang Batubara Bukit Asam, has two main mines. It produced 10 million tons in 1998 (2 million for export and the rest mainly for domestic power generation).
- Coal Contracts of Work (CCOW). Under the first generation CCOW, there are eight foreign and two domestic companies. Nineteen companies, all domestic, have been approved under the second generation CCOW but only one is in production. There are 76 applications under the third generation CCOW, all in the general survey stage. Seven of these are foreign owned.
- Mining Authorization Holders. Only domestic companies can obtain mining authorizations. There are more than 100 of these but most are not active. They produced 3 million tons in 1998, about 6 percent of the total.
- Cooperatives. These also get mining authorizations and must have less than 100 hectares.

Medium-scale coal mining is largely undertaken by domestic companies with domestic costs. However, the output price, whether exported or not, is determined on international markets. For some companies, the local currency devaluation since the onset of the crisis has meant enormous windfall profits due to the big drop in operating costs. Many companies have been encouraged to enter the industry. In contrast to the metallic mining industry as noted above, applications for contracts of work by medium-scale coal mining companies have increased substantially. Although most medium-scale coal companies are in the general survey or exploratory stage, there is the possibility of a significant growth in medium-scale coal mines. There is currently a general oversupply of the average (low) quality Indonesian coal on the global market, and the domestic market for coal is depressed.

No important regulatory changes have been introduced since the economic crisis began. Since its introduction in 1996, the third-generation CCOW has made it easier for companies to undertake coal operations. Bureaucratic procedures were streamlined and the income tax rate was fixed at 30 percent, rather than subject to existing laws. Underground and low quality coal mines are also subject to a lower, negotiated royalty than standard open pit mines. These modifications have undoubtedly played a part in expanding the medium-scale mining industry.

Environmental Effects

The environmental performance of the medium-scale coal mines is generally poor. A significant industry expansion would not bode well for the environment of Indonesia unless their environmental performance improves substantially. Refer back to Table 5 for a summary of important environmental and social risks associated with medium-scale mining. Hamilton (1998a) describes some major problems, including the following:

- Coal preparation plants are often located on river banks. Such siting has no economic justification, and can be dangerous when wastes spill or are blown directly into the rivers. Moreover, siting these plants next to the mine would probably decrease transportation costs.
- Sediment ponds are usually inadequate and often overflow.
- Catchment areas are poorly designed.
- Plants do not have fine coal recovery circuits resulting in a loss of fine coal particulates.
- There is significant ARD from the tailings.
- Companies operating open-pit coal mines often do not even use back filling.
- Topsoil is poorly managed, even deposited at the bottom of the pile of overburden, which means that it is not available for reclamation.

The BLT-OSM TA project has made the case that many medium-scale coal companies have already made essential investments in pollution control equipment and infrastructure. However, recovery of reclamation costs through better handling of coal fine particulates during crushing and washing remains a major issue in medium-scale mining.⁶⁶ Improving and enforcing

⁶⁶ It is estimated in Hamilton (1998b) that the total value of coal fines lost to wind and water from 1990 to 1996 due to poor processing procedures was approximately US\$576 million. To obtain this figure, Hamilton assumes that 10 percent of production was lost fine coal particulates. If the amount lost was 15 percent—a figure that Hamilton thinks is more reasonable—the value of lost coal sales would have been US\$860 million. In different scenarios, he estimates that most mining operations would recover the investment needed to capture the fine coal particulates in one to three years.

environmental performance of medium-scale coal mines should be a high priority for the Indonesian government.⁶⁷

Estimates of the Economic Cost of Environmental Damage

The concessions for the nine medium-scale coal mines under contracts of work cover 224,000 hectares of land. As in large-scale mines, if a reclamation cost of US\$500 per hectare is used, and assuming 20%-30% of the concession area needs to be reclaimed, the total cost would be US\$22-34 million.

An estimate of the annual environmental expenditure needed for preventive measures for the medium-scale coal industry can be derived using Kaltim Prima Coal, considered by experts to be one of the best environmental performers in the Indonesian mining industry, as a guide. Kaltim Prima Coal's reported cost of US\$0.23 per ton of coal can be thought of as an upper bound for the industry as a whole. This figure suggests that medium-scale coal industry of Indonesia could achieve strong environmental performance with an expenditure of about US\$3 million per year, including ongoing reclamation costs. Moreover, a significant part of this cost could be recovered by reducing lost coal fine particulates. Relative to the value of coal output for the medium-scale coal industry in 1997 --about US\$425 million dollars--the cost of reclamation is much less than one percent of gross revenue.

To summarize, in the past coal mining has been a source of environmental damage in Indonesia, although the relatively small area and volume of mining activities have meant that the damage is likely to have been modest. However, in the future coal could play a more prominent role in Indonesia. Unless environmental management is improved considerably, environmental damage caused by medium-scale mining is likely to increase.

Artisanal and Small-Scale Mining

Artisanal and small-scale mining in Indonesia—gold and coal mining in particular – has increased since the onset of the economic crisis.⁶⁸ Some 394 ASM sites are legal traditional mining locations designated by DGM; these locations cover 1.8 million hectares.⁶⁹ An unknown number of ASM locations covering an unknown area are unregulated and illegal. ASM miners typically show little or no concern for environmental procedures.

⁶⁷ See Hamilton (1996: 41).

⁶⁸ Artisanal mining operations are generally defined as those using little or no mechanization or heavy equipment. Small-scale mining operations involve some degree of mechanization and at times entail an investment of as much as US\$2 million. Nevertheless, this amount is much less than a modern, fully mechanized mining operation, which rarely involves an investment of less than \$50 million for metal mines and coal mines. Artisanal and small-scale mines are analyzed together, as they both are often illegal, unregulated, and inattentive to environmental concerns.

⁶⁹ Traditional mining is the term used by the Indonesian Government to refer to legal mining on a small scale, usually by people from the nearby communities. It mostly consists of gold, coal, and diamond mining and suffers from the same environmental deficiencies as illegal ASM. Permits are granted by the provincial government (Dinas Pertambangan).

Table 4.6. Comparative Results of ASM Surveys

Survey questions	South Kalimantan (Coal)	Pongkor, West Java (Gold)
Number of miners interviewed	25	42
Number of community leaders interviewed	17	17
Number of local people interviewed	43	26
Average years mining	2.5	2.2
Average years mining in this region	0.7	1.2
Main reasons for mining (%)	More profitable (80) Crisis induced ^a (10)	More profitable (61) Crisis induced ^a (20)
Percent saying mining is main income source	70	75
Average number of miners in operations interviewed	64	15
Percentage increase in mining in region (%)	100	500
Response to whether mine was inspected by government official (%)	Yes (90)	Yes (0)
Response to whether relations with local community are good or neutral (%)	Miners say yes (90) Community says yes (75)	Miners say yes (100) Community says yes (N/A)
Conflicts with local community (%)	Miners say yes (5) Community says yes (25)	Miners say yes (55) Community says yes (84)
Main income source of local community	Agriculture	Agriculture, mining
Main environmental problems	Miners say soil erosion, sedimentation; Community says road damage	Miners say water pollution (mercury); Community says river pollution, soil erosion, road damage
Health influences of mining according to community leaders	None	None
Community leaders in favor of small-scale mining (%)	90	100

^a Crisis induced signifies that since the economic crisis began, the respondent had lost his primary job or the income from his primary job had fallen substantially.

Given the lack of documentation of ASM, two surveys were undertaken as part of this study: one at the small-scale coal mines in South Kalimantan and the other at the artisanal gold mining operations in Pongkor, West Java. As the most significant but undocumented growth in mineral production since the onset of the crisis was believed to be at the ASM level, the objective of the surveys was to document the scale of ASM activity at two quite different locations; assess the reasons individuals took up small-scale mining and whether the current rapid growth rate would likely continue after the crisis; estimate income levels of ASM miners; and assess damage and costs – environmental, social, and to human health – resulting from ASM activity.⁷⁰ Table 4.6 summarizes the results of the two surveys.

⁷⁰ The findings of the two surveys, which form the core of the empirical analysis of this section, are more fully explained in Appendices I and II. Table 6 summarizes the results of the two surveys.

The surveys indicated that many individuals who take up illegal mining face a loss or decrease in pre-crisis sources of income and believe they lack opportunities elsewhere, while others simply want to benefit from the increased rupiah profit due to the currency devaluation. Entry into the sector is made easier by availability of heavy machinery at low rental prices, especially from the currently moribund construction sector in Kalimantan and, above all, by the partial breakdown in law and order that has accompanied the crisis. An example is legal village cooperatives (KUD), with legal concession rights, that illegally sublet their concessions to better resourced miners from Java, who use heavy equipment.

The damage associated with ASM is widely known. Moreover, the location of many illegal mines is generally known. However, there is little or no attempt to close down these operations, due to powerful interests' support for substantial ASM operations, corruption and lack of law enforcement. There is a general sympathy for anyone trying to survive the crisis.⁷¹ Therefore, it is unlikely that the end of the economic crisis will bring a decline in ASM. Instead, ASM activities seem likely to increase steadily.

Most ASM areas have a short productive life, usually less than ten years. While small-scale mining may increase rural incomes in the short term, increased reliance on mining relative to agriculture combined with significant environmental damage during the mining phase may have lasting impact on the potential for a more balanced rural development in mined-over areas. Whether local potential for balanced development is compromised or not often depends on the savings habits of the recipients --that is, how they use the windfall income generated by the mining activities. Allocation of part of this windfall to better environmental practice or land reclamation improves local development prospects in the longer run.

Environmental and Health Effects

The main environmental effects of ASM are soil erosion, sedimentation of water bodies, mercury pollution, and a total lack of land reclamation after closure. Of these, the most irreversible and dangerous for human health is mercury contamination. Mercury is not biodegradable and, if inappropriately discarded, often combines with other elements in more toxic forms. River dumping can result in dramatic loss of plant and wildlife for considerable distances downstream, as discussed in Box 4.6.

Given that mercury use is universal in small-scale gold mining, reclamation costs can soar above those for large-scale mining, where precautionary measures to limit mercury emissions are ordinarily taken. We can calculate reclamation costs, using a modest figure of US\$500 per hectare and assuming that up to 2 million hectares of legally or illegally ASM land needs to be restored. Under these assumptions, restoration costs for ASM would be up to US\$1 billion. This figure is a conservative estimate that includes neither the recovery of mercury dumped into waterways (extremely difficult and usually prohibitively expensive) nor related health problems to the community and miners.

⁷¹ The DGM has indicated the difficulty of closing down illegal mines due to corruption. Government mining inspectors can order a mine to be closed, but the local police must enforce that order. Martens (1998: 17) reports on a campaign to rid an area of North Sulawesi of illegal gold miners, mounted by the Ministry of Forestry. Three months later the number of ASM operations was the same as before the campaign.

As in the case of medium- and large-scale mining, the environmental situation of ASM in Indonesia is similar to that of other countries in the region. But, given that ASM has not been regularized, and monitoring and enforcement are weak, the reality is that implementing solutions. Corruption and rent-seeking have helped ASM is difficult to thrive. The illegal activities cause substantial environmental damage, but they also provide employment and income for rural society. Although the exact number of workers in ASM operations is not known, it is in the hundreds of thousands at a minimum. Small-scale miners and processors in Indonesia ordinarily have much higher incomes than surrounding communities whose livelihoods and incomes may be jeopardized by the illegal activity. Solutions need to be of the carrot-and-stick type. Miners must understand the health and economic benefits of compliance for themselves, local and downstream communities, as well as the penalties if they do not comply with regulatory requirements.

Better practices and technologies can greatly increase the poor recovery rates of small-scale miners and significantly reduce mercury use and health impacts in the case of artisanal gold mining. In the Pongkor survey the authors saw simple technologies such as sluices reducing mercury use by 90 percent. Other inexpensive devices, such as closed circuit retorts, can greatly reduce health impacts on the miners by capturing and recycling the mercury fumes.²⁵ There is a need for regularization of ASM, technical assistance, educational campaigns, government monitoring and enforcement, and access to finance. At least three technical assistance initiatives are being considered to reduce or eliminate mercury use in gold processing in Indonesia: a UNIDO-supported project, a GTZ-supported project in Central Kalimantan, and a CIDA-supported project in Sulawesi.

To provide incentives for small-scale miners to invest in pollution control and land reclamation, underlying land tenure issues must be addressed. As noted above, a significant part of ASM takes place on the concessions of larger mining companies. There are cases in other countries with a longer mining history, in which large- and medium-scale mines have developed stable, mutually beneficial cooperation with ASM miners operating within their concession boundaries. In the Placer Dome mine, Las Cristinas, in Venezuela, and in a medium-scale gold mine on Masbate Island in the Philippines, for example, the mining companies are giving ASM miners access to small-scale deposits on the condition that they work in an environmentally sound manner and process the ore in centrally located concentration plants.⁷²

Nevertheless, international experience shows that technologies will not solve the problem by themselves. Community pressure can be vital. Citizens of surrounding communities are often supportive of the small-scale miners as they receive payments from them or are actively involved in the mines themselves. This has largely been the case in both Pongkor and South Kalimantan as evidenced by the surveys of the area mines. The communities must be made aware of the long-term environmental consequences of the mining activities for sustainable multiple use of local natural resources. They must also be made aware of the different technologies and mining practices available to the miners in order to pressure them to move to better, less damaging practices.

²³ At a more sophisticated level, groups of miners can process their ore in highly biodegradable cyanide. The gold is separated or leached from the ore by a cyanide solution, which eventually is deposited in a tailings pond. Exposure to the sun quickly breaks down the cyanide compound. However, proper use of the cyanide is essential, as it can be fatal if improperly handled.

⁷² See International Labour Organization (1999: 62-71) for a discussion of the Venezuela case and McMahon (1999) for a discussion of the case in the Philippines.

Box 4.6. Health Effects of Mercury Pollution

Mercury is commonly used by small-scale miners in the processing of gold ore. Direct contact in the concentration process and consumption of foods contaminated by discarded mercury can have serious health impacts. The greatest health risk to humans and wildlife comes from the consumption of contaminated fish. There are no known methods of cooking or cleaning fish that reduce the amount of mercury ingested from fish. Methyl mercury, the form most dangerous to humans, accumulates as it moves up the food chain.

Mercury affects the brain, spinal cord, kidneys, lungs, and liver. The effects of short-term exposure to high levels of mercury include tingling sensations in fingers and toes and tremors. Long-term exposure to mercury can result in symptoms that progressively worsen and lead to personality changes, tunnel vision, stupor, and coma. Mercury also affects fetal growth, preventing normal development of the brain and nervous system. Affected children show lowered intelligence, as well as poor hearing and coordination. Due to the long time span before mercury-induced illness becomes apparent or can be distinguished from other common illnesses, such as malaria, communities affected by mercury pollution often do not recognize the health risks.

Deforestation and small-scale gold mining can produce a deadly build-up of mercury. Deforestation causes soil erosion, which can release large quantities of naturally occurring mercury into river systems. A recent study indicates that mercury contamination in the Amazon basin is largely the result of deforestation, not small-scale gold mining, even though the latter releases over 130 tons of mercury per year into the surrounding environment (Pepall 1997).

By using other methods to crush the ore and limiting mercury use to the final concentration process, a miner can reduce mercury use by as much as 70 to 90 percent. The use of closed retorts to recycle the mercury substantially reduces safety hazards and can reduce the amount of waste mercury by another 10 percent to 20 percent. The ultimate goal, however, is to eliminate the use of mercury in gold production, usually by the introduction of more centralized concentration processes with proper disposal and tailings facilities (Wotruba et al, 1998 or Veiga, 1998).

Overall Summary of Estimates of Sector-wide Annual Costs and Benefits

The picture emerging from the assessment of the environmental performance of the mining sector in Indonesia, compounded by the impact of the economic crisis, is mixed at best. In addition to social ills and conflicts, underlying trends range from disturbance to land and ecological resources, poorly mitigated long-term risks due to acid rock rainage and mercury contamination, large amounts of solid waste, and water quality impairment, to complete lack of public oversight over mushrooming medium to artisanal-scale coal and/or gold mining activities.

Despite the fact that the sector's financial contribution to the economy is substantial (over US\$5 billion annually), a detailed evaluation of the economic costs of environmental damage is not possible at this stage – due to both the paucity of data and the uncertainty about the long-term impacts of mining activities. However, a rough estimate (representing a lower-bound) based on environmental mitigation alone (about US\$0.5 billion in land reclamation and expenditures related to environmental management plans), indicates that the social cost of mining is substantial. Table 4.7 provides a summary of the of the estimated costs and benefits related to mining activities.

**Table 4.7. Estimates of Annual Costs and Benefits of Mining Activities in Indonesia
(million US\$)**

	Environmental Expenditures	Land Reclamation ^a	Productivity Loss ^b	Value of Output
Large-scale/ coal	10	5-7 (26-39)		1,300
Large-scale/ metal	65	100 (550)		3,500
Medium-scale/ coal	3	4-6 (22-34)	82	425
Artisanal and small-scale	(no data)	177 (1,000)		
TOTAL	78	286-290	82	5,225

Source: Study team.

^a Annual equivalent of rehabilitation cost over 10 years using a 12% discount rate. Numbers in parentheses refer to estimated total reclamation cost over a period of 10 years.

^b Annual cost over seven years (see text for details)

This points to the need to strengthen the institutional framework in order to effectively deal with any crisis-induced impacts, and more importantly, to insure the long-term sustainability of mining in Indonesia. This subject is taken up in the next section.

Institutional Issues

Given the sudden shift in market conditions, loss of authority of central line agencies and increased community pressure on local resource bases that accompanied the economic and political crisis, a reevaluation of the institutional framework for management of environmental impacts in the mining sector is called for. This section analyzes the adequacy of existing environmental management tools, coordination issues, both within MME and cross-sectoral, the challenge of the current rush to decentralization, and the pressing need to inform affected populations of the environmental and health risks of mining activities.

The Indonesian mining sector has experienced three periods of development with respect to the environment. The first period (1967 to mid-70s) was the pre-environmental era, in which mining development was mostly focused on supporting economic growth with basically no regulations to protect the environment. There were frequent inter-sectoral conflicts between mining and forestry, agriculture, nature conservation, and the government-sponsored transmigration program.

During the second period (mid-70s to mid-80s) the Ministry of Mines and Energy enacted several environmental regulations regarding prevention and mitigation of pollution. Nevertheless, conflicts continued among the various sectors.

During the third period (mid-80s to present) more generalized environmental awareness emerged in Indonesia. From a legal perspective, this new focus was supported by the Environmental Management Act of 1982 and Government Regulation No. 29/1986 regarding Environmental Impact Assessment (EIA). The Ministry of Mines and Energy enacted an updated

regulation regarding prevention and mitigation of environmental damage and pollution in 1995. The Environmental Management Law was revised in 1997, and the AMDAL regulation was updated in 1999. The Ministries of Mines and Energy, Forestry, and Internal Affairs have issued inter-sectoral agreements to reduce conflicts regarding the use of land for forests and mining operations.

Government agencies with environmental mandates in the mining sector include: (a) the Ministry of Environment; (b) the Environmental Impact Management Agency (BAPEDAL); (c) the Ministry of Mines and Energy; and (d) agencies at provincial and district levels, especially the BAPPEDAs (planning agencies), the provincial mining agencies, and the regional BAPEDALs (BAPEDALDAs).

Environmental Management Tools

The principal environmental management tools used or under development by these agencies include: environmental assessment and management plans; inspections; and reclamation plans and guarantees. A brief discussion of MME's application of each of these tools follows.

Environmental impact assessment and management. There is a broad consensus that although the Indonesian environmental impact assessment procedure (AMDAL) is consistent with international standards, the way it is implemented in most cases limits or totally negates its effectiveness in influencing project planning, design, and implementation. AMDAL in the mining sector is no exception. To begin with, most of the environmental assessment reports (ANDAL) contain a large amount of irrelevant information but fail to focus on the key aspects of the affected environment in sufficient detail. Secondly, key issues unique to mining are not adequately addressed. For example, there is rarely any attempt to reconcile potential mining activities and potential future land use at the site. Thirdly, because of the way mining permit applications are handled (see "Coordination within MME" below), the ANDAL findings and recommendations are often not adequately taken into account in the decision to approve a permit application or in the specifications for environment-related design or operating requirements for the proposed mine. Fourthly, there is little follow-up on the implementation of the environmental management and monitoring recommendations (RKL and RPL) submitted with the ANDAL. And finally, the AMDAL process is designed to address mine-level environmental impacts, but misses landscape-level impacts, such as impacts related to the overall scale of mining activity in a region and its rate of expansion.

Monitoring and enforcement. While MME and regional staff have received considerable training in technical and procedures aspects of environmental inspection, there are significant gaps in the toolkit of standards and responses to lack of compliance that are available to inspectors. These gaps include the lack of performance-based standards for assessing compliance with AMDAL and reclamation plan requirements; and the lack of a schedule of intermediate sanctions, tailored to the severity and frequency of violations and cognizant of the mine operator's previous record, to supplement the mine closure option, which is the single regulatory sanction currently available to inspectors.

As noted earlier, the environmental unit within the DGM considered the pre-crisis budget for environmental monitoring sufficient for discharge of no more than 20 percent of its inspection responsibilities. While there does not seem to have been any significant reduction in

environmental monitoring of the mining sector since the onset of the crisis, given the large increase in ASM, much larger budget allocations would have been necessary just to keep pace. Environmental damage by artisanal and small-scale miners is known about and condemned, but remains outside the regulatory net.

Reclamation bonds. Reclamation of mined land can reduce the long-term impacts of mining with acceptable financial costs. Reclamation plans and incentives for their proper implementation can reduce the “footprint” of mining operations, limit threats of water pollution and erosion to human health and safety, return land to other productive uses, and promote conservation of biological diversity.

In 1995, the DGM issued a decree establishing a Reclamation Guarantee Program and mandating retroactively that all mining contractors in the production stage must post a guarantee of timely and proper reclamation of mining areas. The decree requires mining companies to plan for mine closure and reclamation before the last years of operation and to provide funds for MME to implement the plan if the company fails to do so. The guarantee should be posted before issuance of the exploitation permit, and the amount should be based on reclamation costs specified in the mining operation’s Five-Year Environmental Management Plan.

However, several important elements of the reclamation requirements remain undefined, and this has created confusion between industry and MME. The missing elements include guidelines and a procedure for identification of post-mining land use for each mining area, provision for future renegotiation of reclamation plans to accommodate changes in local circumstances, and measurable performance indicators, by which compliance with reclamation plans can be determined.

Coordination Issues

Coordination within the Ministry of Mines and Energy. Two units within MME currently provide environmental management services and oversight. The Bureau of Environment and Technology (BLT) is located in the office of the Secretary General, which has oversight of both mining and energy, and includes the Secretariat of the Central AMDAL Commission of MME. The Directorate of Technical Mining (DTPU) is under DGM and is responsible for inspections and enforcement, including enforcement of environmental requirements.

In such a situation, there is always potential for key actions to be omitted --one unit thinks another is doing it-- and for required procedures to be overlooked or implemented inconsistently. In MME, one obvious manifestation is the “disconnect” between the feasibility study and the ANDAL within the project approval process.

To obtain a mining permit, a feasibility study and (depending on size and type of mine) an ANDAL are needed. Government Regulation 27 of 1999 specifies that both are to be prepared and reviewed together. However, a mining feasibility study is often already submitted to DGM and approved before the related ANDAL is begun. The interaction between the preparers of the ANDAL and the feasibility study that should lead to sound recommendations on environmental management cannot occur. Moreover, the two studies are not examined by the same reviewer: the feasibility study in mining activity is approved by the Director General of Mining, whereas the ANDAL is approved by the Secretary General after review by the MME AMDAL Commission,

with the BLT providing the technical analysis. There is often a lack of communication and coordination between the Director General and the Secretary General regarding the results of the draft feasibility study and draft AMDAL. Therefore, the final feasibility study may contradict the final ANDAL or vice versa, even to the extent that the ANDAL could recommend against issuance of a permit which has already been approved.

A second "disconnect," which follows from the first, is the poor integration between the ANDAL and oversight of mining activities by the Directorate of Technical Mining, and the frequent lack of follow-up on the implementation of the environmental management and monitoring plans (RKL and RPL) that are attached to the approved ANDAL.

Interagency Coordination Issues. Consistent and comprehensive application of environmental impact assessment safeguards requires a partnership between MME and BAPEDAL. BAPEDAL sets framework requirements regarding AMDAL safeguards, which the line agencies translate into sector-specific AMDAL guidelines. Since the 1986 introduction of AMDAL, primary responsibility for implementing these guidelines has resided in sectoral AMDAL commissions located in the line ministries at the center. Under Government Regulation 29 of 1999, all AMDAL commissions at the central level will be abolished except the one in BAPEDAL which reviews inter-provincial, marine, and highly complex projects only, and all other AMDAL review is to be devolved to the provincial level.

One area in which improvement is needed is the way AMDAL of large mining developments is handled. They often involve several components--for instance, the mine itself, harbor facilities, and road, rail, or river transport--each of which, prior to enactment of PP 27 of 1999, was required to have an ANDAL as a free-standing project under the regulations of the Ministry concerned. There are cases in which separate AMDAL reviews by the various concerned ministries have resulted in multiple environmental management and monitoring recommendations that were not necessarily consistent and increased the cost of the project. The revised allocation of AMDAL review responsibilities between BAPEDAL and the provinces offers an opportunity to utilize the "integrated ANDAL" approach that is authorized by PP 27 of 1999 in all situations where it is appropriate. Not only does the "integrated ANDAL" save effort and expense, but it also facilitates consideration of cumulative impacts and interactions among components. And in implementation of such "integrated ANDALs," the role of BLT in the provision of technical support for review of mining projects by BAPEDAL AMDAL Commission will be important.

Regarding standards, current water quality standards promulgated by the Ministry of Environment are not appropriate for most mining operations, because they require sampling and lab work for parameters which are not typically associated with mining operations (such as fecal coliform) and do not specify standards for parameters which are (such as fine coal particulates). Closer collaboration with the Ministry of Environment is desirable to resolve these issues.

Regarding environmental oversight during mining operations, the Ministry of Mines and Energy and BAPEDAL should consider standardizing the monitoring process, and should ensure that the views and experience of large-, medium- and small-scale mining operators are taken into account. There is a need to define frequency of sampling, parameters to be analyzed, analytical

methods and other monitoring protocols in practical, achievable terms, tailored to the different potential impacts and capacities of the different scale mining operators.

Conflicts between protection or production forestry and mining as prospective uses of the same tract of land are endemic and highly problematic in Indonesia. Many mining locations are *pinjam pakai* (loaned for use) from the Ministry of Forestry and Estate Crops (MoFEC). According to agreements between the ministries, the land should be returned to MoFEC in the same state in which it was received. However, a long-standing Presidential Decree gives mining priority over all other land uses, and a recent inter-ministerial decree, No. 2002 K/20/MPE/1998 regarding small-scale mining, fails to give MoFEC a voice in the permitting process for small-scale mining. There is at least one case of a large mine operating on land that formerly was a national park. When coal was discovered in East Kalimantan, the boundaries of Kutai National Park were redrawn so that the deposits could be developed by Kaltim Prima Coal. Citing the regulation for small-scale mining, the provincial Forestry Service of South Sulawesi has recently granted 14 mining exploitation permits in a geologically unique karst area of South Sulawesi that is under protective forest status. Given cases such as this and the rudimentary state of reclamation plans and their implementation, the requirement that land "borrowed" for mining will be returned in its original state lacks credibility.

Decentralization

Regional governments have had two distinct agencies with responsibility for mining: Kantor Wilayah (Kanwil) Pertambangan, the representative of central government (MME) in each province, and Dinas Pertambangan, the corresponding department of provincial and district governments. Dinas Pertambangan reports to the governor or the district head (bupati) and thus is indirectly under the Ministry of Home Affairs. Each agency has different responsibilities. Kanwil Pertambangan has been responsible for mining in categories "A" (gold, uranium) and "B" (coal, oil, gas). Contracts in these categories have been managed almost entirely by MME Jakarta, ordinarily with little or no consultation with regional planners, mining, or environmental services.²⁵ Dinas Pertambangan is responsible for mining in category "C", which includes sand, gravel, marble, and small gold mines; and has had permitting authority for these activities at the local level. Typically, the coordination between Kanwil and Dinas has been very poor.²⁶

However, the recently enacted legislation for regional autonomy, Law 22 of 1999 mandates a transfer of permitting and oversight of mining activities from MME to district government. BAPEDAL functions are also to be devolved to provincial and district BAPEDALDA, including AMDAL functions, as referenced above.

The transfer of permitting and inspection responsibilities to provincial and/or district governments could potentially reduce both cross-sectoral conflicts between different prospective users of the same tract of land and existing inconsistencies in treatment of the different categories within the mining sector.

²⁵ The single exception is small-scale gold mining, which is under jurisdiction of the Dinas Pertambangan.

²⁶ Another problem that existed in the Kanwil was a confused reporting system. Administratively, Kanwil reports to the MME Secretary General, but functionally Kanwil has to report to several different directors within the DGM.

However, the change also carries with it considerable risks—for example, confusion if concessions overlap more than one regency, the risk that the bupati and the dinas, with less ability to resist strong commercial interests, especially if linked to local officials, will overlook environmental aspects of proposed mining activities, and allow a “fire sale” of local resources that sacrifices long-term sustainability for short-term cash; that the Dinas, with less capacity and less experience than the Kanwil in dealing with environmental issues in Categories “A” and “B”, will be unable to provide the necessary oversight and technical advice; that the new responsibilities of the Dinas will not be matched by adequate fiscal mechanisms and financial resources to discharge them; and that MME will not let go of its authority, among others. The same potential opportunities and risks accompany the decentralization from BAPEDAL to the Regional BAPEDALDA, most of which, having been established in the last 2 to 3 years, lack experience and human and financial resources. For further discussion of environmental and natural resource aspects of decentralization, see Chapter 6.

Until recently 80 percent of mineral royalties were supposed to go to regional government and 80 percent of these (or 64 percent of the total) were to go to local communities. Law 25/1999 on Fiscal Balance Between the Center and Regions, enacted in May 1999, provides that 80 percent of general mining royalties should revert to the supplying district and 20 percent of those funds should go to the local community. In most cases pollution mitigation or environmental remediation could be paid for with a relatively small portion of the royalties, if received by the community.

Information and Public Participation

As noted above, many tens of thousands of poor and others who have lost income and/or employment due to the crisis have taken advantage of the near absence of entry barriers into small-scale mining, and have laid *de facto* claim to gold and coal resources in particular, regardless of whether they are located within mining concessions and/or forest boundaries. Many of those entering gold ASM with no pollution controls are exposing themselves and adjacent communities to high risk of mercury poisoning, which may not be manifested in serious adverse health impacts for ten or more years. To avert the potentially disastrous consequences of rapidly increasing exposure to mercury in small-scale gold mining areas since the onset of the crisis, a mining and health public awareness program on the effects of heavy metals on human health is desperately needed. The Ministry of Health and Ministry of Mines and Energy, in consultation with local governments and NGOs, should consider collaborating to raise public awareness of urgent health issues in the mining sector, focusing initially on mercury contamination in small-scale gold mining.

Conclusions and Recommendations

During the mining boom experienced by Indonesia in the 1990s, production of all but one of the country’s major minerals increased by at least 20 percent, and production of coal, copper, gold, and silver grew more than three-fold.²⁷ The environmental effects accompanying this growth were substantial—increased land disturbance covering hundreds or thousands of hectares at each mine, increased generation of tailing wastes involving increased risk of accidents, acid rock

²⁷ See Table 3, Mineral Production in Indonesia, 1990-1998. The single major mineral with declining output during this period was bauxite. Coal production jumped from 10.6 million tons in 1990 to 55 million tons in 1997.

deposits (ARD), and contamination of rivers used for drinking water and food supplies. However, with the exception of a single tailings dam rupture affecting 3,000 hectares in 1990, Indonesia has not experienced major mining accidents.⁷³

While the economic crisis has not altered significantly the growth trends of the large mining companies operating in Indonesia, it has brought increased mining applications from medium-scale coal companies. Unless existing poor environmental practices in the medium-scale coal sector improve substantially, pollution intensity in that sector is likely to increase in the next 2 to 3 years, as current applications are approved and new areas are brought into production. The crisis has also sparked exponential growth of small-scale, unregulated gold and coal mining, much of which is located within mining concession boundaries and/or forest boundaries. Skyrocketing ASM output has resulted in high pollution intensity in ASM areas, and introduction of untreated toxic mercury into the waste stream in small-scale gold mining areas. Given the high economic returns to ASM operators relative to their alternative sources of income, it is unlikely that the ASM sector will shrink after the crisis abates. Innovative, long-term environmental solutions are needed for ASM, including both win-win incentives and improved enforcement capability.

Although data remain incomplete and further analysis is needed, Indonesia's experience during the crisis offers cautionary lessons. When economic growth stalls, the poor and others experiencing loss of income and/or employment are likely to turn to quick income-generating opportunities requiring little capital or skills, such as ASM. Unless safeguards are put in place quickly, ASM areas are likely to experience high pollution intensity which, left untreated, can produce serious degradation of land and water resources in a short period. Government agencies and professional mining associations need to anticipate such developments, and have in place some quick response strategies, including intensified health monitoring and carrot-and-stick technical assistance to small-scale miners.

Table 4.8 outlines detailed recommendations on key environmental issues in the mining sector, which are based on the findings of this chapter.

⁷³ A recent incident at Freeport, a spill following collapse of an overburden slope tail in mid-2000, was serious in terms of loss of life (3 workers presumed dead), but was not a major spill in environmental terms.

Table 4.8. Recommendations on Key Environmental Issues in the Mining Sector

Key environmental issues	Short-term recommendations	Long-term recommendations
<p><i>Large-scale mines</i> Risk of major accident (tailings spill) Acid rock drainage (ARD) Poor or mediocre reclamation</p>	<ul style="list-style-type: none"> • Focus EIA on major risks and consequences • Identify and target potential trouble spots for extra monitoring and enforcement • Strengthen reclamation bond program 	<ul style="list-style-type: none"> • Research on elements of good practices in reclamation of mining land • Collect case studies of the quantitative and qualitative effects of environmental damage in sampling of mines
<p>Medium-scale coal mines^a Loss of forest cover Poor management of top soil Loss of fine coal particulates due to lack of recovery circuits Inadequate sediment ponds Poorly designed catchment areas Significant ARD from tailings</p>	<ul style="list-style-type: none"> • For new applications/permits focus on EIA of major impacts and credible implementation of environmental management plans • Train government and private mining personnel in identification and solution of environmental problems • Pilot environmental audits for existing mines, emphasizing “win-win” pollution prevention options • Target inspections and audits to potential trouble spots and worst offenders • Strengthen reclamation bond plan 	<ul style="list-style-type: none"> • Expand training, especially in outlying regions with largest mining sectors • Strengthen enforcement capabilities, including introduction of schedule of penalties for offenders, increasing for repeat offenders • Engage stakeholders in developing standards for acceptable losses of fine coal particulates, and introduce technical training and pilot programs for fine coal recovery circuits • Make audit results public
<p>Medium-scale mines (non-coal) Weak day-to-day environmental performance Loss of forest cover Lack of reclamation on closure</p>	<ul style="list-style-type: none"> • Target inspections and audits to potential trouble spots and worst offenders • Train government and private mining personnel in identification and solution of environmental problems • Strengthen reclamation bond plan 	<ul style="list-style-type: none"> • Expand training, especially in outlying regions with largest mining sectors • Strengthen enforcement capabilities, including introduction of schedule of penalties for offenders, increasing for repeat offenders • Make audit results public

Key environmental issues	Short-term recommendations	Long-term recommendations
<p>Artisanal and small-scale mining Total absence of environmental management Health effects from mercury pollution Loss of forest cover</p>	<ul style="list-style-type: none"> • Pilot mini audits and environmental training • Target worst offenders in relatively accessible areas of high environmental and cultural sensitivity • Investigate potential for partnerships between large-scale concession and ASM operators within concession boundaries • Raise public awareness of environmental and health effects of dangerous practices, and start pilot projects on better environmental technology and management, with mercury use receiving highest priority 	<ul style="list-style-type: none"> • Extend permitting, including EIA for ASM • Expand environmental training programs for ASM operators • Close down worst offending areas • Compare studies from other countries on adaptability of solutions to problems in ASM gold mining
<p>Institutional development Lack of trained personnel Poorly defined roles, overlapping responsibilities Lack of coordination</p>	<ul style="list-style-type: none"> • Improve EIA quality and linkage with permitting decisions • Strengthen coordination between MME and BAPEDAL focusing on improving EIA and standardizing environmental monitoring in the mining sector • Enhance coordination between MME and MoFEC, focusing on EIA review and consensus on reclamation goals • Continue training of inspectors, especially at regional centers • Engage industry associations, MME, NGOs, and local governments in discussion on problems and solutions • Emphasize enforcement including schedule of penalties 	<ul style="list-style-type: none"> • Educate public on environmental and health dimensions of mining • Update and strengthen EIA procedures • Collect data set on environmental degradation caused by mining, including baseline conditions

Source: Study team

^a Problems in this category were identified in BLT-OSM project. Other problems noted below related to medium-scale mines in general are also problems for coal mining

5. Environmental Expenditure

Introduction

During the period 1994-1999, public expenditure for environmental services has been generally low in Indonesia. In FY98-99, expenditure of domestic resources on development projects with environmental objectives was only about a third of the level in FY 94/95. This caused environmental expenditure to fall from 0.9 percent of the overall development program to 0.5 percent, and from 0.04 percent of GDP to less than 0.02 percent. These percentages were already generally lower than in other East Asian crisis countries before the crisis, and the declines were greater. Most worrisome in light of decentralization is evidence that expenditure fell more in the regional budget than in the national budget.

This chapter represents an initial step toward providing baseline information on trends and patterns in environmental expenditures in Indonesia during the five-year period FY94/95-FY98/99. It examines mainly the expenditure side of the budget and also pays attention to significant shifts in expenditure as a consequence of the economic crisis.⁷⁴

Environmental expenditure in the national budget

Trends in absolute terms

The Indonesian Ministry of Finance (MoF) reports public expenditures according to two budgets, routine and development, and twenty budget sectors. The routine budget nominally refers to operating expenditure by government agencies while the development budget refers to public investment projects. Development expenditures are further disaggregated into expenditures of own resources (domestically sourced funds) and foreign resources.

While routine and development budget categories should be distinct, there is much mingling between the two budgets, especially for the routine expenditures. The main reason for this is that most agencies are underfunded for operations, and they tap development funds to make up the shortfall.⁷⁵

The twenty budget sectors refer to functional categories, like defense and education. The sector that nominally pertains to environmental management is Sector 10, "Environment and Spatial Planning." Not all expenditure in this sector is "environmental," however. *Core environmental expenditure* can be defined as expenditure on activities that pertain solely or primarily to environmental management and appear as discrete entries in the operating or development budget of a particular sector. (For further discussion of this and other types of

⁷⁴ For the detailed review of environmental expenditure in Indonesia from which this chapter is drawn, see <http://eap.worldbank.org/indonesia/environment>.

⁷⁵ The Ministry of Mining and Energy illustrates this practice in the case of environmental management. The Bureau of Environment and Technology is one of several units in the Ministry with environmental management responsibilities. It reviews environmental assessments of proposed mining projects and evaluates environmental aspects of mining license applications. These are regular functions that involve mainly staff time and travel. They should be funded under the routine budget, but instead, they are funded under the development budget. The environmental units in each of the three Directorates General in the Ministry are also funded under the development budget.

Box 5.1. Definitions of Environmental Expenditures

Environmental programs and projects occur in many ministries and departments. The line items under the “environment” sections of most countries’ budgets, which typically include only expenditures by the one or two agencies exclusively dedicated to environment (such as the Ministry of Environment), tell only part of the story. A definition of environmental expenditures should be applicable across agencies, and should include a range of environmental objectives and a variety of environmental management roles. These considerations and the characteristics of available budget data in Indonesia point toward a three-part definition of environmental expenditures, which include core expenditures, mitigating expenditures and incidental expenditures.

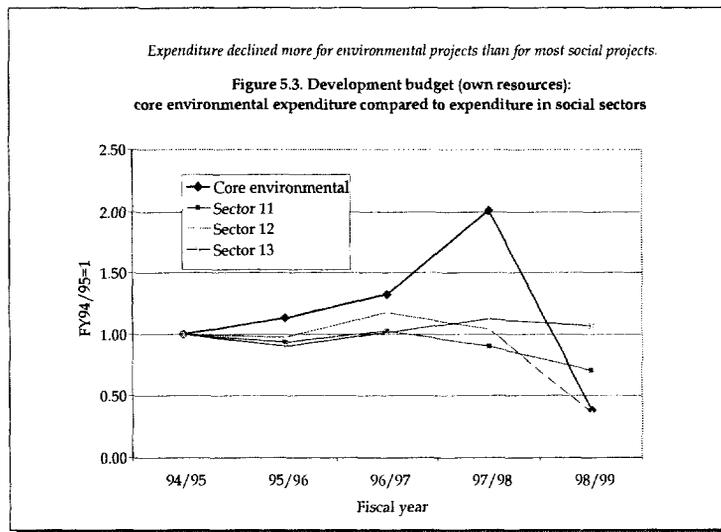
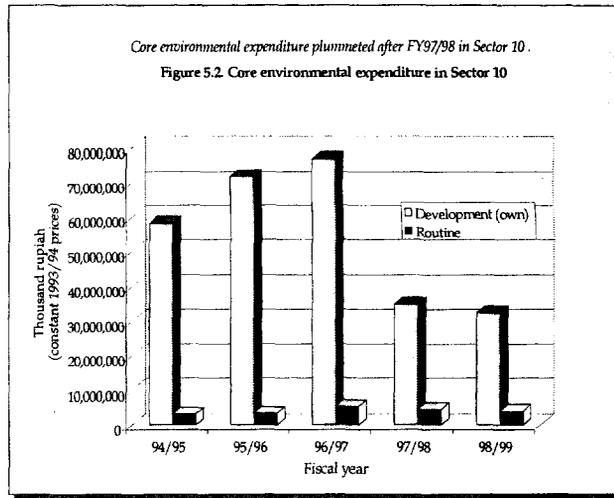
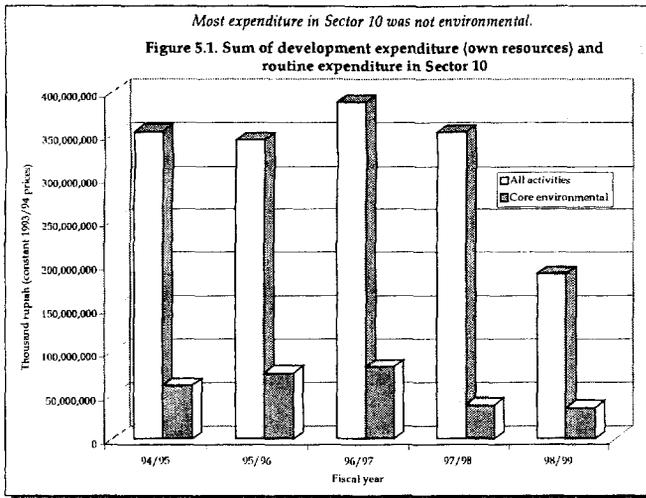
Core expenditures refer to discrete budget allocations whose sole, or at least primary, purpose is either to provide environmental public goods or to address adverse environmental impacts. They include: (i) *routine expenditures by agencies that exist solely for environmental management*; (ii) *routine expenditures by environmental units in line agencies*; (iii) *routine expenditures on conservation, protection, and rehabilitation units in natural resource management agencies* (but not units that primarily support resource production); and (iv) *development expenditures on projects and programs that are totally or primarily for environmental management*.

Examples of core environmental expenditures by core environmental agencies and environmental units in line agencies include monitoring, analyzing, and disseminating information on environmental quality and pollution sources (*inventarisasi, pemantauan, pemanfaatan data, pemetaan, penyusunan neraca sumberdaya*); setting environmental standards (*baku mutu*); enforcing environmental standards; reviewing and overseeing AMDAL; and institutional strengthening and capacity-building of staff responsible for environmental activities. Examples of core expenditures by natural resource management agencies include budgets for national parks and protection forests; ICDP and social forestry budgets; and Dana Reboisasi expenditures on reforestation. Examples of other projects and programs under this definition include sewerage and sanitation projects, government-sponsored industrial pollution control programs.

Mitigating expenditures pertain to non-environmental projects in the development budget that potentially deplete natural resources or generate pollution. These expenditures are included in the projects’ budgets, and they support activities that prevent or mitigate the projects’ negative environmental externalities. However, as these expenditures are not identified separately in MoF data for each project, it is difficult to identify the incremental portion of project expenditures that goes beyond least cost and addresses externalities. Examples of mitigating expenditures include: (i) *expenditures on environmental assessment preparation and implementation in highway construction projects and logging concessions managed by state-owned enterprises (e.g., INHUTANI)*; (ii) *expenditures on drainage systems and borrow pit management to control erosion and other environmental impacts associated with road construction*; (iii) *expenditures on pollution control equipment included in power plant construction*; and (iv) *expenditures on protection of upstream water sources in irrigation projects*.

Incidental expenditures pertain to non-environmental projects in the development budget. The difference is that these projects provide environmental benefits, despite their being undertaken for non-environmental reasons. Examples include: (i) *water supply projects, which reduce exposure to contaminants in traditional water sources, in addition to providing other social benefits*; (ii) *traffic management projects, which reduce not only congestion but also mobile source pollution*; (iii) *industrial energy efficiency projects, which reduce stationary source air pollution, in addition to reducing production costs*; and (iv) *projects that promote the use of recycled scrap in manufacturing processes, which reduce both depletion of natural resources and costs of production*.

Expenditure on such projects does not divide as neatly into environmental and non-environmental portions as does expenditure on mitigating projects. In theory, the purely environmental portion could be estimated by calculating the cost of the least-cost means of providing just the environmental benefits of the projects. This amount would probably, but not necessarily, be less than total expenditure on the projects. The same project can potentially involve both mitigating and incidental expenditures. An example would be a water supply project with a pipeline sufficiently long to require an ANDAL.



environment expenditure, see Box 5.1.) Figure 5.1 illustrates that *core environmental expenditure* (including development expenditure (own resources only) and routine expenditure) was around a fifth of expenditure on all activities in all Sector 10 in most years.⁷⁶

Total core environmental expenditure, including routine and own development expenditures, increased steadily between FY94/95 and FY96/97. However, core environmental expenditure fell by more than half in FY96/97 and by nearly another 10 percent in FY98/99 in 1993/94 constant prices. Figure 5.2 shows that the decrease in core environmental expenditure in Sector 10 was due to a decline in routine expenditure and own development expenditure. The former fell by nearly 25 percent, and the latter by about 60 percent. The reason for the sharper decline in development expenditures was that reductions in routine expenditure, which includes civil servant salaries and debt service, are politically and legally more difficult.

⁷⁶ The figure quoted omits expenditures of foreign resources, as data were unavailable in the case of core environmental activities. The data in this and, unless otherwise noted, subsequent figures and tables are expressed in constant 1993/94 rupiah, based on the GDP.

In addition to Sector 10, several other sectors, including mining, industry, and housing and human settlements, have core environmental activities in their routine or development budgets. Available data indicate that environmental units in non-environmental line agencies have suffered even greater cuts in their routine budgets than have environmental agencies in Sector 10. For example, the routine budgets of the Mining Inspectorate in the Ministry of Mining and Energy and the Industrial Zone and Environment Division of the Ministry of Industry and Trade fell by more than 70 percent (in constant prices) between FY97/98 and FY98/99. This marks a retreat from “mainstreaming” – that is, from line agencies assuming more responsibility for managing the potential environmental consequences of activities in their sectors.

The three sectors with the largest core environmental expenditures are Sector 10, Sector 14 (“Housing and Human Settlements”), and Sector 16 (“Science and Technology”). Subtotals for these three sectors show diverging trends in FY98/99 – while core expenditures in Sectors 10 and 16 decreased, they increased in Sector 14. This increase was due entirely to a single large expenditure item in Sector 14, the Environmental Program for Settlements (*Penataan Lingkungan Pemukiman*, or PLP), which funds the development of wastewater treatment plants and solid waste management facilities. Core environmental expenditure across sectors in FY98/99 was only about a third of that in FY94/95.

A largely missing element in this analysis is the share of foreign resources in environmental expenditures from 1994-99. Available data indicate that foreign resources were about two-thirds as large as domestic resources as a source of core environmental expenditure in Sector 10 in FY95/96. Unfortunately, no information on foreign resources in subsequent years or outside Sector 10 was available. Therefore, the extent to which increased foreign resources may have offset the drop in own development expenditure on environment in FY97/98 and FY 98/99 cannot be assessed here.

Trends in relative terms

Core environmental expenditures versus total budget and GDP. The decline in core environmental expenditure occurred during a period when both government spending and GDP also declined. However, own development expenditure on core environmental activities across sectors declined much more rapidly than did either the entire development program or GDP. Core environmental expenditure declined from 0.9 percent of the development program in FY94/95 to 0.5 percent in FY98/99, and from 0.04 percent of GDP to less than 0.02 percent.

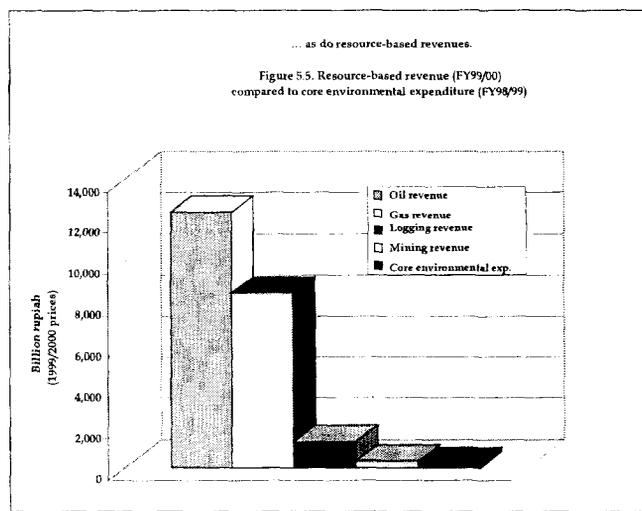
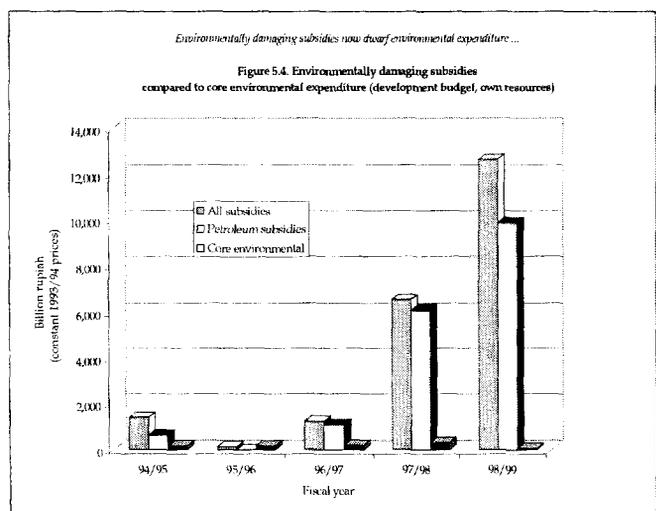
Core environmental versus other social sector expenditures. Core environmental expenditure was also cut deeply relative to expenditure on social projects. Figure 5.3 compares the trend in development expenditure (own resources) on core environmental activities in all sectors to the trend in development expenditure (own resources) on all activities in the three principal social sectors: (i) Sector 11 (“Education, Culture, Belief in Almighty God, Youth, and Sports”); (ii) Sector 12 (“Population”); (iii) Sector 13 (“Social Welfare, Health, Role of Women, Children, and Adolescents”). Through FY97/98, expenditure actually grew more rapidly for core environmental projects than for projects in the social sectors. In FY98/99, however, only Sector 12 suffered a cut as deep as core environmental activities. Own development expenditures on health and education projects decreased, but not nearly as much.

Indonesian versus other Asian countries' environmental expenditures. Table 5.1 places Indonesian environmental expenditure in the context of environmental expenditure by other Asian countries affected by the economic crisis. Table 5.1 shows that the cuts in environmental expenditure in Indonesia were deep relative to cuts that occurred in other Asian countries affected by the economic crisis according to (i) per capita core environmental expenditure in current U.S. dollars, (ii) core environmental expenditure as a percentage of GDP, and (iii) core environmental expenditure as a percentage of total government expenditure. The cuts in Indonesia almost doubled those of Thailand, while the decrease in Korea was negligible. On the other hand, Malaysia was the only country among the four that increased the amount of inflation-adjusted, environmental expenditures in local currency between FY97/98 and FY98/99.

Table 5.1. Environmental Expenditure in Asian Countries Affected by the Financial Crisis

Country	Year*	Per capita (current prices, US\$)	% of GDP	% of government expenditure	Total (constant prices, 1997=1)
Indonesia	1997	\$0.36	0.030%	0.163%	1.00
	1998	\$0.08	0.017%	0.079%	0.47
Malaysia	1997	\$0.67	0.015%	0.067%	1.00
	1998	\$0.53	0.016%	0.070%	1.06
Thailand	1997	\$5.47	0.22%	1.19%	1.00
	1998	\$3.25	0.18%	0.98%	0.72
Korea	1997	\$28.09	0.27%	1.56%	1.00
	1998	\$19.78	0.29%	1.38%	0.99

Note: Definition varies across countries.



Core environmental expenditures versus environmentally damaging subsidies. The routine budget includes funding for petroleum and electricity subsidies while the development budget includes fertilizer subsidies. In FY94/95 and FY95/96 the total amount of these subsidies was smaller than core environmental expenditures (see Figure 5.4). After FY95/96, however, subsidies grew rapidly, especially petroleum and other energy-related ones. In FY98/99 subsidies were more than 100 times as large as core and mitigating environmental expenditures. Especially in the

case of petroleum products, when gasoline prices declined by about 75 percent between July 1997 and February 1998, fuel subsidies became a major fiscal burden with major impacts on the availability of funds for other public purposes. Government subsidies mounted to Rupiah 7.45 trillion (US\$ 1.49 billion) while subsidy per gallon of premium gasoline was estimated at US\$ 0.60 in January 1998.

Under pressure from the IMF, the government agreed to increase prices for premium gasoline, industrial diesel, and kerosene by 71, 39, and 25 percent respectively. Yet, strong public reaction forced the government to reverse this decision within one week. The World Bank 1998 Public Expenditure Review recommends reducing these subsidies as quickly as possible for reasons of efficiency, and in some cases, equity. However, so far the government has not made any final decision on the future role and amount of fuel subsidies.

Core environmental expenditures versus natural resource revenues. A final comparison is between environmental expenditure and revenue that derives from use of natural resources and environmental services. As is well known, natural resources generate a substantial portion of Indonesian government revenue, with oil being especially important. Figure 5.5 shows that resource-based revenue in FY99/00 was enormous compared to core environmental expenditure in FY98/99. Core environmental expenditure was equivalent to less than 1 percent of total resource-based revenue, and less than 20 percent of revenue from just logging and mining. Although the earmarking of resource-based revenue only for resource management and environmental protection would be inappropriate—efficient budgeting dictates that revenues should be expended on activities that generate the highest returns, which might occur in other sectors—some reinvestment is needed to ensure the sustainability of natural resources and the benefits they provide.

Revenues from environmental resources other than commercial natural resources are small in Indonesia. The government has endorsed, and to a limited extent implemented, policies to increase user fees for water supply (see Box 5.2). Despite high levels of air and water pollution, it has made less progress than neighboring countries like Malaysia, the Philippines, and China in introducing pollution charges.

Environmental expenditure in the regional budget

Much of the expenditure in the national budget supports projects and programs at the regional (provincial and district/municipal) level, not activities at the center (*pusat*). The national development program includes two major expenditure categories: allocations to government departments and institutions, and transfers to regions (*Instruksi Presiden*, or INPRES). The first category includes expenditures at all government levels (regional as well as central), while the second includes only regional expenditures. Environmental expenditures occur in both categories.

Law 25/1999 on fiscal decentralization introduces far-reaching changes in regional financing systems, which will become effective in 2001. District government, which typically generated only about one-fifth of their total budgets in the 1990s, will become both more dependent on land- and natural resource-based revenue sources and more autonomous. The reliance on natural resource-based revenue sources is likely to create perverse incentives for districts to accelerate land conversion and natural resource exploitation in the forestry, mining and

fishery sectors, to generate local revenues. These incentives could be quite compelling in resource-starved districts (see Chapter 6, Regional Finance).

Box 5.2. User Fees in the Water Sector

River basin management. River basin authorities in a few regions charge a wide range of users for the abstraction of raw water from surface sources. The table below shows charge rates for the two main river basin authorities on Java: Perum Jasa Tirta in East Java, and Perum Otorita Jatiluhur in West Java. In both cases, all institutional users are currently charged except irrigation schemes, and charge rates have risen over time. Despite these increases, charges are not sufficiently high to cover the full costs of river basin management.

Use/Purchaser	River Basin Authority			
	Perum Otorita Jatiluhur		Perum Jasa Tirta	
Water supply: PDAM	-	-	1991	16 rupiah/m ³
	1997-99	Pam Jaya: 35 rupiah/m ³	1998	35 rupiah/m ³
		Other PDAM: 23 rupiah/m ³		
	2000-03	Pam Jaya: 65 rupiah/m ³	-	-
Other PDAM: 48 rupiah/m ³		-	-	
Water supply: industry	1997-99	23 rupiah/m ³	1998	52 rupiah/m ³
	2000-03	48 rupiah/m ³	-	-
Irrigation	Current ^a	0 rupiah/m ³	Current ^b	0 rupiah/m ³
Hydropower	1991	2.6 rupiah/m ³	1991	6.0 rupiah/m ³
	1994	3.3 rupiah/m ³	-	-
	1997	7.0 rupiah/m ³	1998	12.4 rupiah/m ³
	1999	8.6 rupiah/m ³	-	-
	2000	11.9 rupiah/m ³	-	-

^a Charge likely to be introduced in 4-6 years.

^b Charge likely to be introduced in 3-4 years.

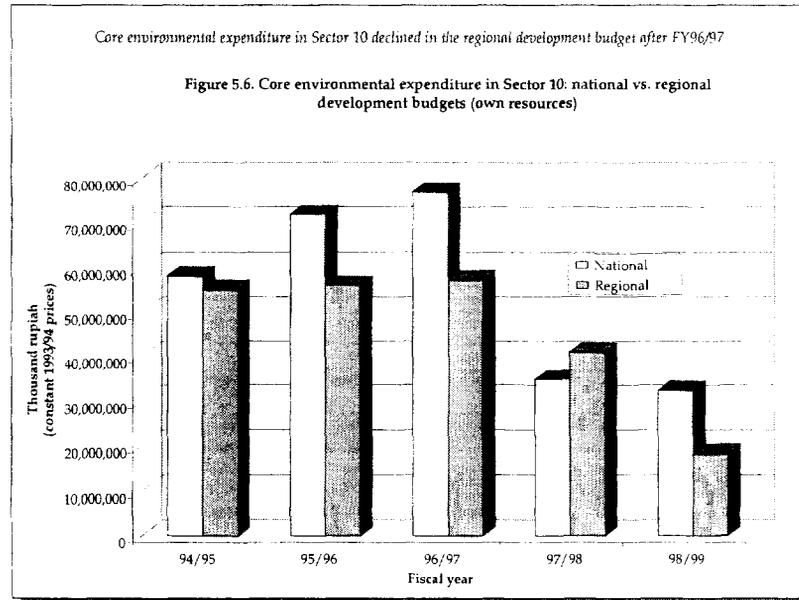
Irrigation schemes. User fees cover less than 10 percent of the O&M costs of irrigation systems in Indonesia (1998 Public Expenditure Review). Recommendations included in the Water Sector Adjustment Loan (WATSAL) include the creation of private water user associations (WUAs), with mandatory annual payments by irrigators into audited WUA bank accounts, and payment rates approved by a scheme-level management committee. For schemes remaining under government responsibility, it recommended greater retention and control of user fee revenues by provincial and district irrigation agencies.

Urban water supply services. Water supply services are not fully self-financing and government funds mainly subsidize capital costs. PDAMs do not receive grants for routine expenditures and are sometimes compelled to pay advance "dividends" that local governments have budgeted, even if they are losing money. This practice is gradually being stopped following concerns raised by donors.

Trends in different measures of core environmental expenditure

Core environmental expenditures at regional versus national levels. There are data on several measures of core environmental expenditure at the regional level in Indonesia. Figure 5.6 compares core environmental expenditure of own resources in Sector 10 of the regional development budget to corresponding expenditure in the national development budget. Regional expenditure was only slightly smaller than national expenditure in FY94/95, but it rose less

rapidly during FY94/95-FY96/97. This indicates that an increasing share of available budgetary resources was allocated to activities at the center. Furthermore, during FY97/98 and FY98/99, expenditure fell by a somewhat larger amount in the regional budget (68 percent) than in the national budget (58 percent). Though not great, this difference suggests an effort to protect the funding of central activities at the expense of regional activities In FY98/99.



Variation in expenditure across provinces

Analysis of expenditure levels across provinces can indicate factors influencing expenditure decisions and identify provinces with expenditure levels that are unusually high or low relative to these factors. A simple econometric analysis found that provincial population was the factor most significantly associated with variations in environmental expenditure across provinces: provinces with larger populations tended to have higher expenditure levels according to all measures except the INPRES for protected areas. This could reflect the greater political clout of more populous provinces. For the INPRES for protected areas, the most significant variable was land area, which is perhaps not surprising: on the basis of sheer land mass, and after controlling for population, larger provinces might be expected to have larger areas under protection. A third variable, per capita provincial GDP, was not significantly associated with most expenditure measures. Hence, wealthier provinces are not more likely to receive funds for environmental management.

On the basis of their population, land area, and per capita GDP, several provinces had lower-than-expected expenditure levels for all measures (Jambi, Kalimantan Barat, Riau, Yogyakarta), while a few others had consistently higher-than-expected expenditure levels (Bengkulu, Sulawesi Selatan, Sulawesi Utara) or are unusually high levels for certain measures

(e.g., Bali).⁷⁷ Whether these large deviations signal inefficient allocations cannot be determined without further analysis.

Conclusions

The analysis in this chapter points toward two broad conclusions. The first is that public expenditure on environmental activities is extremely low in Indonesia, in terms of per capita expenditure level, percentage of GDP, and percentage of government expenditures. Moreover, environmental expenditure has declined since the economic crisis, with deeper cuts in core environmental expenditures than in other development expenditures, as well as relative to the scale of the economy. Line agencies' environmental expenditures have suffered even deeper cuts than those of the core environmental agencies, and there has been a sharp retreat from mainstreaming. Chapters 2, 3 and 4 have demonstrated major increases in pressure on Indonesia's forests, biodiversity stock and land affected by mining operations. Additional funding is needed to keep pace with these natural resource-related trends, as well as urban and industrial pollution. Among other activities, expenditures are required to rehabilitate degraded forests, expand replanting programs, improve forest fire management, protect and manage parks better, prevent mining accidents and reclaim mined-out areas, establish credible databases, build technical capacity in government agencies, and support public awareness programs. Yet, as demonstrated above, the recent trend at an aggregate level has been the opposite.

The second conclusion is that environmental expenditures at regional level have suffered deep cuts since the crisis. Consequently, the share of the total environmental budget allocated to activities at the center has increased. In light of Indonesia's far-reaching decentralization reforms, the share of environmental expenditures in the regions needs to increase significantly, relative to environmental expenditures at the national level. Equally important, regional revenue sources under the new legislative framework for decentralization need to be vetted, and safeguards need to be applied, to ensure that natural resource-based revenues under the decentralization reforms "do no harm" to regional resource bases. As discussed in the next chapter, improved local environmental management will not be possible without increased provision of human and financial resources.

⁷⁷ For more detail on variation by province, see <http://eap.worldbank.org/indonesia/environment>.

6. Decentralization in the Natural Resource Sectors

Introduction

Indonesia stands on the verge of a major decentralization. The legal framework for decentralization (Laws 22 and 25 of 1999) authorizes the districts (cities and rural kabupaten) to manage most government services, and will more than double the subnational share of public expenditures to over 40 percent. This reallocation would make Indonesia, now unusually centralized for its size and diversity, one of the most decentralized countries in the region. Decentralization will take place in some form over the next 3-5 years, but its speed, the balance struck between the political imperative for visible action and the need for structured preparation, and the role of local constituencies will determine whether decentralization will improve the welfare of Indonesia's people by encouraging sustainable utilization of natural resources, or invite serious environmental deterioration.

Indonesia's economy will remain natural resource-dependent over the next decade, and decentralization in the natural resource sectors – forestry, mining, fisheries – will create both risks and opportunities. Given the potent mix of the lingering economic crisis, political uncertainty and a partial breakdown of law and order, decentralization of natural resource utilization and environmental management could accelerate environmental degradation. Under this scenario, newly empowered local authorities would condone or even invite more intensive local resource use to boost local income and revenues, *without adequate environmental safeguards*. Whether due to lack of technical capacity or sympathy for populist demands for access to local resources, this scenario would lead to resource depletion, devastated landscapes and long-term, perhaps irreversible damage to the regional resource base. If exploitation rates in the resource-rich regions off Java remain at the unprecedented levels described in the forestry, biodiversity and mining chapters, these risks could play out quickly over the next five to ten years, ultimately narrowing affected regions' economic options.

On the opportunity side, the benefits of decentralization *with safeguards* could include improved resource outcomes (more efficient, sustainable resource use and conservation of protected resources) and improved governance (greater local participation in resource allocation decisions, greater accountability of regional governments, freeing of central agencies to concentrate on policy and oversight). However, achieving these benefits will require all the key actors – central ministries, district and provincial governments, and local communities – to undergo substantial institutional change. Because the benefits of sensible decentralization in the natural resource sectors will accrue in the long run, there will be substantial pressure for "quick fix" decentralization, without regard to potential long-term negative impacts on the environment. Unless these risks on the road to decentralization receive priority attention in the short term, they could easily foreclose achievement of the long-term benefits.

This chapter focuses on present knowledge of the problems and prospects for decentralization of natural resource utilization and environmental management in Indonesia, the critical issues to be decided, and decentralization support strategies for donors and for the Government of Indonesia. Decentralization is inherently complex. One size fits neither all sectors

nor all locales. This chapter therefore emphasizes the sectoral and geographic variations that must be confronted when the theory of decentralization moves to the reality of the diverse Outer Islands. The concerned government agencies are the Ministry of Forests and Estate Crops (MoFEC), the Ministry of Mines and Energy (MME) and their regional counterparts; BAPPENAS and the BAPPEDAs (Regional Planning Agencies); and the Ministry of Environment, the Environmental Impact Management Agency (BAPEDAL) and their local and regional counterparts (BAPEDALDA and BAPEDAL Regional). The greatest short- to medium-term opportunity of the decentralization process lies in improved accountability and coordination among these agencies, leading to integrated planning, permitting, environmental safeguards and monitoring and reporting of compliance with national minimum standards at district and provincial levels.

The geographic focus of this chapter is one category of Indonesian province, defined by natural resource endowment relative to population.⁷⁸ The resource-rich, low population provinces that are our focus include most provinces in Kalimantan, Riau, Aceh and Irian. These provinces send far more revenues to the center than they get back.⁷⁹ Given that many environmental problems found in densely populated areas, such as lack of sanitation, solid waste, noise and odors, are fundamentally local, and hence best addressed at the local level, decentralization of environmental management in urban and resource-rich, high population regions offers substantial, visible benefits to local residents. However, environmental issues in the natural resource sectors, such as destructive logging practices, mining waste disposal and effluent from oil palm processing, generally occur in less densely populated areas, where natural resources may be virtually the sole source of employment. In addition, environment differs from other service sectors in developing countries, such as health, education or road-building, in that it ordinarily lacks a ready-made constituency, and this is particularly true in resource-rich, low population regions. The problem of building pro-environmental constituencies receives substantial attention in the analysis that follows.

Some of the factual parameters for decentralization policies in the natural resource sectors are known, others are not. For instance, little is known about the capacities of local forestry and mining agencies across a variety of districts and provinces, because until the close of the Suharto era these agencies had neither the authority nor funds to exercise local control. Given district governments' relative lack of technical and managerial capacity, even on Java, it is unlikely that district governments off Java currently possess adequate resources, such as well trained officials, university faculties, accredited laboratories, and political leaders of sufficient stature to sustain the natural resource base for use by future generations. Capacity building will depend on resources such as these, which are generally more likely to be found in provincial capitals rather than smaller district towns.

⁷⁸ There are three basic types of province: a) resource-rich, low population (e.g. Kalimantan); b) resource-rich, high population in absolute terms but resource-poor relative to population (Java, Bali, South Sulawesi, some regions in Sumatra, which have abundant water and coastal zones, some forests, and national parks); and c) resource poor, low population (the Nusatenggara provinces). Personal communication from Guy Alaerts.

⁷⁹ Many other provinces break roughly even, and a few would be even poorer without the transfers they receive from the center. Although many findings of this study may also apply to the other two categories, the field studies conducted for this report did not extend to those areas. Further research is needed to assess whether decentralization prospects for environmental and natural resource management differ from the resource-rich, low population areas targeted in this report.

Likewise, the incentives and penalties for sustainable resource use to be applied by newly empowered local authorities have yet to be determined. While recent legislation provides a formal legal framework, practical management instruments are still lacking, and once they are available, their application will almost certainly be ad hoc and uneven. Some ministries, such as forestry, have chosen *not* to decentralize, while mining is in the process of devolving to the district level.

Preliminary research on local constituency building, described in this chapter, provides an understanding of differences among potential environmental constituencies in three relatively resource-rich provinces off Java. However, little is known about the other twenty-three provinces, not to mention the approximately 350 districts that are supposed to be the focus of power and resources under the new laws.

This chapter lays out the issues that will be encountered during decentralization of natural resource utilization and environmental management functions to the resource-rich, low population regions off Java. These issues include:

- interpretation of the legal framework for regional governance and finance as it applies to the natural resource sectors and environmental management; and
- the balance to be struck between the political imperative for action and the need for regional capacity and constituency building, which are necessarily medium-term efforts, so as to optimize the political, technical and economic outcomes of decentralization.

The chapter is organized in five sections. Section 2 outlines the legal framework for decentralization relative to natural resource and environmental management, and identifies practical implementation issues and options. Section 3 discusses technical capacity requirements. Section 4 presents results of opinion leader surveys designed to assess the strengths and weaknesses of provincial environmental constituencies, and recommends accountability mechanisms. The last section outlines a strategy for decentralization of natural resource and environmental management with adequate safeguards (see Figure 6.1).

The Legal Framework and Safeguards

Three recent pieces of legislation, Law 22/1999 on Regional Governance, Law 25/1999 on the Fiscal Balance Between the Central Government and the Regions, and Government Regulation 25/2000 on Government Authority and Provincial Authority as an Autonomous Region comprise the post-New Order legal framework for decentralization. While this framework remains to be interpreted, it is useful to consider its broad outlines.

A caveat is important here. Legal institutions have never been strong in post-independence Indonesia. Legal rights were repeatedly abrogated under the New Order, and courts have seldom been decisive. While laws may set overall parameters, informal exchanges of favors among government officials, businesspersons and local communities often have greater force than law in a particular matter. What happens to the environment will probably be determined mainly by businesspersons, administrators, police and community representatives, acting informally, rather than by lawyers arguing in court. Moreover, when practical outcomes of decentralization, such as effects on environmental quality or local service delivery, are evaluated,

variation by sector and locality will frequently be as important, if not more important, than laws whose system-wide applicability may be more apparent than real.

Previous regional governance framework. Except for two brief interludes in the 1950s, weak regional authority has been the norm in Indonesia. However, both interludes continue to serve as benchmarks in public debate over decentralization. The first benchmark was the country's brief, reluctant adoption of a federal system as a condition of Dutch recognition of Indonesian sovereignty in 1949, which ended with the adoption of a unitary system the following year. A lasting effect of the federal interlude has been the taboo on any hint of federalism in consideration of regional governance options for Indonesia. The second interlude of strengthened regional authority was the attempted secession of several provinces in Sumatra and Sulawesi in 1956-57, which was settled by military force.

Under the New Order, a centralized system of governance was created, in many cases over the objections of regional elites in the Outer Islands. The legal cornerstone of the New Order's approach to regional governance was Law 5/1974, which confirmed regional executives' appointment by and accountability to the national government, in particular, the Department of Home Affairs. Law 5/1974 created two parallel structures of regional governance. One, the "regional administration," was comprised of branch offices of central government departments (kantor wilayah or kanwil) and the governor at the provincial level, and kantor departemen or kandep and the district executive (bupati or mayor) at the district level, and was an extension of central authority, charged with implementing central policies in the regions. The other, the "regional government," had its own bureaucratic departments (dinas), which were largely a mirror image of the kanwil or kandep, plus a legislature (a Level I or Level II DPRD) and a regional executive called a level I or level II regional head.⁸⁰ Under this bifurcated organization, fiscal resources and executive authority were concentrated on the administrative side, and legislative authority was confined to the "autonomous" regional government side, with the DPRD under surveillance of the Ministry of Home Affairs.

In practice, implementation of Law 5/1974 emphasized mobilization of the regions in the national development effort, through establishment of a hierarchical administrative structure reaching from the center to villages across the archipelago.⁸¹ Despite various ministerial decrees ceding administrative functions to the regions and periodic pilot decentralization initiatives such as the Regional Autonomy Program in the forestry sector, sectoral agencies in the regions remained essentially central "outposts," hobbled by many restrictions and still largely dependent on "assistance" budget allocations from the center.⁸²

⁸⁰ This separation of administration and politics was breached in one key respect – that the same person, the governor or bupati, served simultaneously as head of regional administration and regional government. In some regions, the same official served as both kanwil head and head of the corresponding dinas, and reporting both to the governor and the line agency at the center. However, this practice was uneven across sectors and regions. See Michael Malley, "Regions: Centralization and Resistance," in Donald K. Emmerson, ed., *Indonesia Beyond Suharto: Polity, Economy, Society, Transition* (M.E. Sharpe), 1999.

⁸¹ Terence H. Hull, "Striking a Most Delicate Balance: The Implications of Otonomi Daerah for the Planning and Implementation of Development Cooperation Projects," December 1999.

⁸² See Hariadi Kartodihardjo, "Policies on Decentralized Forest Administration in Indonesia and Their Implementation," 1999. Dinas, of course, had lesser functions and resources than the kanwil all along.

As Law 5/1974 did not address fiscal matters, a large share of central funding to the regions during the New Order was via INPRES (Instruksi Presiden) – ad hoc transfers by presidential decree, in the form of general grants to provinces and districts and funds for various specific purposes, such as education or road building.⁸³ The center appropriated natural resource revenues from oil and gas, forestry and mining, income taxes and the value added tax, leaving inferior sources of revenue, such as motor vehicle registration, to the regions. Through the 1990s, the regions' capacity to raise own revenues remained severely limited, with provinces raising only about one-quarter and districts about one-fifth of their total budgets.

Regional governance reform. Law 22/1999 on Regional Governance, enacted in May 1999 under President Habibie and effective in 2001, abolishes the hierarchical relationship between provinces and districts/cities and treats the two levels quite differently. The country's approximately 350 districts gain greater autonomy, with local elections of district heads no longer subject to higher-level approval, and new responsibility for a broader menu of local services, as well as oversight of village-level government (see Box 6.1).⁸⁴ In theory at least, Law 22 nurtures democratic accountability at the district level.

In contrast, the autonomy of the 27 provinces is sharply bounded under Law 22. Governors remain primarily accountable to the President and the central ministries. The provinces become residual service providers, responsible only for cross-district matters and whatever services are deconcentrated by the center or uploaded by the districts. As bystanders in the decentralization process, the provinces do not gain improved capacity to respond proactively to emerging democratic constituencies under Law 22.

While the district is the default level to which regional authority is assigned under Law 22, the law explicitly allocates responsibilities for natural resource utilization, conservation and environment across all levels of government. In fact, the natural resource sectors, conservation and environment are the only sectors with functions assigned to more than one level of government under Law 22. While natural resource utilization is reserved to the center, the "regions" (presumably both districts and provinces) are also authorized to manage natural resources located in their area. Similarly, conservation is reserved to the center, but "environment conservation" is designated a mandatory function of the districts, and maintenance of environmental conservation is assigned to the "regions" (again presumably both districts and provinces).⁸⁵ For an overview of the allocation of functions across levels of government under the main implementing regulation to date, Government Regulation (PP) 25/2000 on Government Authority and Provincial Authority as an Autonomous Region, see Table 6.1.

⁸³ The two natural resource and environment INPRES, for Regreening and Replanting, date from the 1970s; the Protected Areas and Environmental Impact Management INPRES, date from 1997. See Jeffrey Vincent et al., *Indonesia Environmental Expenditure Review*, 2000.

⁸⁴ Law 22/1999 also provides a foundation for democratic accountability at the village level, which could have important implications for natural resource utilization, but full examination of village level governance of natural resource use is beyond the scope of this chapter. Articles 93-111 provide two bases for recognition of adat or long-established systems of resource utilization, which could support delineation of community resource use rights under subsequent legislation. The two bases are genuine elections of village heads and a village council, and regional powers over natural resource management, which districts could devolve to villages.

⁸⁵ See Law 22/1999, Articles 7.1, 7.2, 10.1 and 11.2.

Box 6.1: Provincial versus District Governance Under Law 22/1999	
Provinces	Districts
<ul style="list-style-type: none"> • Retain both administrative and autonomous functions; • Governors are nominated and elected by the provincial DPRD, subject to President's approval; • The only mandatory provincial functions are cross-district matters, plus whatever functions are "uploaded" by districts or deconcentrated by the center. 	<ul style="list-style-type: none"> • Expand autonomous functions, while shedding administrative ones; • Mayor/bupati are nominated and elected by the district DPRD, without outside approval; • District services are expanded to include 11 mandatory functions^a and all other functions not reserved to the center^b or uploaded to the provinces.
<p>^aThe 11 mandatory functions for districts are public works, health, education and culture, agriculture, communication, industry and trade, capital investment, environment, land, cooperatives and manpower affairs. See Law 22/1999, Article 11.2.</p> <p>^bThe 12 central functions are international policies, defense and security, judicature, monetary and fiscal authority, and religion, as well as national planning and macro national development control, financial balance fund, state administration and state economic institutional systems, human resources development, natural resources utilization, strategic high technology, conservation and national standardization. See Law 22/1999, Articles 7.1, 7.2.</p>	

This evolving framework for regional governance of natural resource utilization and environmental management raises three practical implementation issues:

- that uncertain and/or uneven application of Law 22/1999 could result in a de facto abandonment of environmental safeguards;
- that the new legal framework provides for adjudication and recentralization in the event of failure by district or provincial authorities to maintain national minimum standards, but these provisions require strengthening; and
- that the new framework lacks transition arrangements, particularly with regard to the role of the provinces.

Safeguards and integrated natural resource management. The core elements of environmental safeguards are a set of national minimum standards and a transparent, consultative environmental assessment (AMDAL) process. Under national minimum standards, no province or district can legislate standards that are less demanding than the national standards, though they may enact stricter standards. PP 25/2000 reserves national environmental standard-setting for pollution, conservation and natural resource utilization to the center, and provides that provincial standards must be based on national standards.

Table 6.1. Allocation of Natural Resource and Environmental Management Functions Under Government Regulation 25/2000, by Sector

Sector	Government Authority ⁸⁶	Autonomous Regional Authority (province as "autonomous" region)... ⁸⁷	Comments/Issues
Forestry and Estate Crops	<ul style="list-style-type: none"> ➤ determines forest areas, and changes of status and function; ➤ manages and grants permits for management of conservation and protected areas; ➤ sets criteria and standards for: <ul style="list-style-type: none"> ▪ forest management; ▪ establishment of forest exploitation areas, conservation areas; ▪ tariff of business permit-holders' contribution for forest use, reforestation funds; ➤ business licenses for use of forest areas, forest products, environmental services. 	<ul style="list-style-type: none"> ➤ oversees cross-district forests, including: <ul style="list-style-type: none"> ▪ granting cross-district permits for forest product use and manufacturing; ▪ participating in Government's determination of cross-district forest areas and changes of status and function, together with districts. ➤ manages: ➤ setting and security of forest boundaries; ➤ and supervises forest rehabilitation, reclamation, & choice of silviculture method. 	Under PP 25/2000, MoFEC remains the most centralized of the natural resource sectors. The center retains two operational roles – determination of forest areas and changes in status and functions, and conservation and protected area management. Another MoFEC policy initiative, Perumisasi, would maintain central control of existing forest concession areas. Perumisasi calls for upgrading parastatal Inhutani forest companies to state enterprises (Perum), which would take over existing forest concession leases.
Mining	<ul style="list-style-type: none"> ➤ sets business work area criteria; ➤ sets general mineral exploration and processing standards. 	<ul style="list-style-type: none"> ➤ grants core business permits (exploration and exploitation permits) for cross-district general mining. 	Implies that district grants core business permits for within-district general mining, regardless of scale of mining activity. <i>Issue:</i> need to match level of government engaged in negotiation of permit to scale of mining activity.
Environment	<ul style="list-style-type: none"> ➤ sets standards/guidelines for pollution, conservation, control of natural resources and preservation of environmental functions; ➤ reviews AMDAL of activities with potentially broad social impacts, covering more than one province and having security implications. 	<ul style="list-style-type: none"> ➤ sets environmental quality standards based on national standards; ➤ reviews AMDAL of activities covering more than one district. 	Implies that district reviews AMDAL of within-district activities. <i>Issue:</i> this is inconsistent with the 1997 AMDAL Regulation, which devolves within-province AMDAL review to Provincial AMDAL Commissions (KODAM), but not any lower than the provincial level.
Spatial Planning	<ul style="list-style-type: none"> ➤ derives national spatial plan from district spatial plans. 	<ul style="list-style-type: none"> ➤ determines provincial spatial plans based on mutual agreement between provinces and districts. 	<i>Issue:</i> focus on district spatial plans could conflict with forestry article under PP 25/2000 (Article 2.4c), which vests authority to determine forest boundaries and changes of status and function with Government

⁸⁶ Government Authority is implementable either at the center or by the province as an administrative function and extension of the center (deconcentration).

⁸⁷ Authority of the province as an autonomous region is distinct from administrative authority (per ft. 4), and is implemented by the regional head, DPRD and dinas.

Table 6.1 Continued

Land	<ul style="list-style-type: none"> ➤ Determines: <ul style="list-style-type: none"> ▪ Requirements for issuance of land rights, land reform and National Cadastral Framework; ▪ land administration standards; ▪ land service cost guidelines; ▪ manages “national lands,” including government sites and facilities, national parks and preserves, military lands and forests; and ▪ develops oversight/ supervision system for performance of decentralized land offices 	<ul style="list-style-type: none"> ➤ Local Land Office (Dinas Pertanahan): <ul style="list-style-type: none"> • issues land tenure certificates on demand and in “systematic” registration campaigns; • issues land acquisition and development location permits in accordance with local master plans; • supports local spatial planning; • coordinates with land and building tax (PBB) office to prepare integrated cadaster; and • coordinates with local forestry office for uniform de... of all lands in local government area. 	<p>BPN proposes to retain provincial kanwils as extension of central authority. District kandepts to be merged with dinas. Major reform of land administration is a priority of current Gol leadership, as land was a major factor in the corrupt activities of previous Gol. Proposals for new land legislation and major regulatory reform are under active discussion. Bank has assisted in drafting policy discussion papers and reform options with the Land Administration Project –Part C (Loan 3792-IND).</p>
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Regarding the AMDAL process, PP 25/2000 assigns environmental safeguards review of activities that have broad social impacts, security implications and/or cover more than one province to the center. This is consistent with the current AMDAL Regulation, which places national-level environmental assessment review under a single Central AMDAL Commission managed by BAPEDAL. PP 25/2000 further specifies that provinces will conduct AMDAL review of activities covering more than one district. As the district is the default level to which authority is transferred under Law 22, this implies that districts will conduct AMDAL review of activities within their boundaries. The current AMDAL Regulation devolves within-province environmental safeguards review to Provincial AMDAL Commissions (KOMDA), but no lower.

As a transitional measure, AMDAL review of within-district activities could be conducted at the provincial level, as part of a larger provincial training effort for district officials (see “transition arrangements” and Table 6.3 below). The resources of provincial capital cities and towns (universities, laboratories, NGOs, constituencies for sustainable resource use, more developed government agencies) could be used as training grounds to develop AMDAL skills and procedures for subsequent devolution to the districts.

The degree of flexibility in allocation of responsibility for natural resource utilization under PP 25/2000 is demonstrated by the forestry and mining sectors, which are proposing quite different allocations of functions among levels of government. Such variation could make cross-sectoral coordination among natural resource sectors, safeguards and spatial planning at district and provincial levels extremely difficult.

In the *forestry* sector, PP 25/2000 does not devolve two primary functions – determination of forest areas and changes in their status and function (including conversion), nor does it devolve management of various conservation and protected areas. It places these functions, as well as policy and standard setting, under direct control of the center, and assigns cross-district functions, e.g. granting some cross-district permits, to the provinces. This allocation

of most planning and implementation functions to central and provincial levels under PP 25/2000 appears consistent with the new Law 41/1999 on Basic Forestry. However, while the Forestry Law assigns the provinces a relatively significant role, Law 22/1999 casts the provinces mainly as bystanders in the decentralization process.

In contrast, in the case of *general mining*,⁸⁸ PP 25/2000 assigns standard- and criteria-setting functions to the center and cross-district matters to the provinces. All other operations, regardless of scale, are implicitly devolved to the district. Whereas MoFEC's centralized approach appears to be based on Article 7.2 of Law 22, which reserves natural resource utilization to the center, this radical decentralization of general mining under PP 25/2000 is pegged to Article 10.1 of Law 22, which authorizes regions to manage natural resources in their areas, regardless of scale.

In transactions between rural kabupaten and large- and medium-scale mining companies, the most likely outcome, given the districts' limited technical capacities and likely absence of environmental constituencies, and the mining companies' resources and significance to the local economy, is a "company town" scenario, in which the district government, beholden to the company for revenues and employment, gives little or no attention to environmental and social impacts of mining operations. When local mineral deposits are depleted, the local resource base, which typically suffers severe soil degradation during mining operations, often can no longer support the local population, and they leave the area. Numerous examples of such dying towns can be found in the mining districts of *West Virginia* and *Pennsylvania* in the United States. To avoid the adverse environmental effects of the unequal negotiating position of a district government relative to a medium- or large-scale company, the *scale* of proposed mining activities should be a factor in allocation of regulatory authority among levels of government, with small-scale mining regulated at the district level, and medium- and large-scale mining regulated at higher levels. However, local government and communities should be consulted and participate in government oversight of mining activities, regardless of which level of government has lead responsibility.

Adjudication and recentralization. Law 22/1999 and PP 25/2000 provide several "checks and balances" to prevent or correct misallocation of functions. For example, a district that will not or cannot implement a mandatory function can seek to "upload," i.e., to transfer implementing authority to the province, and the province may in turn seek to upload functions it cannot perform to the center. The President may veto regional regulations and decisions by heads of regions. The Law establishes a Regional Autonomy Advisory Board, chaired and co-chaired by the Ministers of Home Affairs and Finance respectively, to advise the President on fiscal relations and allocation of functions between levels of government.⁸⁹

Good governance in decentralization requires adjudication and "recentralization" mechanisms such as the Regional Autonomy Advisory Board. Two international examples of central governments retaining and using the recentralization option are relevant. In the *United States*, the federal government delegates environmental management responsibility to the states, contingent on the states' performance. Enforcement of national minimum standards may be delegated to states, but not below the state level. State environment agencies must monitor and

⁸⁸ All mining other than oil and gas.

⁸⁹ See Law 22/1999, Articles 115-116 and Government Regulation 25/2000, Article 4.

report to the US Environmental Protection Agency (USEPA), and USEPA can withdraw delegation of functions for poor performance. If delegation is withdrawn, functions are ordinarily taken over by one of USEPA's ten regional offices, which are deconcentrated branches of USEPA, similar to Indonesia's BAPEDAL Regional.

In *Korea*, the recentralization option has allowed the Ministry of Environment (MoE) to withdraw authority that was prematurely delegated to regional environmental agencies, then redelegate once local capacity improved. MoE originally delegated broad air and water pollution control functions to six regional environmental agencies, which were new and lacked experience, in 1986. In 1992, a toxic spill in the Nakdong River, upstream of Korea's third largest city, drew national attention to the regional agencies' weak technical and coordinating capacities, and MoE recentralized many previously delegated functions. Meanwhile, regional and local environment offices worked to build local capacity. Two years later, when a second major spill occurred at the same location on the Nakdong River, MoE determined that regional capacity had substantially improved, and re-delegated the functions that had been withdrawn at the time of the first spill. An important lesson of Korea's experience is that transfer of responsibilities should be contingent on performance, and recentralization pending improvement of regional capacity should always remain an option.

The structure of the Regional Autonomy Advisory Board established under Law 22 and PP 25 – its multi-level membership, including Ministries of Home Affairs, Finance and other concerned ministries, the Regional Government Association (presumably both district and provincial levels) and representatives of regional legislatures (district and provincial DPRD) – is sound. However, several additional provisions are needed, to strengthen the Board's adjudication and recentralization roles, both in general and relative to natural resource and environmental management in particular.

- First, the Board should monitor regional governments' performance of decentralized functions systematically and proactively, instead of waiting for appeals from regional governments. Such appeals are likely to be infrequent, because governments rarely give up functions and accompanying budget voluntarily, even when their performance is poor.
- Second, a cross-sectoral Natural Resource Council should advise the Board on matters related to natural resource management and environmental safeguards at district and provincial levels. Given the Board's broad mandate across all sectors, it will require specialist advice. The Natural Resource Council, comprised of government agencies with natural resource mandates (Forestry and Estate Crops, Mining and Energy, Agriculture, River Basin Agencies, Environment) at central and regional levels, plus other stakeholders, would assess regional performance of natural resource and environmental management functions against national minimum standards, consult with regional stakeholders, and provide technical inputs to the Board's submissions to the President.
- Third, local communities at both provincial and district levels should have standing to submit appeals to the Board when regional performance of decentralized functions, including natural resource utilization and environmental management, is inadequate. If failure to comply with national minimum standards is confirmed, recentralization should be an option. Council and

Board membership should include informed members of civil society who are expert in natural resource and environmental management.

- ***Transition arrangements and the role of the provinces.*** While the goal of the new legal framework – to devolve management of most government services to the districts – is clear, implementation mechanisms and transition arrangements remain to be identified. To reduce confusion in the early phases of decentralization and minimize the need for recentralization, devolution could proceed in stages. (See Figure 6.1 Strategy for Decentralization of National Resource Sectors with Environmental Safeguards.)
- During the first stage, concerned provincial agencies (BAPEDALDA, BAPPEDA, forestry, mining and other natural resource agencies) could receive intensive safeguards skills training, including training of trainers.⁹⁰
- During the second stage, district agencies, anticipating eventual devolution of authority for natural resource utilization and environmental management, could second district environmental and natural resource staff to interim district offices at the provincial level (*magang*), where the resources of provincial capital cities (universities, laboratories, NGOs, constituencies for sustainable resource use, more developed government agencies) would be used as training grounds to produce both skilled manpower and procedures that would subsequently be devolved to the districts. Provincial agencies would be responsible for providing safeguards training to district officials. Secondment of district officials to the provinces for training would be a condition for transfer of authority to the districts.
- During the third stage, district officials, assisted by provincial agencies, could pilot integrated district planning, permitting, environmental safeguards and monitoring of within-district and small-scale activities at the district level. These temporary measures would satisfy both the objectives of Law 22/1999 and practical requirements for successful decentralization. Authority in the natural resource and environment sectors could be fully decentralized when the Regional Autonomy Advisory Board certifies that a district has developed adequate capacity to handle full decentralization.

Implementing regulations could help clarify expectations under Law 22/1999 and PP 25/2000 by establishing a notional schedule for staged decentralization over a 3-5 year transition period. However, given inherent disparities in the regions' local capacities, natural and human resource endowments, commitment to decentralization, and ability to generate own revenues, uniform decentralization across regions and across sectors is highly unlikely. Assigning differentiated authority to subnational governments based on regional political will, technical capacity, revenue, population, geographic make-up and the like can alleviate the pressure of having to implement a country-wide uniform decentralization program for natural resource utilization and environmental safeguards. Under the umbrella of *asymmetric decentralization*, the pace and sequencing of decentralization in the natural resource and environment sectors can be tailored to local capacity, constituencies and needs, while remaining within the parameters of the notional transition schedule.

⁹⁰ See Figure 6.1 and Sections 3 and 5.

Regional Finance. Law 25/1999 on the Fiscal Balance Between the Central Government and the Regions defines regional financing mechanisms and accountabilities for the restructured regions. Provincial and district financing mechanisms differ significantly under Law 25.

As autonomous regions with decentralized authority, districts have their own budgets (APBD). The districts' sources of revenue include: a) own (locally generated) taxes, levies and region-owned enterprises; b) "balance fund" allocations from the State Budget (APBN), which are shared between districts and the center, and include the General Allocation and Special Allocation; c) regional loans; and d) other legal revenues. During the 1990s, districts typically generated only a fifth of their total budgets, and depended on sectoral and INPRES funds from the State for most of their budgets. Under Law 25, INPRES and sectoral allocations from the APBN will be replaced by the General Allocation, Special Allocation and other "balance funds." Two of the three types of balance funds are land and natural resource revenues collected by the center – that is, taxes on land, property and transfer of land and property rights, and shares of forestry, mining, fisheries and Reforestation Fund revenues (see Table 6.2). The only balance fund not based on land or resource revenues is the General Allocation.

The introduction of resource-based balance funds creates perverse incentives for districts to accelerate or, more passively, condone land conversion and natural resource exploitation in the forestry, mining and fisheries sectors, in order to generate local revenues. As the district head is elected by and financially accountable to the DPRD, these incentives are likely to prove compelling for bupati in revenue-starved rural districts. In a context of poor implementation of current laws, incomplete national standards, underfunding of environmental services and limited local capacity, the increased pressures on local resources resulting from reliance on resource-based balance funds are unlikely to "rationalize" use of natural resources. While they may fill district coffers, they are unlikely to produce "win-win" results in terms of sustainable use of the local resource base.

The structure and environmental implications of regional finances under Law 25 differ significantly at the provincial level. The provinces' three principal sources of revenue include: a) own revenues, chief of which is the motor vehicle tax; b) allocations from the APBN via the sectoral ministries, which comprise a "deconcentration budget"; c) shares of oil and gas revenues collected by the center and remitted to the provinces; and d) the General Allocation. However, oil and gas revenues are significant revenue sources for the four main oil and gas-producing provinces only (Riau, Aceh, East Kalimantan and Irian). Most provinces will depend mainly on sectoral allocations from the ministries, for which the governor is accountable to the ministries, and the General Allocation. Under these circumstances, the governor's opportunities and incentives to generate provincial revenues by accelerating exploitation of natural resources will be limited relative to the compelling incentives at the district level.

Existing natural resource charges beyond the ones cited in Law 25 include park entrance fees, which are collected by the center, and irrigation water use fees, which are collected by provincial public works agencies (kanwil). As noted in Chapter 3, the Directorate General of Nature Conservation (PKA) is conducting experiments in revenue sharing with local communities and/or local government as a means of improving the sustainability of protected areas located near rural populations. These and other experiments with revenue sharing in buffer zones and protected areas should be

encouraged. Potential resource-based charges should be evaluated in terms of their effectiveness in generating local employment and revenues, influencing behavior in environmentally positive ways, and financing environmental services. Districts have recently experimented with auctioning use rights to high-value forest products, such as birds' nests, but the results of these experiments have not been entirely satisfactory in terms of sustainability.

Charges for BAPEDALDAs' AMDAL review and environmental monitoring services could help recover costs at district and provincial levels. Local environment agencies in *New Zealand* have had quite positive experience with such charges.

**Table 6.2. Distribution of Revenues between Center and Regions Under Law 25/1999
(percentage of revenue allocated by level of government)**

Type of shared fund	Revenue instrument	Center	Regions
Region's share of natural resource-related revenues	Land & property tax	10*	90**
	Tax on acquisition of land & building rights	20*	80**
	Natural resources:		
	forestry, mining, fisheries	20	80**
	oil	85	15***
	gas	70	30***
General allocation			provinces 10 districts 90
Specific allocation	Reforestation	60	40****

*shared among all districts

**remitted to districts of origin

***remitted to provinces

****remitted to producer area

Vesting local property rights in resources such as forests and fisheries can create positive incentives to offset the perverse ones cited above, as well as a local revenue base, but the ongoing national forestry and land policy dialogues are likely to be long and difficult. There is significant risk that by the time these dialogues produce new, consensus-based local property rights, local resource bases may be severely damaged or even exhausted.

Other proposed policy instruments currently under discussion include a performance bond for production forest concessionaires and a reclamation bond for large-scale mining activities. However, even if mining is devolved to the district level, as implied in PP 25/2000, it is important that district leaders understand that the bonds must be held in trust until expiration of the concession or mine closure, and cannot be considered sources of local revenue.

In the short to medium term, districts and provinces will probably have to rely on the center to pay for regional environmental services, at least in part, through earmarked grants. To attract higher-level financing for these services, regional officials and environmental constituencies will need to learn to track environmental expenditures, justify them in terms of results, and lobby for them.

Technical Capacity

At provincial and district levels, the fledgling environmental agencies will no more control decisions on “big ticket” natural resource management issues and pollution control than do their national-level counterparts. Under these circumstances, the strategy guiding technical capacity building for decentralization of environmental safeguards and natural resource utilization needs to:

- define clearly the skill requirements of the safeguards services the provincial and district environment agencies are expected to deliver; and
- articulate the sustainability criteria that need to be mainstreamed into the operations of the line agencies whose “big ticket” decisions most affect the sustainability of the local resource base and local pollution levels. Environmental sustainability has to be part of these agencies’ decentralization calculus.

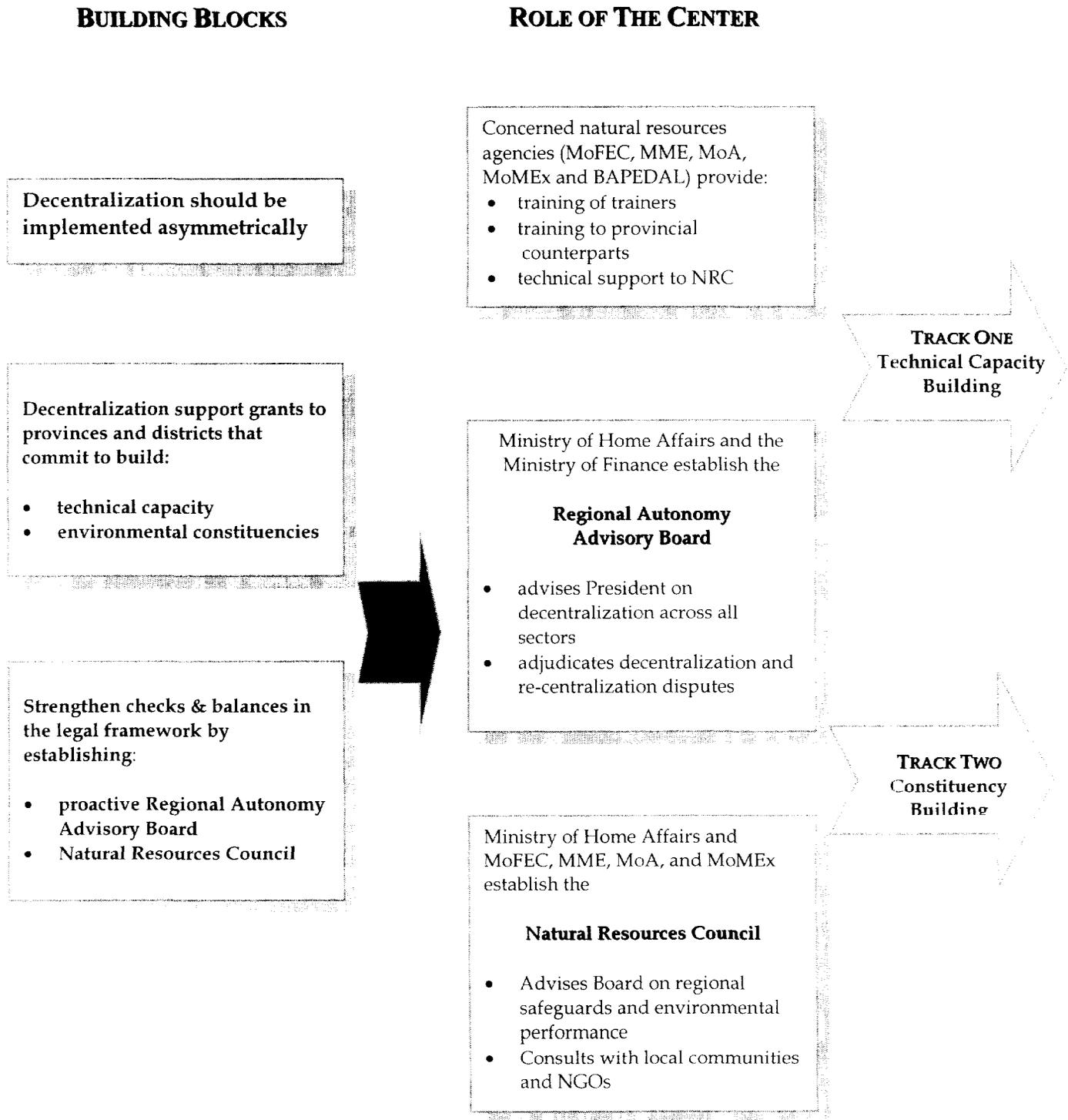
The core environment agencies. There are three levels of regional BAPEDAL. The first, the 27 provincial BAPEDALDA (BAPEDAL Daerah) are under the “regional government” / “autonomous” side of the provincial organization structure.⁹¹ Like the dinas (bureaucratic departments of the regional government), they report to the governor, and are not directly or hierarchically related to MLH or BAPEDAL at the center. In most provinces, small, low-level provincial Environment Bureaus (Biro Lingkungan Hidup, BLH), in place since the 1980s, were upgraded in 1997-98 to form BAPEDALDAs, which have higher-echelon managers and more direct access to the governor than did the BLH. Some of the largest provincial BAPEDALDA have as many as 50 staff.

Second are the district BAPEDALDAs, which report directly to the mayor or bupati. District BLH, established in the 1990s, are currently being upgraded by the Ministry of Home Affairs into district BAPEDALDAs, one by one. The larger municipal BAPEDALDAs typically have over 30 staff. Rural districts, particularly in low population areas, are likely to be among the last regions establishing BAPEDALDAs.

The third type of regional BAPEDAL are the four BAPEDAL Regional (previously known as BAPEDAL Wilayah), which are deconcentrated branches of BAPEDAL, located in Riau, Bali, South Sulawesi and Jakarta. Like the regional office of the USEPA, each BAPEDAL Regional has oversight over a set of provinces. The nature of the BAPEDAL Regionals’ oversight and technical assistance functions remains to be defined.

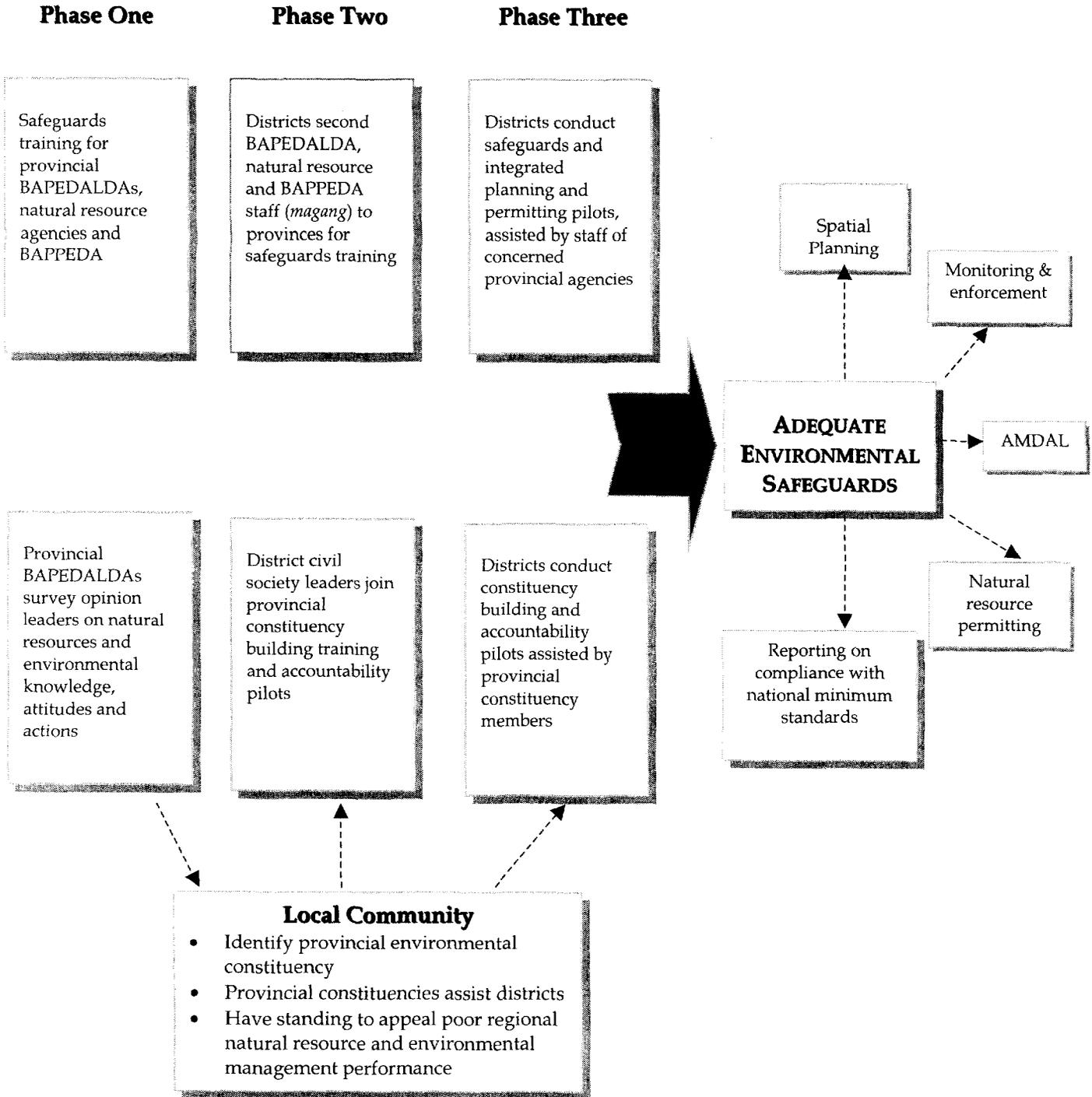
⁹¹ See the description of the previous regional governance framework and organization of the provinces under the new framework, earlier in this chapter.

FIGURE 6.1. STRATEGY OF NATURAL RESOURCE SECTORS



FOR DECENTRALIZATION WITH ENVIRONMENTAL SAFEGUARDS

ROLE OF PROVINCES AND DISTRICTS



Safeguards services the district and provincial BAPEDALDA are expected to deliver include an improved AMDAL process, improved monitoring information and enforcement services. The skill requirements will need to be clearly defined, relative to level of government and the mix of environmental issues arising in specific localities.

At all three levels, regional BAPEDAL staff generally have university degrees in non-technical subjects.⁹² Most, if not all, staff at all levels have received advanced AMDAL training. As provincial BAPEDALs have had the mandate to manage cross-sectoral Provincial AMDAL Commissions for only three years, not all provinces have fully operational AMDAL Commissions. Hands-on AMDAL review experience and implementation monitoring capacities need further strengthening at the provincial level, and safeguards skills such as these should be a top capacity building priority. As noted above, safeguards experience is even more scarce at the district level, where BAPEDALDAs still lack a formal AMDAL review mandate under the existing AMDAL Regulation.

Some regional staff have received training in monitoring methods, and in over half the provinces, BAPEDALDAs have gained industrial effluent monitoring experience through participation in BAPEDAL's PROPER Prokasih industrial water pollution control program. However, training in compliance and enforcement skills such as inspection methods has been limited mainly to central BAPEDAL staff in Jakarta.

Establishing technical credibility with the regulated community is an issue for regional BAPEDALs at all three levels. In Semarang, for example, industrial plant managers surveyed in 1998 generally agreed that municipal Industry and Trade Office staff had better technical skills and were better able to advise on pollution prevention and mitigation than municipal BAPEDALDA staff. The latter, they said, tended to visit plants in response to complaints from the community only, to raise mainly legal issues and to quickly reach the limits of their technical knowledge in discussions with plant managers.⁹³

For BAPEDALDAs in resource-rich, low population areas and rural kabupaten, where priority environmental issues are mainly in the natural resource sectors, the technical credibility challenge will be even more acute. Given that BAPEDAL's mandate and experience have focused mainly on industrial and urban pollution to date, both BAPEDAL and the regional BAPEDALs at all levels lack knowledge and experience in applying safeguards in the natural resource sectors. The recent establishment of BAPEDALDAs in the resource-rich, low population provinces and rural kabupaten poses a strategic human resource development issue for regional BAPEDALs – to what extent should BAPEDALDAs develop specialized knowledge of environmental aspects of the natural resource sectors, and to what extent should such knowledge be outsourced? If the outsourcing option is chosen, without developing sufficient in-house expertise to oversee natural resource safeguards, regional BAPEDALs' technical credibility could be seriously compromised.

In the 1990s, BAPEDAL developed a large stock of training materials, which have been underutilized to date. Development of a capacity building strategy that uses these available materials and develops additional training materials in the natural resource sectors should be a top

⁹² Regional BAPEDAL staff with biology or natural resource-related training are few, and engineers are even more rare.

⁹³ See Jean Aden, "A Rapid Appraisal of Industrial Pollution Abatement in Semarang, Indonesia: Issues and Opportunities," 1998.

priority. Through training of trainers, the center should consider mobilizing the BAPEDAL Regional and provincial BAPEDALDAs to deliver training to the districts.

Natural resource and other agencies. To mainstream safeguards and best practices into their operations, the natural resource line agencies will need sector-specific working knowledge of national minimum standards, AMDAL preparation, types of expected environmental impacts, and prevention and mitigation options in their sectors. In MME, the Environment Bureau (Biro Lingkungan Teknik) under the Secretary General's office in Jakarta, in cooperation with donors, has conducted environmental training, mainly for center staff, but including staff from twelve provincial kanwil as well. In MoFEC, the Directorate General in which sustainable forest utilization practices is concentrated, the Directorate General of Nature Conservation, operates separately from other directorates general, which do not offer environmental training. In both mining and forestry sectors, training targeted to the new roles of each level of government under decentralization and developed in cooperation with BAPEDAL and the regional BAPEDAL should be a priority task of the center.

Another contributor and participant in training for the environmental agencies and the natural resource sector agencies should be the Regional Planning Agencies (BAPPEDAs) at provincial and district levels. The BAPPEDAs have the mapping and overlay skills that are key to development of integrated planning, permitting environmental safeguards and monitoring practices at both levels. The BAPPEDAs have already conducted provincial joint planning exercises – called *paduserasi* – with MoFEC in the 1990s, but pending forestry reforms, *paduserasi* has produced limited results. To facilitate integrated regional planning, managed by the BAPPEDAs, forestry reform is critical.

Environmental Constituencies and Accountability

Whether decentralization delivers positive environmental outcomes or causes lasting damage to regional resources will depend not only on regional technical capacity, but on what regional leaders and their constituencies know, think and do to influence natural resource utilization in their regions. In countries around the world, emergence of environmental constituencies armed with knowledge of environmental cause and effect, well-articulated pro-environmental attitudes and willingness to act on their convictions has been an essential precondition for adoption of well-conceived environmental policies and their full implementation. *Japan* and the *United States* in the 1970s and *Korea* in the 1990s are only a few of the many countries where environmental constituencies have spearheaded decisive public action to turn destructive environmental trends around.

With recent illegal logging and artisanal mining activity pushing natural resource exploitation to unprecedented levels in many regions of Indonesia, as documented in previous chapters, it would not be surprising to find no environmental constituencies in resource-rich regions off Java. The strong incentives for regional leaders to ignore environmentally destructive practices of forest and mining concessionaires during the New Order might still prevail.

Alternatively, regional leaders, acutely aware of simmering local resentment of the center's control of natural resources during the New Order, might either condone, facilitate or even lead redress of the perceived injustices of the New Order by reasserting claims to local forests, land and

surface mineral deposits. And the new fiscal arrangements under Law 25 could create perverse incentives for regional leaders to accelerate natural resource use in order to generate regional revenues. On the other hand, experience has shown that urban areas, with their institutional infrastructure (universities, laboratories, NGO branches, relatively well-trained officials and political leaders with a broader world view) are ordinarily the earliest incubators of environmental constituencies. If emerging environmental constituencies are present at all off Java, they would likely be found in the capital cities of the largest provinces.

Constituency survey. To provide an empirical foundation for this discussion of the role of environmental constituencies in Indonesia's decentralization process, a survey of 122 opinion leaders in three relatively resource-rich provinces off Java was conducted between May and July 1999.⁹⁴ Selection of the respondents – 40 in East Kalimantan and 41 each in Riau and West Kalimantan – was based on their reputations as influential leaders across a range of sectors and occupations, including provincial and district officials, military/police officers, business-persons, academics, and NGO, community and religious leaders. The survey results, presented below, are necessarily preliminary, in light of the difficult data gathering conditions surrounding the June 1999 election. Because local political leaders had not yet been elected, that critically important group could not be included in the sample, and nothing is known of their environment-related predispositions and behaviors (or lack thereof).

The survey targeted provinces with three characteristics: i) relatively resource-rich, diverse, export-oriented economies, including a substantial forestry sector; ii) relatively small populations; and iii) recent experience of high forest loss rates. Forest cover loss in East Kalimantan topped all provinces in Indonesia during the period 1985-97 (331,200 ha annual losses), West Kalimantan ranked third (165,600 ha annually), and Riau ranked eighth (72,000 ha annually).⁹⁵

The survey documented opinion leaders' perceptions of natural resource depletion and pollution levels, sources of resource depletion and environmental damage and government's management of environmental issues in their provinces. It also asked respondents whether they had engaged in specific actions to influence the environment-related behavior of officials and/or natural resource users, and examined the link between pro-environmental attitudes and pro-environmental actions.

Analysis of opinion leaders' responses revealed statistically significant variation along several dimensions, with potentially important implications for the decentralization process. Based on their perceptions of the state of environmental and forest management in their provinces, they divided into three statistically significant groups:

- a "core environmental constituency," comprised of the 30 respondents who scored *high* on general environmental sensitivity *and high* on forestry issues sensitivity. These respondents

⁹⁴ See Jean Aden, "Demand-Side Decentralization in Indonesia: Environmental Constituencies in Three Provinces," 2000. This and other background papers are available on the internet at <http://eap.worldbank.org/indonesia/environment>.

⁹⁵ D. Holmes, "Deforestation in Indonesia: A Review of the Situation in Sumatra, Kalimantan and Sulawesi," Table 1. Rates of Forest Loss. The 72,000 ha/year figure for Riau is a conservative lower bound. The same report also offers an additional annual forest loss estimate of 151,600 ha for Riau.

expressed strong pro-environmental attitudes on a range of issues, and could be appealed to on both general and forestry sector-specific concerns;⁹⁶

- a “non-environmental group,” comprised of the 37 respondents who scored *low* on general environmental sensitivity *and low* on forestry issues sensitivity. These respondents were likely either to be neutral or actively oppose environmental policies and practices, particularly those that require internalization of environmental costs by polluters and/or natural resource users; and
- a middle group, comprised of the 55 respondents who scored high on environmental issue sensitivity but low on forest issues sensitivity (“general environmental constituency”), *or* scored high on forest issues sensitivity but low on environmental issue sensitivity (“sectoral constituency”). Members of these groups would support or reject environmental policies, depending on the particular issue.

There was variability in opinion leaders’ views of government’s environmental performance, as well. Asked whether they thought MoFEC’s ability to monitor forestry concessions and enforce the terms of concession agreements had declined since the crisis, a majority of respondents viewed MoFEC’s performance mostly favorably, with 62 percent stating that MoFEC Jakarta was doing the same or better job as before the crisis. However, members of the core environmental constituency were significantly more likely to say MoFEC was showing decreasing capacity to monitor and enforce or had never had such capacity (57 percent of core environmental constituency members said MoFEC’s capacity was decreasing or non-existent versus 30 percent of the other groups).

When opinion leaders were clustered by occupation into two groups – a “government-business” cluster, comprised of local officials, police/military and businesspeople, and a “civil society” cluster, comprised of academics, NGOs, and community and religious leaders, there was a strong and significant relationship between leadership cluster (government-business versus civil society) and constituency membership. Respondents in the civil society cluster were four times more likely to belong to the core environmental constituency than were respondents in the government-business cluster (45 percent vs 10 percent). Conversely, government-business respondents were three times more likely to hold non-environmental attitudes than were civil society respondents (42 percent vs 14 percent).⁹⁷

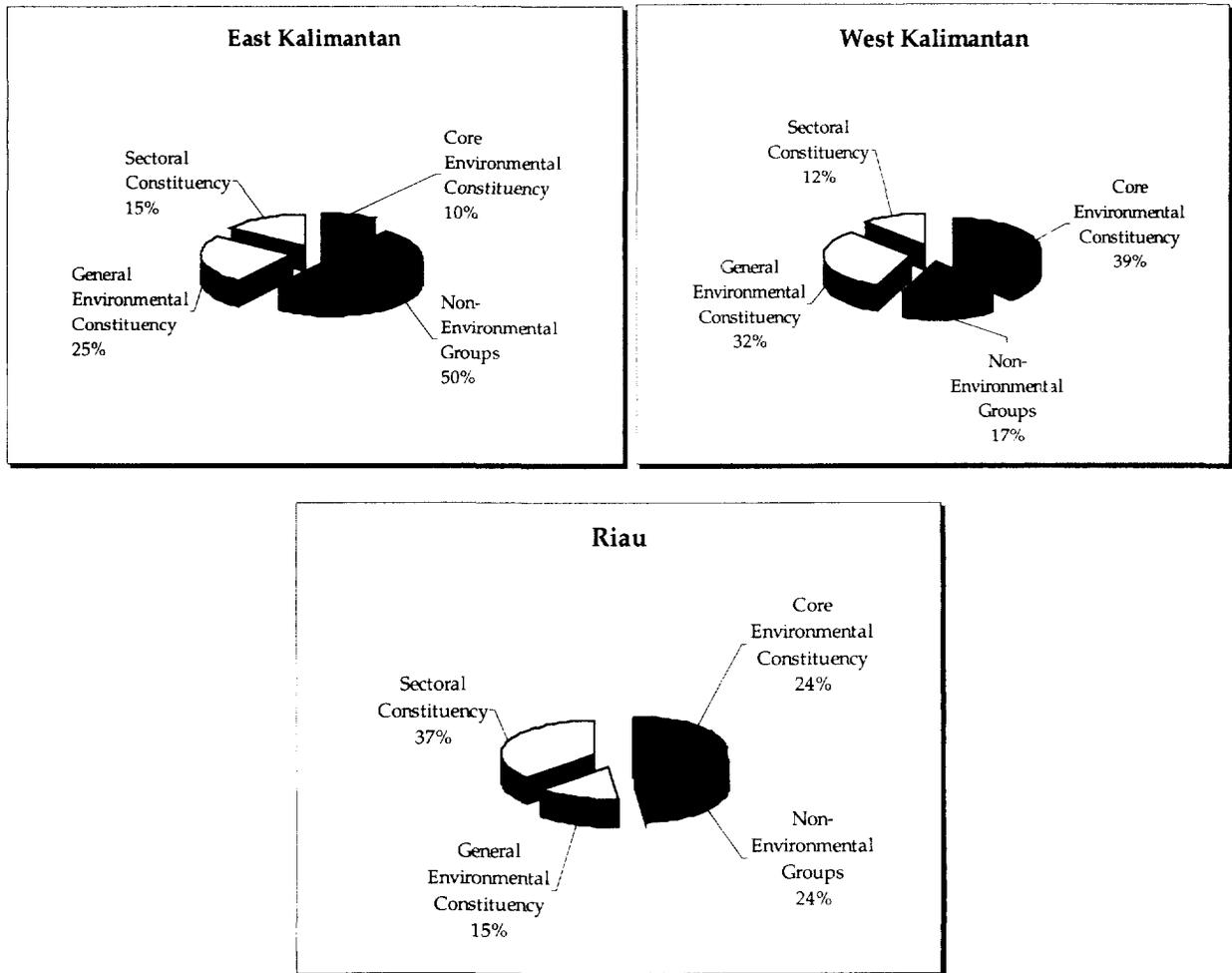
Variability among provinces was also significant. When the distribution of pro- and non-environmental constituencies was compared across the three provinces (see Fig. 6.2), the core environmental constituency was largest in *West Kalimantan*, where it accounted for 39 percent of

⁹⁶ In this case, in which damage to forests was the local environmental issue most or second most frequently cited by respondents in all three provinces, the sector-specific focus is forestry. Seventy-seven percent of respondents in East Kalimantan cited forest damage as a very serious issue, 71 percent in West Kalimantan, and 80 percent in Riau. Obviously, other sectors can be accommodated in this model - industrial pollution in West Java or mercury contamination from gold mining in South Kalimantan, for example.

⁹⁷ The strong relationship between leadership group and environmental constituency categories remains significant when controlled for all the individual characteristics referenced above (level of influence, education, media exposure, local vs. newcomer status).

respondents. Only 17 percent of respondents in West Kalimantan were classified as non-environmentalists, which was the smallest cohort of non-environmental opinion leaders among the three provinces.⁹⁸ The constituency for the environment was weakest in *East Kalimantan*, where only 10 percent of respondents were found among the environmental core, and 50 percent of respondents were classified as non-environmentalists. In *Riau*, the core environmental constituency and non-environmental group were evenly matched – each 24 percent.

Figure 6.2. Constituencies by Province



These provincial variations meant that opinion leaders in West Kalimantan were nearly four times as likely to hold *core pro-environmental attitudes* as opinion leaders in East Kalimantan (39 percent versus 10 percent). Conversely, the views of the *non-environmental group* – i.e., that forest damage is not very serious, there is no illegal logging in the province, and concessionaires are

⁹⁸ Part of West Kalimantan’s apparent pro-environmental strength undoubtedly results from undersampling the business community in that province. See J. Aden, “Demand-Side Decentralization in Indonesia,” Appendix 2 - Sample Frame.

making a serious effort to ensure healthy forests for the next generation, were two to three times more frequent among East Kalimantan opinion leaders than among their counterparts in Riau and West Kalimantan (50 percent in East Kalimantan versus 24 and 17 percent in Riau and West Kalimantan respectively).

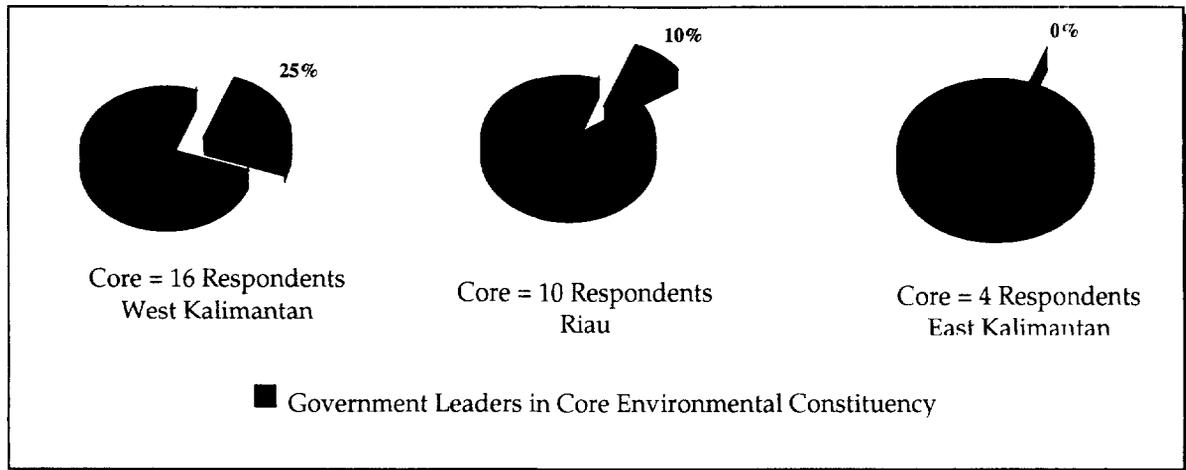
The survey also uncovered a strategic dimension of variability in the composition of the core environmental constituencies – that is, whether the core constituency is comprised of civil society leaders only or includes government and business leaders (see Fig. 6.3). Constituency composition is important because it affects capacity to mobilize support for environmental policies and practices. An inclusive core constituency that mixes civil society, government and/or business members, as in West Kalimantan, is more likely to succeed in mobilizing support from government and business opinion leaders outside the core constituency. An exclusive core constituency that lacks government and business members, as in East Kalimantan, is less likely to succeed in mobilizing government and business leaders.

Two dimensions on which respondents did not differ significantly should also be noted. One is widespread and adamant demand for decentralization. When asked which level of government should be responsible for specific forest management functions, few respondents wanted Jakarta to continue its current responsibilities and practices. Not surprisingly, opinion leaders' overwhelming preference was for an expanded local role, with or without Jakarta sharing responsibility, in negotiation of future land use on expiration of concessions, revenue collection and allocation, reporting arrangements with concessionaires, and monitoring, inspection and enforcement functions (see Table 6.3).⁹⁹

The second shared trait was the weak link between pro-environmental attitudes and behaviors to improve environmental quality, across all respondent groups. While half of respondents said they had taken some action, e.g. awareness-raising activities and raising environmental issues with a government official, those with the strongest pro-environmental attitudes (the core constituency) were not systematically more likely to have engaged in environmental actions. The weak action measures in the survey questionnaire reflected the virtual absence and/or poor functioning of formal mechanisms for pro-environmental actions by government officials and the public at the regional level. To strengthen the link between attitudes and actions, local officials need essential tools (such as, a menu of incentives and penalties against environmentally destructive behavior), administrative authority to apply such tools, and regional political will, in the form of consistent support from the regional head.

⁹⁹ Substantial numbers of respondents say these functions should be carried out entirely at the local level, completely excluding Jakarta. Twenty-nine percent call for local governments to negotiate future use of concession areas after concessions expire; 43 percent say local governments should collect and allocate forestry revenues; 43 percent want technical reports on forest concession operations to go to local governments; and 90 percent want local governments to be responsible for inspection of forest concessions.

Figure 6.3. Government Opinion Leaders as Proportion of Core Environmental Constituency by Province



The survey findings lead to several conclusions:

- constituency building should have top priority for BAPEDAL, the BAPEDALDAs and other agencies and stakeholders with environmental responsibilities. Campaigns to spread environmental knowledge, build pro-environmental attitudes, and forge links between attitudes and actions should be targeted on districts and provinces;
- focusing constituency-building efforts on provinces first, given that they are more likely to have the kind of institutional infrastructure that ordinarily leads to the early emergence of environmental constituencies, makes sense. Provinces could provide the foundation and training ground, from which second-stage efforts to build district-level constituencies could be launched; and
- the significant variation in core environmental constituencies' size relative to non-environmental groups and composition across provinces flags the need to factor these important dimensions into the speed and sequencing of decentralization in the natural resource and environmental sectors. Provinces with the strongest pro-environmental constituencies would be the best candidates for early devolution of authority over safeguards. Conversely, provinces and districts where opinion leaders show no concern or willingness to take action for environment should receive new authority later, rather than sooner.

Evaluation of fledgling environmental constituencies' strength and composition is needed, to enable targeting of constituency building efforts. A champion of constituency assessment and strengthening efforts is also needed. A Natural Resource Council, in collaboration with PKA, MLH, BAPEDAL, the regional BAPEDALs and interested donors, could perform this function.

Table 6.3. Preferences for Level of Government to Take Lead Responsibility

Which level of government should take lead responsibility for...				
	Negotiating future land use when concessions expire	Collecting and allocating concession revenues	Receiving concessionaires' reports on timber output, log prices and operations	Monitoring, inspection and enforcement of terms of concession agreements
MoFEC Jakarta should continue its current responsibilities and practices	14%	9%	20%	19%
MoFEC Jakarta and local government should share responsibility	56%	48%	36%	45%
All responsibility to be assigned to local government	30%	43%	43%	33%

Accountability. Environmental constituencies and accountability, defined as the degree to which government has to explain or justify what it does or fails to do, are two sides of a single coin. The formal foundation of accountability is regional election of regional officials. Under Laws 22 and 25/1999, this foundation is strongest at the district level, where selection of the bupati or mayor is no longer subject to higher-level approval, and the district head is financially accountable to the DPRD. It is somewhat less strong at the provincial level, where the governor continues to be selected in consultation with the President, and the governor's primary financial accountability is to the President and central ministries. However, elections are blunt instruments, exercised only at intervals and providing only the broadest citizen control over government.

The heart of accountability is a two-way exchange between local communities and government, in which old habits of passivity on the part of local communities are replaced by more proactive, participatory community engagement in decisions affecting the common good. Similarly, regional officials' engrained habits of seeking higher-level approval and largely one-way communication with local communities should be replaced by two-way communication, in which the official is prepared to explain and justify government performance and use of public resources. The AMDAL process is specifically designed to provide environmental constituencies with information about proposed natural resource utilization and its potential impacts, and to ensure that officials responsible for granting natural resource utilization permits are held accountable for potential adverse impacts of activities for which they grant permits. However, unless environmental constituencies and accountability mechanisms are functioning properly, environmental safeguards cannot function properly.

Box 6.2 . Accountability Mechanisms¹⁰⁰

In addition to local elections, citizens need more discriminating instruments to reinforce accountability. Examples of available instruments employed in developed and developing countries include:

- NGO-led workshops and seminars, which can inform and help articulate local communities' reaction to local government and lobby officials to be responsive;
- opinion surveys to assess and publicize public opinion about service delivery;
- public meetings, which can be an effective mechanism for encouraging citizens to express their views and obliging public officials to answer them. The *cabildos abiertos* (open consultations) held in many *Latin American countries* are a good example. Another is the "open budget sessions," held during preparation of public expenditure budgets, that are being piloted in some countries. In some settings, such meetings may be little more than briefing sessions, but in others they can be effective in getting public officials to defend their actions; and
- formal redress procedures, which have been included as an accountability mechanism in some decentralization initiatives. *Bolivia* probably has the most elaborate instrument along these lines, with its municipal Vigilance Committees that are based on traditional local social structures, are charged with monitoring elected councils, and are encouraged to file actionable complaints with higher levels and/or advisory boards (for example, the Regional Autonomy Advisory Board), if needed.

One way for bupati, mayors and governors to begin building accountability is to hold informal, regularly scheduled "open door" sessions at their offices, at which any member of the local community can raise issues and receive a response. For additional accountability mechanisms that have been successfully applied in developing countries, see Box 6.2. Donor assistance in the natural resource sectors should be required to include funds for the awareness raising and constituency building that will be needed, to activate mechanisms such as these.

Conclusions and Recommendations

Whether Indonesia's drive to decentralize leads to more efficient, sustainable resource use or invites serious environmental deterioration will depend to a large extent on whether decentralization goes forward with or without adequate environmental safeguards at the regional level. *With safeguards*, regional commitment, a transparent, consultative AMDAL process and consistent application of national minimum standards will improve the likelihood that this generation will bequeath a sustainable resource base to future generations. *Without safeguards*, newly empowered regional authorities are likely to condone or even invite more uncontrolled resource use to boost regional income and revenues, without regard to potential long-term and perhaps irreversible impacts on the regional resource base.

Four factors – the incentives created by the legal framework for decentralization, regional technical capacity, the presence or absence of a regional environmental constituency, and scope for

¹⁰⁰ For further discussion of accountability in the context of decentralization, see www-wbweb.worldbank.org/prem/prmps/decentralization/accountability.htm.

asymmetric decentralization – will largely determine whether decentralization will lead to positive or negative environmental outcomes.

The evolving legal framework for decentralization (Law 22/1999, Law 25/1999 and PP 25/2000) appears to create incentives for less sustainable natural resource use in two senses. Indonesia's approximately 350 districts will become more dependent on natural resource-based revenues, and the resulting perverse incentives to accelerate land conversion and natural resource exploitation in the forestry and mining sectors could prove compelling for bupati in revenue-starved rural districts. In addition, the legal framework appears to provide scope for some natural resource sectors, such as forestry, to avoid significant decentralization, while others, such as mining, appear to be moving toward radical devolution of authority to the district level, where district negotiating and oversight capacities are likely to be overwhelmed by medium- and large-scale mining companies.

On the other hand, the legal framework creates several potential "checks and balances" to prevent or correct misallocation of functions (districts' and provinces' option to "upload" functions, the Regional Autonomy Advisory Board, the President's authority to veto regional regulations and decisions, and the regions' right to appeal). To support sustainable resource use under decentralization, these mechanisms need to be substantially strengthened (see below).

Overall, technical capacity for safeguards application is limited at provincial and, to an even greater extent, district levels, in both core environment agencies (the regional BAPEDALs at all levels) and the natural resource agencies. Given that BAPEDAL's mandate and experience have focused mainly on industrial and urban pollution to date, both BAPEDAL and the regional BAPEDALs at all levels lack knowledge and experience in applying safeguards in the natural resource sectors.

Regarding the third essential precondition for decentralization with safeguards – strong regional environmental constituencies – a survey of opinion leaders in three resource-rich provinces off Java showed significant variability on several dimensions, with potentially important implications for decentralization. Significantly more opinion leaders shared core pro-environmental attitudes in some provinces than in others. Moreover, some provinces' core environmental constituencies were more inclusive (that is, included government officials and businessmen as well as civil society) than others. Nevertheless, a common denominator across all three provinces was the weak link between *attitudes* and specific *actions* to support sustainable natural resource use. The survey results underline the fact that community support for the environment is significantly more developed in some regions than in others, and needs to be encouraged as an integral part of the decentralization process.

Recommendations. Five elements of a strategy to support decentralization of the natural resource sectors with adequate safeguards are:

- *First, recognize that successful devolution will necessarily be asymmetric: some regions will be ready for natural resource and environmental management sooner than others.* Assigning differentiated authority to regional governments based on political commitment, technical capacity, revenues, population, and constituency strength can alleviate the pressure of having to implement a country-wide uniform decentralization program.

- *Second, recognize that regional BAPEDALDAs' technical credibility with the regulated community is an issue, and is particularly acute in regions where priority environmental issues are mainly in the natural resource sectors.* Given BAPEDAL's focus on industrial and urban pollution to date, both BAPEDAL and the BAPEDALDAs lack knowledge and experience in applying safeguards in the natural resource sectors. Development of a capacity building strategy that includes training in environmental aspects of the natural resource sectors should be a top priority. Strengthening of safeguards capacities of natural resource agencies and BAPPEDAs is also needed. Available technical capacity and constituency-building resources – in particular, the generally stronger institutional base for building capacity and constituencies at the provincial level – should be used to strengthen safeguards capacity for the benefit of the districts, in particular, rural districts. District staff could be seconded (*magang*) to provinces for training and piloting.
- *Third, environmental constituency building should have high priority for BAPEDAL, the BAPEDALDAs and other stakeholders with environmental responsibilities.* Campaigns to spread environmental knowledge, build pro-environmental attitudes, and forge links between attitudes and proactive behaviors to improve environmental quality should be targeted on key decision-makers in districts and provinces. Constituency-building should be accompanied by “accountability pilots,” featuring two-way communication between officials and constituencies, in which the official is prepared to explain and justify government performance and use of public resources related to natural resource and environmental management.
- *Fourth, strengthen the “checks and balances” in the legal framework for decentralization to prevent misallocation of functions among levels of government.* Strengthen the adjudication role of the Regional Autonomy Advisory Board, by mandating proactive and systematic monitoring of regional performance of decentralized functions generally, and relative to natural resource and environmental management in particular. Also, establish a cross-sectoral Natural Resources Council to provide technical advice to the Board on natural resource management and environmental safeguards at provincial and district levels. Ensure that the Board and Council members include all levels of government and civil society, and that local communities have standing to appeal when regional natural resource and environmental management performance is inadequate.
- *Fifth, decentralization support grants* to districts and provinces that demonstrate commitment to capacity building, constituency building and regional implementation of safeguards could be a mechanism to facilitate decentralization, while recognizing the need for an asymmetric approach.

Finally, Table 6.4 summarizes the suggested roles of each level of government, cross-level bodies and local communities in decentralization of the natural resource sectors.

Table 6.4. Decentralization of Natural Resource Utilization and Environmental Safeguards Functions by Level of Government

Responsible Level		Functions
Center		<ul style="list-style-type: none"> ➤ Provide <i>legal framework</i> that defines clearly responsibilities and services to be provided at central, provincial and district levels, how each level will generate revenues, and how their performance will be evaluated. Set minimum national standards. Specify a notional timeframe for transition, recognizing that implementation will necessarily be asymmetric. ➤ <i>Set policy and get out of operations</i>, except where functions are specifically reserved to the center or activities cross regional boundaries (e.g. central responsibility for cross-provincial activities), and reorganize central agencies and fiscal balance accordingly. ➤ Deliver <i>training</i> (mainly training of trainers to provinces), to build knowledge of minimum standards and service delivery capacity. ➤ <i>Monitor compliance</i> with national minimum standards (mainly provincial compliance during early decentralization), and be prepared to recentralize functions where compliance is lacking. ➤ <i>Perform provincial natural resource utilization and safeguard functions</i>, if “uploaded” from provinces and/or recommended by Regional Autonomy Advisory Board.
Cross-level Management Mechanisms	Regional Autonomy Advisory Board	<ul style="list-style-type: none"> ➤ Evaluate regional service delivery and performance, to determine <i>readiness for decentralization</i>, and <i>need for recentralization</i> in case of regional failure to meet national minimum standards.
	Natural Resource Council	<ul style="list-style-type: none"> ➤ <i>Conduct consultation</i> with all levels of government and civil society regarding natural resource utilization permitting, environmental safeguards and monitoring. ➤ <i>Advise Regional Autonomy Board</i> on permitting, environmental safeguards and monitoring.
Province		<ul style="list-style-type: none"> ➤ <i>Develop and implement integrated regional planning, permitting, environmental safeguards and monitoring</i> of natural resource utilization, for cross-district and mid-size activities. ➤ <i>Deliver transitional on-the-job training</i> to district officials, temporarily seconded to provincial agencies, to prepare for eventual full district autonomy. Working with district officials, assist pilots of integrated regional planning, permitting, environmental safeguards and monitoring of natural resource utilization to within-district and small-scale activities at district level. ➤ <i>Self compliance monitoring and reporting</i> to community organizations and center. ➤ <i>Build accountability</i> to provincial community and upward. ➤ <i>Asymmetric transfers of authority</i> and sharing of responsibility, based on different natural resource endowments, population, capacity and constituencies. ➤ <i>Perform district natural resource utilization and safeguard functions</i>, if “uploaded” from districts and/or recommended by Regional Autonomy Advisory Board.
District		<ul style="list-style-type: none"> ➤ <i>Build capacity</i> to deliver natural resource utilization and environmental management services. ➤ <i>Build accountability</i> to local community and upward. ➤ <i>Pilot integrated regional planning, permitting, environmental safeguards and monitoring</i> of natural resource utilization for within-district and small-scale activities. ➤ <i>Self compliance monitoring and reporting</i> to local community and upward to province and center. ➤ <i>Asymmetric transfers</i> of authority and sharing of responsibility at district level, based on different natural resource endowments, population, capacity and level of constituency development.
Local community		<ul style="list-style-type: none"> ➤ <i>Constituency building</i>, moving from passive acceptance of government’s actions to insistence on consistent delivery of services tailored to local needs, and accountability of district and provincial officials.

7. Conclusions and Recommendations

Indonesia's forestry and mining sectors and biodiversity protection efforts have undergone important changes during a period of massive economic and political transition, and these changes have significant implications for the future of the country's natural resource base, particularly in the resource-rich areas off Java. During this time of transition, the controls over resource extraction established by the New Order government have been rendered much less effective. However, an improved natural resource and environmental management framework, including environmental safeguards, is not yet in place. A major objective of the report has been to identify steps toward putting into place a new natural resource and environmental management framework designed to produce more sustainable natural resource outcomes than under the prior system.

In addition to covering specific natural resource sectors, there are two cross-cutting themes – first, public environmental expenditures, which serve as indicators of government's response to intensifying pressures on the environment; and second, the post-Suharto governments' major fiscal and administrative decentralization initiatives, due to become effective in 2001, which will surely impact the natural resource base in the resource-rich areas. The main conclusions and recommendations in these five priority areas are summarized below.

Forestry. After several years' interruption, MoFEC and a group of donors with forestry concerns resumed forestry policy dialogue in 1998. An essential foundation for the dialogue is the recent forest cover mapping exercise conducted by MoFEC, which has produced the most reliable aggregate data on forest cover loss rates and the size of the forest estate since the late 1980s. The loss of 20 million ha of forest cover off Java during the period 1985-97, equating to 1.7 million ha annually, has driven the area of Indonesia's forest estate below the 100 million ha mark, to an estimated 96 million ha in 2000. The principal factors contributing to Indonesia's high deforestation rate are well known, and are illustrated by a series of presentations by Indonesian experts, supplemented by Bank studies and analysis, which are summarized in the Forest Resources chapter. These factors include the forest fires of 1997-98, production forest concessionaires' management practices, illegal logging, overcapacity and lending without due diligence in the wood processing industry, the continuing disconnect between spatial planning and forest delineation and management, and land use conflicts involving community and traditional forest users. A major cause of continuing patterns of inadequate planning, lack of consultation, and collusion and corruption in forest land conversion is MoFEC's insistence on retaining forest area designation and conversion authority at the center.

Prospects for slowing or halting forest loss trends depend on successful completion of the forestry policy dialogue. Two of the main sticking points at this point in the dialogue are within MoFEC's discretion: the inclusiveness of the dialogue (the Interdepartmental Committee on Forestry still lacks representation of sectors other than forestry) and MoFEC's willingness to consider delegating management of nominal forest land that has lost forest cover to parties outside the forestry bureaucracy, such as local communities, NGOs, the private sector and/or other natural resource agencies. If such delegation were accompanied by a rigorous evaluation of the delegates'

performance, with an option for MoFEC to revoke the delegation in case of poor performance, future forest allocation could be conducted on a more objective, results-oriented basis.

Biodiversity protection and management. While many priority actions under the country's first Biodiversity Strategy and Action Plan (BSAP) have been implemented since the early 1990s, the main drivers of biodiversity loss – habitat loss, fragmentation and degradation, overharvesting of species with medicinal and specialist food value, and secondary extinction due to loss of lowland forests – continue to exert downward pressure on the country's biodiversity stock. Rural poverty, social resentment, weak governance and loss of control from the center have facilitated an increase in illegal logging, which has not spared protected areas, even those receiving the largest shares of the conservation budget and subject to international scrutiny.

Lessons learned during implementation of Integrated Conservation and Development Programs and local communities' recent more assertive claims to local resources in both protected and production areas underline the importance of pragmatic efforts to better reconcile biodiversity with local livelihoods. Innovative initiatives to develop an improved, consultative boundary demarcation process are urgently needed. Block grant schemes to compensate kabupatens with large national parks within their boundaries are also needed. Effective government action to stop illegal logging in protected areas and ensure that powerful military and local sponsors do not escape prosecution will be a key test of political will, and should be a condition of GEF support under the second BSAP.

Mining. Although the mining boom of the 1990s disturbed hundreds or thousands of hectares at each mine site and generated tailing wastes that raised the risk of costly accidents, Indonesia's mining sector has been relatively fortunate to date. The relative newness of Indonesia's large-scale mining operations, which generally use new technology, and the relatively small portion of territory dedicated to mining have been plus factors for the environment. With the exception of a tailings dam rupture in 1990, the country has not experienced major mining accidents.

Environmental mis-management is most severe among medium-scale mines and, especially, artisanal and small-scale mines (ASM). Medium-scale operations, which are poised for rapid growth in the short to medium term, are generally poor environmental performers. Illegal, unregulated ASM gold operations, which have grown rapidly since the economic crisis and are likely to continue to do so, are releasing untreated mercury, which causes severe and irreversible health damage, into rivers that supply water and fish. However, mining health risks have not been widely communicated in Indonesia. With rapid expansion of the sector at all scales – large, medium and small – highly likely in the next decade, a growing proportion of provinces and districts will face environmental and social challenges in the mining sector.

The recent entry of mining issues into the national environmental agenda poses an opportunity to make the mining sector a model for sustainable decentralization of authority and responsibility in the natural resource sectors, with adequate environmental safeguards. Using past capacity building initiatives as a foundation, MME's environmental units at the center should proactively train trainers in environmental safeguards and best practices at the provincial level. Partnerships with BAPEDAL to disseminate environmental safeguards and with health agencies and NGOs to spread knowledge of the health and occupational risks of mining to the district level and below should be actively pursued. MME should ensure that the levels to which negotiating and environmental oversight functions are devolved are commensurate with the scale of each mining

operation. For instance, a kabupaten with limited staff, limited technical capacity and a weak environmental constituency should not be expected to oversee a massive multinational mining operation. However, kabupaten governments may be best suited to reduce health and safety risks of ASM, because they are close to the problems, and the necessary resources (public awareness materials and extension agents) could be much more within a kabupaten's reach than the skills needed to interact effectively with large mining companies. MME, in partnership with regional governments, can do much to promote accountability of mining operators and regional governments for prevention and mitigation of environmental damage from mining operations.

Public environmental expenditures. Public environmental expenditure trends are an important indicator of government's responsiveness to the worsening environmental trends explored in this report. The Environmental Expenditures chapter has demonstrated that Indonesia has imposed larger cuts on environmental spending than on expenditures on other social sectors and the budget as a whole since the economic crisis. Moreover, among the East Asian crisis countries, Indonesia spent the least on environmental prevention and mitigation before the crisis, and has cut environmental budgets more deeply during the crisis. More worrying in the context of decentralization is evidence that environmental expenditure has declined more steeply in regional budgets than in the national budget.

Regional heads and legislatures need to allocate funds for environmental expenditures that are more commensurate with intensifying environmental challenges in the regions. Increased expenditures for prevention and mitigation of environmental damage need to be made in a climate of stronger regional environmental constituencies and official accountability for environmental expenditures and their outcomes.

Decentralization of the natural resource sectors. Through the 1990s, the vast natural resource base off Java, on which export growth has been and will remain critically dependent, remained largely beyond the institutional reach of the central agencies – MLH and BAPEDAL – in which the country's limited environmental management capacity was concentrated. The core elements of environmental safeguards – environmental standards, environmental impact assessment, spatial planning and monitoring and enforcement systems – suffer various shortcomings in forestry, biodiversity protection and management, and mining. Poor coordination across agencies and levels of government and weak environmental constituencies weaken implementation of existing safeguards, especially at provincial and district levels. Unless countermeasures are taken, decentralization will magnify greatly the consequences of these weaknesses.

The decentralization strategy laid out in the current legal framework for decentralization is unusual, in that it largely bypasses the country's 27 provinces and cedes greater autonomy to the 350 districts (both municipalities and rural kabupaten). In terms of allocation of authority and responsibility for natural resource and environmental management, this report concurs that strong district level management capacity is a medium- to long-term objective and, indeed, an indicator of a healthy and mature natural resource and environmental management system. It should be noted, however, that most countries that have successfully pursued a decentralized approach to environmental management have devolved authority mainly to the provincial level. This is because local governments are sometimes too close to environmental problems and are sometimes part of the problem – for example, when they grant permits to polluting industries without

safeguards or operate waste treatment systems that do not meet national minimum standards. Moreover, provincial capital cities and towns are much more likely to be able to afford highly trained environmental personnel and sophisticated equipment, and to have the institutional infrastructure for support of essential technical capacity building and constituency building during decentralization. At present, these elements are less developed at the district level. Decentralization to the district level should be pursued gradually, as these functions become sufficiently robust.

With these considerations in mind, this report recommends a practical approach to decentralization of natural resource and environmental management, which emphasizes:

- *a two-track program of technical capacity and constituency building, which relies on and strengthens provincial capacity and constituencies while strengthening and piloting district capacity and constituency building activities;*
- *strengthening of checks and balances to prevent or correct misallocation of functions;*
- *an asymmetric approach, which recognizes that some regions will be ready for decentralization sooner than others; and*
- *decentralization grants to support phased devolution, targeted on regional governments that commit to the two-track program.*

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THE WORLD BANK

1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Telephone: 202 477 1234

Facsimile: 202 477 6391

Internet: <http://eap.worldbank.org/indonesia/environment>