Folder Title:	Indonesia - Natural Resources and Environmental Management - 1987-1993
Folder ID:	30098693
Series:	Subject files
Dates:	10/01/1987 - 01/28/1993
Fonds:	Personal papers of Gloria Davis
ISAD Reference Code:	WB IBRD/IDA DAVIS-15
Digitized:	06/09/2023

Indonesia - Natural Resources & Environmental Management 1987, 1993

Biodiversity Support Program

WWF

The Nature Conservancy

A U.S.A.I.D.-funded consortium of World Wildlife Fund, The Nature Conservancy, and World Resources Instititute

January 28, 1993

Dr. Gloria Davis
Environment Department
The World Bank
1818 H Street, N.W.
Washington, D.C. 20433

Dear Dr. Davis:

I'm writing to request your assistance in providing a technical review of the Environmental Assessment (EA) of USAID's Natural Resources Management Project (NRMP) in Indonesia. The EA was undertaken by a team recruited by the Biodiversity Support Program in September - November 1992.

The EA was conducted at the request of the USAID Mission in Jakarta in order to comply with relevant U.S. Government legislation and USAID regulations. We hope that lessons learned from the NRMP EA will serve to improve the environmental assessment process for USAID projects already designed to be "environmentally friendly", such as NRMP.

There are no plans to publish the EA report, but the current final draft will be revised prior to its submission to USAID/Jakarta in final form. The full English-language EA report consists of seven volumes: a summary of findings and recommendations, and six reports by individual team members. We are sending you a copy of the summary, and would be happy to provide copies of the annexes upon request. We appreciate receiving any comments you may have by mid-February.

Thank you very much for your assistance. We appreciate your taking time to review the document and hope you find it to be of interest.

Sincerely,

Janis Alcorn

Janis Alcorn, Ph.D.

enclosure

c/o World Wildlife Fund • 1250 24th Street, NW • Washington, DC 20037 • Tel: (202) 293-4800 • Fax: (202) 293-9211 • Telex: 64505 PANDA

DRAFT

FINAL DRAFT

SUMMARY OF FINDINGS AND RECOMMENDATIONS

OF THE

ENVIRONMENTAL ASSESSMENT

OF THE

NATURAL RESOURCES MANAGEMENT PROJECT (NRMP)

Submitted by: Frances J. Seymour, Team Leader

On behalf of: The Biodiversity Support Program (BSP)
Washington, D.C.

Based on reports by: Patrick Dugan, Forest Management Specialist
Anita Kendrick, Social Scientist
Lesley Potter, Ph.D., Social Scientist
Herwasono Soedjito, Ph.D., Forest Ecologist
Hernán Torres, Nature Conservation Specialist
Alan White, Marine Conservation Specialist
Nengah Wirawan, Ph.D., Nature Conservation Specialist

With contributions from: Wandoyo Siswanto, Kristianus Atok, Arnold Winawatan, and Djoko Prawoto Praseno

Date: January 21, 1993

DRAFT

ACKNOWLEDGEMENTS

This report benefited from the assistance of a large number of individuals and institutions. Kathy Saterson, Janis Alcorn, Charles Zerner, Rich Richina, Margaret Bjerklie, and Wanda Towles at the BSP provided technical, administrative, and moral support throughout the assessment. Jim Tolisano provided assistance to the BSP in preparation of the scope of work. Molly Kux, Jim Tarrant, and Tobey Pierce of USAID's Asia Bureau, and Pat Durst and Scott Lampman of the United States Forest Service provided the team leader with much-needed guidance prior to departure for Indonesia.

Jerry Bisson and his staff at USAID in Jakarta and Colin MacAndrews and his staff at NRMP/ARD project offices in Jakarta, Pontianak, Bukit Baka, and Manado -- particularly Sukarman, Esthy, and Bob -- responded with graciousness and efficiency to the many logistical demands of the EA team. NRMP advisors and consultants Jill Belsky, Lisa Curran, Elmo Drilling, Ali Hayat, Jeff Izefri, Jim Jarvie, Mering Ngo, Fernando Potess, Rizal Rompas, Graham Usher, and Roy Voss gave generously of their time in assisting the EA team to understand the NRMP and responding to our questions and suggestions.

Numerous Ministry of Forestry officials facilitated the team's work. Sopari Wangsadidjaja, Wahjudi Wardojo, Tony Soemartono, and Ramon Palete were especially helpful, as was Kuswanda of ITTO and Nana Suparna of the Alas Kusuma Group. Herman Haeruman and his staff at BAPPENAS and numerous provincial government officials in West Kalimantan and North Sulawesi provided guidance and support in the context of scoping and debriefing sessions.

Sandra Moniaga of WALHI, Kristianus Atok of IDRD, and Arnold Winawatan of Yayasan Nurani ably facilitated the team's interactions with NGOs, and provided significant, substantive input to the EA. Wandoyo Siswanto of PHPA and Djoko Prawoto Praseno of LIPI joined the team for portions of its work, and provided much assistance and many valuable insights.

The staff of P.T. Sari Bumi Kusuma (SBK) in Pontianak and Bukit Baka provided unstinting hospitality at the logging camps, and opened their operations and their files for the EA team's perusal. Dr. Hanny Batuna of the MUREX dive company in Manado was particularly helpful to the team. Villagers and local government officials at the three project sites gave generously of their time, knowledge, hospitality, and patience.

Patrick Dugan, Anita Kendrick, Lesley Potter, Herwasono Soedjito, Hernán Torres, Alan White, and Nengah Wirawan maintained remarkably good humor under conditions that were frequently challenging, and produced the analyses upon which this report is based. Special thanks for editorial assistance are due to Yoon Park. Any errors of fact or interpretation are the responsibility of the author.

EXECUTIVE SUMMARY AND GUIDE TO THE FULL REPORT

During a two-and-one-half month period from September through November 1992, a team fielded by the Biodiversity Support Program conducted an Environmental Assessment (EA) of field activities of the USAID Natural Resources Management Project (NRMP) in Indonesia being implemented by the Ministry of Forestry (MOF). The full report consists of eight volumes: a summary of the EA team's findings and recommendations, six reports prepared by individual team members (Annexes A - F), and a volume containing an Indonesian-language summary and Indonesian-language contributions from other participants in the EA.

The eight-member EA team was assisted in its work by locally-recruited resource persons from government agencies and non-governmental organizations. Formal and informal scoping sessions were held in Jakarta and in the provincial capitals of West Kalimantan and North Sulawesi prior to the initiation of fieldwork. Information on the EA team's composition, schedule, and summaries of scoping sessions are included as appendices to the English-language summary report.

The purpose of NRMP is to improve natural resources management in Indonesia through policy analysis, training, and the field testing of improved policies and practices for the management of production forests and protected areas. The EA was limited to the project's field activities. NRMP field sites currently include the Bukit Baka/Bukit Raya National Park and adjacent timber concessions in West/Central Kalimantan, and Bunaken National Park, a marine reserve in North Sulawesi. NRMP is projected to expand to include Gunung Palung National Park in West Kalimantan.

At the Bukit Baka/Bukit Raya project site, NRMP is providing technical assistance to improve production forest management in the P.T. Sari Bumi Kusuma (SBK) timber concession. The Sustainable Forest Management Project (SFMP) funded by ITTO, is coordinated with NRMP under a Joint Implementation Plan, and will provide similar support to an adjacent concession managed by P.T. Kurnia Kapuas Plywood (KKP). NRMP advisors are also providing assistance to the Ministry of Forestry in the development and implementation of a management plan for the Bukit Baka/Bukit Raya National Park, and are working with local communities to develop agroforestry systems and other livelihood enhancement activities. SFMP will finance, and NRMP advisors will assist, the construction and operation of an applied forestry research station at the Bukit Baka/Bukit Raya project site.

At the Bunaken project site, NRMP advisors are providing assistance to the Ministry of Forestry in the development and implementation of a management plan for Bunaken National Park. Proposed activities at the Gunung Palung project site would provide assistance in the revision of an existing management plan for Gunung Palung National Park.

Overall, the EA team found no significant adverse social or environmental impacts of activities planned under NRMP if the project's proposed participatory planning and implementation strategies are realized. However, a serious commitment to a participatory approach will require the mobilization of significant additional resources for community organization, and will imply a reduction in the geographic and sectoral scope of project activities.

Regarding the Bukit Baka/Bukit Raya project site in West/Central Kalimantan, the EA team endorses NRMP's strategy of working with a progressive timber concessionaire to minimize adverse environmental impacts of logging and to refine silvicultural techniques based on natural regeneration. The project's mechanism of channeling field information to national-level decision-makers has significant potential to influence national forestry policy. The EA team recommends that the proposed collaboration with P.T. Sari Bumi Kusuma in the pilot testing of improved practices for sustainable forest management be deemed in compliance with U.S. Government legislation regarding assistance for commercial timber extraction. However, the EA team finds that the P.T. Kurnia Kapuas Plywood concession, located on steep terrain in the middle of a nature reserve complex, does not lend itself environmentally- or socially-sound logging. The EA team recommends that NRMP not provide assistance related to timber production in that concession.

The team made several recommendations to enhance the positive impacts of collaboration with SBK, including the pilot testing of labor-intensive waste utilization, cable yarding systems, and a five-year delay in liberation thinning treatments. The team identified no negative impacts from proposed agroforestry and community development activities. While the impacts of the proposed research station will be marginal in comparison to existing disturbances caused by logging activity, NRMP staff should nevertheless ensure adherence to appropriate environmental standards in design and construction. In particular, major earth-moving activities associated with road rehabilitation and maintenance should be confined to the dry season. Detailed findings and recommendations related to forest ecology and timber extraction are found in the EA reports by Dugan and Soedjito (Annex A) and Wirawan (Annex D).

Regarding collaboration with the SBK Bina Desa program (a concessionaire-led agricultural intensification program) and the formulation and implementation of a national park management plan, negative social impacts will be avoided and positive impacts enhanced to the extent that NRMP is successful in facilitating the community organization necessary for a genuinely participatory approach to agricultural intensification and protected area management. To realize this objective, NRMP will have to develop and mobilize additional resources for field implementation, particularly from non-governmental organizations. Detailed findings and recommendations related to social impacts at the Bukit Baka/Bukit Raya project site are included in the EA report by Potter (Annex B). Findings and recommendations related to nature conservation are treated in EA reports by Torres (Annex C) and Wirawan (Annex D).

Proposed NRMP interventions at the Bunaken project site in North Sulawesi are judged to have no significant negative social or environmental impacts if a participatory approach to planning and implementation in the marine reserve is realized. However, this will depend on resolving current jurisdictional conflicts at the provincial level, involving community development NGOs in community organization, and the addition of a long-term advisor in community development to the NRMP team. The EA team recommends that project objectives be focussed on specific sectors and geographic locations so as to be commensurate with available financial and staff resources: the team suggests a focus on reef fisheries management and ecotourism development confined initially to two islands. Detailed findings and recommendations related to the Bunaken site are included in EA reports by Kendrick (Annex E) and White (Annex F).

As project activities have not yet commenced at the proposed Gunung Palung project site in West Kalimantan, the EA team limited its work to the preparation of a revised Initial Environmental Examination (IEE). The team found that Gunung Palung National Park has experienced an increase in pressures on the reserve in the ten years since an earlier management plan was prepared. Prior to the formulation of a revised management plan, the EA team recommends that diagnostic research on community and other actors' interactions with the reserve be carried out. The EA team recommends that the draft management plan be subject to an Environmental Assessment, and that project activities not be initiated in the absence of a long-term advisor to ensure the social and environmental soundness of project-supported interventions. Findings and recommendations related to the Gunung Palung site are included in the EA reports by Potter (Annex B) and Wirawan (Annex D).

In addition to site-specific recommendations, the EA team made suggestions regarding more general institutional and policy issues. With respect to project management, the team recommends that the NRMP advisor based in the Ministry of Forestry be charged with facilitating the involvement of MOF staff in the project, and in particular with making links between field innovations and policy. It is recommended that field-based project advisors spend less time on direct implementation of project activities, and more time on the facilitation of the involvement of government, university, and non-governmental organization staff. National-level policy studies are recommended to address constraints and opportunities identified at field sites.

Despite difficulties encountered by the EA team in communicating the purpose of an EA of a project designed to enhance the environment, the EA process was useful in a variety of ways. The EA team provided an endorsement of numerous elements of the NRMP project design, but also made recommendations for modifications and additions to mitigate unintended negative impacts and enhance positive impacts of the project. The EA provided a timely forum for NRMP participants, particularly MOF officials, to focus on project issues, and project advisors benefited from technical assistance provided by EA team members in the field. The substantive involvement of non-governmental organizations in the EA exercise demonstrated the interest and capability of those organizations to participate in project activities, and created links that can form the basis of longer-term cooperation.

TABLE OF CONTENTS

ANNEXES

1 INTRODUCTION

This report summarizes the background, findings, and recommendations of an Environmental Assessment (EA) of the USAID Natural Resources Management Project (NRMP) in Indonesia that was conducted September through December, 1992. Appendices to this volume document the process of the EA. The full report consists this summary and seven annexes: six reports prepared by individual EA team members (Annexes A - F), and a volume (Annex G) containing an Indonesian-language summary and Indonesian-language contributions from other participants in the EA.

1.1 Purpose and Scope of the Environmental Assessment

The following sections provide a brief description of the Natural Resources Management Project, and the background, purpose, and scope of the Environmental Assessment.

1.1.1 Brief Description of NRMP and Background of the EA

The Natural Resource Management Project in Indonesia is one of USAID's premier environment and development assistance initiatives in Southeast Asia. The purpose of the project is to improve natural resources management in Indonesia through:

- policy analysis of a broad range of issues and the development of institutional capacity in natural resources policy analysis, and

- field testing of improved policies and practices for the management of production forests and protected areas.

The project was designed with the expectation that field activities would generate valuable information for the formulation of natural resources management policy, as well as demonstrate viable approaches for production forest and protected area management that could be replicated elsewhere. Innovative features of the field implementation strategy include cooperation with the private sector and the participation of local communities in management planning. A project training component complements the policy and field testing components with short- and long-term training opportunities, in Indonesia and abroad. The focus of the EA is on the field implementation component of NRMP, although issues emerging from project sites with implications for policy analysis and training were considered to be within the scope of the EA.

The inter-agency Environment and Natural Resources Policy Working Group (PWG) governs the policy analysis component of NRMP, and is chaired by the National Development Planning Board (BAPPENAS). NRMP project advisors based in a Policy Secretariat provide technical assistance to the PWG. BAPPENAS also chairs the Project Coordinating Committee (PCC), which guides project activities and is the mechanism for

channeling findings from the field to the policy level. Responsibility for the implementation of NRMP field activities is vested in the Ministry of Forestry (MOF). Technical assistance for the project is provided through a contract with Associates in Rural Development, Inc. (ARD) of Burlington, Vermont.

Grant funds in the amount of US$18.5 million over five years were committed in mid-1990 to the NRMP, which is being implemented in conjunction with the seven-year US$10 million Sustainable Forest Management Project (SFMP) funded by the International Tropical Timber Organization (ITTO).[1] The SFMP provides support to the MOF for research and training related to the sustainable management of production and protection forests. Both NRMP and SFMP are governed by a Joint Implementation Plan (JIP) developed by BAPPENAS, MOF, and ITTO, with assistance from USAID (March 1992).

Under the auspices of the Ministry of Forestry, NRMP field activities are currently being carried out in two field locations: the Bukit Baka/Bukit Raya reserve complex in West and Central Kalimantan, and Bunaken National Park in North Sulawesi. In Bukit Baka/Bukit Raya, four long-term NRMP advisors and two locally-recruited assistants are working with the P.T. Sari Bumi Kusuma (SBK) timber concession to develop improved policies and practices for natural production forests, working with local communities to develop improved land management and livelihood enhancement schemes, developing a management plan for Bukit Baka/Bukit Raya National Park, and planning for the establishment of an applied forestry research and training station. ITTO funds are committed to support the construction of the research station and to field additional advisors to work with the P.T. Kurnia Kapuas Plywood (KKP) timber concession in improved production forest management.

In North Sulawesi, NRMP has fielded one long-term advisor and a part-time consultant recruited from the provincial university to assist in the development and implementation of a management plan for Bunaken National Park, a marine reserve located near the provincial capital of Manado. In the future, NRMP plans to extend project activities to the Gunung Palung National Park in West Kalimantan, but no NRMP advisors are currently assigned there. A map of Indonesia illustrating the location of NRMP current and proposed field activities is appended as Figure 1.

The NRMP/SFMP Joint Implementation Plan provides for an Environmental Assessment to be undertaken at an unspecified point in the 1992/3 - 1994/5 workplan. According to the JIP (pp. 27-28), the EA:

> ...will evaluate potential environmental impacts of field activities to be implemented under the Natural Resources Management (NRM) and Sustainable Forest Management (SFM) projects aimed at developing approved policies and approaches for managing

---

[1] Counterpart funds in the amount of US$6.5 million and US$1 million have been committed to the NRMP and SFMP, respectively, by the Government of Indonesia (GOI).

natural production forests and protected areas. Accordingly, it will recommend design modifications and/or mitigation measures as appropriate. The assessment will examine the potential impacts of project-funded activities to be implemented in cooperation with the P.T. Sari Bumi Kusuma and P.T. Kurnia Kapuas Plywood forest concession holders, located in the Bukit Baka area of West and Central Kalimantan. It will also review the proposed approach for developing and implementing multi-purpose management plans for (1) the Bukit Baka/Bukit Raya National Park located in West/Central Kalimantan and the Gunung Palung National Park, located in West Kalimantan, and (2) the Bunaken-Manado Tua Marine National Park, located in North Sulawesi.

In order to ensure compliance with U.S. Government legislation and USAID environmental regulations, the Initial Environmental Examination (IEE) of the NRMP specified that an Environmental Assessment (EA) would be conducted prior to the implementation of project-supported management plans for production forests and protected areas. As project activities in the Gunung Palung National Park had not yet been initiated at the time the EA was being planned in mid-1992, USAID determined that the Gunung Palung portion of the assessment would take the form of a revised IEE for that project component, in order to determine whether or not a separate EA will be required.

1.1.2 Scope of Work

The scope of work for the EA was jointly developed by USAID Washington, the USAID Mission in Jakarta, and the Biodiversity Support Program (BSP), a cooperative non-profit collaboration between the World Wildlife Fund U.S., The Nature Conservancy, and the World Resources Institute in Washington, D.C.[2] In consultation with BSP and USAID, the EA scope of work was modified by the EA team in Indonesia to reflect issues identified in scoping sessions and the current status of the project. As a result, the final EA outputs are somewhat different from those envisioned in the original scope of work, but such changes were not unexpected.

The EA was intended to address the specific environmental and social impacts of NRMP, as well as to contribute to improving the overall project design. According to the scope of work, the EA team:

> ...will identify and describe potential social and environmental impacts of project-funded activities based upon an analysis of specific field conditions at the [project sites]. The team will describe actions and measures which can be applied to minimize any adverse environmental or social impacts, enhance beneficial impacts, and ensure that the NRMP is carried out in a manner that promotes environmentally sound practices....Both the process of conducting the EA and the written product are

---

[2] A brief description of the BSP is included as Appendix 1.

intended to improve the technical design of the NRMP, generate wider understanding and support for NRMP objectives, and demonstrate to the Ministry of Forestry and others the constructive role of an EA in project design.

In addition to the utility of the EA exercise in fulfilling the requirements of U.S. Government legislation and USAID environmental regulations and improving NRMP design, USAID staff and other participants in the preparation of the EA recognized the opportunity that it would provide for achieving additional objectives. In particular, the EA was expected to provide:

- technical assistance to project staff and advisors in the formulation and revision of management plans;

- opportunities to inform and involve a broader group of individuals and institutions than had participated in project activities to date; and

- training in environmental impact assessment approaches and methodologies.

Due to the nature of the NRMP and the timing of the EA early in the life of the project, the team found it appropriate to give priority to objectives related to technical assistance and participation. The rationale for this emphasis is twofold. First, NRMP and SFMP are, by design, projects that have as their primary objective the improvement of natural resource management through the provision of technical assistance, and thus do not include activities expected to have significant adverse effects on the natural environment. Since the activities proposed by the projects would not be subjected to an environmental impact assessment process under Indonesian law, many participants in scoping sessions expressed surprise at the application of U.S. Government regulations in this case. The EA was necessary, however, to identify unintended adverse consequences of project interventions, particularly social impacts, and to provide suggestions for enhancing the project's positive impacts.

Secondly, the timing of the EA, which occurred during the early stages of project implementation, was a strategic opportunity for providing technical assistance and facilitating wider involvement in project activities. While the EA was initially expected to focus on the management plans produced by the project for production forests and protected areas, at the time the EA team initiated its fieldwork, those plans were in draft outline form. Thus, while there was some scope for evaluating the environmental impact of project activities already underway or described in general terms in the JIP, the team was in a position to assist in the formulation of ecologically and socially sound implementation plans rather than to assess the impact of plans already in final form. This is in line with the overall intent of the EA process, which is to influence project design.

1.1.3 Distinguishing Project from Non-Project Activities

A fair and accurate Environmental Assessment must clearly distinguish project from non-project activities, in order to attribute to the project only those positive and negative social and environmental impacts directly or indirectly resulting from project interventions. The NRMP presents a particularly difficult case for such differentiation. Due to the primarily technical assistance nature of project inputs, and the fact that the project is specifically designed to contribute to improved resource management, negative social and environmental impacts directly attributable to project activities are expected to be few. Indirect impacts are more problematic, however, tending to be characterized by longer and more diffuse chains of causality.

The EA team attempted to address this issue by carefully describing the existing situation at the various project sites, as well as recent changes and trends underway prior to the initiation of NRMP activities. Projections of these trends were then used to formulate a "without project" scenario, against which the effects of project interventions could be measured. For example, at the Bukit Baka/Bukit Raya site, the negative impacts of current logging practices would be expected to continue unabated in the absence of mitigating measures planned under NRMP, and are not themselves attributable to the project.

The question then faced by the EA team was to what degree NRMP's assistance to a particular activity implied a sharing of responsibility for the overall impacts of that activity. In the case of assistance for the procurement or use of logging equipment, U.S. Government legislation is quite clear that USAID must ensure that timber harvesting be conducted in an environmentally sound manner (see Section 2.2.1.3 below). The extent of NRMP's responsibility for the impacts of activities funded by other donors with which NRMP is collaborating, such as the ITTO-funded SFMP, was less clear, necessitating that the EA team consult with USAID legal advisors.

NRMP's explicit intent to develop models for national-level replication raised the issue of the project's responsibility for the impacts of national programs, such as the HPH Bina Desa Hutan Program (described in Section 2.1.2.2 below), assisted at the pilot-testing level at the Bukit Baka/Bukit Raya project site. Clearly, the assessment of social and environmental impacts of current and proposed national-level programs was beyond the scope of the EA, but the team found it appropriate to recommend surveys and policy studies complementary to pilot testing to ensure sufficient attention to those issues.

1.2 Design and Process of the Environmental Assessment

The EA was conducted over a two-and-one-half month period from September through November 1992, according to the schedule outlined in the scope of work.[3] The following sections describe the composition of the EA team, scoping sessions conducted during the EA, methodology employed in the fieldwork, and constraints and limitations encountered by the team.

1.2.1 Composition of the EA Team

The EA was prepared by a core team of eight internationally-recruited consultants fielded by the BSP.[4] This group was divided into three interlocking sub-teams, one for each of the three project sites. At Bukit Baka/Bukit Raya, the team included specialists in forest management, nature conservation, social science, forest ecology, and institutional and policy analysis. The Gunung Palung sub-team was composed of a social scientist and a specialist in nature conservation and forest ecology. The Bunaken sub-team consisted of a marine conservation specialist, a social scientist, and an institutional and policy specialist.

In addition to the internationally-recruited team members, the EA also benefited from the participation of locally-recruited resource persons, facilitators, and consultants who joined the team for certain portions of the assessment.[5] The EA team also collaborated with non-governmental organizations (NGOs) not currently participating in NRMP or SFMP activities for the purpose of facilitating NGO and community participation in the assessment. The NGOs involved were the Indonesian Environmental Forum (WALHI) in Jakarta, the Institute of Dayakology Research and Development (IDRD) in Pontianak, and Yayasan Nurani in Manado. Formal and informal village leaders also participated in the assessment, assisting the team as key informants, guides, and facilitators of community discussions.

1.2.2 Scoping for the Assessment

In accordance with the EA scope of work, the EA team conducted formal scoping sessions hosted by government agencies and informal scoping sessions hosted by NGOs in Jakarta and provincial capitals. In Jakarta, the formal scoping session was hosted by the Ministry of Forestry Directorate General for Forest Protection and Nature Conservation (PHPA). In Pontianak, a meeting of the provincial environmental impact assessment commission (*Rapat Komisi AMDAL*) was utilized as a forum for the formal scoping session.

---

[3] A bar chart and calendar illustrating the EA schedule are included as Appendices 2 and 3.

[4] A list of team members and a summary of their biodata is included in Appendix 4.

[5] Their names, institutional affiliations, and scope of their participation are included in Appendix 5.

In Manado, the formal scoping session was hosted by the provincial office of the Ministry of Forestry (*Kanwil Kehutanan*). Informal scoping sessions for NGOs were facilitated by WALHI in Jakarta, IDRD in Pontianak, and Yayasan Nurani in Manado.[6] Informal scoping for the EA was also conducted by the Team Leader in Washington, D.C. prior to departure, and by all team members throughout the assessment exercise in Indonesia.[7] Formal debriefing sessions were held at the Ministry of Forestry and at the USAID Mission in Jakarta prior to the Team Leader's departure from Indonesia.

1.2.3 Methodology

In addition to the gathering of information in the context of formal and informal scoping sessions described above, the EA team reviewed the secondary data and maps available for each of the project sites prior to initiating fieldwork. Particularly in the case of the Bukit Baka/Bukit Raya site, for which other documentation was scarce, the team relied heavily on reports prepared by short-term consultants fielded by NRMP during the first year of project implementation, several of which were still in draft form. These included reports by Granert (1992), Belsky (April 1992), Curran and Kusneti (1992), Bergau (1992), Hendrison (1992), and Voss (1992). For the Bunaken project site, the preliminary draft report by Belsky (October 1992) was especially helpful. Key informant interviews were held with a variety of government officials, individuals in the private sector, staff of non-governmental organizations, and staff of forestry projects funded by other donors.

In the field, the EA team utilized various rapid appraisal methodologies for data collection. To assess biophysical conditions, team members utilized transects (e.g. to determine species composition), plot sampling (e.g. to estimate recovery of biodiversity in regenerating logging blocks), and direct observation (e.g. to estimate slope). To supplement the quantitative data available on socio-economic characteristics in reports by Belsky (1992a and 1992b) and to explore the perceptions of various project-related actors, semi-structured key informant interviews were conducted with project advisors, concession staff, village officials, and informal village leaders, including traditional leaders and teachers. Special efforts were made to contact women, members of poorer households, and community members with particular background or occupational characteristics. Small group discussions were also held with villagers in several communities.[8]

---

[6] Documentation of the formal and NGO scoping sessions is included in Appendix 6.

[7] A list of persons contacted by the EA team is included in Appendix 7.

[8] Additional detail on specific field methodologies is contained in the EA reports by Dugan and Soedjito (Annex A), Potter (Annex B), Torres (Annex C), Wirawan (Annex D), Kendrick (Annex E), and White (Annex F).

1.2.4 Constraints and Limitations

The EA team faced several constraints in fulfilling the tasks outlined in the scope of work. The NRMP-assisted management plans that were to have been the focus of the assessment were not available as of the arrival of the various teams at the project sites, and specific activities to be undertaken within the context of these plans were still in the process of formulation. The EA team based its understanding of proposed project interventions on:

- the Joint Implementation Plan (JIP) dated March 1992;
- a draft revision of the JIP's Annex B dated August 1992;
- drafts of the Bukit Baka/Bukit Raya National Park Management Plan (Potess, November 1992) and the Bunaken National Park Management Plan (Usher and Rompas, November 1992) produced by NRMP advisors during the EA team's fieldwork;
- short-term consultancy reports by Granert (1992), Belsky (April 1992), Belsky (October 1992 in draft) Curran and Kusneti (1992 in draft), Bergau (1992), Hendrison (1992), and Voss (1992);
- monthly reports and personal communications shared by project advisors and consultants at the project sites; and
- scoping sessions and interviews with GOI and ITTO officials, USAID Mission staff, and NRMP advisors and consultants.

Due to the inadequacy of maps available from NRMP staff, the EA team commissioned the production of maps for the Bukit Baka/Bukit Raya and Gunung Palung sites based on composites of various maps collected during the assessment. These maps are appended as Figures 2 through 6, 8, and 9. The reader is cautioned that these maps have no official status, have not been ground checked, and may contain significant errors.[9]

Another constraint faced by the EA team was the difficulty of scheduling scoping and debriefing sessions with key persons involved in the NRMP, several of whom were out of town and unavailable for consultation at strategic points during the course of the assessment. For example, all of the key participants in the Pontianak, West Kalimantan scoping session from the Ministry of Forestry and the provincial planning authority were out of town and

---

[9] Maps of the Bukit Baka/Bukit Raya project site were produced at a scale of 1:250,000. Maps of the proposed Gunung Palung project site were produced at a scale of 1:100,000. Maps have been reduced for inclusion in this report.

unavailable for a formal debriefing session during the week following completion of the EA team's work in Bukit Baka/Bukit Raya.

A special case relates to consultation with provincial officials in Palangkaraya, Central Kalimantan. Although a visit to Palangkaraya, the provincial capital, was not envisioned in the scope of work for the EA, the EA team realized the critical role of institutions there with respect to the implementation of project activities in Bukit Baka/Bukit Raya, in view of the fact that two-thirds of the national park, most of the SBK concession area, and the site of the proposed research station are located on the Central Kalimantan side of the provincial border. Taking into account time and budget constraints, the difficulty of access from West Kalimantan, and the fact that NRMP advisors had not yet established strong working relationships with provincial-level officials there, the decision was made that the EA team not attempt to visit Palangkaraya.

Despite extensive advance preparation on the part of USAID Mission staff, the EA team experienced a variety of problems related to official interagency communications regarding scoping sessions and administrative arrangements necessary for foreign consultants to work in Indonesia. Delayed invitations to scoping sessions compromised participation in those meetings. Administrative difficulties encountered in processing passports, visas, and travel letters shortened the field time of the Nature Conservation Specialist and the Gunung Palung sub-team.

The significance of many of the constraints encountered by the EA team, including difficulties in acquiring maps, scheduling meetings with provincial-level officials, travel between Pontianak and Palangkaraya, and administrative arrangements necessary for foreign consultants, is that they reflect on a small scale the constraints encountered by the NRMP staff in the course of their routine work. The EA team attempted to bear these constraints in mind when formulating recommendations for additional project activities.

1.3 Organization of the Report

The remainder of this report summarizes the findings and recommendations of the Environmental Assessment of planned activities at NRMP project sites. Section 2 summarizes the EA of the Bukit Baka/Bukit Raya site, and reflects in length and level of detail the relatively greater project resources devoted to activities at that site. Section 3 summarizes the EA of the Bunaken site, and Section 4 summarizes the revised IEE of the proposed Gunung Palung site. Section 5 provides findings and recommendations related to institutional and management issues; Section 6 raises policy issues for further study. Section 7, the report's conclusion, is followed by a comprehensive bibliography. Maps of the project sites are appended as Figures 1 through 7; Appendices 1 through 7 document the EA process. Appendix 8 provides a recapitulation of the EA team's recommendations in summary form.

2 SUMMARY OF THE ENVIRONMENTAL ASSESSMENT OF THE BUKIT BAKA/BUKIT RAYA PROJECT SITE [10]

2.1 The Existing Situation

Prior to a discussion of NRMP interventions and impacts, a brief description of the existing situation and recent changes and trends at the Bukit Baka/Bukit Raya project site is provided in order to develop a "without project" scenario.

2.1.1 General Description of the Area

The following sections provide information on the location of the project site and ecological and social characteristics.

2.1.1.1 Location of the Project Site

The long-term objective of NRMP activities in Kalimantan is to improve the management of forests in and around the 181,090 hectare Bukit Baka/Bukit Raya National Park. The park is located on the border between West and Central Kalimantan, and comprises the catchment area for the Melawi and Katingan river systems of the two provinces. Gazetted as a nature reserve in 1985, Bukit Baka/Bukit Raya became Kalimantan's fourth national park in early 1992. Maps of the Bukit Baka/Bukit Raya project site are found in Figures 2 through 6.

NRMP activities are currently focused on the 180,000-hectare P.T. Sari Bumi Kusuma (SBK) timber concession and adjacent communities located to the west and northwest of the national park. Eight other timber concessions are also operating in areas surrounding the park, including the P.T. Kurnia Kapuas Plywood (KKP) concession. The KKP concession was opened in 1991 in an area in the middle of what was then the Bukit Baka Nature Reserve. With the recent declaration of the Bukit Baka/Bukit Raya National Park, the KKP concession now defines the northern border of the national park. To the north of the KKP concession is a remnant of the Bukit Baka Nature Reserve. Both the nature reserve and the KKP concession area are proposed for eventual inclusion in the national park.

The Bukit Baka/Bukit Raya project site is approximately 400 kilometers due east of the West Kalimantan provincial capital of Pontianak. It can be reached in a day's journey from Pontianak via air to Nanga Pinoh, speedboat to the SBK logpond at Nanga Popai, and road to SBK logging camps. The logging road provides a convenient reference point for the location of project activities: a kilometer designation refers to the distance south along the

---

[10] See also EA reports by Dugan and Soedjito (Annex A), Potter (Annex B), Torres (Annex C), and Wirawan (Annex D).

road from its northern terminus at the SBK logpond. Thus, Camp Km 35 is the logging camp located 35 kilometers from the logpond.

2.1.1.2 Ecological Characteristics[11]

The forest ecosystems of the Bukit Baka/Bukit Raya region are of global significance in terms of biodiversity. The terrain, ranging from rolling hills to the highest peak in Kalimantan (Bukit Raya at 2280 meters), offers examples of lowland and hill dipterocarp forest, as well as montane and moss forest. Observations of the low density and localized distribution of many species indicate a high level of endemism (Nooteboom, 1987). Vegetation in the national park also provides habitat for several species known to be rare and endemic, including the orangutan. Forests surrounding the national park are rich in commercially valuable timber, and the majority of species extracted belong to dipterocarp family (*Shorea sp.*), commonly known as Meranti.

The region's biological richness is poorly documented, and it would be difficult to overstate the paucity of information on the ecology of the area. Basic data and maps related to climate, topography, soils, and the composition and distribution of plant and animal communities are rudimentary or unavailable. The 1982-83 Rijksherbarium expedition to Bukit Raya collected at least 29 new records for Indonesia, including 22 undescribed taxa (Nooteboom, 1987). Recent work by the short-term NRMP Taxonomy Specialist indicates that almost 30 percent of all trees inventoried by SBK, and 10 percent of those marked for felling, are recorded by concession staff as unknown species (Jarvie, pers.comm.).

The forest area inside the national park boundary is relatively undisturbed, in contrast to the vast expanse of anthropogenic alang-alang (*Imperata cylindrica*) grassland traversed by the main SBK logging road to the north of the Bukit Baka/Bukit Raya reserve complex. The grassland, which extends north to south from approximately Km 5 to Km 25 and several kilometers to the east and west of the SBK road, has been estimated to cover more than 200 square kilometers.

---

[11] The draft management plan for Bukit Baka/Bukit Raya National Park prepared by Potess (1992b) and EA reports by Dugan and Soedjito (Annex A), Potter (Annex B), Torres (Annex C), and Wirawan (Annex D) provide additional descriptive material and references on the ecological characteristics of the project area.

2.1.1.3 Social Characteristics[12]

The population density in the Bukit Baka/Bukit Raya area is quite low. It has been estimated that some 2100 people live in the communities located in the vicinity of current project activities to the north and east of the national park (Ngo, 1992a). These communities, roughly arrayed along the north-to-south transect defined by the main SBK logging road, can be usefully separated into two distinct groups: villages in the alang-alang grasslands on the West Kalimantan side of the provincial border, and more remote villages inside the forested SBK concession areas on the Central Kalimantan side. Until a few years ago, these communities were among the most isolated in the region, requiring several days' journey to reach district capitals. Contact with outsiders remains limited; village guest books reflect infrequent visits from government health, agricultural, or other personnel. In several villages, the only teachers are those provided by the timber concessionaire.

None of the villages now affected by project activities are located inside the current boundaries of Bukit Baka/Bukit Raya National Park. Whether or not there are other villages inside the park's southern or eastern boundaries is unknown: old maps indicate that there were at least two villages located inside what is now the park's southern boundary (see Figure 6), but NRMP advisors have not yet travelled to those sites for confirmation. Similarly, some maps indicate that the hamlets of Belaban Dalam and Nanga Juoi, which are affected by current NRMP activities, are located just inside the northern border of the Bukit Baka Nature Reserve (see Figure 6), which NRMP advisors anticipate will be included in the national park at some point in the future.

While there has been some moving around of populations within the project area over the last several generations, the EA team found no evidence of significant recent in- or out-migration. Oral histories regarding the previous location of longhouses are verified by large forest gardens and other evidence of long-term occupancy and resource management. The significance of such evidence is demonstrated by a hamlet of Nanga Juoi village located on the edge of the Bukit Baka Nature Reserve adjacent to current KKP logging activity. This hamlet, thought by KKP concession staff to be a temporary camp for ironwood exploitation, is located only a few hundred meters from weathered burial monuments and large durian trees.

The basic livelihood system of communities located near the park is traditional upland rice cultivation. In the West Kalimantan villages, the spread of the alang-alang grassland has led to increasing pressure on remaining fertile land for shifting cultivation. Production of

---

[12] NRMP reports by Ngo (1992a and 1992b) and Belsky (1992a) and the EA report by Potter (Annex B) provide additional descriptive material and references regarding social conditions in the project area.

wet rice remains limited, and a majority of households are not self-sufficient in rice (Belsky, 1992a). In contrast, there is little sense of resource scarcity in the Central Kalimantan villages, where a long-fallow rotation system is practiced. A majority of households in these forest villages produce a surplus of rice (Belsky, 1992a). Household income is supplemented by cultivation of rubber (West Kalimantan), rattan (Central Kalimantan), exploitation of timber for housing and roofing, hunting and gathering of other forest resources, and most recently, wage labor associated with logging.

2.1.2 Recent Changes and Trends

Two developments over the last ten to twelve years -- the advance of the alang-alang frontier and the advent of timber concession operations -- have had profound impacts on the ecological and social conditions of the project area. A third development, the gazetting of a nature reserve and subsequent designation of the national park, has not yet had a significant impact, but has the potential to do so through the restriction of various activities deemed incompatible with conservation. Plans on the drawing board for a segment of the Trans-Kalimantan Highway to pass through the area, as well as a projected industrial timber plantation in the SBK concession, would also have significant impact.

2.1.2.1 Advance of the Alang-alang Frontier

While the EA team did not attempt to conduct a thorough analysis of the origin and expansion of the alang-alang grassland, oral histories provided by villagers indicated that fifty years ago, there was still good secondary forest as far north as Km 13. Villagers attribute the gradual advance of the grassland to fires caused by intentional burning for cattle fodder and hunting, as well as unintentional fires escaping from the burning of agricultural fields. As elsewhere in Kalimantan, the drought of 1982-83 led to particularly extensive fires, pushing the alang-alang frontier to the south, close to its current location near the northern boundary of the Bukit Baka Nature Reserve. The team found no evidence that current logging in the vicinity is a direct cause of creating, maintaining, or expanding the alang-alang grassland.

The main impact of grassland expansion on local communities has been the corresponding decline in available secondary forest/scrubland for *ladang* (swidden agriculture fields for upland rice). Prior to the initiation of "permanent" ricefields three years ago under the SBK HPH Bina Desa Hutan Program (see Section 2.1.2.2), villagers in the northernmost areas were walking up to three hours to reach their ladangs at the forest edge. The annual burning of the grasslands has also limited the development of treecrops, such as rubber. Ecologically, annual burning continually exposes the soil, leading to erosion, depletion of nutrients, and decline in biodiversity. Effects on local hydrology and microclimates are likely to be significant, although no relevant data is available.

2.1.2.2 Advent of Timber Concession Activity

By far the most significant development in recent years for the Bukit Baka/Bukit Raya region has been the advent of large-scale timber extraction. SBK, the concessionaire with which NRMP is cooperating, has a reputation for conscientious adherence to government regulations that seek to ensure the sustainability of forest exploitation. SBK constructed the main logging road into the area and began logging operations in 1980. Initial cutting blocks were near the provincial border at Km 41, and logging has gradually moved south toward current felling areas around Km 107. KKP opened a road through the Bukit Baka Nature Reserve to the east from the SBK road and began operations in mid-1991.

The single most significant ecological impact of logging operations in the project area as elsewhere is the massive soil disturbance caused by road-building and skidding of logs by bulldozers. Various studies[13] have estimated that up to 45 percent of the soils in logging areas elsewhere are laid bare by roads, skid trails, and logyards. While the selective removal of large quantities of biomass in the form of commercial logs has significant long-term impacts on forest structure and function, it is the soil disturbance and collateral damage to remaining vegetation that most compromise the forest's ability to recover and regenerate.

Logging and associated road-building have both direct and indirect effects on biodiversity. Soil disturbance and collateral vegetation damage alter habitats, favoring species that thrive in open, disturbed sites over those that require shade. Refinement treatments prescribed under the Indonesian Selective Cutting and Planting System (TPTI)[14] select for merchantable timber species, and due to limited taxonomic knowledge, may also result in unintentional species loss. Large volumes of logging waste left in the cutting blocks (estimated to be 30 percent of merchantable volume) could lead indirectly to loss of biodiversity by contributing to the hazard of forest fire.

Earth-moving activities associated with logging also have profound impacts on the hydrology of the area, which in turn has important social impacts. Most significant for local communities has been the siltation and pollution of the rivers and streams which serve as sources of water for drinking and other household uses. Villagers reported, and EA team members observed, that following rains, the streams flood, became turbid, and carry large quantities of logging waste ranging from whole logs to kerosene and gasoline. Villagers reported that such floods used to subside in a few hours, but it now takes a full day and night for waters to recede. The disruption in river flows and increased sedimentation has also affected fishing, and has limited traditional river transport systems by exaggerating floods and decreasing the depth of channels.

---

[13] These studies are cited in the EA report by Dugan and Soedjito (Annex A).

[14] An English translation of the TPTI regulations is included as an appendix to the EA report by Dugan and Soedjito (Annex A).

The advent of concession activity has also had an impact on villagers' access to forest resources. Timber company staff state that their crews as a matter of policy do not cut species of local economic importance, including ironwood (*Eusideroxylon zwagerai)*, tengkawang (*Shorea sp.*), jelutong (*Dyera costulata)*, and various fruit trees, that are "close" to villages and/or are actively being tended. However, villagers reported that such species were indeed frequently cut, either intentionally or by mistake. The opportunistic collection of forest products such as honey and rattan by concession staff (reported by Belsky, 1992a) represents an increase in the pressure on those resources. While not cited as a problem by villagers, the EA team observed anecdotal evidence of hunting by concession staff, such as a hat made from a wildcat pelt.

Another social impact of the presence of timber concessions is the agricultural intensification promoted under the HPH Bina Desa Hutan Program. This national-level program (hereafter "Bina Desa"), promulgated by the Ministry of Forestry (MOF) in 1991, requires concessionaires to undertake rural development activities as one of the conditions of their timber license. One of the primary objectives of the program is to convince farmers to abandon shifting cultivation in favor of settled rice cultivation. In 1982, long before the MOF requirement came into effect, SBK had initiated work on an irrigated rice demonstration plot at Km 23, and has subsequently assisted farmers in neighboring villages to develop rainfed ricefields. Participating farmers are provided with agricultural inputs (seed, fertilizer, pesticide) and intermittent extension services. KKP initiated a Bina Desa program in 1992 in the Melayu village of Nanga Nuak, bringing in transmigrant laborers from the regency capital of Sintang to hoe the field and "give an example" to the local farmers.

Wet rice cultivation may indeed have the potential for economic and ecological sustainability in certain niches. However, farmers now participating in the SBK Bina Desa program are dependent on agricultural inputs supplied by the concessionaire, and intensive fertilizer use has led to a proliferation of weeds in the dryland rice fields. Pesticide use without proper instruction has adverse implications for ecological and human health. The negative psychological impact of concessionaire (and government) attempts to change traditional practices is palpable in the project area. Farmers now refer to their own agricultural system as *perladangan liar*, a pejorative term meaning "wild cultivation". Belsky (1992a) and the EA report by Potter (Annex B) discuss concerns related to the social soundness of the Bina Desa program, including impacts on rice self-sufficiency, labor availability, and social stratification.

The coming of the concessionaires also seems to have had a demoralizing effect on local communities by undermining official and traditional authority systems. A feeling of powerlessness and frustration was widely articulated by formal and informal leaders. While concession staff reported that they regularly consult with local villagers regarding road-building and logging plans and related compensation, and place much faith in the mediating role of locally-recruited crews, villagers themselves are not satisfied with their representation in the decision-making process. Village leaders expressed particular grievances regarding

insufficient respect for their authority in the resolution of disputes between villagers and company staff related to incidents ranging from petty theft to sexual assault.

A prospective tree plantation development in the SBK concession area would have significant social and environmental impacts. The EA team was informed that in accordance with a recently-promulgated MOF policy, SBK plans to implement a 3000 hectare industrial forest plantation and transmigration settlement (*HTI-Trans*) within its concession area. The site that has been identified would require the clear-cutting of primary and secondary forest, and the settlement of transmigrants in close proximity to the national park. Some of the land projected for the scheme has been previously cultivated, and is likely encumbered by local community land rights.

Concessionaire activity has brought some positive benefits for local communities, including improved access to roads, employment, and markets. To the extent that the SBK Bina Desa program has been successful in assisting farmers to develop ricefields near their homes, West Kalimantan villagers have been spared the long commuting distance to *ladangs* at the forest edge. Villagers are particularly appreciative of SBK's support for local education. In keeping with SBK's reputation as an exemplary concessionaire in fulfilling its social responsibility as well as in its timber operations, villagers reported more satisfactory relationships with SBK than with KKP. During KKP's relatively brief tenure in the area, people in villages adjacent to the concession area have experienced significant costs, particularly in terms of pollution and sedimentation of their water supply. Benefits, such as employment opportunities and participation in KKP's Bina Desa program, have been targeted at the relatively distant village of Nanga Nuak.

2.1.2.3 Establishment of Protected Areas

In 1985, following interagency accord on the Consensus Forest Landuse Agreement (*TGHK*) at the provincial level, the Bukit Baka/Bukit Raya Nature Reserve was declared. Leaders of villages located near the northern boundary reported negotiating its position with the boundary-marking team in order to ensure that traditional land rights were respected. These leaders are aware of the existence and meaning of the nature reserve designation, and both they and SBK concession staff reported having exercised their authority to prevent the opening of new ladangs in the reserve area. The EA team was unable to determine the extent to which the alang-alang grassland's current frontier, which roughly coincides with the nature reserve border, is a result of the effectiveness of such control in the seven years since the protected area was established.

Various informants disagreed on the status and recent history of the forest edge, including whether or not new ladangs are currently being opened inside the nature reserve. Some referred to the forest inside the nature reserve as *hutan adat* (forest managed under traditional land rights regimes), while others indicated that the boundary had been marked so as to exclude hutan adat. Village leaders and SBK staff agreed that the initiation of KKP

logging activities in an area formerly included in the nature reserve has undermined efforts to cultivate respect for the reserve boundary.

Otherwise, the EA team was unable to uncover any convincing evidence that the reserve designation -- or the southern portion's upgrade to a national park in early 1992 -- has had any significant impact on local forest use, given that no MOF staff have been assigned to the area to restrict access. Local community members continue traditional extractive activities within the reserve, and outsiders enter with some frequency, particularly collectors of *gaharu* (the diseased heart of *Aquilaria* used for incense). It should be stressed that with the possible exception of ironwood exploitation near the village of Nanga Juoi, the EA team found no evidence to suggest that extractive activities by local communities are unsustainable or constitute an acute threat to the reserve's resources.

2.1.3 "Without Project" Scenario

In the absence of interventions planned under the NRMP, it is likely that the trends described above would continue. The adverse ecological and social impacts of road-building and logging activities would not be abated. Realization of plans to implement an industrial timber plantation in the SBK concession would lead to the clearing of primary and secondary forests, and transmigrant laborers would bring additional pressures on surrounding resources and communities. The Bina Desa program in its current form is unlikely to achieve its objective of providing sustainable alternatives to shifting cultivation. The combination of burning of the alang-alang grassland and the opening of ladangs on the forest edge would exert chronic pressure on the northern boundary of the Bukit Baka Nature Reserve, in addition to the damage caused by KKP's logging activities.

Provincial planning authorities anticipate that the Trans-Kalimantan Highway, eventually projected to link Pontianak to the Central Kalimantan capital of Palangkaraya, will follow the route of the SBK logging road past Camp 54. While it is unlikely that work on this section of the highway would commence during the life of NRMP, uncontrolled development along this road in the future would have significant negative social and environmental impacts. In the absence of NRMP, the Bukit Baka/Bukit Raya reserve complex would not be a Ministry of Forestry priority for conservation activities, and would not receive significant allocations of budget or staff. More generally, without the project, it is unlikely that the area's natural or human resources would receive increased attention from government agencies. The current dearth of government services and data for development planning would continue.

2.2 USAID-Funded Natural Resources Management Project: Interventions, Impacts, and Recommendations

The NRMP proposes to intervene in the situation described above in Bukit Baka/Bukit Raya, West and Central Kalimantan, in at least four ways:

(1) cooperation with timber concessionaires to improve the management of production forests through technical assistance and research;

(2) cooperation with local communities in production and protection-oriented land management activities, including fire control and agroforestry;

(3) provision of support for the preparation and implementation of a management plan for the Bukit Baka/Bukit Raya National Park; and

(4) provision of support for the development of a research station and applied forestry research program.

These activities are linked to national-level forestry sector policy formulation through the NRMP Project Coordinating Committee and the Policy Working Group.

NRMP long-term advisory resources allocated to the Bukit Baka/Bukit Raya site include a Nature Conservation Advisor fielded in September 1991[15] and a Social Forestry Advisor fielded in December 1991. A Natural Forest Management Advisor was fielded in May 1992, and a Research Advisor/Team Coordinator was fielded in October 1992. Two locally-recruited assistants have recently been added to the field team. NRMP advisors reside at SBK logging camps, and spend one week per month in Pontianak. No MOF counterparts have yet been assigned to work with the advisors at the project site.

2.2.1 Sustainable Forest Management[16]

The following sections describe NRMP interventions and impacts related to sustainable forest management. These include technical assistance for improved logging practices in the SBK concession, and cooperation with the ITTO-funded SFMP in the KKP concessions. A third section discusses the compliance of these activities with U.S. government legislation related to assistance for commercial timber extraction.

2.2.1.1 Cooperation with SBK

The most innovative feature of the NRMP is the strategy of working directly with a progressive private sector timber concessionaire, SBK, to improve the management of production forests. NRMP interventions related to production forest management have to

---

[15] In some cases, due to delays for language training and other preparatory activities, the NRMP advisor's actual arrival at the field site was one or two months subsequent to his official starting date.

[16] More extensive findings and recommendations are found in the EA report by Dugan and Soedjito (Annex A).

date been limited to the short-term consultancies of a Forest Harvesting Specialist (Hendrison, July-August 1992), a Taxonomy Specialist (Jarvie, September-December 1992) and the provision of preliminary technical assistance to SBK by the Natural Forest Management Advisor. According to the Joint Implementation Plan, additional short-term technical assistance in forest harvesting, soils, hydrology, and chainsaw operation are planned, in combination with applied research and training activities. In the absence of a management plan governing NRMP cooperation with SBK in sustainable forest management, it is the EA team's understanding that project activities will follow recommendations put forth by the Forest Harvesting Specialist and other recent short-term consultants.

The EA team identified no negative ecological or social impacts likely to result from the promotion of improved forest management activities currently underway or planned by NRMP in collaboration with SBK. Indeed, if project-supported applied research demonstrates the economic viability of improved logging and road-building practices, including directional felling and use of wheeled skidders, there is potential to significantly mitigate the severe negative environmental impacts of current practices. SBK already invests considerable resources in pre-harvest planning and post-logging rehabilitation treatments, and is open to consideration of modifications that are financially and environmentally sound. The Ministry of Forestry will be in a position to incorporate these findings into concession regulations, and disseminate them to concessionaires nationwide.

In view of the team's finding that soil disturbance associated with logging and road-building constitutes the most significant ecological and social impact affecting the project area, the NRMP's focus on seeking ways to mitigate such disturbance in the SBK concession is fully justified. Recommendations to further enhance the positive impacts of NRMP interventions in sustainable forest management are elaborated in the EA report by Dugan and Soedjito, and are summarized below.

WASTE UTILIZATION AND HARVESTING METHODS:

The EA team observed the large volume of waste left behind in logging blocks in the SBK concession in the form of stumps, tops, and imperfect logs. In addition to posing a fire hazard, this waste represents unutilized potential for increasing the productivity per hectare of logged forest and providing income to local communities. High transportation costs and regulations affecting on-site wood processing appear to be the primary constraints on waste utilization.

The EA team recommends that in conjunction with the pilot testing of low-cost skidding techniques, NRMP seek authorization to test the manual conversion of logging waste into cants and roughsawn boards in collaboration with local communities. Related recommendations concerning community institution-building, mechanisms for determining appropriate forest charges, and testing the feasibility of sliced veneer are elaborated in the EA report by Dugan and Soedjito. A recommendation for a related policy study is included in Section 6.1 below.

In addition to the pilot testing of rubber-tired skidders, NRMP should test the feasibility of cable logging systems, which could significantly reduce damage from road-building and skidding. The EA team recommends that NRMP facilitate a study tour to the Philippines for MOF and SBK staff to observe operating skyline and other cable logging systems and to assess their feasibility for application at the project site.

POST-LOGGING THINNING TREATMENTS/TAXONOMY:

Silvicultural treatments prescribed under the Indonesian Selective Cutting and Planting System (TPTI), particularly liberation thinning (*pembebasan*) one year after logging, risk unnecessary loss of biodiversity due the premature interruption of natural succession and the elimination of unknown and misidentified species. The EA team recommends that NRMP seek authorization to pilot test a postponement of *pembebasan* thinning treatments until the fifth year after logging to avoid unnecessary negative impacts on biodiversity. In addition, the EA team endorses the proposed study of forest tending treatments proposed in Curran and Kusneti's Case Study 6, and the training in species identification and herbarium development at Tanjungpura University (UNTAN) recommended by the short-term Taxonomy Specialist (Jarvie, pers. comm.).

ROAD-BUILDING AND HYDROLOGY:

The EA team endorses the recommendations made by the short-term Forest Harvesting Specialist (Hendrison, 1992) for reducing the length of skid roads and secondary roads. However, the recommendation that mainline roads follow more even gradients should be reviewed, as it might entail larger volumes of earth-moving than the present system, with corresponding negative impacts. The EA team endorses the proposed hydrological studies in collaboration with UNTAN proposed in Curran and Kusneti's Case Study 4. In addition to collecting baseline data and data on the hydrological impacts of road-building, the impact of improved logging practices should be systematically monitored in order to demonstrate positive impacts of NRMP interventions. Both economic and ecological data should be collected and analyzed to provide the MOF with information that could be incorporated into guidelines for other concessionaires.

INDUSTRIAL FOREST ESTATE:

Adverse social and environmental impacts of plans for an industrial forest estate with transmigrant labor (HTI-Trans) in the SBK concession (described in Section 2.1.2.2 above) would severely constrain NRMP attempts to demonstrate improved management of production forests and protected areas. The EA team recommends that NRMP seek a review of these plans by appropriate Ministry officials, with a view toward obtaining an exemption

from the requirement that a HTI-Trans project be implemented in the SBK concession.[17] The case of the proposed HTI-Trans in the SBK concession raises questions about the soundness of current MOF policies mandating such plantations in all concessions above a certain size. A recommendation for a related policy study is included in Section 6.2 below.

2.2.1.2 Cooperation with the ITTO-funded SFMP

The Joint Implementation Plan indicates that the Sustainable Forest Management Project (SFMP), financed by ITTO, will provide support to KKP in improving the implementation of forest harvesting practices in the KKP concession. Parallel to NRMP's cooperation with SBK, the SFMP would field a natural forest management advisor and support applied research activities within the KKP concession. No SFMP advisors have yet been fielded and activities have not yet been initiated.

In contrast to the potential for project-supported activities to mitigate the adverse environmental impacts of logging in the SBK concession, the EA team identified no significant potential for similar benefits to be derived from cooperation with KKP. The topography of the concession area, with slopes in excess of fifty percent, and its location sandwiched between a national park and a nature reserve (through which its access road must pass), guarantee that extractive activities will have severe environmental impacts under any production regime.

Residents of villages adjacent to the KKP concession do not understand why KKP is allowed to log in areas previously identified as protected forest, in which they had previously been forbidden by MOF, SBK, and local government officials to make new ladangs. In addition, villagers report a variety of disputes with KKP related to water pollution, crime, and unfulfilled promises. As villagers do not at present distinguish SFMP from NRMP, SFMP cooperation with KKP as envisioned in the JIP could have a negative impact on local community members' perceptions of the NRMP. Such perceptions could jeopardize the effectiveness of joint NRMP/SFMP efforts to involve local communities in the management of protected forest areas.

Aside from the question of compliance with U.S. Government legislation (treated in Section 2.2.1.3. below), the EA team was divided regarding the appropriate level of cooperation of NRMP/SFMP with KKP. One team member argued that unless the KKP concession could be cancelled, the two projects should assist the Ministry of Forestry in working with concessionaire to minimize logging damage to the extent possible, as well as to implement conservation and community development activities. Other team members argued

---

[17] The EA report by Dugan and Soedjito (Annex A) contains a proposal for marrying the HTI and Bina Desa concepts through smallholder timber plantations in the alang-alang grasslands. However, resources currently allocated to NRMP would be inadequate to undertake such a major and problematic initiative.

that cooperation with a concessionaire active in an area unsuitable for logging would seriously compromise the credibility of the projects' goal of promoting sustainable production forest management and participatory protected area management.

Since SFMP activities have not yet been initiated in the KKP concession, (nor had a formal memorandum of understanding been concluded between SFMP and the concessionaire as of the EA team's work), a reconsideration of the allocation of ITTO funds for assistance to KKP would not be disruptive to ongoing field activities. One alternative to be considered by the PCC is reprogramming ITTO funds to assist the Ministry of Forestry prepare to implement ITTO's "Year 2000" guidelines. These guidelines will require that all internationally-traded tropical timber be sourced from sustainably managed forests by the turn of the century. While it is true that much additional research is needed before specific guidelines to ensure sustainability can be developed, attention must also be paid to the institutional mechanisms to be used to certify the source of wood. Development of a wood certification program, along the lines described in Chapter 2 of the Curran and Kusneti (1992) report, would benefit from technical assistance that could be provided with ITTO funds. A recommendation for a related policy study is included in Section 6.3 below.

2.2.1.3 Compliance with U.S. Government Legislation Concerning Assistance for Commercial Timber Extraction

U.S. Government legislation[18] states that USAID assistance will be denied for:

> ...the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner which minimizes forest destruction and that the proposed activity will produce positive environmental benefits and sustainable forest management systems.

NRMP has no plans to procure or use logging equipment directly. Proposed activities in sustainable forest management in collaboration with P.T. SBK are limited to the provision of technical assistance with the aim of introducing improved harvesting techniques, which in the EA team's judgment have considerable potential to mitigate the adverse environmental impacts of current logging practices.

---

[18] Section 118 of the Foreign Assistance Act of 1961 (as amended)

Subsequent legislation[19] prohibits the use of USAID funds for:

> ...any program, project, or activity which would result in any significant loss of tropical forest; or involve commercial timber extraction in primary tropical forest areas.

According to Congressional guidance[20], this prohibition does not apply if an Environmental Assessment:

> 1) identifies potential impacts on biodiversity; 2) demonstrates that all timber extraction will be conducted according to an environmentally sound management system which maintains the ecological functions of the natural forest and minimizes impacts on biological diversity; and 3) demonstrates that the activity will contribute to reducing deforestation.

Given the lack of baseline data on the Bukit Baka/Bukit Raya project site and the absence of long-term research on the TPTI system, it would be impossible to make an absolute determination of the ecological sustainability of logging in the SBK concession. That issue is itself the focus of NRMP-supported research. It is the EA team's judgment that the improved forest management policies and practices being promoted by NRMP have considerable potential to reduce adverse impacts on biodiversity through minimizing habitat disturbance and species loss through inappropriate post-logging treatments.

The EA team recommends that NRMP's collaboration with SBK be deemed in compliance with the provisions of U.S. Government legislation and Congressional guidance elaborated above. However, to ensure continuing compliance, NRMP support for the pilot testing of improved harvesting methods should be subject to periodic review and assessment. The NRMP Natural Forest Management Advisor should be responsible for preparing a brief statement asserting compliance for each project-supported activity not specifically endorsed by the EA team that could be construed as involvement "in the use of logging equipment". These statements should be reviewed by the USAID Project Officer and made available to future project evaluation teams.

In view of the steep terrain of the concession area and its location in the middle of a nature reserve complex, it is the EA team's judgment that assistance to production forest activities in collaboration with KKP would not be in compliance with U.S. Government legislation. The prospective SFMP collaboration with KKP is to be financed with ITTO

---

[19] Section 532(d)(3), sometimes cited as 533(c)(3), of the Foreign Operations, Export Financing, and Related Programs Appropriations Act of 1991. This language applies to funds appropriated in 1991 and 1992; the language was dropped from 1993 legislation.

[20] contained in State Department cable 188515

funds, and therefore is not subject to the provisions of U.S. law. However, any activities on the part of NRMP advisors that could be deemed "assistance" to commercial timber extraction in the KKP concession would be subject to those provisions. At the same time, certain types of collaboration with SFMP, in the form of sharing information, for example, would be encouraged by U.S. legislation. As certain sections of the March 1992 JIP are vague regarding the exact nature of assistance to be provided by NRMP advisors to the SFMP project, the EA team recommends that the JIP be revised to clarify that all proposed collaborative activities are in compliance with relevant legislation.

2.2.2 Agroforestry/Community Development Activities[21]

Annex B of the Joint Implementation Plan identifies numerous land management and livelihood enhancement activities to be undertaken in cooperation with communities in the Bukit Baka/Bukit Raya project site. Some of these activities, such as fire control, are focussed on the villages in West Kalimantan, while others, such as the development of a community-managed forest concession, are focussed on the Central Kalimantan villages. The following sections will briefly describe and assess the impact of NRMP activities related to the proposed community-managed concession, agroforestry/soil conservation, fire control, potable water, and cooperation with the SBK Bina Desa program.

2.2.2.1 Community-Managed Concession

The EA team endorses the exploratory efforts underway by the NRMP Social Forestry Advisor regarding the feasibility of a community-managed forest concession. However, in the Central Kalimantan village tentatively selected for this initiative, Riam Batang, there is currently little sense of resource scarcity, and cultivation of an institutional framework for concession management will require an intensive, long-term community organization effort, preferably in collaboration with an appropriate NGO.[22]

The community-managed concession initiative would benefit from coordination with related donor-funded initiatives in West Kalimantan. The EA team recommends that NRMP consult with the staff of the GTZ-supported Social Forestry Development Project (SFDP; also known as "The Tengkawang Project") with the aim of learning from relevant experience and developing modes of cooperation between the two projects. Initial consultation by the Social Forestry Advisor could be followed up with a study tour for project advisors and

---

[21] More extensive findings and recommendations are found in the EA reports by Dugan and Soedjito (Annex A) and Potter (Annex B).

[22] One possibility, outlined in the EA report by Dugan and Soedjito (Annex A), is to develop community management capacity in tandem with the labor-intensive waste utilization initiative proposed above.

community members from Bukit Baka/Bukit Raya, along with prospective NGO partners, to the SFDP project site.

2.2.2.2 Agroforestry/Soil Conservation

The NRMP Natural Forest Management Advisor has recently initiated discussions with target communities to formulate a plan of activities related to home-gardens, ladang enrichment, soil conservation, and multipurpose tree and forage grass propagation in the alang-alang grasslands. In addition to the fire control initiative described below, Accelerated Natural Regeneration (ANR) interventions are planned.[23] All of these have the potential for positive ecological impacts, and virtually no risk of adverse ecological impacts. NRMP advisors are sensitive to the fact that the social impacts of interventions may vary by household, labor availability and gender, and have recommended that a female agriculturalist be added to the advisory team. The EA team endorses NRMP's strategic use of cross visits and study tours to expose farmers and extension staff to new ideas.

The EA report by Wirawan (Annex D) suggests that NRMP could play a potentially significant role in assisting Central Kalimantan villagers to intensify the management of their rattan gardens. Preliminary evidence indicates that the current practice of storing cane on the living plant during periods when prices are low may not be silviculturally or economically optimal. Further study and experimentation would be needed prior to a major project initiative in this direction.

2.2.2.3 Fire Control

NRMP staff and consultants have correctly identified fire control as a necessary precondition for virtually all other land management activities in the alang-alang areas of the West Kalimantan villages. Accordingly, the NRMP Social Forestry Advisor has facilitated discussions with official and traditional village leaders in Nanga Siyai regarding the initiation of a community-based fire control program. A short-term consultancy on environmental awareness targeted this issue as well (Bergau, 1992). During field visits to the West Kalimantan villages, the EA team found that fire control is the project initiative about which villagers are most knowledgeable and enthusiastic. The village head of Nanga Siyai used the occasion of the team's visit to the hamlet of Nanga Apat to consult with leaders there about the proposed fire control system.

---

[23] Accelerated Natural Regeneration (ANR) is a forest management strategy based on natural biological succession. ANR interventions are applied ensure that succession is not interrupted, and to accelerate the growth of preferred species. ANR can be applied as a reforestation technique in grasslands, as well as a post-harvest silvicultural treatment in production forests. More information on ANR is found in the EA report by Dugan and Soedjito (Annex A).

The ecological and social impacts of a successful community-based fire control program would be positive, at least for the majority of households that do not rely on the grasslands for cattle fodder. With the cessation of annual burning, the natural regeneration of secondary forest would be facilitated, gradually restoring soil fertility and biological diversity. Effective fire control would also lift current constraints on investments in tree crops such as rubber, fruit trees, and tengkawang. However, the program will likely face difficulties stemming from the fact that fire control will impose additional costs on wealthier, cattle-owning households that currently utilize the grasslands as an open access fodder resource.[24] Resolution of inter-village conflict, particularly between Nanga Siyai and the cattle-owning village of Nanga Nuak, will require coordination at the district level. In addition to intensive, long-term community organization efforts assisted by NRMP, community leaders will need to enlist the support of authorities at higher levels of government.

2.2.2.4 Potable water

In response to priorities articulated by communities in the project area, the NRMP is providing a short-term consultant to test the design and construction of simple potable water supply systems. In view of the EA team's judgment that the disruption in the quality and flow of rivers is one of the most significant social impacts of timber concession activity, an NRMP intervention to mitigate this impact is fully appropriate. As simple, small-scale systems are proposed, no significant adverse environmental impacts from construction are envisioned. In addition to the direct positive social benefits likely to result from the availability of a safe and reliable drinking water supply, indirect positive effects of associated community organization efforts could also result.

2.2.2.5 Cooperation with the SBK Bina Desa Program

In June 1992, NRMP advisors reached an agreement with SBK to formally cooperate with the company's Bina Desa program, although the exact nature of this cooperation had not yet been worked out as of the time of the EA team's fieldwork. The prospective collaboration poses a dilemma: on the one hand, by engaging the Bina Desa program, NRMP associates itself with the input-intensive technology and subsidy-driven approach that currently characterize that program. Villagers already assume that the purpose of NRMP is the same as that of Bina Desa, i.e., to eradicate shifting cultivation. On the other hand, the NRMP advisors and SBK's Bina Desa staff are working with the same farmers. Given that SBK has committed staff and resources to agricultural extension and is open to new ideas, by not cooperating, NRMP would miss an opportunity to effect positive change in the implementation of that program.

---

[24] The EA report by Potter (Annex B) recommends that NRMP conduct a study of the local cattle industry, to include the potential for developing alternative fodder resources.

The appropriate response of NRMP to this dilemma was a matter of controversy within the EA team. Some team members argued that NRMP's collaboration with the Bina Desa program could lead to indirect involvement with practices that are of questionable ecological and social soundness, such as the inappropriate use of pesticides. Other team members argued that since rice production is the primary concern of the affected communities, and one that is not addressed by other NRMP interventions, the project had an obligation to assist the Bina Desa rice intensification efforts. One team member suggested that NRMP work on these issues in parallel to the Bina Desa program, at a location distinct from the SBK demonstration plot. All EA team members agreed that current resources allocated to the project site are insufficient to undertake all of the agroforestry/community development initiatives described above, as well as take on the further challenge of reorienting the existing SBK agricultural extension program toward a more participatory approach.

The EA team recommends that NRMP mobilize additional human and institutional resources, particularly NGOs and female staff, for field implementation of agroforestry/community development activities. To the extent that NRMP engages the SBK Bina Desa rice intensification activities, additional agricultural expertise should also be tapped. Investment should be made in developing the capacity of cooperating institutions such as NGOs, rather than hiring additional individual project staff members. A recommendation for a policy study related to the national-level HPH Bina Desa Hutan Program is included in Section 6.4 below.

2.2.2.6 Compliance with U.S. Government Regulations Concerning Assistance for Pesticide Use

U.S. Government regulations[25] require that projects involving assistance for the procurement or use of pesticides undergo specific procedures to evaluate the economic, social, and environmental risks and benefits of the planned pesticide use. As no such procurement or use is currently anticipated in the JIP or by NRMP advisors, NRMP should be deemed in compliance with relevant regulations. To ensure continuing compliance, NRMP advisors should continue to avoid direct involvement with the promotion or use of pesticides in the context of cooperation with the SBK Bina Desa program.

---

[25] AID Environmental Review Regulations (22 CFR 216)

2.2.3 National Park Management Planning and Implementation[26]

Complementary to the sustainable forest management and agroforestry/community development interventions described above is NRMP assistance for the preparation and implementation of a multi-purpose national park management plan.

2.2.3.1 Plan Development

The NRMP Nature Conservation Advisor has given priority to preparing a management plan for the Bukit Baka/Bukit Raya National Park (Potess, 1992a and 1992b) and to initiating outreach activities in affected communities. The plan's management strategy proposes a zonation system including core, wilderness, utilization, rehabilitation, traditional use, and collaboration zones.[27] The plan also elaborates three sub-programs:

- Resource Protection and Management, to intensify the protection of flora and fauna in the national park through habitat management and control of destructive activities;

- Extension and Human Use of Natural Resources, to increase the welfare of local communities through the promotion of ecologically and economically viable land-use practices in "Traditional Use" and "Collaboration-Buffer" Zones; and

- Tourism, Interpretation, and Environmental Awareness, to promote greater awareness of and support for conservation goals.

The EA team identified three issues related to the formulation of the national park management plan: constraints on collaborative planning posed by the remoteness of the site and the lack of field counterparts; the lack of field-based ecological and social data on which to base the zonation system; and the lack of access to comprehensive maps of the area.

Although the Nature Conservation Advisor has consulted periodically with local community leaders, NGOs, and Ministry of Forestry officials in Pontianak, Palangkaraya, and Jakarta, the Advisor's posting in a remote location and lack of field counterparts has precluded the substantive participation of many interested parties in preparation of the management plan. One constraint on a more collaborative planning process is Ministry of Forestry regulations that preclude the allocation of staff and resources for a national park management unit until a management plan is approved. The EA team recommends that NRMP take additional steps to work around these constraints. The EA report by Torres

---

[26] More extensive findings and recommendations are found in the EA reports by Potter (Annex B), Torres (Annex C), and Wirawan (Annex D).

[27] These zones correspond to those allowed in the Government of Indonesia's Act No. 5 of 1990 Concerning Conservation of Living Resources and Their Ecosystems.

(Annex C) provides a general framework for a team-based planning approach. Recommendations related to the deployment of field-based advisors and mobilization of government and non-government "counterparts" are included in Section 5.3 below.

The management plan is itself a tool for enhancing the positive social and ecological impacts of nature conservation activities associated with the establishment of a protected area. However, the potential positive ecological impacts could be compromised, and some negative social impacts could emerge, if the plan is formulated in the absence of adequate supporting data and fieldwork. For example, inappropriate delineation of core zones could result without information on habitats, populations, and distributions of rare and endemic species. The planned biodiversity survey will begin to address these data needs.

Similarly, socially inappropriate zonation could occur unless sufficient information on the history, land rights, and current use patterns of surrounding communities is gathered in advance. While the NRMP-supported social survey (Belsky, 1992) provided a wealth of information on the socio-economic conditions of villages near the park, it did not attempt to address the crucial spatial aspects of community resource rights and livelihood activities. Planned participatory sketch-mapping activities will be an appropriate first step in gathering this data.[28]

NRMP advisors and consultants (including the EA team) have not had access to comprehensive maps of the Bukit Baka/Bukit Raya project site detailing relevant topography, land use, concession and protected area boundaries, and the location of human settlements. Composite maps prepared by the EA team indicate some confusion over the location of the boundary between the SBK concession and the national park, and the location of villages in relation to protected area boundaries. The EA team recommends that as a matter of priority, NRMP coordinate with relevant agencies to obtain all relevant existing maps, as included in the 1991/92 workplan, and to develop additional maps utilizing satellite imagery, GIS, GPS, and aerial photography. These maps are a prerequisite to the further development of the national park management plan, and to the accurate demarcation of the national park boundary, which was also included in the 1992/92 workplan.[29]

2.2.3.2 Plan Implementation

If current deficiencies in baseline data and maps are remedied, implementation of the management plan is likely to have positive ecological impacts through preventing or controlling disturbance to the protected area. Facilities to be constructed under the plan,

---

[28] Additional studies that will be necessary to fill in existing information gaps are detailed in EA reports by Potter (Annex B), Torres (Annex C), and Wirawan (Annex D).

[29] The EA report by Wirawan (Annex D) provides specific recommendations related to the acquisition and development of maps.

such as an interpretation center, have been tentatively slated for construction on already disturbed sites, and could assist in channeling future disturbance from tourists and other users away from more sensitive areas, in accordance with the park zonation system.

Social impacts of plan implementation, on the other hand, will depend on the degree to which local communities understand, accept, and benefit from the management regime. One area of concern, already alluded to above, is the perception in affected communities that the purpose of the "National Park Project" (or *Proyek Taman Nasional* as NRMP is known in the villages) is to eradicate shifting cultivation and otherwise minimize their interactions with the park and its resources. This perception contrasts with the participatory management strategy envisioned in NRMP documents. The basis for the villagers' conclusion may be that they are so far unable to distinguish NRMP activities, which up to now have focused on alternative income-generation activities such as home gardening, from the SBK Bina Desa program.

The EA team recommends that NRMP advisors give higher priority to promoting the active participation of community members in park planning and preparation for playing roles in park management. For example, field surveys to support the formulation of national park zones should include representatives of nearby communities. NGOs and/or other intermediary institutions should be mobilized to assist in the community organization necessary for this process. Such institutions could also facilitate study tours for villagers to other national parks where communities play formal roles in protected area management. The EA team endorses NRMP plans to involve community members in planned biodiversity surveys, and NGOs in participatory sketch-mapping of community forest resource use.

A second area of concern is the likely negative social impact of law enforcement approaches to protected area management. Given community perceptions noted above, the construction and staffing of guardposts without significant investment in winning community acceptance would alienate local villagers from participation in conservation efforts. The EA team recommends that the construction of any infrastructure (such as signs, trails, and guardposts) be preceded by a systematic process of consultation with affected communities. Prior to the placement of park personnel, NRMP advisors should coordinate with PHPA to ensure that staff receive sufficient training in participatory resource management approaches. To the extent feasible, community members themselves should be recruited to fulfill park management roles. A related policy study is recommended in Section 6.5 below.

2.2.3.3 Compliance with U.S. Government Legislation and Regulations Concerning Endangered Species

U.S. Government legislation and regulations[30] promote the conservation of biodiversity and require that projects having an effect on an endangered or threatened species or critical habitat be subject to an Environmental Assessment "...which shall discuss alternatives or modifications to avoid or mitigate such impact on the species or its habitat." The forests of Bukit Baka/Bukit Raya provide habitat for rare and endangered vertebrate species such as the orangutan (*Pongo pygmaeus*) and the helmeted hornbill (*Rhinoplax vigil*).[31] More comprehensive data on the status of those species, or other flora and fauna that may be endangered, does not yet exist.

NRMP's impact on endangered species at the Bukit Baka/Bukit Raya project site is likely to be positive. First, information collected during project-supported taxonomic studies, biodiversity surveys, applied research, and routine monitoring will significantly expand the knowledge base for planning to protect those species. Secondly, the national park management plan (Potess, 1992b) will include a strategy to identify, protect, and manage particular species and habitats, as well as to implement rehabilitation efforts if necessary. NRMP interventions related to production forest management (described in Section 2.2.1 above) are designed to mitigate the adverse impacts of current logging practices on the environment. Construction of the research station (described in Section 2.2.4 below) on a previously-disturbed site minimizes the likelihood of damage to remaining critical habitat.

2.2.4 Research Station and Applied Research Program

The following sections discuss the impacts of the planned research station and applied forestry research program to be jointly implemented by the NRMP and SFMP at the Bukit Baka/Bukit Raya project site.

2.2.4.1 Research Station and Mini-Hydropower Installation

Under the Joint Implementation Plan, NRMP and SFMP are collaborating on the planning, construction, and operation of a forestry research and training station to be located in the SBK concession adjacent to the Bukit Baka Bukit/Raya National Park. NRMP has provided technical assistance for a topographical survey of the site and is financing the planning and construction of a mini hydro-electric power and water supply system (Johnson, 1992). In addition, the NRMP Forestry Research Advisor has prepared guidelines and

---

[30] Section 119 of the Foreign Assistance Act of 1961 (as amended), and AID Environmental Review Regulations (22 CFR 216)

[31] Potess (1992b) contains a partial listing of mammal and bird species known to occur in the national park.

procedures for the station's operations (Voss, 1992) and will be providing intensive supervision during the station's construction. Thus, while the construction and operation of the station are to be financed by ITTO, environmental and social impacts of the station are appropriately considered to be indirect effects of the NRMP under the JIP.

The EA team reviewed the documentation available on the planned research station, held discussions with NRMP field advisors, and visited the proposed site. While the construction and operation of the research station will inevitably result in some direct adverse environmental impacts, it is the EA team's judgment that these impacts will be for the most part temporary, and marginal in comparison to the disturbance already caused by the existence of logging roads, camps, and operations in the immediate vicinity of the proposed building site.

The design of the mini-hydro system does not include an impoundment. A portion of the pipeline will pass through pristine forest, and caution will have to be exercised to avoid unnecessary disturbance of vegetation during its installation. A manually-cleared footpath (rather than a bulldozed road) is planned for the alignment, which will minimize earth-moving and allow for zig-zagging to avoid cutting large trees.

The proposed design and siting of the research station are such that the direct environmental impact of the facility itself will be minimal. Simple raised wooden structures are proposed, and their location -- in a previously logged area -- will not require any bulldozing. In addition, while construction and operation of the station could cause some direct adverse environmental impacts such as sedimentation and pollution of adjacent streams, it is the EA team's judgment that such impacts can be kept to an acceptable level through adherence to appropriate construction and waste disposal standards already proposed by the long-term NRMP Research Advisor. It is the EA team's understanding that the Research Advisor will be responsible for supervising and monitoring the contractor during construction of the station. The EA team recommends that the Research Advisor should also be responsible for designing a simple water quality monitoring system to ensure continuing compliance during subsequent operation and maintenance of the station.

The most significant potential environmental impact of the station will be the significant erosion from the initial road rehabilitation and ongoing maintenance necessary to ensure access to the site. Major earth-moving activities during the rainy season would cause unacceptable levels of sedimentation, given the steep dropoffs from the station site to streams that provide the water supply to SBK Camp 54. Continuing maintenance of the approximately 10 kilometer spur from the mainline road to SBK Camp 54 would be the most significant environmental impact of station operation, if the road were not being kept open by SBK for access to the camp. The EA team recommends that the construction, road rehabilitation, and regular maintenance activities for the proposed research station and its access road be limited to the dry season months.

The direct social impacts of the research station are likely to be minor and positive if local communities are the primary beneficiaries of employment generated by its construction and operation. While it is the current practice of SBK to employ local villagers in construction activities, kitchen and laundry positions at the camps tend to be filled by Javanese transmigrants recruited from outside the immediate project area. It is the EA team's understanding that the Research Advisor plans to give priority to the recruitment, hiring, and training of local labor in the operation of the research station.

The EA team also considered the potential for adverse indirect ecological and social impacts related to the construction and operation of the station. Clearly, any activity that results in an increase in the human population adjacent to protected areas will also increase pressure on the local flora and fauna. Similarly, any activity that increases the number and frequency of contacts with outsiders will have both positive and negative social impacts on the local population. However, given that the research station will be sited in a concession area currently supporting a labor force in excess of 700 employees, of which at least three-quarters are from outside the immediate area, the additional ecological and social impacts of a research station staff of approximately 60 are likely to be marginal.

2.2.4.2 Applied Research Studies

NRMP has not yet formulated a specific agenda for research, but the report of the short-term NRMP Research Advisor (Curran and Kusneti, 1992) contains a set of recommendations and proposals for research related to production forest management that are strongly endorsed by the EA team (see Section 2.2.1 above). The proposed case studies in the Curran and Kusneti report are presented in the form of project profiles that could be adapted and undertaken by Indonesian researchers at various government and university institutions. Proposed topics include:

- assessments of the economic and ecological feasibility of enrichment planting and thinning treatments prescribed under the TPTI system as compared to natural forest regeneration;

- ecological and social impacts of logging roads; and

- the floristic composition and distribution of commercial species in the SBK concession, and pre- and post-harvest seedling densities.

To the extent that the results of such studies influence improved forest management at the project site as well as national policy (as in the case of revisions to the TPTI system), the potential for indirect positive impacts is significant. The EA team does not anticipate any negative social or environmental impacts stemming from the proposed research efforts, as long as appropriate precautions are taken to minimize impositions on the time or privacy of nearby communities. The EA team recommends that researchers be encouraged to employ local research assistants, and to share research results with local communities.

2.3 Recommended Environmental Determination

The EA team recommends that NRMP activities in the Bukit Baka/Bukit Raya project site proceed, subject to a satisfactory response to the specific recommendations contained in the full EA report as summarized in Appendix 8. Detailed findings and recommendations related to the potential environmental and social impacts and mitigation strategies are contained in EA reports by Dugan and Soedjito (Annex A), Potter (Annex B), Torres (Annex C), and Wirawan (Annex D). NRMP should be deemed in compliance with U.S. Government legislation and regulations related to commercial timber extraction, pesticides, and endangered species. NRMP should ensure that collaborative activities with the SFMP not take the form of assistance to timber production the KKP concession area.

3 SUMMARY OF THE ENVIRONMENTAL ASSESSMENT OF THE BUNAKEN PROJECT SITE[32]

3.1 The Existing Situation

Prior to a discussion of NRMP interventions and impacts, a brief description of the existing situation and recent changes and trends at the Bunaken project site is provided in order to develop a "without project" scenario.

3.1.1 General Description of the Area

The following sections provide information on the location of the project site and ecological and social characteristics.

3.1.1.1 Location of the Project Site

The long-term objective of NRMP activities in North Sulawesi is to improve the management of Bunaken National Park. The 89,065 hectare park, most of which is sea, encompasses five islands (Bunaken, Manado Tua, Mantehage, Siladen, and Nain) and two stretches of mangrove and coral reef-dominated coastline adjacent to the provincial capital of Manado. The coral reefs for which the islands are famous can be reached in less than an hour by boat from the mainland. Due to time and data constraints, the EA team focused its attention on the marine and island portions of the reserve. A map of the Bunaken project site is appended as Figure 7.

3.1.1.2 Ecological Characteristics[33]

The marine resources of the park, located near the marine biogeographic center of the Indo-Pacific region, exhibit a high degree of biodiversity of both invertebrates and fish. Rare species occasionally seen in the park include the Dugong and Green, Hawksbill, and Leatherback sea turtles. Giant clams occur in moderate numbers, and other molluscs include the Giant triton, Helmet shell, and Trochus. The reefs and their associated seagrass beds are in moderate to excellent condition, and while trend data is not available, there is no evidence that significant deterioration has taken place in recent years. Reef fisheries are viable and relatively productive.

---

[32] See also EA reports by Kendrick (Annex E) and White (Annex F)

[33] The draft management plan for Bunaken National Park (Usher and Rompas, 1992) and the EA report by White (Annex F) provide additional descriptive material and references on the ecological characteristics of the project area.

The park also includes some 1800 hectares of mangrove forest, which is used by local communities and outsiders for fuel, boat-building, and a cottage furniture industry. The seaward stands of mangrove trees observed by the EA team on the islands are quite dense, and large, old trees are relatively common. The mangrove forests provide habitat for various species of crab and fish, and play an important role in filtering sediment from onshore runoff.

Water quality within the park is relatively good, with no evidence of significant pollution from shipping or local sources. Sedimentation is relatively minor, although major problems could arise if mangroves are cleared or if the present cultivation of steep slopes on Manado Tua Island continues. Floating solid waste such as plastics, bottles, and rubber, which apparently originates from rivers flowing into Manado Bay, constitutes a problem from an aesthetic point of view.

3.1.1.3 Social Characteristics[34]

The islands within the national park contain a population of almost 9000 inhabitants organized into nine villages, each of which are in turn composed of two or more smaller communities. According to local informants, settlement on the islands dates back to at least the turn of the century. The population of the islands has remained stable over the last ten years, with no significant in-migration, although there is some seasonal migration related to labor for fishing and coconut plantations. The level of isolation is low; many island residents have family in Manado, and travel back and forth on a weekly basis for shopping and other needs.

The level of government presence in the islands is relatively high. In addition to village administrative structures, posts are maintained by the Ministry of Forestry, the provincial tourism service, and the military. Fisheries extension agents visit regularly, and marine police patrol the shoreline. Among non-government institutions, protestant churches are the strongest and most visible, and mosques are present in Muslim communities.

Recent survey results (Belsky, 1992b, in draft) indicate that island communities are quite heterogeneous in terms of religion, livelihood strategies, resource dependence, and social organization. While household income data is not available, there is no evidence of the extreme poverty characteristic of fishing communities elsewhere in Indonesia. Dependence on marine resources is high, with approximately half of households surveyed reporting fishing as their major source of cash income (Belsky, 1992b, in draft). "Fishing"

---

[34] The draft management plan for Bunaken National Park, a draft social survey report (Belsky, 1992b) and the EA report by Kendrick (Annex E) provide additional descriptive material and references on the social characteristics of the project area.

includes a broad range of activities characterized by various types of gear, seasonality, and levels of labor and capital intensity, ranging from simple hooks and lines to motorized purse seiners. Gleaning from reef flats at low tide is particularly important for women, children, and elderly men, who, in general, do not go out to sea.

Many households also engage in part-time farming, and it is the primary source of cash income for approximately one fourth of surveyed households (Belsky, 1992b, in draft). The principal land use of the islands is coconut plantation, and cassava and banana are also grown. A mangrove-wood furniture industry is an important source of income for many households on Nain Island.

With the exception of mangrove forest and a small protected forest area on the summit of Manado Tua Island, land on the islands is held as private property. Although few land owners hold official certificates, their claims are strengthened by village land registration, payment of taxes, and long-term occupation and use. In general, local communities acknowledge that marine resources belong to the government, and those resources are managed under open access regimes. Other than some locally-recognized rules stemming from resolution of past conflicts, the EA team found no evidence of a comprehensive traditional sea tenure system. Competition and conflicts over marine access and use rights appear to be more significant between residents of villages and islands within the park rather than between park residents and outsiders.

3.1.2 Recent Changes and Trends

The most important recent change at the Bunaken project site is the acceleration of tourism development. While adequate data is not available to support strong conclusions, local communities' use of natural resources does not appear to have contributed significantly to the degradation of those resources in recent years. The designation of the area as a national park has led to anxiety on the part of island residents regarding their future.

3.1.2.1 Tourism Development

Bunaken National Park is North Sulawesi's premier tourist attraction, drawing some 18,500 scuba divers and snorkelers to use the park through Manado-based dive resorts last year. Tourism, while providing welcome revenue to the province, threatens the park's resources both directly and indirectly. The most significant direct effect is coral breakage and disturbance of other fragile organisms caused by careless handling of dive boats and anchors. Indirectly, tourism is stimulating the unplanned development of tourist facilities along Liang Beach on the southern side of Bunaken Island. While there are some concerns regarding the environmental impact of accommodations that have been built along the beach, such as the use of sand for construction and inadequate sanitation systems, the primary impact of tourism development is social.

Due to a lack of clarity and consensus regarding the status of the land and people within the national park and the jurisdictional authority of various government agencies, various attempts to stimulate and regulate tourism development are proceeding in an uncoordinated and non-transparent manner. Without the knowledge or concurrence of Ministry of Forestry officials, Bunaken Island "homestay"[35] owners were recently informed by local government officials that their structures on the beach would have to be torn down, at the same time that local newspapers were reporting that a private businessman (who also owns beachfront cottages) had received a government contract to manage existing tourism facilities for day use on the island. These and other rumored developments, in conjunction with reported land speculation, have generated fears among island residents that they will be displaced by outside commercial investment, and has intensified interagency competition to gain control over the park.

3.1.2.2 Local Resource Use

Threats to natural resources within the national park stemming from local exploitation appear to be chronic rather than acute. The pressure on coral reef fisheries around Mantehage and Nain Islands is high and may be in excess of sustainable levels; fishermen on these islands complain of decreasing catch per unit effort. However, observations indicate that most areas of the reef are not severely overfished. Indeed, there is evidence that more destructive fishing practices (such as bombing) have declined in recent years, and that the reef adjacent to Bunaken Island is in better condition now than ten years ago. Some fishing methods are marginally disturbing to bottom habitat, and need to be controlled.

While mangrove forests on the islands remain in reasonably good condition, there is no data available on whether or not current levels of exploitation are sustainable. Coral mining for construction is not sustainable, and it is not clear what level of exploitation is occurring now. Gleaning on the reef flats is physically destructive due to trampling of the reef, and has depleted sea cucumber populations. Collection of shells for souvenirs and handicraft production does not appear to be a serious ecological threat at present.

3.1.2.3 National Park Designation

Bunaken's status as a national park has evolved in stages since it was declared a protected area by the provincial governor in 1980. Most recently, the area was designated as a national park by the Ministry of Forestry in October 1991. No special park management unit has yet been established, and the MOF continues to be a minor player among the many

---

[35] Bunaken islanders differentiate "homestays" from "cottages". The former term applies to structures built and occupied by island residents that rent out rooms for overnight guests, while the latter is applied to free-standing tourist accommodations constructed by outside investors.

government agencies with interests in the park at the provincial level. Jurisdiction over the islands within the park is a matter of contention among government agencies.

The area's elevation to national park status has intensified the anxiety of island residents over the possibility that they will be resettled to the mainland. Recently posted signs on the beaches of island communities regulate exploitation of reef resources and specify fines and jail sentences for various infractions. These signs have caused resentment among island residents, who feel they are being made the scapegoat for damage to the reef caused primarily by outsiders. Island residents have already been alienated by marine police arrests related to violations of fishing regulations, and the heavy-handed enforcement by MOF, military, and local government officials of prohibitions against mangrove cutting.

3.1.3 "Without Project" Scenario

In the absence of external interventions, it is likely that the trends described above would continue. Coral reef fisheries and mangrove forests would continue to be managed as open-access resources, likely at levels of productivity below what could be achieved under alternative management systems. The negative environmental and social impacts of uncontrolled tourism development resulting from the lack of coordination among concerned government agencies would likely intensify, and could include the displacement of island communities through forced resettlement and land speculation. Such displacement, as well as law enforcement approaches to national park management, would increasingly alienate local communities from participation in conservation efforts. If local communities feel that conservation efforts that restrict their livelihood activities are for the benefit of outsiders, at the same time that they feel unfairly blamed for environmental damage that is taking place, they will be unlikely to cooperate with the plans of park managers.

3.2 USAID-Funded Natural Resources Management Project: Interventions, Impacts, and Recommendations

The NRMP proposes to intervene in the situation described above through the design and implementation of a national park management plan and the development of an applied research program. NRMP advisory resources allocated to the Bunaken site are limited to a long-term Marine Conservation Advisor fielded in October 1991, and a part-time consultant in marine conservation recruited from the Manado-based Sam Ratulangi University (UNSRAT). NRMP advisors are based at the MOF Forest Protection and Nature Conservation sub-office in Manado to work with the head of that office and his staff.

The draft management plan proposes a two-pronged approach to park management:

- demarcation and enforcement of a zonation system to allow "the control of activities that damage or degrade park habitats and of the conflicts that occur from usage of the park for mutually exclusive activities"; and

- implementation of "incentive programs for local communities and other users to reduce activities that cause habitat degradation, either by modifying existing use patterns or introducing alternative options".

The zoning system would create totally protected "core" zones to serve as marine sanctuaries adjacent to the islands and mainland sections of the park, as well as within the mangrove forest on Mantehage Island. Various categories of "use" and "buffer" zones would accommodate tourism, agriculture, and fishing. The incentive programs are expected to include deep-water fisheries development, agriculture, and forestry. In addition, the draft management plan proposes an institutional framework for park management, and related infrastructure, equipment, and training.

Overall, the EA team found that proposed NRMP activities at the Bunaken site have the potential to produce significant positive ecological and social impacts, and pose few risks of negative impacts. However, the effectiveness of NRMP interventions, as well as their ecological and social soundness, will depend on:

- progress toward resolution of the current jurisdictional impasse between provincial government agencies and the MOF;

- mobilization of additional human and institutional resources to realize meaningful community participation in park management planning and implementation; and

- harmonization of project objectives with the limited resources available to the project in recognition of the complexity of the situation to be addressed.

3.2.1 Interagency Coordination

Interagency coordination related to park management is currently constrained at the provincial level by polarization among various government agencies regarding jurisdictional authority over the park. There is some danger that private interests aligned with development-oriented agencies will exploit this ambiguity, leading to ecologically and socially unsound developments that will be difficult to reverse.

The EA team recommends that NRMP:

- seek immediate, policy-level intervention from MOF officials in Jakarta to prevent irreversible developments on the islands that would conflict with the national park management plan;

- support the formation of an informal working group among the various stakeholders in park management, including provincial planning, forestry, tourism, and fisheries agencies, in addition to the formal Park Coordination Committee proposed in the draft management plan; and

- facilitate team- and consensus-building through the sponsorship of study tours to relevant positive and negative examples of coastal resource management in the Southeast Asian region.

The EA team encountered lingering concerns among NGOs that NRMP might be supportive of proposals to resettle island residents of the national park. The EA team recommends that NRMP staff and advisors continue to use every opportunity to go on record as being against resettlement alternatives for island residents. In addition, "traditional use zones" proposed in the draft management plan should not be seen as a transitional phase subject to the imposition of more restrictions in the future: traditional use can be consistent with sustainable community resource management in the long term. A recommendation for a policy study related to the legal status of communities within national parks is included in Section 6.6.

3.2.2 Community Participation

In view of the number and heterogeneity of communities in the national park, and the complexity of their interactions with park resources and outside claimants on the reserve, the process of community organization to realize the participatory strategy envisioned in the draft management plan is critical to the plan's success. This will require a significant investment of human resources at the field level, community by community. The EA team recommends that NRMP expand its collaboration with NGOs to include organizations with community development experience, and support a program of field-based community organizers to facilitate meaningful participation in park planning and management.

The process of developing NGO capacity in community organization, in addition to negotiating and coordinating their activities with NRMP, will require a significant investment of NRMP advisory resources. The EA team recommends that NRMP add a full-time, internationally-recruited specialist in community development and communication to the project advisory team.[36]

3.2.3 Harmonization of Objectives with Resources

Even with additional staff and collaboration with community development NGOs, the scope of activities envisioned in the management plan are too ambitious to be addressed effectively all at once. The EA team recommends that NRMP set sectoral and geographical priorities for the phased implementation of park management activities. The EA team suggests that:

---

[36] A draft terms of reference for the additional advisor is appended to the EA report by Kendrick (Annex E).

- NRMP initially limit its focus to increasing local participation in marine resource management -- particularly zoning for community management of reef fisheries -- and ecotourism development, starting with Manado Tua and Bunaken Islands, respectively; and that

- NRMP support the placement of researchers and/or community organizers in communities on Mantehage and Nain Islands to collect data on current patterns of marine and mangrove resource use to provide baseline data for planning eventual expansion to those islands.

3.2.4 Specific Recommendations for Zoning, Tourism, and Mitigation of Adverse Social Impacts

The zonation system as currently proposed is excessively complicated and is not sufficiently responsive to current resource use patterns. The EA team recommends that:

- the marine zonation system be simplified to community-managed sanctuary and sustainable-use zones developed in consultation with current resource users. Existing dive sites (rather than zones) to be marked with mooring buoys can be accommodated within both of these zones.

- the regulations regarding buffer zones in deepwater areas surrounding the reefs take into account the placement of Fish Aggregating Devices (FAD's), which have already been the source of some conflict among fishers.[37]

- the land zonation system be limited to a tourism zone on Liang Beach, Bunaken Island. NRMP should assist in the development of guidelines for shoreline development within this zone that would also apply to national park infrastructure.

- NRMP assist in the formulation of policies and regulations supportive of small-scale, locally owned and managed tourism facilities.

To minimize adverse social impacts:

- gleaning should be regulated with great care, as restriction of these activities would disproportionately affect economically vulnerable households.

- any livelihood enhancement activities should be targeted to households most likely to be negatively affected by resource use restrictions resulting from implementation of the management plan.

---

[37] For a more detailed discussion of FADs, see the EA report by Kendrick (Appendix E).

3.2.5 Park Infrastructure and Law Enforcement

NRMP assistance for national park infrastructure and equipment, such as guard posts and patrol boats, could potentially result in negative social impacts if inappropriately used for law enforcement activities. Initial park management interventions undertaken by the Ministry of Forestry, such as recently-posted signs regarding prohibitions and fines for park resource use and recent arrests of individuals for cutting of mangrove forests, have led to feelings of alienation on the part of park residents. To avoid future negative impacts, the EA team recommends that the construction of any park infrastructure (such as signs and guardposts) and any use of patrol boats for law enforcement activities be preceded by a systematic process of consultation with affected communities. In addition, NRMP should facilitate the training of current MOF staff assigned to the national park in participatory approaches to park management.

3.2.6 Applied Research

The routine monitoring of park ecosystems proposed in the draft management plan is an important management tool, and local capacity must be developed for implementation over the long-term. The EA team recommends that the planned biodiversity survey be designed so that monitoring can build on the initial database and use the same data collection methods, and should be used as an opportunity to train a survey team from UNSRAT. Supplementary short-term technical expertise could also be obtained from LIPI in Jakarta or the Marine Science Institute of the University of the Philippines. The recently completed social survey should form the basis for long-term monitoring of social impacts. Results of surveys and monitoring should be shared with local communities to enhance their understanding of the results of their own conservation efforts.

3.2.7 Compliance with U.S. Government Legislation and Regulations Concerning Endangered Species

U.S. Government legislation and regulations[38] promote the conservation of biodiversity and require that projects having an effect on an endangered or threatened species or critical habitat be subject to an Environmental Assessment "...which shall discuss alternatives or modifications to avoid or mitigate such impact on the species or its habitat." Bunaken National Park is known to provide habitat for rare and endangered vertebrate species such as the dugong (*Dugong dugon*) and green and hawksbill sea turtles (*Chelonia*

[38] Section 119 of the Foreign Assistance Act of 1961 (as amended), and AID Environmental Review Regulations (22 CFR 216)

mydas, Etetmochelys imbricata).[39] More comprehensive data on the status of those species, or other flora and fauna that may be endangered, is very limited.

NRMP's impact on endangered species at the Bunaken project site is likely to be positive. Information collected during project-supported biodiversity surveys, applied research, and routine monitoring will significantly expand the knowledge base for planning to protect those species. The project's strategy of promoting community management of marine resources, in combination with the management plan's zonation strategy, will provide a framework for controlling the exploitation of endangered species and disturbance of critical habitat.

3.3 Recommended Environmental Determination

The EA team recommends that NRMP activities in the Bunaken project site proceed, subject to a satisfactory response to the specific recommendations contained in the full EA report as summarized in Appendix 8. Detailed findings and recommendations related to the potential environmental and social impacts and mitigation strategies are contained in EA reports by Kendrick (Annex E) and White (Annex F).

---

[39] Usher and Rompas (1992) contains a listing of protected species known to occur in the national park.

4 SUMMARY OF THE REVISED INITIAL ENVIRONMENTAL EXAMINATION OF THE PROPOSED GUNUNG PALUNG PROJECT SITE[40]

4.1 The Existing Situation

Prior to a discussion of proposed NRMP interventions and impacts, a brief description of the existing situation at the Gunung Palung project site is provided in order to develop a "without project" scenario. The following sections provide information on the location of the project site and ecological and social characteristics, and recent changes and trends.

4.1.1 General Description of the Area[41]

The 90,000 hectare Gunung Palung National Park is located on the coast of southwestern West Kalimantan between the Kapuas and Barito rivers, adjacent to the towns of Teluk Melano and Sukadana. These towns can be reached in a day's journey by boat from the provincial capital of Pontianak; there are also several flights a day from Pontianak to the regency capital of Ketapang. The interior of the park is less easily accessible, requiring up to two days' travel by boat or on foot depending on water levels in the streams. Maps of the proposed Gunung Palung project site are appended as Figures 8 and 9.

Stretching from coastal mangrove forest to peaks in excess of 1100 meters, Gunung Palung National Park includes a broad range of forest types. The two mountains included in the reserve, Palung and Panti, are isolated "islands" of hill dipterocarp, submontane, and cloud forest surrounded by flat plains of peat swamp forests. Species diversity is very high, and wildlife is abundant. Orangutans, proboscis monkeys, and a wide variety of bird species can be easily observed.[42]

Communities surrounding the park are predominantly Islamic Melayu, while Dayak populations that may have once inhabited the area are now located quite far to the north of the reserve. There are long-standing communities of Chinese in the market towns and Bugis

---

[40] See also IEE reports by Potter (Annex B) and Wirawan (Annex D). The revised IEE is based on a brief visit to the proposed project site by two members of the EA team. In contrast to the Bukit Baka/Bukit Raya and Bunaken project sites, the Gunung Palung site has no resident NRMP-supported advisors, nor have there been any project-supported studies of the area.

[41] The existing management plan for the Gunung Palung Reserve (UNDP/FAO, 1982) and IEE reports by Potter (Annex B) and Wirawan (Annex D) provide additional descriptive material on the ecological and social characteristics of the area.

[42] Lists of bird and mammal species found in Gunung Palung National Park, including protected species, are included in the preliminary management plan prepared by MacKinnon and Warsito (UNDP/FAO, 1982).

and Banjarese along the coast, as well as new populations of transmigrants from Bali and Java. Livelihood strategies include shifting agriculture and cultivation of tree crops, including rubber, coconut, and fruit trees such as durian. Extensive areas of wet rice cultivation have been established on the western edge of the park. A wide variety of forest products are exploited by local communities, as described below.

4.1.2 Recent Changes and Trends

Recent changes and trends at the proposed Gunung Palung project site include a significant intensification of pressures on the national park by collectors of forest products in increasing populations associated with transmigration settlements and logging activities. Boundary marking and law enforcement activities related to the designation of the area as a national park has led to conflicts with local communities. The construction and operation of a research station has expanded the data available on the area's ecosystems.

4.1.2.1 Local Resource Use

Field observations indicate that pressures on the Gunung Palung National Park have increased significantly since the previous management plan was developed in 1982. Exploitation of gaharu (diseased heart of *Aquilaria*, used for incense), pole-sized trees (for construction), and commercial timbers such as ramin, cited as threats in the 1982 plan, have intensified. Within the last three years, a good market has developed for the bark of medang (*Lauraceae*) trees, which is used in the manufacture of mosquito coils. The medang tree, one of the most common peat swamp species, dies after its bark has been removed. With the exception of farmers' efforts to control wild pigs, which destroy crops, there does not appear to be strong hunting pressure on animals in the park. However, the EA team did observe the trapping of monitor lizards, a protected species.

More general pressure on the park's resources is resulting from the decreasing isolation of the area. The recent influx of transmigrants and workers drawn to the logging industry have increased the population surrounding the park to about 32,000. Accessibility has improved with the opening of the Ketapang-Sukadana road, and logging roads have drawn some villages closer to the national park. Plans are well advanced for new transmigration settlements on the northeast corner of the park associated with an oil palm estate and an industrial timber plantation. Transmigration development to the south of the park has led to illegal logging and conversion of adjacent protected forest. Debris left behind in damaged forests and the use of burning to clear swamp forests in drought years have increased the risk of fire. Local communities appear to treat the national park as an open access resource, and there is no evidence of initiative to restrict the entry of outsiders or otherwise assist in its protection.

4.1.2.2 National Park Designation and Management

The Gunung Palung area has enjoyed some form of protected status since 1937. In 1981 the area was designated a nature reserve, and a boundary was marked in 1982. Gunung Palung became a national park in 1990, at which time the area was remapped, and a boundary reconstruction was apparently conducted in 1991. Ministry of Forestry staff have been assigned to the area since 1980, and the park is now managed by the head of the PHPA office at Sukadana, his assistant, and five guards.

Inaccurate mapping and inappropriate field demarcation of the park boundary have had negative ecological and social impacts. A wildlife corridor to connect the mangrove area south of Sukadana to the main park is misplaced on the map and not marked in the field. The boundary also fails to include examples of the deep peat swamp ecosystem that occurs to the south of the Simpang river. Boundaries following the Meliya, Laur, and Matan rivers preclude the effective monitoring or control of resource flows out of the park, as persons found travelling with forest products can always claim that they were obtained from the other side of the river.

In general, the boundary has been marked along roads, beaches, and around the foot of hills, with the result that many ricefields and treecrop plantations owned by local communities have been included inside the park. In many cases these field boundaries conflict with the official map, and with the explicit provision in the 1982 management plan that settlements be excluded from the park. While some settlements have been excised as enclaves, others have not. This inconsistency has led to resentment and anxiety on the part of local communities, who have been informed that their livelihood activities within the park now constitute trespassing.

Law enforcement-oriented attitudes toward local communities were reflected by the 1982 management plan, which provided for the apprehension of persons collecting forest products such as firewood for their own use, and for the burning down of huts of shifting cultivators. These attitudes are shared by MOF staff assigned to the park, and would pose a formidable challenge to developing a participatory park management strategy.

4.1.2.3 Cabang Panti Research Station

In 1985, a research station at Gunung Palung was established by Dr. Mark Leighton of Harvard University, and is now under the management of PHPA. Located deep within the park, station has facilitated the work of Indonesian and expatriate researchers on such topics as forest regeneration and seedling establishment, soil nutrient cycling, and vertebrate nutrition and migration patterns. This research has considerably expanded the information on park ecosystems, and would provide useful baseline ecological data for the formulation of a revised management plan. Due to its remote location and research focus, however, the station is perceived as an alien entity by local communities, and has not produced significant applied research results of value to park management.

4.1.3 "Without Project" Scenario

In the absence of external interventions, it is likely that the trends described above would continue, and perhaps accelerate. Additional transmigration settlements are proposed for areas adjacent to the park, as are new roads leading into the park to facilitate access for tourism. It is unlikely that the current park management staff, utilizing law enforcement methods, would be successful in protecting the integrity of the park from the pressures of existing communities and the increasing numbers of newcomers.

4.2 Implications for NRMP

As of the visit of the EA Team (October-November 1992), NRMP staff had not yet produced any plans or initiated any activities related to Gunung Palung National Park. According to Annex B of the Joint Implementation Plan, activities to revise the existing management plan are scheduled to begin in mid-1993. It is the team's understanding that technical assistance focused on the Gunung Palung site will be short-term in nature, and that there are no plans to field long-term advisors to the site.

As described above, pressures on park resources from surrounding communities and outsiders have intensified since the existing management plan was written, and the population continues to grow. New issues have emerged from park management interventions, including the alienation of local communities due to inappropriate boundary demarcation and the traditional law enforcement approach of park personnel. Development of an effective management plan for the park will depend on comprehensive information about the interactions of local communities with park resources and staff. The EA team recommends that, prior to the formulation of a management plan, NRMP support diagnostic research on resource use by people in surrounding communities, their attitudes and social organization, and the nature of their interactions with park staff. Given the sensitivity of illegal forest product exploitation, this information will be difficult to obtain through short-term studies.

Based on the results of the diagnostic research, a revised management plan could be prepared. The EA team recommends that the revised plan include strategies for park management to:

- cooperate with local government officials and line agencies to prevent the inappropriate siting of transmigration settlements, roads, and other developments that constitute threats to the park;

- revise the park boundary, both to incorporate missing areas of ecological importance (such as the corridor and deep peat swamp mentioned above), and to excise community land inappropriately included in the park;

- negotiate exclusive exploitation rights for local communities in certain zones of the park in exchange for assistance in controlling access by outsiders;

- cooperate with local communities in the monitoring of wildlife of economic importance either as pests or sources of income;

- train existing and future park personnel in participatory resource management approaches;

- develop community-based tourism, as a way of developing local support for conservation; and

- cooperate with the Cabang Panti Research Station in applied research of direct relevance to park management issues.

Preparation of a good management plan will not guarantee appropriate implementation. Given current attitudes of park staff, any intensification of park management activities will require careful supervision to avoid negative social impacts. The EA team recommends that NRMP not initiate activities in the Gunung Palung reserve unless long-term resident advisors can be fielded to ensure the environmental and social soundness of project-supported interventions.

4.3 Recommended Environmental Determination

The EA team recommends that the draft management plan be subject to a comprehensive Environmental Assessment, emphasizing likely social impacts of the management prescription, and measures necessary to mitigate potential adverse impacts. The expertise required to undertake the assessment would be a social scientist and a conservation specialist with experience in tropical forest ecology. The EA should also include an assessment of the project's potential impacts on endangered species and critical habitat protected by the national park. More detailed findings and recommendations related to the proposed Gunung Palung project site is contained in IEE reports by Potter (Annex B) and Wirawan (Annex D).

5 INSTITUTIONAL AND MANAGEMENT ISSUES

The NRMP is at a very early stage in implementation -- the first long-term advisors being fielded only one year prior to the Environmental Assessment -- and institutional relationships among various actors necessary to support field activities are still being developed. Several obstacles to smooth project implementation have already been identified, and ameliorative action taken. For example, NRMP recently added a long-term Research Advisor to the Kalimantan-based advisory team, in order to coordinate the activities of that team and to provide more intensive liaison with institutions based in Pontianak.

5.1 The Link to Policy-Makers at BAPPENAS and the Ministry of Forestry

One of the most strategic features of the NRMP design is the linkage of national-level policy analysis and pilot-testing of improved practices in the field. Particularly through the work of the short-term Research Advisor in collaboration with BAPPENAS, the NRMP has made an impressive start in bringing issues emerging from field work to the attention of Jakarta-based policy-makers. In the future, results of NRMP-sponsored applied research on production forest management have the potential to influence national-level policy in the forestry sector through this linkage.

Equally important, NRMP will be in a position to use field experience with participatory protected area management strategies to assist in the formulation of supportive policies. For example, successful collaboration with NGOs at the Bukit Baka/Bukit Raya and Bunaken project sites can help to overcome MOF reluctance to work with NGOs. Positive experience with community management of production forest resources could help develop a legal and policy framework for recognition of community resource rights, particularly if undertaken in cooperation with the GTZ-funded Social Forestry Development Project.

Even if various initiatives at the project sites were to prove unsuccessful, however, NRMP's field presence nevertheless provides policy-makers with access to valuable information on the implementation of existing policies and their unintended consequences. For example, the aspects of the industrial timber plantation planned for the SBK concession at the Bukit Baka/Bukit Raya project site indicate that current policies promoting HTI-Trans development should be reviewed.

NRMP advisors and USAID Mission staff should continue to cultivate periodic dialogue with policy-makers in BAPPENAS and MOF through the Policy Coordinating Committee and the Policy Working Group. The significant investment of staff time necessary for adequate preparation and follow up to meetings of those groups and with individual members will yield positive returns in the long run. The NRMP Policy Secretariat's physical proximity to BAPPENAS, and the availability of Jakarta-based NRMP advisors to respond quickly to requests for analyses of policy issues, has supported the development of a highly productive working relationship with BAPPENAS. A specific

recommendation related to developing a similar relationship to the Ministry of Forestry is discussed in Section 5.2 below.

5.2 The Role of the Ministry of Forestry

The Ministry of Forestry (MOF) is the lead agency for implementing the field components of the NRMP and SFMP under the Joint Implementation Plan. MOF officials acknowledge that the Ministry has been slow to assume ownership of the project and take the initiative in directing field activities. Some reasons cited are specific to NRMP, such as the complexity of project design and administrative arrangements, which involve at least four distinct bureaucratic entities within the Ministry in addition to ITTO, and USAID rules against the payment of honoraria to government employees. Other reasons are common to all MOF projects: the shortage of capable staff for management and implementation of the increasing number of externally-financed projects, the high rate of turnover in key positions, and the variable effectiveness of foreign advisors.

The lack of sustained focus on NRMP on the part of MOF officials in Jakarta and Bogor has proven frustrating to Ministry staff in the provincial capitals and NRMP advisors at the project sites. It has nurtured the perception that NRMP is a USAID project, as opposed to an MOF project implemented with USAID assistance. In recognition of these problems, MOF officials are currently formulating proposals to streamline the project administrative structure, and lessons learned from the first year's planning and budgeting exercises are being internalized in the second year. The project now has an opportunity to further support the MOF's developing ownership of the project utilizing the currently unfilled advisory position based at the Ministry in Jakarta.

It is the EA team's understanding that the Terms of Reference (TOR) of the NRMP advisory position based in the Ministry of Forestry in Jakarta have been adjusted to give more emphasis to facilitating the involvement of MOF officials in project-supported activities, and particularly the linkage between field implementation and policy. The EA team recommends that this role be given priority over other roles in the identification of suitable candidates for the advisory position, formulation of work plans, and evaluation of performance. Advisory roles related to research coordination and policy analysis included in the TOR are also important, but a single individual is unlikely to be able to perform all three. The advisor should help channel information about field activities to officials at the center, and actively cultivate policy and administrative support for NRMP field initiatives, including cooperation with NGOs. Various tools that could be employed to achieve this objective include the circulation of a project newsletter, and the organization of strategic field trips and study tours for policy-level officials.

5.3 Institutional Resources for Field Implementation

A related issue facing project management is the definition and mobilization of "counterparts" for field implementation. Counterparts are usually understood to be staff of

the implementing agency assigned to work with donor-assisted project advisors, but could also include the staff of other government agencies, universities, and non-governmental and other private sector organizations. This issue is of particular relevance to the Bukit Baka/Bukit Raya project site, where there are not yet any resident MOF staff. It also has implications for the Bunaken project site.

NRMP advisors are reaching the limits of their effectiveness working as direct implementors of project activities. The EA team recommends that their roles be reoriented toward the facilitation of the involvement of other actors. And while increased participation by MOF staff is a desirable goal at all project levels, it may more feasible and appropriate to mobilize alternative human resources such as NGOs for certain roles, particularly community organization. The EA team recognizes that capacity-building at provincial institutions such as universities and NGOs will be a necessary precondition to their ability to plan and implement project activities effectively. Investment in such capacity-building is an important role that the NRMP can play, especially in conjunction with facilitating working relationships between such institutions and the MOF.

The EA team recommends that the roles of long-term advisors be reoriented toward facilitating of the involvement of other institutions as planners and implementors of project activities such as community organization. This recommendation has several implications:

- NRMP would have to commit significant financial and staff resources to developing the capacity of provincial NGOs (and/or other institutions such as universities and planning authorities) to plan and implement activities related to participatory resource management. At the Bunaken field site, this will require an additional full-time advisor in community development.

- In the short run, long-term advisors in Kalimantan would need to devote proportionally more of their time to developing plans with prospective MOF, NGO, and other field counterparts in the provincial capital.

- Through the provision of separate office and living quarters, NRMP would have to establish an identity independent of SBK at the Bukit Baka/Bukit Raya site. The project's current status as a long-term guest of the concessionaire gives an appearance of conflict of interest, and hampers recognition of NRMP as a separate entity. The current lack of separation serves as a barrier to the participation of MOF and NGO counterparts in field activities.

- Short-term technical assistance inputs would need to be selected and scheduled judiciously, so as to enable project staff, advisors, and NGO and other counterparts to adequately prepare for, participate in, and follow up to visits from short-term consultants.

5.4 Monitoring

Several indicators of the ecological and social impacts of NRMP have been identified that could provide useful information for project management and evaluation. Site-specific monitoring needs already mentioned above include the impact of construction and operation of the research station on downstream water quality, and the hydrological impact of improved road-building and logging methods at the Bukit Baka/Bukit Raya site. At the Bunaken field site, there is a need to monitor the impact of the project on marine resources and community attitudes toward the national park.

The EA team recommends that planned biodiversity surveys at the Bukit Baka/Bukit Raya and Bunaken project sites be designed and implemented in such a way as to put into place long-term monitoring capacity at the local level. Social surveys that have already been completed at project sites can serve as a baseline for future monitoring efforts related to a variety of indicators relevant to NRMP interventions. In Bukit Baka/Bukit Raya, changes in household livelihood and community land-use strategies should be monitored, as well as their impacts on household rice security. In Bunaken, monitoring should focus the impact of project interventions related to fisheries management and tourism development on household incomes. Supplementary social surveys recommended by short-term consultants and the EA team, such as studies related to resource rights (see Section 6.6 below) and the cattle industry in Bukit Baka/Bukit Raya, will provide additional baseline data for monitoring of project impacts.

6 POLICY ISSUES

As discussed in Sections 2.2.1 and 2.2.4 above, the EA team endorses NRMP's research agenda related to natural forest management. Resulting refinements of the Indonesian Selective Cutting System have the potential to effect national level positive impacts in the management of Indonesia's production forest. The EA team identified several additional policy issues, some already flagged by NRMP advisors and consultants, that would be appropriate for review at the national level.

6.1 Labor-Intensive Waste Utilization

An issue deserving of attention at the policy level relates to current constraints on the utilization of logging waste by concessionaires and local communities. A study of these constraints would complement the pilot testing of labor-intensive waste utilization proposed in Section 2.2.1.1. Issues to be considered include enforcement (i.e., how to prevent the "creation" of waste and the cutting of small trees) and appropriate charges to be levied on the resulting high-value wood products.

6.2 Industrial Timber Plantations (HTI)

As described in Section 2.2.1.1, the strict application of current MOF policies requiring the implementation of HTIs within concession areas could have severe social and ecological impacts at the Bukit Baka/Bukit Raya field site. Interviews with MOF staff indicate that such problems are being experienced by concessionaires throughout Indonesia. NRMP could play a useful role by surveying the planning and implementation of HTIs in Kalimantan and elsewhere in Indonesia, and analyzing existing policy governing the program. Issues to be considered include conflicts with existing policy related to stocking limits on conversion of existing forest, perverse incentives for siting of plantations, and conflicts with existing land rights. Such a study could also collect data necessary to compare the costs and benefits of timber plantations with those of natural forest regeneration.

6.3 Wood Certification

The EA team endorses the proposal of the short-term Forestry Research Advisor that the project invest in the development of an Indonesian wood certification or "sustainable labelling" process. Support for the investigation of possible institutional mechanisms through which to enforce the ITTO Year 2000 guidelines would complement NRMP support for the development of sustainable production forestry practices. Many observers have cited the formidable obstacles to implementing a wood certification system. Tracking timber from the cutting block to the logpond to the processing facility and to the international market would pose enormous logistical and administrative difficulties, and would be vulnerable to corruption. Nevertheless, the idea merits further consideration, and NRMP is well-placed to facilitate the provision of technical assistance for this task.

6.4 HPH Bina Desa Hutan Program

The EA team was impressed by the long-standing efforts of SBK to implement agricultural development programs and to provide other services such as education in villages in and around the concession area. A broad range of observers agree that SBK's Bina Desa program is one of the best, and reinforces the company's reputation as a "model" concessionaire. This criterion was among the most important factors in the selection of Bukit Baka/Bukit Raya as an NRMP project site. Nevertheless, after ten years of investment in agricultural extension, SBK staff themselves express frustration with the program's limited success in helping farmers become self-sufficient sedentary rice farmers. Potential ecological and social constraints on the SBK Bina Desa program are discussed in Sections 2.1.2.2 and 2.2.2.5 above, and treated in more detail by Belsky (1992) and the EA report by Potter (Annex B).

Even if the SBK Bina Desa program were to be judged completely successful, it would be premature to judge the potential of the national MOF policy, which requires all concessionaires to undertake such programs, based on the performance of one concessionaire. Recent studies undertaken by university researchers in collaboration with the MOF have raised questions about the conceptual basis of the Bina Desa program, which assumes that timber concessionaires can and should be responsible agents of rural development. Anecdotal reports of the nature of programs implemented by other concessionaires -- including KKP's use of imported transmigrant labor to hoe the ricefields for its program -- indicate the limitations of concessionaires' expertise in agricultural extension. The national program's emphasis on sedentarizing shifting cultivators could lead to inappropriate resettlement efforts in the absence of close supervision. MOF officials have recognized problems in the implementation of the Bina Desa program, and in 1992 promulgated a new policy requiring concessionaires to undertake diagnostic research efforts to determine community needs prior to the initiation of Bina Desa interventions.[43]

NRMP should build on work already initiated by the short-term Research Advisor to survey the Bina Desa efforts of concessionaires elsewhere in Kalimantan and Indonesia, and to analyze existing policies governing the national program. Issues to be considered might include the role of local government institutions program planning and implementation, and mechanisms for dispute resolution between concessionaires and target communities. Alternative institutional arrangements for timber companies to fulfill their social obligations, such as contracting with private firms, universities, or NGOs for the provision of extension services, should be explored. The study should be coordinated with ongoing work undertaken by the Ecological Anthropology Research Program at the University of Indonesia, and the Research Center for Rural and Regional Development at Gadjah Mada University.

---

[43] Neither SBK nor KKP had undertaken such studies as of the time of the EA team's fieldwork.

6.5 National Park Staffing

The restrictive nature of civil service rules regulating recruitment and hiring of national park staff is a significant barrier to meaningful participation by local communities in protected area management. Decisions regarding the allocation and filling of field positions are made in Jakarta, and are encumbered by lengthy bureaucratic procedures. Educational requirements, age limits, and testing hurdles severely narrow the opportunities for local community members -- particularly in remote areas like Bukit Baka/Bukit Raya -- to be hired even in the lowest level forest guard positions. While the MOF does have the flexibility to retain locally-recruited staff on a temporary basis in the context of specific projects, this does not solve the problem of administrative and financial resources for such staff in the long term.

The EA team recommends that a study be conducted to clarify the current policies governing the staffing of national parks. The study could be complemented by a survey of staffing patterns at selected parks analyzing the origin, education, and career paths of personnel at various levels, and how these attributes correlate with job satisfaction and attitudes toward local communities. Interviews with park managers and community leaders might reveal existing experience or ideas related to involving community members in park management roles. The study could then formulate alternatives to civil service employment, including contractual arrangements with individuals, formal or informal community institutions, or NGOs, that could be tested at project field sites.

A related issue of importance to protected area management is the limited number of MOF staff trained in the biological and social sciences. Such expertise is clearly needed for the kinds of initiatives supported by NRMP, and is being developed through the training component of the project. A study complementary to the one mentioned above could look at how the MOF currently recruits, trains, and deploys its staff with biology and social science expertise, and the mechanisms for sourcing individuals with those skills from other government and non-governmental organizations.

6.6 Legal Status of Communities within National Parks

Although the status of occupied land within gazetted forest areas is an issue that has received increasing attention in recent years, the legal and administrative options for recognizing community resource rights remain unclear. Of special relevance to NRMP is the status of land and people within marine national parks. As mentioned above, overlapping jurisdictions related to Bunaken National Park are constraining interagency support for the management plan, and could create a loophole through which commercial interests could initiate developments that would be difficult to reverse.

At the policy level, it would be useful for NRMP to sponsor a compilation and analysis of existing regulations governing the status and development of communities within national parks. This would include not only relevant forestry law and regulations, but also

land certification, coastal setback regulations, and building permit requirements controlled by other agencies. In addition, a survey of experience in other national parks, including Pulau Seribu and Komodo and parks elsewhere in the Southeast Asia region, might uncover positive and negative examples of strategies to harmonize the interests of community development and conservation.

In addition, and as a complement to the field activities being undertaken by the Social Forestry Advisor, the EA team endorses the proposed study, "Forest Product Extractive Rights for Local Communities within Production Forests" that is included as Case Study 5 in the Curran and Kusneti report (1992). A parallel study of the legal framework and existing experience related to granting communities exclusive extractive rights over marine resources would be highly supportive of the proposed zonation system of the Bunaken National Park management plan.

7 CONCLUSION

Overall, the EA team finds no significant adverse social or environmental impacts of activities planned under NRMP if proposed participatory planning and implementation strategies are realized.

Regarding the Bukit Baka/Bukit Raya project site, the EA team finds that planned initiatives to mitigate the negative impacts of current logging and road-building practices are sound. Planned applied research on production forest management through natural regeneration has considerable potential for positive impacts at the national level. The EA team recommends that the proposed collaboration with SBK in the pilot testing of improved practices for sustainable forest management be deemed in compliance with U.S. Government legislation regarding assistance for commercial timber extraction. To ensure continuing compliance, NRMP should not provide assistance related to logging activities in the KKP concession, in which environmentally-sound logging is not feasible.

The EA team made several recommendations to enhance the positive impacts of collaboration with SBK, including the pilot testing of labor-intensive waste utilization and a delay in liberation thinning treatments. The team identified no negative impacts from proposed agroforestry and community development activities. While the impacts of the proposed research station will be marginal in comparison to existing disturbances caused by logging activity, NRMP staff should nevertheless ensure adherence to appropriate environmental standards in design and construction. In particular, major earth-moving activities associated with road rehabilitation and maintenance should be confined to the dry season.

Regarding collaboration with the SBK Bina Desa program and the formulation and implementation of a national park management plan, impacts will depend on the extent to which NRMP is successful in facilitating the community organization necessary for a genuinely participatory approach to agricultural intensification and protected area management. To realize this objective, NRMP will have to develop and mobilize additional resources for field implementation, particularly from non-governmental organizations.

Proposed NRMP interventions at the Bunaken project site are judged to have no significant negative social or environmental impacts if a participatory approach to planning and implementation is realized. This will depend on resolving current conflicts at the provincial level regarding jurisdiction over the national park, involving community development NGOs in community organization, and the addition of a long-term advisor in community development. Project activities should also be focussed on particular sectors and geographic locations so as to be commensurate with available resources. The EA team suggests a focus on reef fisheries management and ecotourism development.

The proposed Gunung Palung project site has experienced an increase in pressures on the reserve in the ten years since the previous management plan was prepared. Prior to the

formulation of a revised management plan, diagnostic research on community interactions with the reserve should be carried out. The draft management plan should be subject to an Environmental Assessment, and project activities should not be initiated in the absence of a long-term advisor to ensure the soundness of project-supported interventions.

The linkage of NRMP field activities to the policy level through coordination with BAPPENAS is very effective, and has the potential to influence production forest and protected area management nationwide. Ministry of Forestry involvement in and support for NRMP activities need to be increased, and the currently unfilled NRMP advisory position based in the Ministry should be used to cultivate administrative and policy support for field activities. The roles of field-based advisors should be reoriented from direct implementation of project activities to the facilitation of MOF staff and other actors, including NGOs. This requires the addition of a long-term advisor in community development at the Bunaken site. National-level policy studies related to problems and opportunities identified in the field should be conducted on logging waste utilization, industrial timber estates, wood certification, the Bina Desa program, staffing of national parks, and the legal status of communities within national parks.

Despite difficulties in communicating the purpose of an EA of a project designed to enhance the environment, the EA process was useful in a variety of ways. The EA team provided an endorsement of numerous elements of the NRMP project design, but also made recommendations for modifications and additions to mitigate unintended negative impacts and enhance positive impacts of the project. The EA provided a timely forum for NRMP participants, particularly MOF officials, to focus on project issues, and project advisors benefited from technical assistance provided by EA team members in the field. The substantive involvement of non-governmental organizations in the EA exercise demonstrated the interest and capability of those organizations to participate in project activities, and created links that can form the basis of longer-term cooperation.

BIBLIOGRAPHY

Adedeji, F.O. 1984. "Nutrient Cycles and Successional Changes Following Shifting Cultivation Practice." *Forest Ecology and Management* 9: 87-99. Nigeria.

Allin, C.W. 1990. *National Parks and Nature Reserves.* Cornell College, Mt. Vernon, Iowa.

APKINDO (Asosiasi Panel Kayu Indonesia - The Indonesian Wood Panel Association). 1990. 3rd Edition, Directory.

Aweto, A.O. 1981. "Secondary Succession and Soil Fertility Restoration in South Western Nigeria II," in *Journal of Ecology* 69: 609-614.

Ave, J.B. and V.T. King. 1986. *Borneo: The People of the Weeping Forest, Tradition and Change in Borneo.* National Museum of Ethnology, Leiden, Netherland.

BAPEDAL - Environmental Impact Management Agency. 1991. *AMDAL, A Guide to Environmental Assessment in Indonesia.* July.

BAPPENAS - Ministry of Forestry (assisted by USAID & ITTO). 1992. *Joint Implementation Plan for The Natural Resources Management (NRM) and The Sustainable Forest Management (SFM) Projects 1991/92-1994/95.* March.

Bayle, E. et al. "Strengthening Environmental Procedures under 22 CFR 216 to Address Section 533(C)(3) of the Foreign Diversity." USDA Forest Service, International Forestry, Forest Support Program. January.

Belsky, J.M. 1992a. *Balancing Forest and Marine Conservation with Local Livelihoods in Kalimantan and North Sulawesi. Consultant Report.* ARD, Inc. May.

------ 1992b. *Local Involvement in Bunaken National Park*, Preliminary Presentation of Consultancy Results. ARD, Inc. 17 October. (in draft)

Bergau N. 1992. *Environmental Education and Awareness in Bukit Baka. Guide to Environment and Fire Campaign.* Vols. I and II. ARD, Inc. July 1992.

Bisson J. 1991. "Promoting Sustainable Agroforestry Development." U.S.A.I.D./Jakarta, Indonesia. June.

Brookfield, H.C., F.J. Lian, K.S. Low, and L.M Potter. 1990. "Borneo and the Malay Peninsula," in *The Earth as Transformed by Human Action*, B.L. Turner II (ed.). Cambridge University Press.

Brown, S. and A.E. Lugo. 1990. "Tropical Secondary Forests," in *Journal of Tropical Ecology* 6:1-32.

Burley, J., P. Stevens, and J. Beach. 1991. "Inventory of Plant Resources of West Kalimantan." Proposal submitted to the National Science Foundation. Oct. 15.

Colfer, C.J. 1989. "Site Visit to Bunaken National Marine Park." Report prepared for USAID in the design of the Natural Resources Management Project. Jakarta, Indonesia.

Curran, L.M. and M. Kusneti. 1992. *Applied Research Recommendations for Production Forest Management: An Economic and Ecological Review of the Indonesian Selective Cutting and Replanting System.* Natural Resource Management Project, BAPPENAS - Ministry of Forestry with assistance from USAID and ARD. Indonesia. (in draft)

David, W. 1979. "Soil Erosion Studies at Pantabangan Watershed." University of the Philippines.

Departemen Perhubungan Direktorat Jenderal Pariwisata. (undated) Proyek Pembuatan Design Pengembangan Obyek/Kawasan Wisata Pantai Bunaken dan Manado Tua. Buku I: Rencana, and Buku II: Inventarisasi.

Departemen Pekerjaan Umum, Bagian Proyek Penataan Bangunan Sulawesi Utara. (undated) Rencana Penataan Bangunan Kawasan Pulau Bunaken. Final Report.

Djohani, R. 1991. *A Communication Strategy to Support the Planning and Management for Bunaken Marine National Park.* World Wildlife Fund (WWF), Indonesia Program. Jakarta, Indonesia. September.

------ 1989. *Marine Conservation Development of Indonesia, Coral Reef Policy.* World Wildlife Fund (WWF) Report for Indonesia Program. December. Jakarta, Indonesia.

Douglas, I. 1992. "Hydrologic and Geomorphic Changes Following Rainforest Disturbance with Special Reference to Studies in Borneo," in *Forest Biology and Conservation in Borneo*, Ghasally Ismail, et al., eds. Center for Borneo Studies Publication No. 2: 261-287. Sabah, Malaysia.

Drilling, M.E. 1989. *Research Priorities for the Reforestation in Indonesia with an Emphasis on Accelerated Natural Regeneration.* U.S.A.I.D./Jakarta. December.

Drilling, M.E. 1992. "NFMA Work Plan and Monthly Report Summary." Pontianak, West Kalimantan, Indonesia. October.

Dugan, P. 1990. "Rehabilitation of Logged-Over Forests in the Asia-Pacific Region." Report No.1, Extent of Logged-Over Areas in Need of Rehabilitation. (Sub-Project II, PD 2/87[F]). ITTO-JOFCA. Yokohama, Japan.

Durst, P. and J. Campbell. 1990. "Toward a Strategy for Developing Nature Tourism in West Kalimantan, Indonesia." Report prepared for USAID/Jakarta and the Government of Indonesia. December 11.

Dystra, D. and R. Heinrish. 1992. "Sustaining Tropical Forests Through Environmentally-Sound Harvesting Practices." *UNASYLVA*. Vol.43, FAO, Rome.

FINNIDA. 1991. *Master Plan for Forestry Development in the Philippines.* Asian Development Bank, Government of the Philippines.

Government of Indonesia. 1990. Act No.5 of 1990 Concerning Conservation of Living Resources and Their Ecosystems. Jakarta.

Granert, B. 1992. *Report of The Short Term Agroforestry Advisor.* ARD, Inc. March 27.

GTZ. 1992. Background of the Social Forestry Development Project (SFDP) - Model - Concession for "Participatory State Forest Management".

Hadi Suparto, H. 1989. *Selected Rainfall Kinetic Energies and Erosivity on A Cleared First Order in West Kalimantan, Indonesia.* Unpublished paper to the Regional Seminar on Tropical Forest Hydrology, Kuala Lumpur. September 4-9.

Hendrison, J. 1992. *Forest Harvesting Practices for Bukit Baka.* ARD, Inc. Jakarta, Indonesia.

Holmes, D. and S. Nash. 1990. *The Birds of Sumatra and Kalimantan.* Oxford University.

ITTO. 1990. *Guidelines for Achieving Sustainable Management of Tropical Forests by Year 2000.* International Tropical Timber Association. Yokohama, Japan.

------ 1991. *Incentives in Producer and Consumer Countries to Promote Sustainable Development of Tropical Forests.* Oxford Forestry Institute. February.

------ 1992. *Second Quarter Report.* ITTO Project PD. Jakarta, Indonesia.

Johnson, M. 1992. *Bukit Baka Mini - Hydroelectric System Implementation Plan.* ARD, Inc. June.

Kartawinata, K., R. Abdul Hadi, and T. Partomihardho. 1981. "Composition and Structure of a Lowland Dipterocarp Forest at Wanariset, East Kalimantan, Indonesia," in *Malayan Forester* 44: 397-418.

Kemp, R. 1992. "The Conservation of Genetic Resources in Managed Tropical Forests," *UNASYLVA*. Vol 43. FAO, Rome.

Koesoebiono, White, A., M. Purb Hardjono, and S. Rahardjo. 1989. *Integrated Management Plan for the Coastal Resources and Land Uses of Segara Anakan Lagoon and Vicinity*. Cilacap, Indonesia (draft). ASEAN-US Cooperative Program on Marine Sciences Coastal Resources Management Project, ICLARM. Manila, Philippines.

Lalamentik, Laurentius T.X. (undated) *Bunaken Island Marine Park Management Plan.*

"Laporan Pelaksanaan Lokakarya Forum Komunikasi Pecinta Alam Manado cooperated with U.S. Agency for International Development (USAID)." 1991. Manado. July 11.

Ledec, G. 1992. "Guidelines for Preparing Managment Plans for National Parks." The World Bank. Washington, D.C.

Leighton, M.. 1990. "A Report on Possible Options for Managing Research and Training in the Gunung Palung Nature Reserve." Report to PHPA on Management of Research at Gunung Palung. January.

Lembaga Pelatihan dan Penunjang Pembangunan Sosial Institute of Dayakology Research and Development. 1992. *Transformasi Budaya Dayak*. Pontianak, Kalimantan.

Lennertz, S. 1991. *Sustained Yield Management in Dipterocarp Forests*. RP-German Dipterocarp Forest Management Project, Quezon City, Philippines.

Liew T.C. and F.O. Wong. 1973. "Recruitment, Mortality, and Growth of Dipterocarps in Virgin and Logged Over Forests in Sabah," *Malayan Forester* 36:3-15.

Ludwig, R. 1991. *Cable Crane Logging in Dipterocarp Forests of the Philippines*. RP-German Dipterocarp Forest Management Project, Quezon City, Philippines.

Lugo, A. et al. 1987. *Ecological Development in the Humid Tropics, Guidelines for Planners*. Winrock International Institute for Agricultural Development. Arkansas.

MacKinnon, K., et al. 1992a. "Flagship Species to Attract Funding and Support for Indonesian Parks and Protected Areas," in *Indonesia's Papers of the IV World Congress on National Parks and Protected Areas*. Caracas, Venezuela. Compiled by the Ministry of Forestry, Republic of Indonesia.

------ 1992b. "The National Conservation Plan for Indonesia: Ten Years On," in *Indonesia's Papers for the IV World Congress on National Parks and Protected Areas.* Caracas, Venezuela. Compiled by the Ministry of Forestry, Republic of Indonesia.

------ 1986. *Managing Protected Areas in the Tropics.* IUCN. Gland, Switzerland.

------ 1981-1982. National Conservation Plan for Indonesia. Vols.1-7. FAO Field Reports FO/INS/78/061.

Mahasiswa Pecinta Alam "COMODO". 1990. *Laporan Hasil Expedisi Pegunungan Schwaner Bukit Baka Raya.* Fakultas Ekonomi Universitas Palangkaraya.

Malingreau, J.P., Stephen and Fellow. 1985. "Remote Sensing of Forest Fires, Kalimantan and North Borneo in 1982-1983," *Ambio* 17: 314-321.

Maini J. 1992. "Sustainable Development of Forests," *UNASYLVA.* Vol. 43. FAO, Rome.

Ministry of Forestry, Republic of Indonesia. 1992a. *Indonesia's Papers for the IV World Congress on National Parks and Protected Areas.* Caracas, Venezuela.

------ 1992b. Social Forestry Development Project, *Indonesia-German Technical Cooperation Project Summary.* Pontianak, Kalimantan Barat. March.

------ 1992c. *Progress Towards Sustainability Target Year 2000 at National Level.*

------ 1991. *Indonesia Forestry Action Programme.* November.

------ 1989. *Guidelines for the Indonesian Selective Cutting and Planting System (Tebang Pilih Tanan Indonesia-TPTI),* Draft English Translation. August 22.

Ministry of State for Population and Environment, Jakarta, Indonesia. 1986. *Analysis of Impacts Upon the Environment.* English Translation of Government Regulation No. 29.

Miyatake, S. 1986. *Examining Varietal Differences in the Family Dipterocarpaceae Through Chromosome Analysis.* JICA, Sabah, Malaysia.

Mueller Dombois, D. 1981. *Fire in Tropical Ecosystems in Fire Regimes and Ecosystem Properties.* Proceedings of the Conference. USDA, Forest Service, General Technical Report. WO-26: 137-176.

Natural Resource Management Project (NMRP). 1992. *Quarterly Report.* Bappenas and USAID/Jakarta.

------ 1990a. *Project Paper and Selected Annexes. Volume I.* USAID, Jakarta, Indonesia

------ 1990b. *Strategy for Promoting The Management of Natural Forests and Protected Areas for Sustained Yields.* USAID/ Jakarta.

------ 1990c. *Elements of An Environmental Education and Public Awareness Strategy.* USAID/Jakarta.

------ 1990d. *Social Soundness Analysis.* USAID/Jakarta.

Ngo, T.H.G. Mering. 1992a. *Structure of the Local Communities Within and Around the Bukit Baka/Bukit Raya National Park, West/Central Kalimantan.* ARD Inc. July.

------ 1992b. NRMP Progress Reports: February/March, April/May, and May/June.

Nooteboom H.P. 1987. *Report of the 1982-1983 Bukit Raya Expedition.* Rijksherbarium. Leiden, The Netherlands.

NS/S. 1992. *Questions for the World Bank. Critique of World Bank-assisted Forestry Projects in Mexico.* ADESMO, Guadalajara, Jalisco, Mexico.

Paoli G. 1992. Proyek Gunung Palung, *Third Quarterly Report on Scientific Research.* April 14 - July 14.

Payne, J. et al. 1985. *A Field Guide to the Mammals of Borneo.* The Sabah Society with the World Wildlife Fund/Malaysia.

Petocz, R. and N. Wirawan. 1990. *The Kutai National Park: Planning for Action. Preparatory Mission Report*, Kaltim Prima Coal and WWF, Jakarta.

Phillips, C. 1986. "Preliminary Observation on the Effects of Logging on a Hill Forest in Sabah," in *Proceedings of Workshop on Impact of Man's Activities on Tropical Upland Forest Ecosystems*, Faculty of Forestry, Universiti Pertanian Malaysia.

PHPA/Ministry of Forestry. 1991. *Kutai National Park, Kalimantan Timur, Indonesia: Development Plan 1991-1995, Operating Plan 1991, and Framework for Management.* A study sponsored by PT Kaltim Prima Coal. Jakarta.

Pollnac, R.B., C. Bailey and A. Poernomo (eds.) 1992. *Contributions to Fishery Development Policy in Indonesia.* Central Research Institute for Fisheries, Ministry of Agriculture, USAID. Jakarta.

Potess, F. 1992a. *Draft Outline Management Plan Structures, Bukit Baka National Park 1992. Looking Beyond The Boundaries A Conservation Systems Management Approach*, Natural Resources Management Project. August.

------ 1992b. *Draft Management Plan Working Structures, Bukit Baka National Park 1992. Looking Beyond The Boundaries A Conservation Systems Management Approach*, Natural Resources Management Project. November.

------ 1992c. NRMP Montly Progress Reports: April/May and May/June.

Potter L.M. 1987. "Land Degradation, Innovation and Social Welfare in the Riam Kiwa Valley, South Kalimantan," in *Land Degradation and Society*. P. Blaikie, and H.C. Brookfield, (eds.), Methuen, London.

Pretty J., A. McCracken and G.R. Conway. 1988. *An Introduction to Rapid Rural Appraisal for Agricultural Development.* International Institute for Environment and Development. United Kingdom.

Puslibang Biology-LIPI, 1992. *Survey Biodiversity at Cagar Alam Bukit Baka untuk baseline Data, dalam Rangka Penyusunan Management Plan, Terms of Reference.* Bogor.

Research Triangle Institute. 1992. *Environmental Planning for Manado and Minahasa, An Assessment of the Potential Environmental Impacts of Growth in Urban Population, Tourism, and Industry.* Research Triangle Park, N.C. (in draft).

Richards P.W. 1952. *The Tropical Rain Forest.* Cambridge University Press, London.

Riswan S. and R. Yusuf. 1985. "Effects of Forest Fires on Trees in the Lowland Dipterocarps Forest of East Kalimantan, Indonesia," in *Forest Regeneration In South East Asia. BIOTROP.* Special publication No. 25. 155-163 pp.

Robinson A. 1990. Report on the Bunaken Manado Tua Marine National Park Pre-Planning workshop, August 27-31, 1990. 8 September.

Rousseau J. 1990. *Central Borneo, Ethnic Identity and Social Life in A Stratified Society.* Clarendon Press. Oxford.

Salm, R.V. and T. Soehartono. 1981. *Coral Reefs, Associated Habitats and Species in the Vicinity of Manado. Assessment of Their Conservation Value.* Field Report of World Wildlife Fund Marine Conservation Project 1819. April.

Salm, R.V. and G. Usher. 1984. *Zoning Plan for Bunaken Islands Marine Park.* Report for Direktorat Jenderal Perlindungan Hutan dan Pelestarian Alam. IUCN/World Wildlife Fund (WWF). Bogor. February.

Samset, I. 1985. *Winch and Cable Systems.* Matinius Niljoff/W.Bank, Dordrecht, Boston.

Santiapillai, C. 1986. *The Status and Conservation of the Clouded Leopard in Sumatra.* WWF/IUCN Project 3133 No. 20. Bogor.

Schindele, W., W. Thomas, K. Panzer. 1989. *The Forest Fire 1982/1983 in East Kalimantan. Part I: The Fire, the Effects, the Damage, and Technical Solutions.* FR-Report No.5. ITTO, GTZ, DFS, and Balai Penelitian Kehutanan Samarinda.

Siebert S.F. "Rattan Management for Sustainable Livelihoods and Forest Conservation." (undated).

Smits, W.Th. 1983. "Dipterocarps and Mycorrhiza: An Ecological Adaptation as a Factor in Forest Regeneration," in *Flora Malenana Bulletin.* 36: 3926-3937.

Smith, W. and A.E. Lugo 1990. *Dipterocarps and Nycrorhiza Forest Regeneration, An Ecological Adaptation and A Factor in Forest Regeneration.*

Smythies, B. 1960. *The Birds of Borneo.* The Sabah Society with the Malayan Nature Society.

Soedjito H., 1990. *Root Systems of Successional and Old-Growth Forest Species and Its Role on Nutrient Dynamics Within A Tropical Rainforest in Indonesia.* Unpublished Ph.D. Dissertation. Rutgers University, New Jersey.

Soekarno. 1989. *Coral Reef and Associated Habitats in the Vicinity of Bunaken, Togian Islands and Takabone Rate Atoll. Their Conservation Value and Needs.* Prepared for USAID NRMP, Center for Oceanological Research and Development. 15 December.

Stadmueller T., 1990. "Soil Erosion in East Kalimantan," in *International Association of Hydrological Sciences* 190: 221-230.

Subijanto, J., A. Widianto and H. Prajitma. 1992. "Buffer Zone to Provide Benefits to Local Communities in West Kalimantan," in *Indonesia's Papers for the IV World Congress on National Parks and Protected Areas.* Caracas, Venezuela. Compiled by the Ministry of Forestry, Republic of Indonesia.

Suwando, A. 1990. *Country Report: Indonesia, Rehabilitation of Logged-Over Forests.* ITTO/JOFCA, Yokohama, Japan.

Team Topografi. 1992. *Laporan Pengukuran dan Pemetaan Topografi Sebagian Daerah Taman Nasional Bukit Baka/Bukit Raya.* Untuk Perencanaan Station Riset dan Fasilitas Lainnya. Jakarta, Indonesia. April.

Tjitradjaja, Iwan. 1991. *Differential Access to Resources and Conflict Resolution In A Forest Concession In Irian Jaya.* University of Indonesia.

Uebelhor, K. 1989. *Impacts of Selective Logging on Dipterocarp Forests in Mindanao.* RP-German Dipterocarp Forest Management Project, Technical Report No. 2. Quezon City, Philippines.

UNDP/FAO Field Report. 1982. *Gunung Palung Reserve Kalimantan Barat, Preliminary Management Plan.* For Directorate of Nature Conservation, Republic of Indonesia. Based on the work of John Mackinnon. FAO, & Ir. Warsito, PPA.

U.S.A.I.D. 1992. *Strategy for Implementing Field Activities Under the Natural Resources Management (NRM) and the Sustainable Forest Management (SFM) Projects.* Annex B, (Draft for Joint Implementation Plan). August. Jakarta, Indonesia.

------ 1991. *Agency FY 91 Forestry Legislation Guidance.* Washington, D.C.

------ 1990. *Natural Resources Management Project (497-0362), Vol. I, Project Paper and Selected Annexes.* Jakarta, Indonesia. July.

------ 1989. *AID Environmental Review Regulations (22 CR 216),* 4/1/89 Edition. Washington, D.C.

------ 1987. *Progress in Conserving Tropical Forests and Biological Diversity in Developing Countries,* The 1987 Annual Report to Congress on the Implementation of Sections 118 and 119 of the Foreign Assistance Act, As Amended. Washington D.C.

Usher, G. and R. Rompas. 1992. *Bunaken National Park Management Plan* (Draft for discussion only). Prepared for sub-Balai Konservasi Sumber Daya Alam Manado. November.

Usher, G. 1992. NRMP Monthly Reports: June, July, and August.

Von der Heyde, B., et al. 1989. *Timber Stand Improvement Manual.* GTZ/Forest Products Research and Development Institute/Bureau of Forest Development, Quezon City, Philippines.

Voss, R. 1992. *Report on a Proposed Organizational Structure for the Bukit Baka Research Station. Volumes I-III.* ARD, Inc. Jakarta.

Wadsworth F.H. and H. Tschinkel. 1990a. *Forestry Research Planning for Kalimantan, Indonesia.* Prepared for USAID/Jakarta. December 14.

------ 1990b. *Potential Forestry Research at Bukit Baka, West and Central Kalimantan, Indonesia.* Prepared for USAID/Jakarta. December 14.

WALHI. 1992. "Building a Participatory Process in the Indonesian National Forestry Action Plan." Jakarta.

Wells, S. 1992. " 'Successful' Coral Reef Management Programmes", in *Intercoast Network* 17: 1-3. September. Coastal Resources Center, Rhode Island.

Wells, S. and A.T. White. (in press) "Involving the Community," Chapter for *Marine Protected Areas.* Elsevier Press.

White, A.T. and R.J. Tobin. (in press) *Coastal Management in Asia: Are Programs Sustainable and Beneficial?* Draft manuscript for Asian Development and Public Policy.

White, A.T. and N. Lopez. 1991. *Coastal Resources Management Planning and Implementation for the Fishery Sector Program of the Philippines.* Proceedings of 7th Symposium on Coastal and Ocean Management. Long Beach, CA. July 8-12. p. 762-775.

White, A.T. and V.P. Palaganas. 1991. "Philippine Tubbataha Reef National Marine Park Status, Management Issues and Proposed Plan," in *Environmental Conservation* Vol. 18, No. 2: 148-157. Geneva

White, A.T. 1989. "Two Community-Based Marine Reserves. Lessons for Coastal Management," in T.E.Chua and D.Pauly (eds.). *Coastal Area Management in Southeast Asia. Policies, Management Strategies and Case Studies.* ICLARM Conference Proceedings 19. Manila, Philippines.

------ 1988a. *Marine Parks and Reserves, Management for Coastal Environments in Southeast Asia,* ICLARM Education Series No. 2. Manila, Philippines.

------ 1988b. "The Effect of Community-Managed Marine Reserves in the Philippines on Their Associated Coral-Reef Fish Populations," in *Asian Fisheries Science.* Manila, No. 2: 27-41.

White, A.T., Delfin, E. and F. Tiempo, 1986. "The Marine Conservation and Development Program of Silliman University, Philippines," in *Tropical Coastal Area Management,* ICLARM, Vol. 1, No. 2: 1-4. December. Manila, Philippines.

Williams L.G. 1983. "Biomass and Nutrient Content in Two-Successional Stages of Tropical Wet Forest in Uxpanapa, Mexico," in *Biotropics* 15, 4: 275-284.

Wind, J. 1992. "Planning of Effective Buffer Zones." National Parks Development Project Indonesia. Jakarta.

Wirawan, N. 1992. "Buffer Zone Concept and Activities in the Integrated Protected Area Systems in Indonesia." Asian Development Bank Project T.A. No. 1430-INO Final Report (Annexes), Deutsche Forst Consult, Germany and PT Hasfarm Dian Konsultan, Jakarta.

------ 1991. "The Hazard of Fire." Paper presented at Toward a Sustainable Environmental Future for South East Asia Conference. Gajah Mada University, Yogyakarta, Indonesia. 6-10 May.

------ 1985. *Kutai National Park Management Plan, 1985-1990.* WWF Project 1687. Bogor.

World Bank Technical Paper. 1992a. *Environmental Assessment Sourcebook, Volume I. Policies, Procedures, and Cross-Sectoral Issues.* The World Bank, Washington D.C.

------ 1992b. *Environmental Assessment Sourcebook, Volume II Sectoral Guidelines.* The World Bank, Washington, D.C.

Zerner, C. 1989. "Marine Tenure in the Makassar Strait." The Mandar Raft Fishery. Paper presented at the First Annual Meetings of the International Association for the Study of Common Property. Duke University, North Carolina.

Figure 1. Location Maps of National Parks in Indonesia:
EA of NRMP Sites

LOCATIONS OF NATIONAL PARK :

1. GUNUNG LEUSER
2. KERINCI SEBLAT
3. BUKIT BARISAN SELATAN
4. WAY KAMBAS
5. UJUNG KULON
6. KEPULAUAN SERIBU
7. GUNUNG GEDE PANGRANGO
8. BROMO TENGGER SEMERU
9. MERU BETIRI
10. BALURAN
11. KEPULAUAN KARIMUN JAWA
12. BALI BARAT
13. GUNUNG RINJANI
14. KOMODO
15. TANJUNG PUTING
16. KUTAI
17. GUNUNG PALUNG
18. DUMOGA BONE
19. BUNAKEN MANADO TUA
20. LORE LINDU
21. RAWA AOPA GUNUNG WATUMOHAI
22. MANUSELA
23. KEPULAUAN TELUK CENDERAWASIH
24. WASUR
25. BUKIT BAKA/BUKIT RAYA

FIGURE 2. Land System within Bukit Baka/Bukit Raya National Park

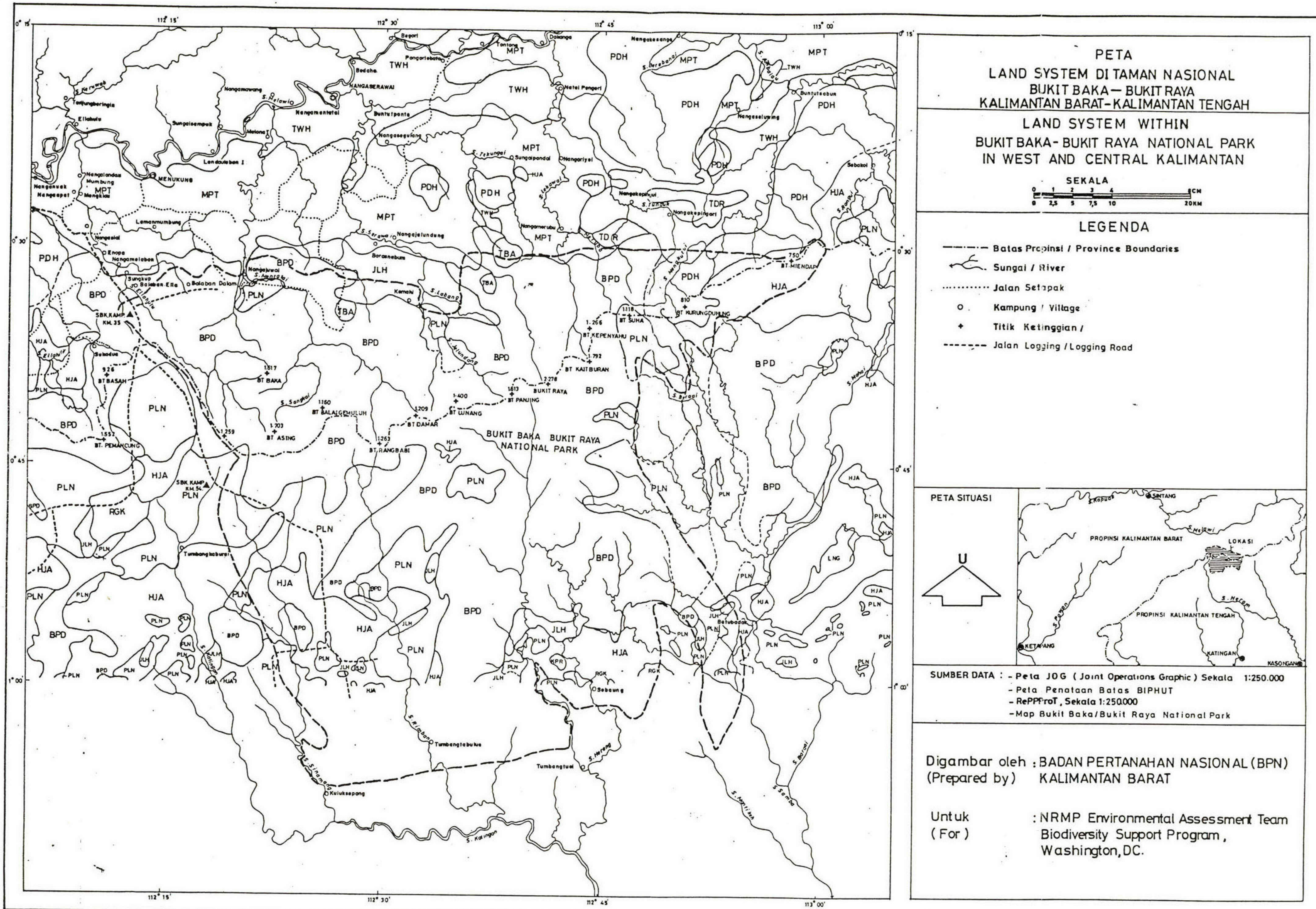


FIGURE 3. Present Land Use in and Around Bukit Baka/Bukit Raya National Park

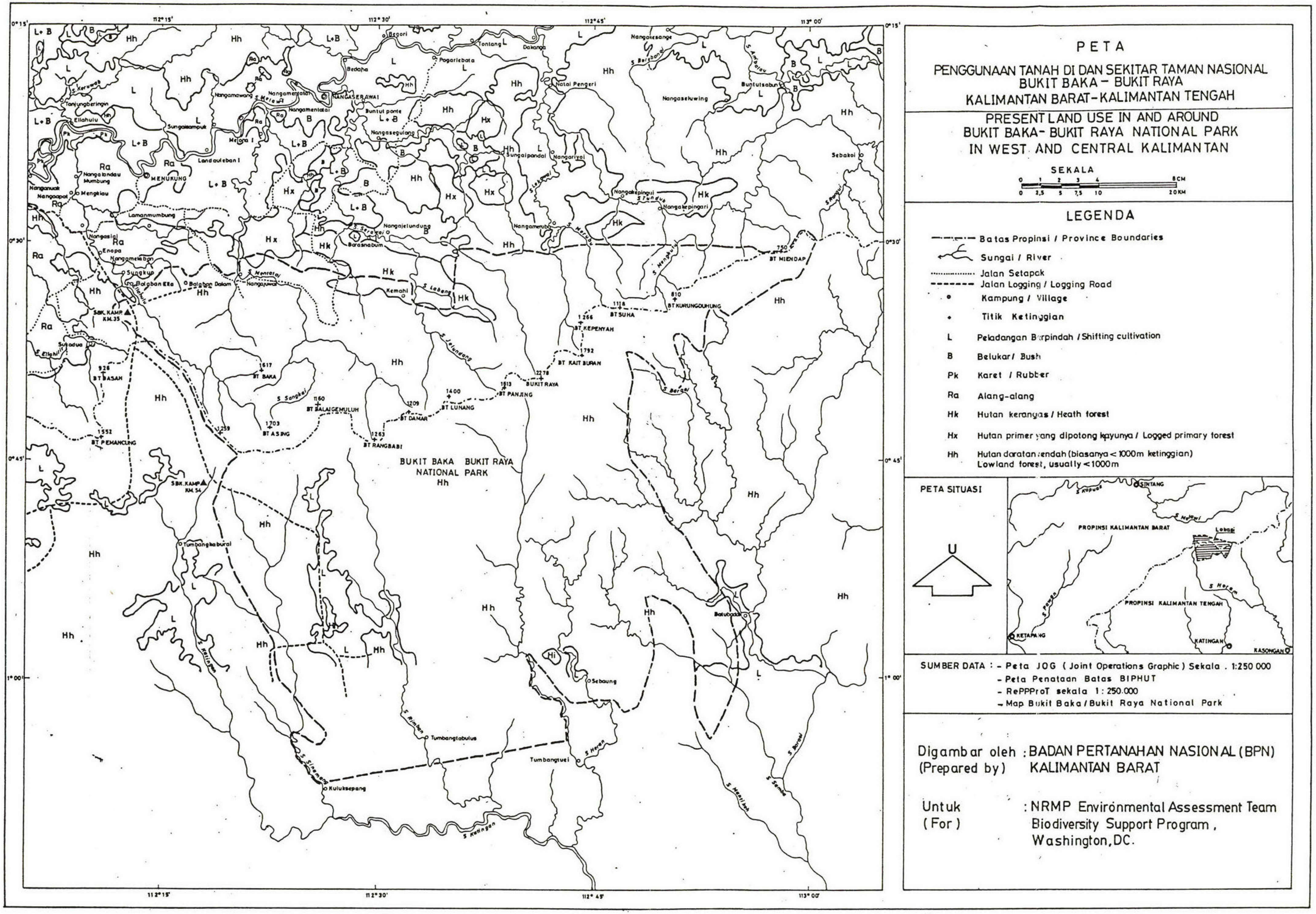


FIGURE 4. Logging Concession Around Bukit Baka/Bukit Raya National Park

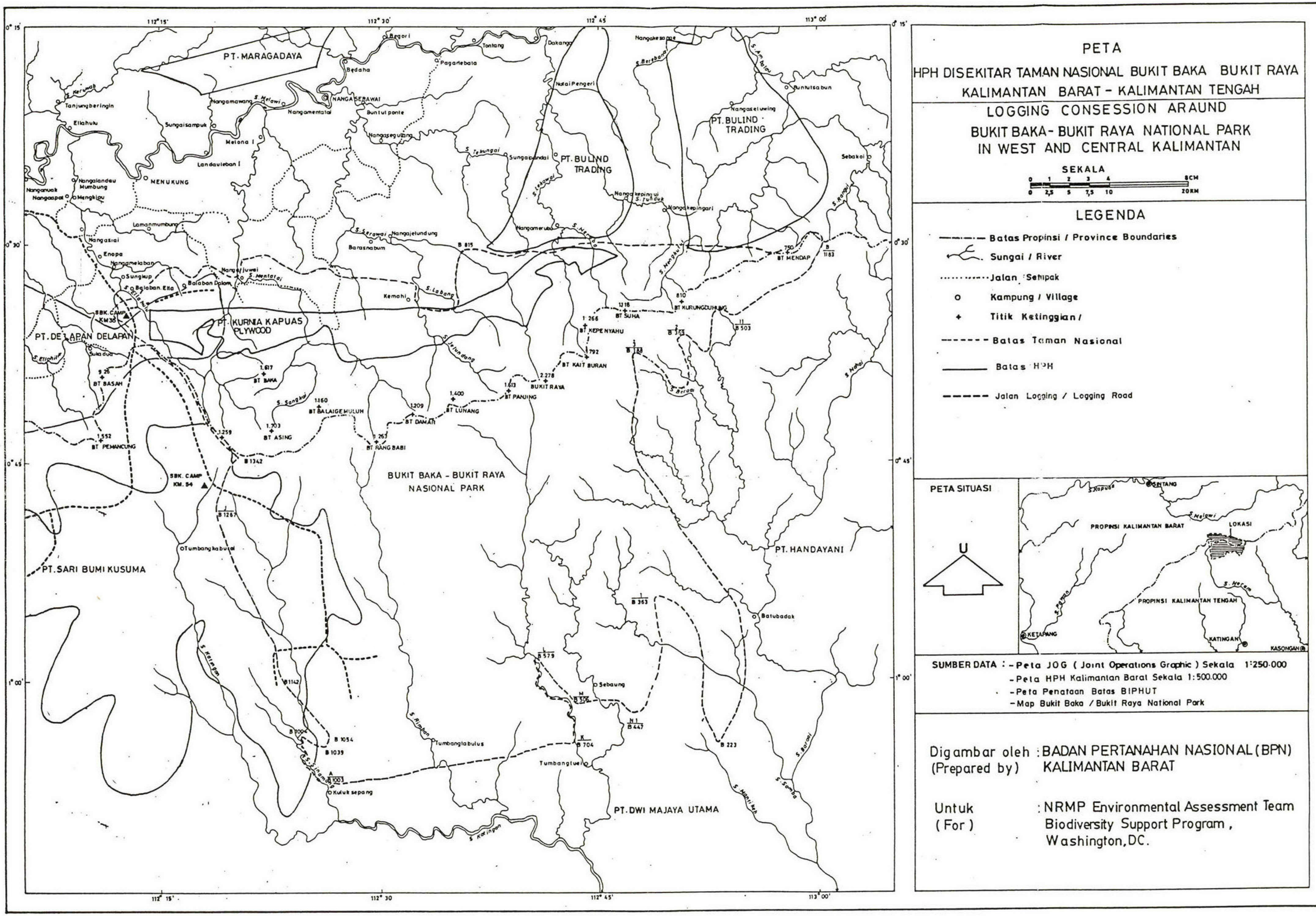


FIGURE 5. Cutting Areas in the SBK Logging Concession

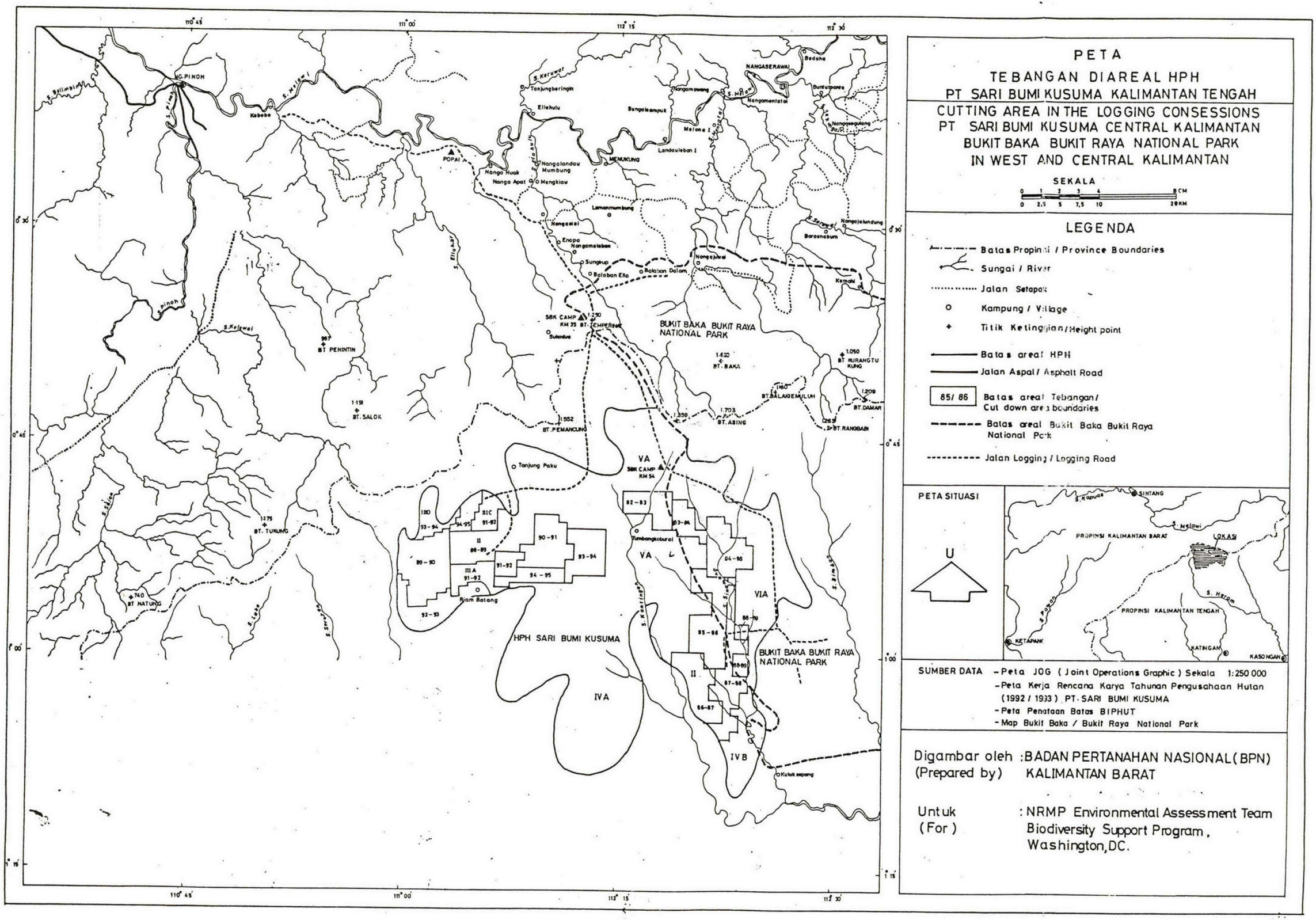
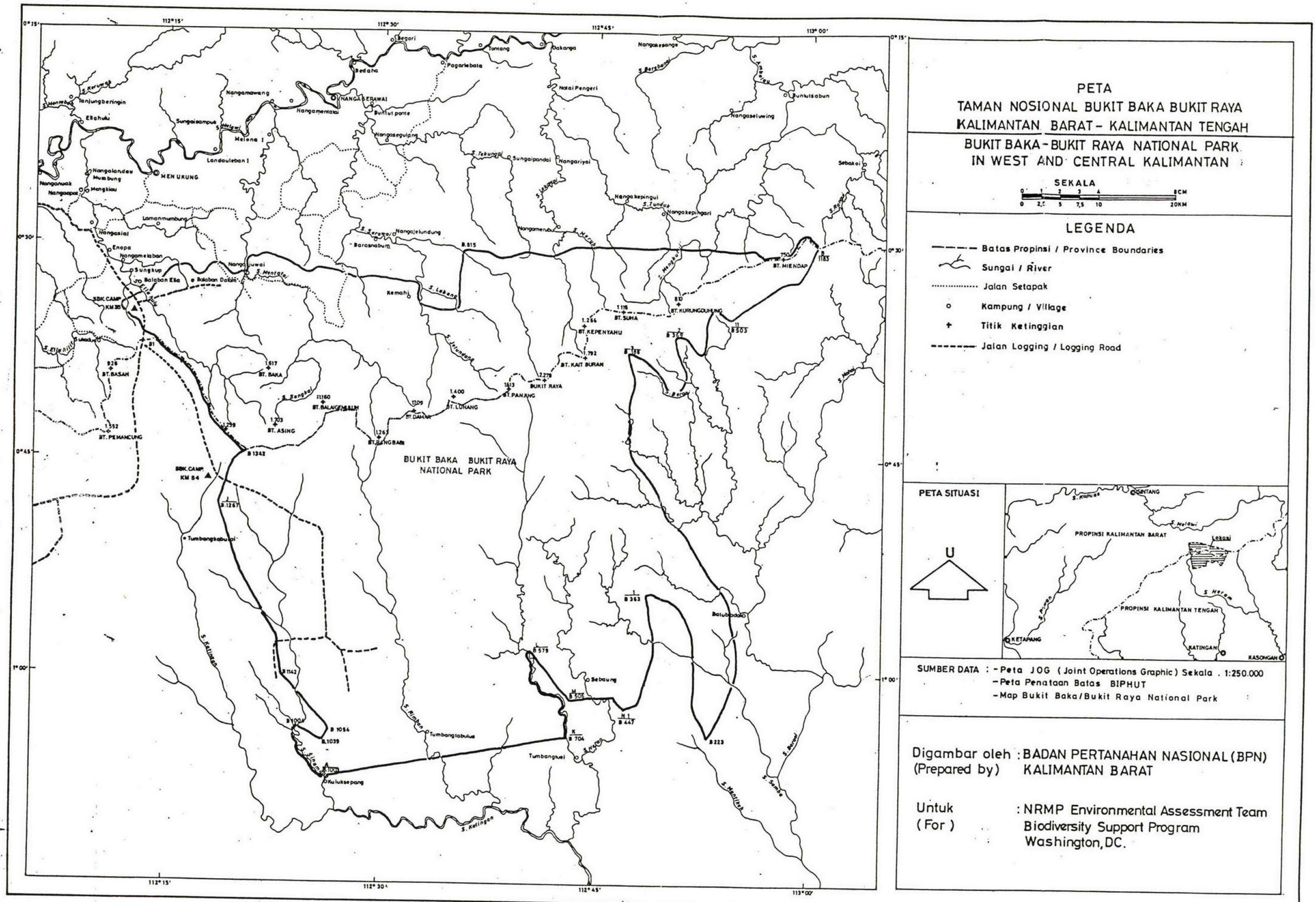


FIGURE 6. Bukit Baka/Bukit Raya National Park



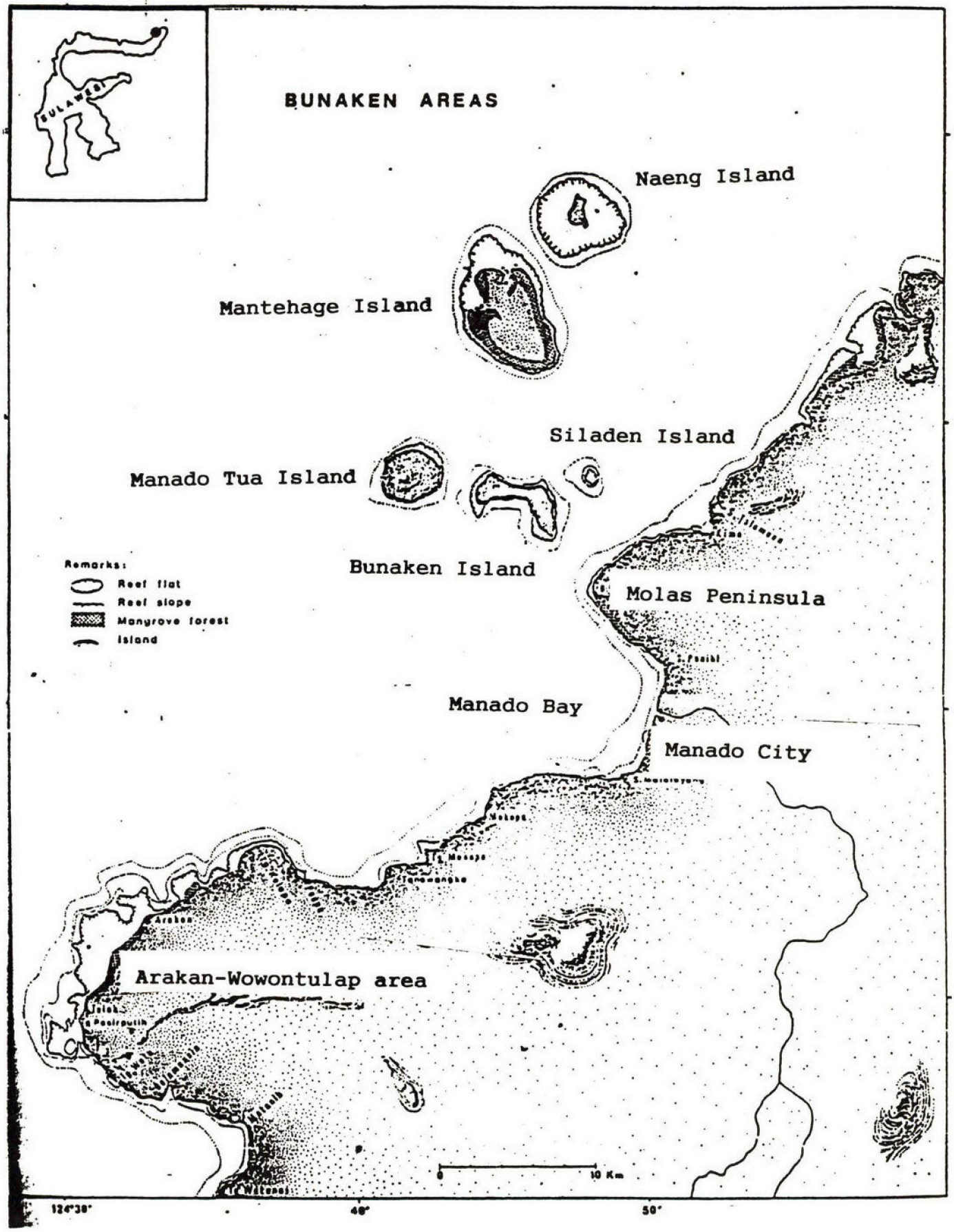


FIGURE 7. Bunaken National Park

FIGURE 8. Gunung Palung National Park and its Surrounding Forest Status

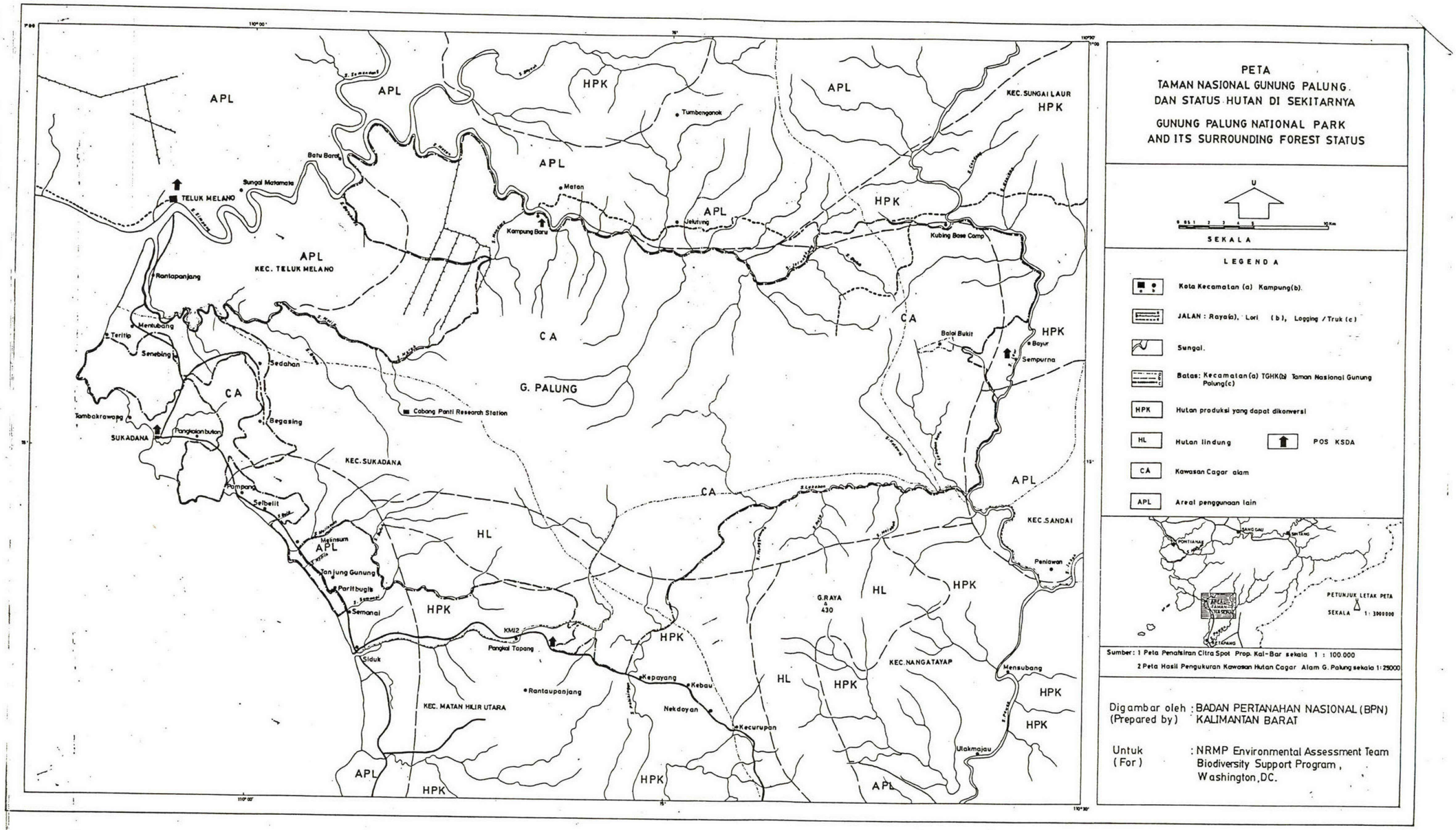
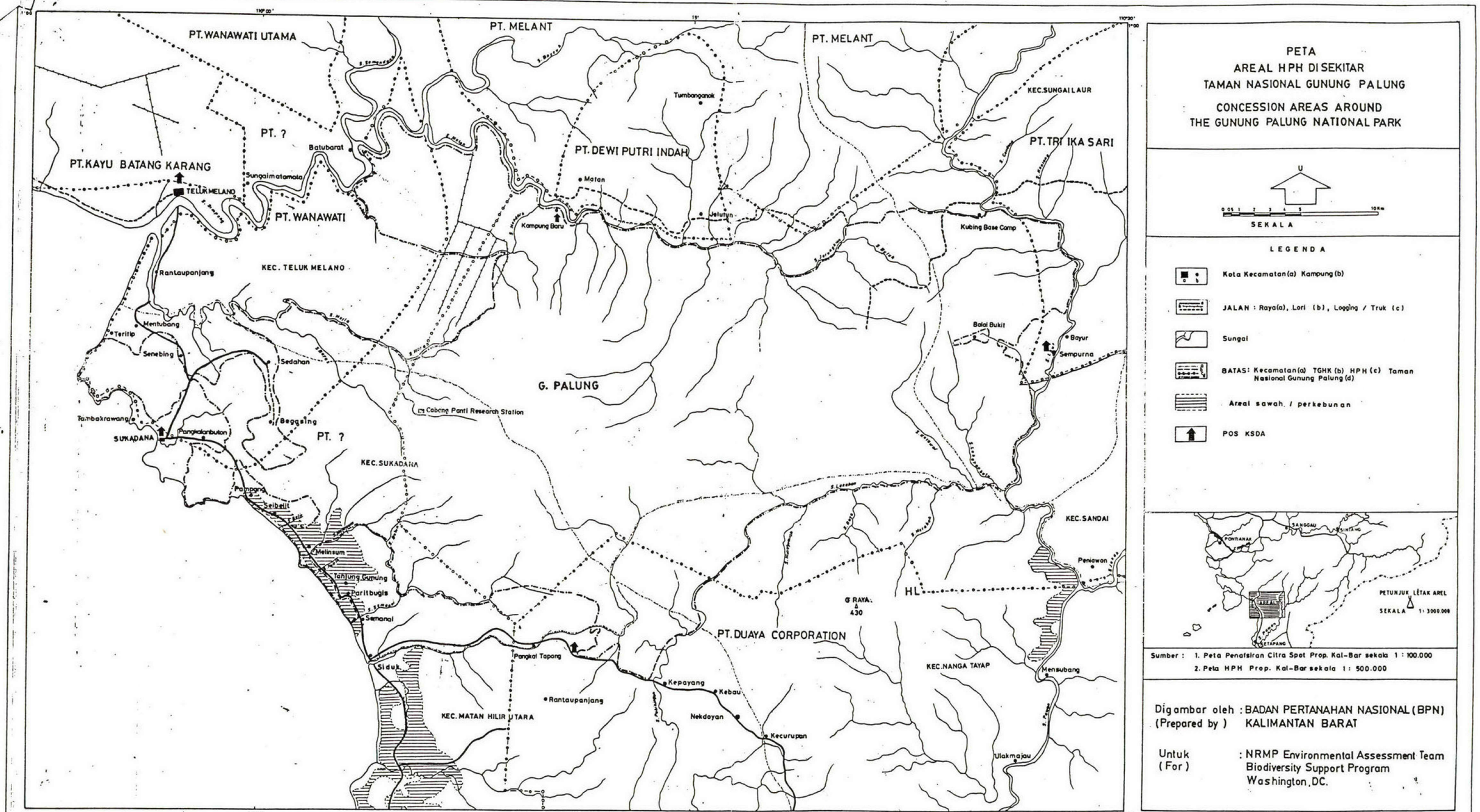


FIGURE 9. Concession Areas Around the Gunung Palung National Park



Biodiversity Support Program

BSP INFO
October 1992

A U.S.A.I.D.-funded consortium of World Wildlife Fund, The Nature Conservancy, and World Resources Institute

The Biodiversity Support Program (BSP) is funded by the U.S. Agency for International Development (A.I.D.) through a Cooperative Agreement with the World Wildlife Fund (WWF). BSP is implemented as a consortium of WWF, the Nature Conservancy (TNC) and the World Resources Institute's Center for International Development and Environment (WRI).

The 10-year BSP cooperative agreement (currently funded for 1988-1994) includes core funding from A.I.D.s Bureau of Research and Development. Additional funds for programs and activities are received by BSP from A.I.D. overseas Missions and from other A.I.D. bureaus in Washington.

The mission of BSP is to promote efforts to conserve biological diversity while enhancing human livelihoods in developing countries through improved conservation and use of biological resources.

BSP works to improve the capacities of individuals, local communities, non-governmental organizations and governmental institutions in A.I.D. partner countries and of U.S.A.I.D. assistance programs to identify the need for and economic potential of conservation and wise management of biological resources, including safeguarding ecological processes and maintaining the variety of genetic resources.

The Biodiversity Support Program provides technical expertise and assistance in the design and implementation of innovative projects and the development of host-country leadership and NGO capacities. Serving as a conduit for A.I.D. collaboration with the broader U.S. conservation community, including other NGO's, universities, botanical gardens, and zoos, BSP matches A.I.D. needs with available conservation expertise.

In order to support A.I.D.'s objectives for conservation of biodiversity, BSP activities fall within the following major categories:

1) **technical assistance** to Missions and Bureaus, host-country governments and non-governmental organizations, and the Peace Corps.

2) a small grants program for host-country **research** on specific issues relevant to A.I.D.'s conservation priorities

3) **training** focused on improving the capacity of recipient countries to integrate economic development with conservation

c/o World Wildlife Fund • 1250 24th Street, NW • Washington, DC 20037 • Tel: (202) 293-4800 • Fax: (202) 293-9211 • Telex: 64505 PANDA

4) an **information** collection and dissemination network on pivotal conservation issues, including monitoring and evaluation of conservation activities of A.I.D. and other US institutions

5) **pilot demonstration projects** that support innovative approaches to conservation

To date, BSP has received about $5.5 million in core funds from the A.I.D. R&D Bureau and $10 million in additional funds for specific projects from overseas A.I.D. Missions and A.I.D. Washington Bureaus. BSP has supported over 100 activities in 66 countries. Examples of completed and ongoing BSP projects include:

Technical Assistance:

* Nepal: assessment of feasibility of creating a conservation training institute near Royal Chitwan National Park

* The Gambia: development of an integrated conservation and village development project for Kiang West National Park.

* Bolivia: provided dendrology consultant to train Bolivians in forest inventories.

Training:

* Indonesia: environmental NGO workshop on financial resource development

* Ecuador: field course in ecology and population biology

Pilot Demonstration Projects:

* Pakistan: develop a management plan for Himalayan forests that promotes sustainable development initiatives

* Brazil: develop a sustainable timber management plan to be implemented by private companies and local Amazon communities

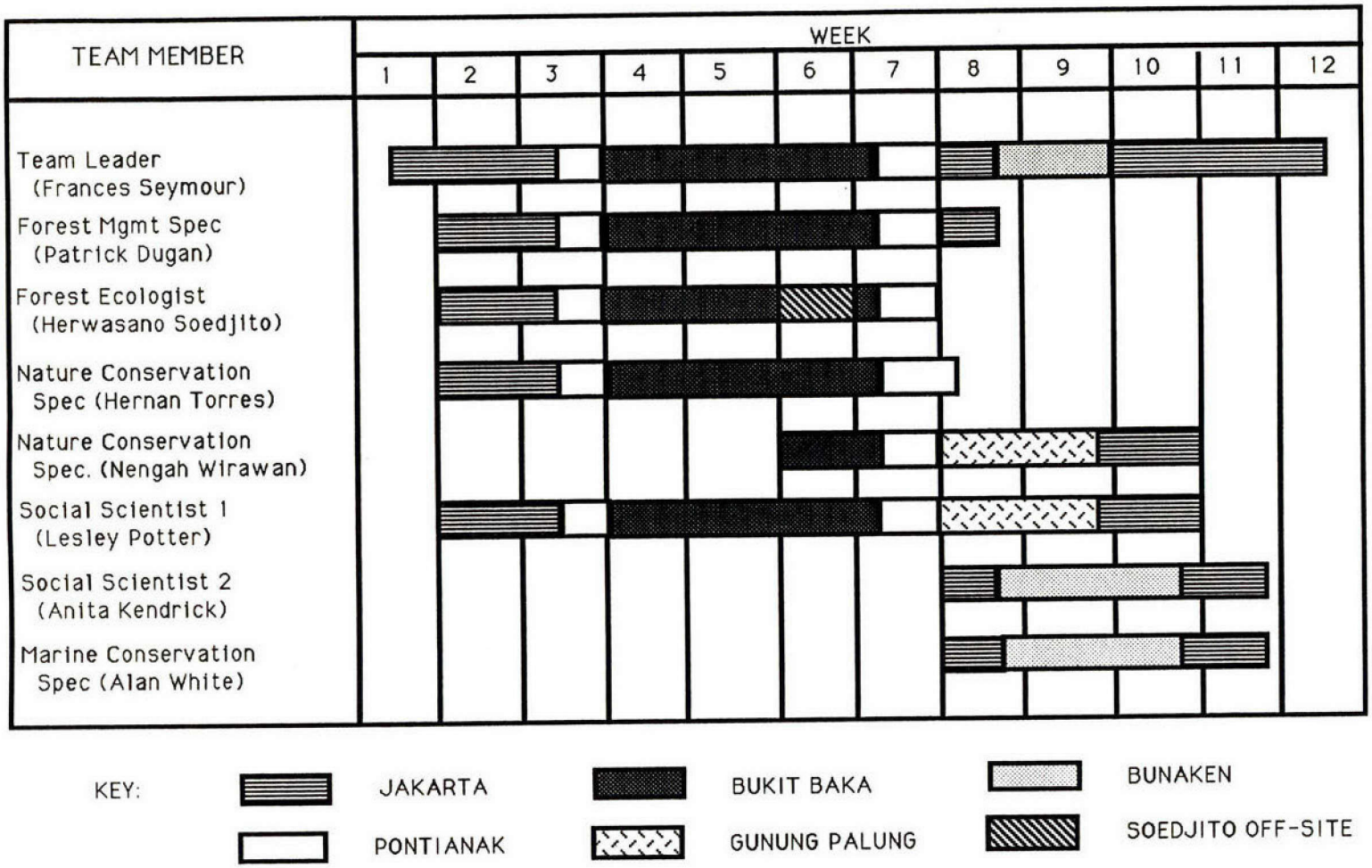
For more information contact:

Kathryn Saterson, Director. Phone: 202/861-8330
Janis Alcorn, Asia/Pacific Program Officer. 202/778-9697
Kate Newman, Africa/Madagascar Program Officer. 202/778-9524
Meg Symington, Latin America/Caribbean Program Officer.202/778-9727
Francesca Grifo, Eastern Europe Program Officer. 202/293-4800
Bruce Leighty, Finances/Management Program Officer. 202/778-9685

APPENDIX 2

NATURAL RESOURCES MANAGEMENT PROJECT

PROPOSED SCHEDULE FOR ENVIRONMENTAL IMPACT ASSESSMENT TEAM



APPENDIX 3

FS - Frances Seymour HT - Hernán Torres LP - Lesley Potter PD - Pat Dugan HS - Herry Soedjito AK - Anita Kendrick
AW - Alan White NW - Nengah Wirawan JAK - Jakarta PONT - Pontianak BB - Bukit Baka BUN - Bunaken GUN - Gunung Palung

SEPTEMBER

		1	***2***	***3***	***4***	***5***
6	***7***	***8***	***9***	***10*** FS JAK	***11*** FS JAK	***12*** FS JAK
13 FS JAK	***14*** FS JAK	***15*** FS JAK	***16*** FS PD JAK HT Travel	***17*** FS PD JAK HT	***18*** FS PD JAK HS HT	***19*** FS PD JAK LP HS HT (1st team mtg)
20 FS PD JAK LP HS HT	***21*** FS PD JAK LP HS HT	***22*** FS PD JAK LP HS HT (NGO scoping session)	***23*** FS PD JAK LP HS HT (formal scoping session)	***24*** FS PD Travel LP HS to HT PONT	***25*** FS PD PONT LP HS HT (NGO scoping session)	***26*** FS PD PONT LP HS HT (formal scoping session)
27 FS PD PONT LP HS HT	***28*** FS PD Travel LP HS to HT BB	***29*** FS PD BB LP HS HT	***30*** FS PD BB LP HS HT			

FS - Frances Seymour HT - Hernán Torres LP - Lesley Potter PD - Pat Dugan HS - Herry Soedjito AK - Anita Kendrick
AW - Alan White NW - Nengah Wirawan JAK - Jakarta PONT - Pontianak BB - Bukit Baka BUN - Bunaken GUN - Gunung Palung

OCTOBER

				1 FS PD BB LP HS HT	**2** FS PD BB LP HS HT	**3** FS PD BB LP HS HT
4 FS PD BB LP HS HT	**5** FS PD BB LP HS HT	**6** FS PD BB LP HS HT	**7** FS PD BB LP HT	**8** FS PD BB LP HT	**9** FS PD BB LP HT	**10** FS PD BB LP HT
11 FS PD BB LP HT NW PONT	**12** FS PD BB LP HT NW	**13** FS PD BB LP HT NW	**14** FS PD BB LP HT NW	**15** FS PD BB LP HT NW HS PONT	**16** FS PD BB LP NW HT HS PONT	**17** FS PD BB LP NW HT HS PONT
18 FS PD BB LP NW HS PONT HT JAK	**19** FS PD PONT LP HS NW HT JAK	**20** FS PD PONT LP HS NW HT PONT	**21** FS PD PONT LP HS NW HT Out	**22** FS PD PONT LP HS NW	**23** FS LP PONT NW PD HS JAK	**24** FS LP PONT NW PD HS JAK
25 FS PD JAK HS LP NW PONT	**26** FS PD JAK HS NW LP GUN AW Travel	**27** FS PD JAK HS AW AK NW LP GUN	**28** FS PD JAK AW AK HS NW LP GUN	**29** PD FS JAK AW AK NW LP GUN	**30** PD JAK FS AW BUN AK NW LP GUN	**31** PD Out FS AW BUN AK (NGO scoping sess) NW LP GUN

FS - Frances Seymour HT - Hernán Torres LP - Lesley Potter PD - Pat Dugan HS - Herry Soedjito AK - Anita Kendrick
AW - Alan White NW - Nengah Wirawan JAK - Jakarta PONT - Pontianak BB - Bukit Baka BUN - Bunaken GUN - Gunung Palung

NOVEMBER

1 FS AW BUN AK NW LP GUN	**2** FS AW BUN AK NW LP GUN (formal scoping session)	**3** FS AW BUN AK NW LP GUN	**4** FS AW BUN AK NW LP GUN	**5** FS AW BUN AK NW LP Travel	**6** FS AW BUN AK NW LP PONT	**7** LP NW PONT FS JAK AK AW BUN
8 AW AK BUN FS NW JAK LP	**9** AW AK BUN FS LP JAK NW	**10** AW AK BUN FS LP JAK NW	**11** AW AK BUN FS LP JAK NW Out	**12** AW AK BUN LP FS JAK	**13** LP Out AW AK BUN FS JAK	**14** FS AW JAK AK
15 FS AW JAK AK	**16** FS AW JAK AK	**17** FS AW JAK AK	**18** FS AW JAK AK	**19** FS AW JAK AK	**20** AW Out FS AK JAK	**21** FS JAK AK Out
22 FS JAK	**23** FS JAK	**24** FS JAK	**25** FS Out	**26**	**27**	**28**
29	**30**					

APPENDIX 4

LIST OF ENVIRONMENTAL ASSESSMENT TEAM MEMBERS

Patrick Dugan, who served as the Forest Management Specialist, is currently a senior consultant to the Government of the Philippines and USAID/Manila on national forestry programs and policies. He has more than 30 years' experience working on agroforestry projects and forest enterprises in the Philippines.

Anita Kendrick, who served as the Social Scientist for the North Sulawesi portion of the EA, is a doctoral candidate in the field of Development Sociology at Cornell University. She did her dissertation research on resource management in fishing communities in East Java, and has worked as a consultant to Catholic Relief Services in Jakarta.

Lesley Potter, who served as the Social Scientist for the West Kalimantan portion of the EA, and Team Leader for the Gunung Palung IEE sub-team, has a Ph.D. in Geography from McGill University. She currently teaches in the Geography Department at the University of Adelaide in South Australia. Over the last ten years, she has conducted periodic research in Kalimantan, and has published extensively on social aspects of forestry policy in the region.

Frances Seymour, who served as the EA Team Leader and Institutional and Policy Specialist, has a master's degree in Public Affairs from Princeton University. She served for five years as a Ford Foundation Program Officer in Indonesia specializing in social forestry programming.

Herwasono Soedjito, who served as the Forest Ecologist, has Ph.D. in Forest Ecology from Rutgers University. He is a researcher at the Center for Research and Development in Biology, Indonesian Institute of Sciences (LIPI), and has worked on resource management issues in Indonesia for the last 15 years.

Hernán Torres, who served as the Nature Conservation Specialist for the Kalimantan portion of the EA, has a master's degree in Environmental Studies from Yale University. During the last 10 years, he has worked in Chile and elsewhere in Latin American on environmental planning and assessment and the implementation of protected area and wildlife management plans.

Alan White, who served as the Marine Conservation Specialist, has a Ph.D. in Marine Resource Management from the University of Hawaii. He is currently serving as a Coastal Resource Manager in Sri Lanka through the Coastal Resources Center at the University of Rhode Island. He has worked on marine resource management projects in Asia for the past ten years.

Nengah Wirawan, who served as a Nature Conservation Specialist for the Kalimantan portion of the EA and a member of the Gunung Palung IEE sub-team, has a Ph.D from the University of Hawaii. He currently teaches in the Department of Forestry at Hasanuddin University in Ujung Pandang, Indonesia. He has worked on natural resource management issues in Indonesia for the past 30 years.

APPENDIX 5

LIST OF RESOURCE PERSONS, FACILITATORS, AND CONSULTANTS

Wandoyo Siswanto is a staff member in the Directorate of Forest Protection under the Directorate General of Nature Conservation in the Indonesian Ministry of Forestry, and is a specialist in Environmental Impact Assessment. He served as the Ministry resource person for the EA team, and took responsibility for arranging scoping and debriefing sessions with Ministry officials in Jakarta. He also accompanied the team to Pontianak and Manado in order to participate in official scoping sessions at the provincial level.

Kristianus Atok is a staff member of the Institute of Dayakology Research and Development (IDRD), a Pontianak-based non-governmental organization. He visited the Bukit Baka/Bukit Raya project site prior to the EA team's arrival, and participated in the full three weeks of the team's fieldwork. He also facilitated NGO scoping and debriefing sessions in Pontianak.

Bahagiawati is a staff member of the Provincial Office of the Ministry of Forestry (*Kanwil Kehutanan*) in Pontianak. She accompanied the EA team during its first four days at the project site in Bukit Baka/Bukit Raya.

Erwin Effendi is a staff member of the Provincial Nature Conservation Office (*Sub-Balai KSDA*) of the Ministry of Forestry in West Kalimantan. He participated in the fieldwork of the Gunung Palung portion of the assessment.

Djoko Prawoto Praseno is a Senior Researcher at the Center for Oceanology Research and Development of the Indonesian Institute of Sciences (LIPI) in Jakarta, and is the coordinator for all LIPI programs in North Sulawesi. He served as a locally-recruited consultant for the Bunaken portion of the EA, and participated in the first week of scoping sessions in Manado and fieldwork in Bunaken National Park.

Arnold Winawatan is a staff member of Yayasan Nurani, a non-governmental organization based in Tomohon, North Sulawesi. He facilitated the NGO scoping session in Manado, and joined the EA team for portions of its fieldwork at the Bunaken project site.

APPENDIX 6

SCOPING SESSIONS

Attached are summaries and attendance lists of the following scoping sessions held for the NRMP Environmental Assessment (EA):

1. Jakarta - Government-sponsored, Wednesday 23 September
2. Jakarta - NGO-sponsored, Tuesday 22 September
3. Pontianak - Government-sponsored, Saturday 26 September
4. Pontianak - NGO-sponsored, Friday 25 September
5. Manado - Government-sponsored, Monday 2 November
6. Manado - NGO-sponsored, Saturday 31 October

The summaries of discussions are based on notes taken by the Team Leader, and have not been approved by meeting participants.

1. JAKARTA GOVERNMENT-SPONSORED SCOPING SESSION

A. SUMMARY

The Jakarta scoping session for the NRMP Environmental Assessment was held on Wednesday, September 23rd, at the Ministry of Forestry (MOF). Preparations for this event had begun a month previously through correspondence and discussions initiated by USAID Mission staff and the Ministry of Forestry. The EA Team Leader followed up on these preliminary arrangements upon arrival in Jakarta the second week of September with officials of the National Planning Authority (BAPPENAS) and the Ministry of Forestry. A consensus emerged that the scoping session should be hosted by the Ministry of Forestry, and staff of the Directorate General of Forest Protection and Nature Conservation (PHPA) agreed to take on this responsibility.

Invitations to the meeting were to have been extended by the Secretary to the Director General of PHPA, but as of the morning of the meeting, most participants had not yet received a formal written invitation, nor any background materials for the meeting. Fortunately, verbal invitations that had been extended by the EA team, USAID Mission staff, and PHPA staff succeeded in securing the attendance of representatives of key institutions. However, several key individuals, including Herman Haeruman (BAPPENAS), Wahjudi Wardojo (PHPA), Sopari Wangsadidjaja (Directorate General of Forest Utilization, PH), Jerry Bisson (USAID), and Colin MacAndrews (Associates in Rural Development, ARD), were unable to attend due to other commitments, travel abroad, or illness. An attendance list is attached.

The meeting was held in the Director General PHPA's conference room, and was conducted in Bahasa Indonesia. The meeting was chaired by Ari Soedarsono, and Komar Soemardja served as moderator of the discussion. Highlights of the presentations and discussion are summarized below.

Ari Soedarsono opened the meeting by stating that its purpose was to assist the EA team in refining its terms of reference prior to going to the field. He briefly described the three components of the project being implemented in collaboration with the MOF as being natural forest management, management of forest and marine conservation, and education and training.

Ari Soedarsono then provided an extensive treatment of a conceptual framework for integrating the MOF's forest classification system (which allocates forests to conservation, protection, production, and conversion functions) with the three objectives contained in the 1990 Law on the Conservation of Living Natural Resources and Their Ecosystems: protection of life support systems, preservation of biodiversity, and sustainable utilization. He also alluded to the relevance of international covenants related to forestry recently entered into by Indonesia at the Rio "Earth Summit". Finally, he mentioned a recent Ministerial decree mandating environmental impact assessments of all activities to be implemented in forest areas.

Mr. Soedarsono then called on the representative from the Forest Utilization Directorate to describe NRMP activities being planned and implemented in collaboration with that directorate. Mr. Asmawi, representing Mr. Sopari Wangsadidjaja, stated that as the staff of his office had not yet been actively involved in the project, they did not have any basis upon which to make a presentation.

Mr. Agus Widiyanto of the USAID Mission then made a presentation regarding the activities planned under the NRM project in West Kalimantan and North Sulawesi as agreed under the Joint Implementation Plan. The one point from the presentation that elicited a request for clarification from MOF officials was an allusion to an experimental village forest concession.

Frances Seymour, EA Team Leader, then introduced the team and its mandate. She presented a list of nine working hypotheses regarding the likely social and environmental impacts of the NRMP that the team had formulated to focus its work, and invited comment from the group. The discussion that followed was dominated by the more senior MOF officials, and focussed on three of the nine hypotheses. Regarding the hypothesis that the NRM project had potential to positively affect policy change at the national level, Mr. Soedarsono stated that the hypothesis was too broad, and that the resources allocated to the NRM project were insufficient to achieve such an ambitious goal. Mr. Sastra warned the team against "changing policies in the field", and reminded the team that forest policies and laws were already in place and could only be changed through officials in Jakarta and the existing legal system.

Hypothesis number five, regarding the importance of community and NGO participation in project planning and implementation, stimulated the most discussion. Mr. Soedarsono warned the team that this topic was "sensitive", and that "perceptions" of NGOs and the government regarding what constitutes peoples' welfare must be the same. Mr. Soemardja warned against the importation of inappropriate cultural precepts, and stressed that community participation must be limited to project implementation, since policy must emanate from the center.

Mr. Sastra agreed with those views, and warned the team against reporting findings or recommendations directly to the field. In order to avoid the kind of problems that have arisen in East Malaysia, he suggested that the team not focus on traditional land rights (*hak ulayat*), stating that the focus should be on increasing peoples' welfare and changing the way of life of shifting cultivators. He went on to clarify MOF policy regarding the rights of local communities to continue to exploit forest products for in concession areas for subsistence needs.

The hypothesis regarding the management of "logged-over" forest areas was also of concern to MOF officials. They stressed that such areas were already covered by the Indonesian Selective Cutting and Planting System (TPTI), and that the project should only look at perfecting the existing system. Mr. Kuswanda reminded the group that one of the purposes of the project was research, and that therefore the possibility of experimentation in the field in collaboration with concessionaires and local communities was necessary. Following expressions of concern from MOF officials that central MOF approval was necessary prior to any such experimentation, Mr. Widiyanto reminded the group that NRMP was in fact an MOF project, and not something being unilaterally implemented by USAID, as the discussion seemed to imply.

Mr. Dedi of BAPPENAS then provided a clarification of the project structure, including the function of the Policy Working Group and the Project Coordination Committee. He then asked for clarification regarding the EA team's Term of Reference (TOR): did it include policy issues? And in regard to the NGO involvement issue, was the team planning to get into the actual mechanisms for such involvement, or limit itself to the general picture only? He later noted that the hypothesis regarding community participation seemed to have a more prescriptive cast than the others.

Mr. Subianto of PHPA stated that he thought it was strange that the EA team was here even though the NRM project hadn't started yet, and asked for clarification of the TOR. He felt that the goals and targets of the project needed to be clarified in order to determine whether or not they were achievable, and stated that they might be beyond the capability of the host institution. He stated that he thought the team should look at *hak ulayat* issues, and Mr. Komar, in his summary, later agreed.

Mr. Djuweng of the Institute for Dayakology Research and Development (IDRD) then addressed the issue of community participation. Citing an example from his own village, he

stated that projects that do not involve people in the planning as well as implementation tend to fail. He stated that if government does not respect the people, people will not respect the government, and that they should be involved according to their capability. He agreed with the need to look at *hak ulayat* issues. He also questioned whether increasing community welfare necessarily implied a dependency-creating "charity" approach.

Mr. Darminto of the Forestry Research Institute (LitBang) then commented that his agency's participation in the project was constrained by a lack of standard operating procedures for field implementation, including those specifically related to community participation. He stated that while financial procedures were complete, implementation procedures were lacking. He also noted that with respect to the hypothesis regarding the sustainability of project benefits, he was concerned that the siting of the proposed research station had not been harmonized with regional development priorities.

Mr. Wandoyo of PHPA commented that the hypothesis that most NRM project impacts are likely to be social rather than ecological had implications for change in project design. He agreed with the team's hypothesis that social impacts will lead to indirect ecological impacts, and mentioned several considerations that the team should consider, including the local communities' current dependence on the forest and the intentions of the project to "change their profession".

Following an invitation from the team leader for comments specifically related to the Bunaken site, Mr. Arnold of Yayasan Nurani enjoined the team to look at all the islands included in the conservation area, and not just Bunaken Island itself. He also stressed the need for community participation, and commented that local people should specifically be involved in any boundary delineation activities. He later added that the team should consider disputes over jurisdiction over the Bunaken area among the municipal and provincial authorities, as well as various government agencies concerned with forestry and tourism.

Mr. Widiyanto of USAID informed the group of the project's strategy to work with dive operators in the management of the conservation area, and suggested that the team look at its potential impact. Mr. Subianto of PHPA suggested that the team also look at the potential impacts of the new policy regarding *konsesi wisata* (tourist concessions) at the Bunaken site. Mr. Wandoyo suggested that the team also provide input on the appropriate zonations for the marine park.

Following the official closing of the meeting, Mr. Soedarsono made two additional comments. He stated that while according to official MOF policy, the provincial government apparatus is the official channel for community aspirations, we all know that that system doesn't always work, and that NGOs can be used as a "cross check" on that system. Then, regarding the difficulty of the project in fielding counterparts, he mentioned that the project does not fit with the MOF's civil service system.

B. ATTENDANCE LIST

Ministry of Forestry

Ari Soedarsono, PHPA
Herman Sastra, PHPA
Komar Soemardja, PHPA
Wandoyo Siswanto, PHPA
Subianto, PHPA
Asmawi, PH
Darminto, LitBang

BAPPENAS

Tamtama Purwowinoto
Dedi Riyadi

USAID

Agus Widianto

ITTO

M. Kuswanda

Non-Governmental Organizations

Monty, Indonesian Environmental Forum (WALHI)

Kristianus Atok, Institute of Dayakology Research and Development (IDRD)
Stephanus Djuweng, IDRD

Arnold Winawatan, Yayasan Nurani

Private Sector

Nana Suparna, Alas Kusuma Group

Biodiversity Support Program Environmental Assessment Team

Frances Seymour
Patrick Dugan
Lesley Potter
Herwasono Soedjito
Hernan Torres

2. JAKARTA NGO-SPONSORED SCOPING SESSION

A. SUMMARY

The Jakarta NGO scoping session for the NRMP Environmental Assessment was held on Tuesday, September 22nd, at the offices of the Indonesian Environmental Forum (WALHI). The Biodiversity Support Program in Washington, D.C. had initiated correspondence with WALHI two months previously requesting WALHI's assistance in facilitating NGO participation in the Environmental Assessment (EA). In subsequent discussions with the Team Leader, WALHI agreed to host an informal scoping session in Jakarta, and to coordinate the attendance of representatives of NGO affiliates from West Kalimantan and North Sulawesi.

The meeting was attended by staff from WALHI, LATIN, IDRD, and Yayasan Nurani. A list of individual attendees is attached. BSP had provided WALHI with the same package of background materials supplied to the EA team, but meeting participants had not yet had time to study it in detail. The meeting was conducted in Bahasa Indonesia with intermittent translation provided for the two members of the EA team not conversant in that language. The meeting was moderated by Sandra Moniaga of WALHI, and began with introductions of the individuals attending and the institutions represented. Frances Seymour, EA Team Leader, then provided an overview of the NRM project and the EA team's mandate. Highlights of the discussion that followed are summarized below.

A participant mentioned that the NRMP Social Forestry Advisor had solicited a proposal from his organization, but that there had been no follow up due to the lack of clarity regarding the envisioned role for NGO participation in the project. He noted that his organization is using the EA as an opportunity to become more familiar with the project. He stated that his main concern was the potential impact of the national park on the local communities, particularly if there were to be any resettlement plans. He alluded to relevant experience with the Gunung Palung National Park, where villagers' rubber gardens had been included inside the park boundaries.

Another participant was then asked to report on his findings during a preliminary visit to the Bukit Baka/Bukit Raya project site the previous week. He provided a comprehensive description of what he had seen. He stated that the alang-alang grassland between the logpond and the Km 35 logging camp was the largest he had ever seen, and speculated that it was generated and maintained by shortened fallow periods, high density of cattle, and burning for deer hunting. He described the two timber concessions active in the area, Sari Bumi Kusuma (SBK) and Kurnia Kapuas Plywood (KKP), and mentioned that the latter was the source of conflict due to unclear boundaries: there were reports that logging camps and roads were being built into the adjacent protected area.

He described the local communities as being arrayed along the rivers, and having little fertile agricultural land other than the alang-alang grassland. He described local

attitudes as being strongly influenced by the presence of the concessions, particularly in expecting to be paid for labor and given handouts by the HPH Bina Desa Program[1]. He mentioned that the HPH Bina Desa Program and the NRM project activities were seen as jointly pressuring local communities to give up shifting cultivation and become settled rice farmers. A lively discussion later ensued regarding whether or not the development of *sawah* (wet rice) cultivation was ecologically and socially appropriate for Kalimantan, with no strong consensus emerging.

The speaker agreed that development of sawah was an important focus for NRMP, but warned that potential was limited due to water and fertility constraints. He described burning as a limitation to tree crop development, and described a recent incident in which rubber seedlings provided by the NRMP had experienced high mortality due to technical deficiencies. He thought there was good potential for livestock development.

He reported that it was his impression that communities were not yet fully involved in the NRMP, and that people were unable to distinguish HPH Bina Desa and NRMP activities. He suggested that conservation must provide benefits for local communities, and that the appropriate first step would be community organization. He suggested that NRMP could facilitate NGO involvement to achieve this objective.

Another participant expressed skepticism that communities or NGOs coul be meaningfully involved in the NRMP as long as the project was controlled by the Ministry of Forestry. She stated that it was also her impression that there had been no meaningful participation of local communities or NGOs in the NRMP, but reported that she understood that the Social Forestry Advisor was working to revive dormant *adat* councils. She suggested that community members should sit on project advisory boards, and that they should be given opportunities to go on study tours to parks where local communities are involved in park management. She added that few local people work for the concessionaires, and that even then they were limited to the lowest level jobs. She later suggested that the project "start small and simple", focussing, for example, on the development of local capacity to be entrepreneurs in the national park. She also highlighted the potential conflict of interest between NRMP and the concessionaires, given the project's high level of dependence on SBK for logistics.

Another participant suggested that the project's seven year horizon would provide sufficient time to develop and implement a management plan involving all relevant parties. He mentioned the need for an independent forum within which the potential conflict of interest could be openly discussed and criticized. Subsequent discussion stressed that there is at least a perception that the NRMP is "captured" by the concessionaire.

---

[1] The HPH Bina Desa Program is a mandatory Ministry of Forestry program under which timber concessionaires provide agricultural extension and other rural development services to communities in and around their concession areas.

A consensus was reached that the project's first priority should be the development of management capacity of the local people, and that the NRMP training component should be redirected toward this end. It was observed that scholarships for graduate degrees would disproportionately benefit the employees of the Ministry of Forestry and other Java-based institutions, and would not likely benefit local communities.

After a lunch break, a smaller group convened to discuss issues specific to the Bunaken component of the NRMP. A participant described a community organization initiative recently begun by his organization independent of the NRMP on the five islands included in the reserve. He expressed concern that the marine national park management plan would include plans to resettle communities, and was not sure what USAID's position was on this. He hoped that he project could help local communities become the guardians of the protected area, and thought that the project would have a positive social impact if local people were involved. However, he thought that many were still unaware of the area's status as a national park.

He went on to say that the NRMP had engaged the Manado NGO community through a "*plat merah*" NGO (red license plates connote government vehicles). He also suggested that the project had focussed too much attention on Bunaken Island, and insufficient attention to the more remote islands in the park. He suggested that there was a need to develop income-generating opportunities for the islanders, and that study tours would be a welcome project activity.

He alluded to conflicts among various agencies regarding jurisdiction over the park, and stated his opinion that creation of a special authority to oversee the national park (as has been suggested) would not be a good idea. He mentioned that the head of the provincial forestry office had been known to favor resettlement of local communities, and cited rumors that powerful interests had designs on developing the islands for tourism. He mentioned an ongoing controversy related to the fate of some cottages that had been built on the beach, and related land speculation and prostitution.

The issue of local vs. outside ownership and control was the subject of subsequent discussion, which also touched on the current and potential role of private sector dive operators, and the fact that local communities already exercise some control over dive operators' activities. Finally, the relevance of a new Ministry of Forestry SK (letter of decision) regarding the granting of concessions in conservation areas was raised both as a potential threat (if captured by outside interests) and as an opportunity (if used to protect the rights of local communities).

B. ATTENDANCE LIST

Non-Governmental Organizations

Sandra Moniaga, Indonesian Environmental Forum (WALHI)
Monty, WALHI

Tri Nugroho, Indonesian Tropical Resources Institute (LATIN)
Bowo, LATIN

Stepanus Djuweng, Institute of Dayakology Research and Development (IDRD)
Kristianus Atok, IDRD

Arnold Winawatan, Yayasan Nurani

Biodiversity Support Group Environmental Assessment Team

Frances Seymour
Patrick Dugan
Lesley Potter
Herwasono Soedjito
Hernan Torres

3. PONTIANAK GOVERNMENT-SPONSORED SCOPING SESSION

A. SUMMARY

The Pontianak scoping session for the NRMP Environmental Assessment (EA) was held on Saturday, September 26th, at the Mahkota Hotel. USAID Mission staff, in consultation with the Biodiversity Support Program in Washington, D.C., had decided to utilize a *Rapat Komisi AMDAL* (meeting of the provincial environmental impact assessment commission) for the EA scoping session in Pontianak as a mechanism to bring together all interested parties, as well as to link the EA process insofar as possible with the Indonesia environmental impact assessment process. Preparations for this event had begun a month previously through correspondence and discussions initiated by USAID Mission staff and the Ministry of Forestry (MOF) in Jakarta with the West Kalimantan office of the MOF and the provincial planning authority (BAPPEDA) in Pontianak.

The EA Team Leader, USAID Mission staff, and Ministry of Forestry staff followed up on these preliminary arrangements upon arrival in Pontianak on September 24th and 25th. Several misunderstandings regarding the purpose and scope of the meeting emerged. In particular, staff of the provincial office of the Ministry of Forestry (*Kanwil Kehutanan*) and provincial office of the Nature Conservation Directorate General (KSDA) felt that the background materials on the EA that had been provided by the USAID Mission were insufficient for an AMDAL commission meeting, and requested that the EA team produce, distribute, and present detailed workplans for the Bukit Baka and Gunung Palung studies for consideration at the meeting. In response to this request, the EA team, with the able assistance of Ir. Wandoyo Siswanto of the Ministry of Forestry, produced two brief documents, "*Ruang Lingkup Kegiatan Studi Lingkungan Proyek NRM*" (Scope of Work for NRMP EA) and "*Taman Nasional Gunung Palung: Revisi dari Penilain Pendahuluan Faktor Lingkungan*" (Gunung Palung National Park: Revised IEE).

Invitations to the meeting had been extended by the head of the provincial planning authority (*BAPPEDA Tingkat I*). An attendance list is attached. The meeting was conducted in Bahasa Indonesia, and was chaired by Soeparno S., head of the provincial office of the Ministry of Environment and Population (*Kepala Biro BKLH*) of West Kalimantan, representing the head of BAPPEDA, who was unable to attend. The platform was shared by Oetje Baboe, Kepala Biro BLKH of Central Kalimantan, and by Suhendar, representing the head of the Kanwil Kehutanan. Highlights of the presentations and discussion are summarized below.

Soeparno opened the meeting by giving a brief description of NRM Project activities and the purpose of the meeting. Suhendar then provided a more comprehensive overview of the project, utilizing transparencies prepared by USAID. He specifically highlighted the project's good cooperation with SBK and the potential impact of the trans-Kalimantan highway on the area. He then clarified the role of the EA team, mentioning that in addition to the necessity of conducting an EA to satisfy Congressional requirements, it was hoped that

the team could provide input to refining project design. He addressed the earlier confusion regarding the relationship between the EA and the Indonesian AMDAL process, and acknowledged that it seemed strange that a project specifically designed to improve the environment would need an EA.

Oetje Baboe began his presentation by reminding the assembly that of the some 180,000 hectares included in the Bukit Baka/Bukit Raya National Park, approximately 110,000 are in Central Kalimantan. Accordingly, he urged the EA team to collect secondary data from both provinces. He reviewed the history of the park's establishment, and stated that he did not know the status of boundary marking. He expressed concern about the operation of timber concessions surrounding the park, and mentioned that he had recently attended an AMDAL meeting in Jakarta regarding the SBK concession. He expressed concern over the Ministry of Forestry's granting of a corridor for a road through the protected area over the objections of provincial government officials.

Oetje Baboe then raised questions regarding the status of the EA with respect to the AMDAL process, and requested clarification regarding jurisdiction. Soeparno reiterated that the focus of the EA was to be on the NRMP in order to fulfill U.S. Government rather than Indonesian Government requirements, and that its purpose was to provide revisions to a project that was already underway.

Frances Seymour, EA Team Leader, then made a presentation summarizing the team's Scope of Work and working hypotheses. Her presentation was based on the first of the two handouts mentioned above, and also utilized an overhead transparency summarizing the team's working hypotheses regarding NRMP's likely positive and negative social and ecological impacts.

Soeparno then opened the discussion by informing the team that it was provincial government policy to utilize natural resources as an agent of development to equalize income distribution and provide employment opportunities. He stated that while he was supportive of the HPH Bina Desa program, there was a need to clarify the responsibility and sustainability of the program, and to reach a common understanding of the program's goals to provide not only infrastructure, but to increase economic welfare. He suggested that the program should not conflict with existing government policy, and that it should be coordinated with the provincial office of village development under the Ministry of the Interiaor (*BangDes*).

Citing Mubyarto, Soeparno acknowledged that while timber exploitation generated revenue for the government, most communities in logging areas remained below the poverty level. He listed issues faced by local communities and the fact that their traditional forest exploitation activities (*banjir kap*) were now considered to be illegal, and that increasing logging activities seemed to be linked to increasing losses from floods and fires. He questioned the effectiveness of the Indonesian Selective Logging and Planting System (TPTI), and suggested that better enforcement was necessary.

Mamet Mulyana of SBK then asked for the floor to clarify the situation with respect to the corridor mentioned by Oetje Baboe. He stated that the planning, permission, and initial construction of the road in question had predated the designation of the forest as a protected area, so that in fact the national park had been overlaid on the corridor rather than the other way around. He mentioned recent developments in regulations regarding such roads issued by the Ministry of Forestry in Jakarta. Mamet Mulyana then raised the issue of the status of villages within the SBK concession area. He stated that the boundary marking of the concession perimeter was complete, and that SBK had recently received a letter from the Kanwil Kehutanan of Central Kalimantan mandating boundary marking between the concession and the villages. He questioned by what authority concessionaires could undertake such a boundary-marking activity.

Soemarsono of Yayasan Agromitra then questioned the appropriateness and sustainability of the HPH Bina Desa program. He suggested that the program does not allow communities to identify their own priority needs, and felt that a target-driven approach would boomerang and create dependency. He then raised a question about the impact of logging activities on the fauna in production forests, and wondered about the impact of logging and planned plantations in the vicinity of the national park.

Syafuddin Said of the University of Tanjungpura questioned the use of exotic species concession management, and their potential negative impact on endemic species. He then suggested that concessionaire timber inventories also take account of species of particular importance to wildlife. Regarding HPH Bina Desa, he expressed concern about the sustainability of the agricultural systems being promoted, especially in light of high rates of erosion and misuse of fertilizer. He suggested that a more appropriate strategy might focus on more intensive livestock raising.

Soeparno then requested a clarification of the HPH Bina Desa program from a representative of the Ministry of Forestry in Jakarta. Sopari then described the Ministry's new policy requiring concessionaires to prepare a diagnostic study prior to the initiation of HPH Bina Desa activities. The study would identify community needs (as distinct from wants) as well as conflicts that needed to be resolved. He acknowledged that communities are in a weak bargaining position in relation to the concessionaires, and suggested that a role for NGOs would be to go into those communities as social workers (as opposed to advocates) to assist in community organization.

Soekarno of BKLH then suggested that local institutions must be used to involve communities in planning. He mentioned that winners of the *KalPaTaRu* (an annual national environmental award) were often communities that themselves had developed a system for managing the environment. Soeparno cited the relevance of *hukum adat* (traditional law) in the setting of sanctions for violations of local rules. Mustawa of BangDes stressed the need for bottom-up planning in the HPH Bina Desa program, and cited the need for specific mechanisms to facilitate that process.

Tony Soehartono then asked the EA team for clarification of the model and methodology they planned to use for the assessment, especially in view of the fact that the management plans to be assessed were not yet ready. The Team Leader agreed that the team's job would be easier if the plans were ready, but mentioned that on the other hand, the team's input could be more readily incorporated into draft documents. She acknowledged that the team would have to rely on consultations with project advisors to learn of planned activities and rapid rural appraisal methodologies to assess their likely impact.

Dr. Heruyono of the University of Tanjungpura then provided a brief description of international pressures for sustainable forest management by the year 2000. He then cited key issues for the team's consideration as being: biodiversity conservation, hydrology (specifically river level fluctuations), the effect of road-building on soil erosion, and the use of exotic species in concession management.

Before breaking for lunch, Soeparno reminded the team that poverty is the main issue, and that the challenge is how to meet people's basic needs through other activities so that they will not be dependent on the forest. He suggested that the commercial focus of the concessionaires might adversely impact conservation through providing wage labor opportunities more attractive than farming, and that there was a need to change people's attitudes.

After lunch, Suhendar took over the chair and refocussed the meeting's attention on Gunung Palung National Park. He mentioned that a representative from the Katapang Regency was in attendance. He stated that Gunung Palung was very different from Bukit Baka, and that while a management plan did exist, it was ten years old and in need of revision.

Lesley Potter, the EA team's social scientist and Team Leader for the Gunung Palung portion of the assessment, made a presentation based on the second handout distributed to participants. She described the composition and mandate of the sub-team going to Gunung Palung, and summarized her working hypotheses. In particular, the team would focus on changes in the situation over the last ten years, and would assess the need for a full environmental assessment later on if the NRM project were to initiate activities in the park.

Suhendar stated that Gunung Palung was much more vulnerable to disturbance than Bukit Baka/Bukit Raya, and that it had received significantly more attention from researchers and tourists.

Soemarsono, who had spent ten years in Katapang, then provided an extensive description of the situation at Gunung Palung. He highlighted the activities of timber concessionaires close to (and in one case crossing) the park boundary, and the wood exploitation activities of local communities. He mentioned that most disturbance was caused by recent migrants to the area, and cited the threat of planned additional transmigration settlements adjacent to the park. He also mentioned the need to find a substitute for road-

building materials now being taken from the park. He criticized previous research efforts as being too academic, and cited the need for more attention to the needs of local people. He alluded to the plans of Mark Leighton (a Harvard University researcher) to collaborate with NGOs on biodiversity issues.

A. B. Tangdililing, representing Yayasan Madu Hutan on behalf of Dr. Syamsuni Arman, apologized that he was unable to give any further information on the NGO that he was representing. He then suggested that the team utilize participant observation methodology in addition to observation and interviews. He expressed his interest in the development of concrete mechanisms for community participation in conservation, and suggested that local people could serve as forest guards and refreshment stand operators.

Agus Jam'an, representing the Katapang Regency, then provided further information about existing and planned infrastructure developments in the vicinity of the Gunung Palung reserve, including a planned road to facilitate tourism development. He asked the team to look at the impacts of the road, tourism, and proposed zonation of the park. He mentioned the exploitation of *gaharu* (a type of diseased wood used for incense) by outsiders, and suggested that there was insufficient KSDA staff to adequately guard the reserve. He stressed the need for coordination with local government and other agencies.

Tony Soehartono then responded to several of the points of information raised earlier, including the resolution of the incident of a concessionaire being inside the park. He stated that the park was now "clean" of production activities and settlements, although he had had reports of shifting cultivation and taking of wood on the eastern border. He mentioned that the planned road access would likely facilitate park and tourism development.

He suggested that the biodiversity information in the management plan is still good, and that his office had many maps and research reports on the reserve. He stated that research in the reserve up to now had been "scientific" rather than social, and that while the research station has been turned over to KSDA to manage, he has not yet been able to field a manager. KSDA now has only one staff member in the area, and while he would like to recruit additional staff locally, such decisions are controlled by Jakarta.

Dr. Heruyono then requested clarification of the team's proposed use of RRA methodology. He described his own impressions from a trip to Gunung Palung, including the turbidity of the streams giving clues to upland ecology. He mentioned that the large number of migrants in the area has led to a more complex social situation, and specifically highlighted the criminality of the gaharu hunters.

Before closing the meeting, Suhendar reiterated the suggestion of Oetje Baboe that the team should visit Central Kalimantan. It was agreed that the team would present its preliminary findings in a more informal setting at the Kanwil Kehutanan or BAPPEDA office the week of October 20th after returning from the field.

B. ATTENDANCE LIST

Provincial Government - West Kalimantan

Soeparno S., Kepala Biro BKLH
Yuslinda, Karo Bina Bangda
M. Sukarno, Kabag. Ling. Pemukiman Pedesaan, Biro BKLH
Nustaun, Dit. Bangdes
Agus Sam'am, BAPPEDA Tkt. II Ketapang
M. Ilya Raid, Biro BKLH

Provincial Government - Central Kalimantan

Ir. Oetje Baboe, Kepala Biro BKLH / Sek. AMDAL

Ministry of Forestry

Suhendar, Kanwil Kehutanan
Hiar B., Kanwil Kehutanan
Munasir Ch., Kanwil Kehutanan
Bahagiawati, Kanwil Kehutanan

Tony Soehartono, Sub=Balai KSDA
Erwin Effendi, Sub-Balai KSDA

Darwis Syukur, Litbang Kehutanan

Sopari Wangsadidjaja, PH

Wandojo Siswanto, PHPA

Tanjungpura University

Heruyono H., Faculty of Forestry
Syafruddin Said, Environmental Studies Center

Ministry of Tourism and Communication

M. Zeet Hamdy, SE

Non-Governmental Organizations

Soemarsono, Yayasan Agromitra

A. B. Tangdililing, Yayasan Madu Hutan

Private Sector

Ir. Mamet Mulyana, P.T. Sari Bumi Kusuma

Ir. B. Mahendra, P.T. Kurnia Kapuas Plywood

USAID

Jerry Bisson
Agus Widiyanto

NRMP

Fernando Potess
Mering Ngo
Elmo Drilling

Biodiversity Support Program Environmental Assessment Team

Frances Seymour
Patrick Dugan
Lesley Potter
Herwasono Soedjito
Hernan Torres

4. PONTIANAK NGO-SPONSORED SCOPING SESSION

A. SUMMARY

The Pontianak NGO scoping session for the NRMP Environmental Assessment was held on Friday, September 25th, at the Wisma Harun, and hosted by the Institute of Dayakology Research and Development (IDRD). At the request of WALHI, IDRD had agreed to facilitate NGO participation in the West Kalimantan portion of the Environmental Assessment. In subsequent discussions with the Team Leader, IDRD agreed to host an informal scoping session in Pontianak, and to coordinate the attendance of representatives of other West Kalimantan NGOs.

The meeting was attended by staff from WALHI, IDRD, and some five other NGOs. A list of individual attendees and institutions represented is attached. The meeting was conducted in Bahasa Indonesia with intermittent translation provided for the two members of the EA team not conversant in that language. The meeting was moderated by Stephanus Djuweng of IDRD. The meeting began with introductions of the individuals attending and the institutions represented. Frances Seymour, EA Team Leader, then provided an overview of the EA team's mandate. Highlights of the discussion that followed are summarized below.

One participant began by stating that NGOs had been involved in the design phase of the NRMP. He observed that local communities' access to resources had been compromised by the existence of concessionaires, and suggested that those concessions that overlap with conservation areas should be cancelled. He stated that it was his impression that USAID was constrained by Ministry of Forestry policy.

In response to questions, the EA Team Leader provided a summary of the substance of meetings earlier that day at the Ministry of Forestry office and the formal scoping session planned for the next day. She then provided an overview of the structure and planned activities of the NRMP.

A discussion ensued regarding the relationship of the NRMP to the ITTO. It was suggested that ITTO funding of the proposed research station might lead to a commercially-oriented research program. Pat Dugan then provided clarification of ITTO's mandate and operating procedures, specifically its policy of responding to requests from member countries.

Further clarification was then requested regarding the project's funding and structure, and specifically regarding the implementing agent. One participant suggested that the team should look at the contracting system employed for the project, and offered her opinion that too much money was spent on foreign experts, while too little money was spent on local human resource development.

The first speaker mentioned that his organization had promoted a human resource development strategy from the project design phase, and related an experience of suggesting community participation in a course in community forestry, only to have USAID channel the suggestion through BAPPENAS to the Ministry of Forestry. He stated that he was pessimistic about possibility of the NRMP to stimulate change as long as it is based in the Ministry of Forestry. He suggested that some sort of "buffer institution" (*lembaga penyangga*) was needed to mediate between the local communities and the Ministry of Forestry.

One participant stated his opinion that the proposed role of local communities in park management was weak; even if village heads were to be included in some sort of park management authority, their status as civil servants would constrain their advocacy role. He suggested that the project must involve NGOs, and that NGOs should get a fair share of scholarships funded by the project.

Another participant suggested that the project should focus on delineating boundaries between the concessionaires, conservation areas, and land belonging to local communities in consultation with local people. The first speaker mentioned that there was such a boundary-marking exercise several years ago, but that it was forgotten when the KKP concession was awarded. A discussion then ensued about the boundary marking process, and the opportunity, at least in theory, for local communities to review and appeal proposed boundaries. One participant suggested that the process of developing management plans be reviewed, and warned that USAID seemed to be promoting a "top down" approach. In her view, it would be better to cancel the project if USAID were not willing to engage the Ministry of Forestry on these fundamental issues.

One participant suggested that the project work with small groups of farmers to introduce wet rice (*sawah*) cultivation. A discussion then ensued about the ecological and social feasibility of sawah development in this area. Another participant highlighted the negative psychological effects of agricultural intensification programs as people are made to feel stupid for being shifting cultivators. A discussion then ensued about the HPH Bina Desa Program and its patronizing aspects.

In response to a question from Lesley Potter regarding the potential role of NGOs in the project, a participant described his organization's role in a social forestry project in Sanggau. He suggested that NGOs need to work at the grassroots to develop legitimacy for policy dialogue. He predicted that someday, timber concessions would be owned by local people. He suggested that foreign consultants in a project like NRMP could assist in lobbying the Ministry of Forestry to work with NGOs.

A discussion ensued regarding the appropriate role of NGOs with respect to projects like NRMP. One participant stressed the need for some NGOs to maintain a critical distance (as "*mitra kritis*", critical partners) and focus on policy reform. Another participant agreed that NGOs needed to maintain their independence from the project and work as "parallel partners". Before adjourning, the group agreed to reconvene after the EA team's return from the field. The Team Leader encouraged all participants to think about specific mechanisms through which the NRMP could collaborate with NGOs as the basis for the next discussion.

B. ATTENDANCE LIST

Non-Governmental Organizations

Sandra Moniaga, Indonesian Environmental Forum (WALHI)

Stephanus Djuweng, Institute of Dayakology Research and Development (IDRD
Kristianus Atok, IDRD
John Bamba, IDRD
Nico Andasputra, IDRD
Regina, IDRD
Laurensius Salem, IDRD
Ramli, IDRD

Frans Laten, Yayasan Semessa Dian Khatulistiwa (YSDK)
Marcell Djawa Lodo, YSDK

Samuel Ulok, Yayasan Mitra Mandiri (YMM)

Paul Anuar, IPGAS (Kelompok Pecinta Alam)

Soemarsono S., Yayasan Agromitra

Yf. Rajuit, Yayasan Luku Membangun (YLM)

Biodiversity Support Group Environmental Assessment Team

Frances Seymour
Patrick Dugan
Lesley Potter
Herwasono Soedjito
Hernan Torres

5. MANADO GOVERNMENT-SPONSORED SCOPING SESSION

A. SUMMARY

The Manado scoping session for the NRMP Environmental Assessment (EA) was held on Monday, November 2nd, at the provincial office of the Ministry of Forestry (*Kanwil Kehutanan*). As with the West Kalimantan portion of the EA, USAID Mission staff had decided to utilize a *Rapat Komisi AMDAL* (meeting of the provincial environmental impact assessment commission) for the EA scoping session in Manado, and preparations for this event had begun more than two months previously during a visit of USAID Mission staff to Manado. Unfortunately, as of the arrival of the EA team, officials in Manado had not yet received official letters from the Ministry of Forestry in Jakarta regarding the scoping session, and no preparations had been made.

Due to limited time available to arrange the scoping session, unsatisfactory experience with the Rapat Komisi AMDAL mechanism in West Kalimantan, and the fact provincial government plans to develop tourism in Bunaken National Park was the subject of a political controversy in the headlines of local newspapers the week of the EA team's arrival, it was decided to hold a lower-profile meeting hosted by the Ministry of Forestry.

Invitations to the Monday meeting were thus extended by the Ministry of Forestry on the previous Saturday afternoon, and although attendance was good, several key agencies were represented by lower level staff. An attendance list is attached. The meeting was conducted in Bahasa Indonesia, and was chaired by Soejarwo, representing the head of the Kanwil Kehutanan, who was unable to attend. Highlights of the presentations and discussion are summarized below.

Romon Palete, head of the provincial office of the MOF Nature Conservation Directorate (*Sub-Balai PHPA*), clarified that the EA was not an AMDAL process, that its purpose was to fulfill U.S. Government requirements, and that the NRMP could be cancelled if it did not "pass" the EA. He stated that the purpose of the meeting was to seek input form concerned agencies. He mentioned that while the project has been going on for one year, field activities were just getting started, and called on Graham Usher, NRMP Marine Conservation Advisor, to give an overview of project activities.

Graham Usher then gave a brief presentation, based on a two-page handout, "*Kegiatan Proyek Pengembangan Taman Nasional Bunaken Khususnya Proyek Komponen NRMP*" (Project Activities in the Development of Bunaken National Park, Especially NRMP Components). He emphasized that the national park includes other islands and coastlines besides Bunaken Island, and stressed the links among the three values of the park: conservation, resources for local communities, and tourism. He also mentioned that local community involvement in park management would be implemented through both "carrot" and "stick" approaches.

Frances Seymour, EA Team Leader, then gave a brief presentation on the mandate and purpose of the EA, based on a one-page handout, "*Ruang Lingkup Kegiatan: Environmental Assessment Proyek NRM*" (Scope of Work: NRMP EA). She presented the team's working hypotheses, which included the likely minimal negative environmental impacts of project activities, and that social impacts would depend on the planning and implementation approach employed.

Lucky Soudaka of Sam Ratulangi University (UNSRAT) commented on the political (as opposed to academic) nature of environmental impact assessment processes, and suggested that their recommendations depend on how democratic the process is. He mentioned that the university community had a lot to contribute. He later raised issued regarding potential negative effects of tourism on the environment and local communities, citing cases in the Philippines and Thailand. He also suggested that the EA team consider the impacts of resettling island residents, as has been suggested by certain parties in the past. Frances Seymour suggested that study tours to the Philippines and Thailand to observe positive and negative examples of marine tourism development would likely be a recommendation of the EA team.

Dr. Batuna of MUREX Dive Center expressed his frustration at the lack of concrete activities of the project to date, and suggested that in view of the lack of impact so far, cancellation wouldn't make much difference. On the subject of local community involvement, he raised the question, "Who are the local people (*masyarakat*) of Bunaken?", and warned against project activities that would attract migrants from Manado to the islands. He later elaborated that most Bunaken residents are not originally from the islands, and that everyone in Manado City should be considered as targets for project activities. A discussion ensued regarding the limited water supply on the islands, and the danger that if clean water were provided, it would only encourage additional in-migration and development.

Gobel of the provincial planning authority (*BAPPEDA Tingkat I*) cited the need for interagency coordination related to park management, and asked for clarification from the Ministry of Forestry regarding how coordination was to be effected. He also mentioned several completed or ongoing studies related to Bunaken, including those by the national technology agency (BPPT) and the Ministry of Public Works. Romon Palete responded saying that several interagency meetings had been held in the management plan development process, and that the draft management plan would be the subject of a seminar sponsored by BAPPEDA. He stressed that local government agencies (*PemDa*) would have to approve the plan before it could be forwarded to Jakarta.

Gunansyah of the provincial Public Works Service (*Dinas Pekerjaan Umum*) made several comments related to potential conflicts between tourism, conservation, and community development. Among others, he suggested that for waste management and aesthetics, island villages be reoriented to face the sea, and that overnight tourism facilities not be developed. Mulyono of the provincial office of the Ministry of Public Works (*Kanwil Pekerjaan Umum*) stressed the need to cultivate a sense of ownership of the reserve among

local communities so that they will help to guard it. He suggested working through local government institutions, and sharing revenues to gain their support.

Arnold Winawatan of Yayasan Nurani suggested that the project needed to have a clear attitude toward outside investors, and questioned whether the Ministry of Forestry would be strong enough to resist granting concessions on the islands. He reported on an ultimatum given by provincial officials to island residents the previous month to tear down their homestays, apparently to make way for outside private investment. Fahruddin of BAPPEDA Tingkat II Manado clarified that hotel development would not be allowed on the islands, but that the EA team should consider the carrying capacity of the islands. He mentioned that resettlement of island communities was an option still under consideration.

Nico Luni of the provincial tourism service (*Dinas Pariwisata*) stated that the policy of his agency was not to encourage development of overnight accommodations on the islands, although since tourists want them, homestays have been built. Benny Donaken of the provincial office of the Ministry of Tourism and Communication (*Kanwil Parpostel*) mentioned despite previous attempts to have the cottages on the islands torn down, they were increasing in number. He stated that the Ministry of Forestry clearly had the authority to control this development, and that the constraint up to now has been the lack of zonation.

Rizal Rompas of NRMP made several comments related the negative environmental impacts of tourism development. He acknowledged that development was occurring in the absence of zonation, but stressed that more social and biological data was necessary before appropriate zones could be delineated. A discussion then ensued on the application of AMDAL regulations to development within national parks.

In response to an invitation from Romon Palete for NGO commentary, Arnold Winawatan stated that in principle, NGOs support the concept of NRMP, as long as there will be not resettlement of local communities. He described Yayasan Nurani's program to increase the communities' legal awareness and participation in the development of ecotourism. He expressed frustration with the continuing interagency jurisdictional disputes, and suggested that the biggest challenge faced by NRMP was the potential for tourism development by outside investors, which can only be controlled by government authorities. He stated that while NGOs are often seen as "the opposition" by government officials, in fact their objectives may be the same. He cited the need for transparency in the process, and expressed his hope for government-NGO cooperation.

Romon Palete then invited other members of the EA team to comment. Djoko Prawoto Praseno provided a brief description of the ongoing cooperation between LIPI and the BAPPEDA to identify alternative marine tourism destinations in North Sulawesi. With regard to Bunaken, he suggested that the local communities be understood and understand themselves as part of the ecosystem. Alan White thanked participants for their ideas, and suggested that it was necessary to decide the primary objectives and beneficiaries of the project. From his experience in Java and the Philippines, an integrated approach that

involved all stakeholders was necessary. He stated his own bias for working with the people who now live in the islands. Anita Kendrick cited the importance of finding out what the local people's vision of "participation" was.

Djoko Tridjojo of the national land office (BPN) stated that local people are not the only ones responsible for environmental damage in Bunaken, citing trash originating from the mainland and fishermen coming from other areas as examples. He suggested that a strategy of working with local farmers and fishermen to control their pressures on the reef must be based on an understanding of their livelihood strategies. Johny Tampanguna of the provincial fisheries service (*Dinas Perikanan*) mentioned the use of bombs and poison as examples of environmentally destructive fishing practices, and cited the difficulty of changing attitudes. He described his agency's attempts to provide extension on proper fishing practices and encouragement of fishermen to shift away from reef and nearshore fisheries.

B. ATTENDANCE LIST

Provincial Government

Is. L. A. Gobel, BAPPEDA Tingkat I
Roy Terok, BAPPEDA Tingkat I

M. Fahruddin, BAPPEDA Tingkat II Manado

Johny Tampanguna, Dinas Perikanan

Nico Luni, Dinas Pariwisata

Soemarno, Dinas Kesehatan

M. N. Gunansyah, Dinas Pekerjaan Umum

Ministry of Forestry

J. Soedjarwo, Kanwil Kehutanan
Hendrick Sunde, Kanwil Kehutanan

Romon Palete, Sub-Balai KSDA

Wandojo Siswanto, PHPA

Sam Ratulangi University

Lucky Soudaka, Environmental Studies Center

Ministry of Tourism

Benny Donakan

Ministry of Transportation

Taswin

National Land Office

Djoko Tridjono

Ministry of Public Works

Muljono

Non-Governmental Organizations

Arnold Winawatan, Yayasan Nurani

Rudy Wantah, Forum Komunikasi Pecinta Alam (FKPA)
Jacky A. Malonda, FKPA

Private Sector

H. S. Batuna, Manado Underwater Expeditions (MUREX)

Frangki David, Nusantara Dive Center (NDC)

NRMP

Graham Usher
Rizal Rompas

Biodiversity Support Program Environmental Assessment Team

Frances Seymour
Alan White
Anita Kendrick
Djoko Prawoto Praseno, Indonesian Institute of Sciences (LIPI)

6. MANADO NGO-SPONSORED SCOPING SESSION

A. SUMMARY

The Manado NGO scoping session for the NRMP Environmental Assessment (EA) was held on Saturday, October 31st, at the offices of the Manado Legal Aid Institute (LBH), and hosted by the Regional Forum of the Indonesian Environmental Forum (FORDA WALHI). At the request of WALHI, Yayasan Nurani had agreed to facilitate NGO participation in the North Sulawesi portion of the Environmental Assessment. In subsequent discussions with the Team Leader, Yayasan Nurani agreed to arrange an informal scoping session in Manado, and to coordinate the attendance of representatives of other North Sulawesi NGOs.

The meeting was attended by staff from Yayasan Nurani, LBH, and some six other NGOs and study groups. A list of individual attendees and institutions represented is attached. The meeting was conducted in Bahasa Indonesia, and was moderated by Arnold Winawatan of Yayasan Nurani. Arnold Winawatan opened the meeting by mentioning three reasons NGOs were concerned about Bunaken: an interest in conservation, concern about talk of resettlement of the people on the islands, and concern about island residents being blamed for environmental problems. He then characterized the current policy environment as beset by disagreements about overlapping jurisdictions among provincial government, tourism, and forestry agencies. The meeting continued with brief introductions of the individuals attending and the institutions represented.

Frances Seymour, EA Team Leader, provided an overview of the EA team's mandate. Graham Usher, Marine Conservation Advisor on the NRM Project, then gave a presentation on project activities envisioned in the draft management plan for Bunaken National Park. Suwiryo Ismail, coordinator of the FORDA-WALHI for North Sulawesi, was asked to give some background on the problems and potentials of NGOs in the province. He described the NGOs as falling into two groups, one coordinated by the Communication Forum for Nature Lovers (FKPA), and the other by FORDA-WALHI. The second group, which is more oriented to advocacy, has not been involved in the NRMP up to now. Graham Usher clarified that the project's focus on FKPA was a result of his following the precedent set by project activities (including an NGO workshop in July 1991) and the fact that he was not aware of the existence of the second group of NGOs. He stated that he would prefer that NGOs "speak with one voice". Highlights of the discussion that followed are summarized below.

The first topic of discussion was the possibility that the government might decide to resettle communities currently residing on the islands included in Bunaken National Park. One participant stated his concern that promoters of the park -- such as provincial government, tourism, and forestry agencies -- were still envisioning resettlement of local communities, even if the management plan prepared by the NRMP advisor did not. Another participant reported that based on her own information from the area, resettlement was not

envisioned, and that the current issue on Bunaken Island was the zoning to separate residential and tourist areas.

One participant stated that the lack of clarity of the status of land and people included in the park could provide an opportunity for powerful interests to exploit. He feared that the NRMP's position within the Ministry of Forestry implied a vision of a national park without people, and suggested that the NRMP give more attention to policy issues. At a later point in the meeting, another participant reminded the group that at the 1990 workshop on Bunaken sponsored by the USAID, all government participants were in favor of resettlement.

Several speakers endorsed the basic approach and management plan framework presented by Graham Usher, but questioned the process to be used to include local communities in project activities such as research. Graham then presented his concept of a Coordination Committee for the park that would include representatives from government, NGOs, and the local communities, complemented by working groups for the islands and each of two coastal areas included in the park. He stated that the problem would be how to decide who would represent NGOs and the local communities. In subsequent discussions, several speakers expressed their disagreement with the proposed framework.

Following a lunch break, Arnold Winawatan focussed the discussion on the potential roles of NGOs related to the NRMP. He proposed that NGOs field community organizers on each island that could work through informal leaders and church structures to strengthen existing community institutions. NGOs could also play a lobbying role with provincial legislators, agency officials, and project staff. One participant added that there was a need for a regular forum for exchanging information.

A brief discussion also took place regarding the relative impacts of local communities and other parties on the environment in the National Park. While it was admitted that local communities do engage in some extractive activities, most participants believed that subsistence level activities did not have a significant impact, and that commercial activities, such as boat building, were financed by outsiders.

One participant stated that since the project is still apparently in the information-gathering state, it would be appropriate to involve local people in research, and to share research results to date. Another participant expressed skepticism regarding the quality of university research, stating that NGOs are more objective and committed. Another suggested that the group allocate roles, for example, NGOs providing community organizers, while universities focussed on research.

A participant suggested that specific activities, such as dealing with the recent controversy regarding tourist cottages, be undertaken immediately. Another proposed that a working group be formed to meet on a monthly basis to define the problems, divide up the work to be done, and keep each other informed. A discussion then ensued regarding whether or not such a group would be limited to NGO participants, or would include government

officials. It was agreed that the FORDA-WALHI would serve as a vehicle for following up on this idea, and a November date was chosen to discuss NRMP in greater depth and to share the results of the recently completed NRMP socioeconomic survey.

Before the meeting closed, the EA team requested that each organization represented provide a brief description of its staffing, programs, and geographical focus. Materials related to NRMP were distributed to participants following the meeting.

B. ATTENDANCE LIST

Non-Governmental Organizations

Arnold Winowatan, Yayasan Nurani
Maryke Siwu, Yayasan Nurani
Roosye Repi Yayasan Nurani

Suwiryo Ismail, Lembaga Bantuan Hukum (LBH) Manado

Suhendro Boroma, Kelompok Studi "Titian"

Henry Darungo, Kelompok Refleksi & Studi "Selaras"

Marthen Sualang, Kelompok Studi Lingkungan Hidup "Tumou Tou" Tomohon

Yopi Muskita, Kelompok Pecinta Alam Tangkoko
Yuri Sigarlaki, Kelompok Pecinta Alam Tangkoko

Pitres Sombowadile, ForDa WALHI

Coen Husain Pontoh, Lembaga Pendidikan, Penelitian, dan Pengembangan Masyarakat (LP3M)

Individuals

Verrianto Madjowa, Student

Reiner Ointoe, Independent Scholar

Hamdi Mayulu, Faculty of Livestock, Sam Ratulangi University

Natural Resources Management Project

Graham Usher

Biodiversity Support Program Environmental Assessment Team

Frances Seymour
Alan White
Anita Kendrick
Djoko Prawoto Praseno, Indonesian Institute of Sciences (LIPI)

APPENDIX 7

LIST OF PERSONS CONTACTED BY ENVIRONMENTAL ASSESSMENT TEAM

	Team Member*
JAKARTA/BOGOR	
Alas Kusuma Group	
Nana Suparna	FS,PD
BAPPENAS	
Herman Haeruman	FS
Dedi Riyadi	FS
Tamtama Purwowinoto	FS
FAO Agroforestry Project	
Chun Lai	FS
Institute for International Education (IIE)	
Norman Goodman (via telephone)	FS
International Tropical Timber Organization (ITTO)	
M. Kuswanda	FS,PD
LIPI Center for Research in Oceanology	
Djoko Prawoto Praseno	FS,AK,AW
LIPI Center for Research in Biology	
Soetikno Wirjoatmodjo	LP,HT,HS
Johanis P. Mogea	LP,HT,HS
Ari Budiman	LP,HT,HS
Dedy Darnaedi	LP,HT,HS

Ministry of Forestry

Titus Sarijanto	FS
Sopari S. Wangsadidjaja	FS,PD,LP
Abdul Bari TS	FS,LP
Maryanti	FS
Subiyanto	FS
Wandoyo Siswanto	FS
Komar Soemardja	FS
Herman Sastra	FS
Ari Soedarsono	FS
Wahjudi Wardojo	FS,AW,AK

Associates in Rural Development (ARD)

George Burrill	FS,AK,AW
Colin MacAndrews	FS,LP,PD,HS,HT,AW,AK
Lisa Curran	FS,HT,HS,LP,PD
Michael Johnson	FS
Jill Belsky	FS,LP,PD,HT

Padjadjaran University

Otto Soemarwoto	FS,LP,PD

Private Businessman

Djon Wono	PD

USAID

Jerry Bisson	FS,HS,HT,LP,PD,AW,AK
David Ostermeier	FS
Agus Widiyanto	FS,LP,PD,HS,HT

WALHI (Indonesian Environmental Forum)

Zulkarnaen	FS
Sandra Moniaga	FS
Monti Pramono	FS
Suraya Affif	FS

World Wide Fund for Nature (WWF)

Rili Dohani	FS,AW
Bernard Sellato	FS,LP
Russell Betts	FS
Tim Jessup	FS

Yayasan Nurani

Bert Supit	FS

WEST AND CENTRAL KALIMANTAN

Agromitra

Soemarsono Sastrodihardjo	LP

Associates in Rural Development (ARD)

Elmo Drilling	FS,PD,HS,LP,NW,HT
Ali Hayat	FS,PD,HS,LP,NW,HT
Jeff Izefri	FS,PD,HS,LP,NW,HT
James Jarvie	FS,PD,HS,LP,NW,HT
Mering Ngo	FS,PD,HS,LP,NW,HT
Fernando Potess	FS,PD,HS,LP,NW,HT
Sukarman	FS,PD,HS,LP,NW,HT
Roy Voss	FS,PD,HS,LP,NW,HT

BAPPEDA

Arifin H.	FS,NW
Said Djafar	FS,NW
Firus Firdaus	FS,NW
Tadjuin	LP
Rehan	LP
Nova Darma	LP
Hasinum Hasmum	LP

GTZ Social Forestry Development Project

Ernst Kuester	FS,LP,NW

Balai Pertanahan Nasional Kalbar (National Land Office)

Usman Altha	NW
Budjang A.S.	NW
David R. Speller	NW

The Forest Garden Project, Des Benawai Agung, Kec. Sukadana

Nik Salafsky	NW,LP

KSDA

Tony Soemartono	FS,LP,NW
Erwin Effendi	FS,LP,NW
P. Samosir	NW,LP
Erhari	NW
Hamid	NW,LP
Jembu	NW
Moch. Arsil	NW,LP

Cabang Panti Research Station

Gary Paoli	LP
Geoffrey Blate	NW,LP
Daniel Gavin	NW,LP
Timothy G. Laman	NW,LP

Darajuanti

Yusman Syams	LP

Kanwil Kehutanan

Tony Soemardjo	FS,LP
Soeprayitno	FS,NW
Suhendar Wiradinata	FS
Bahagiawati	FS

Dinas Kehutanan Nanga Pinoh

Syahruddin	FS

Kurnia Kapuas Plywood (KKP)

Wijaya Tandra	FS,LP
Rionsky	FS,LP
Sutarman	FS

Litbang Kehutanan

Syahrun	FS

New York Botanical Garden

Christine Padoch	LP

Sari Bumi Kusuma (SBK)

Mamat Mulyana	FS,PD
Adlin	PD
Cucu Sunardi	FS,LP,PD
Budi Supardiat	FS,PD
Tri Hardjanto	FS,PD
K. Damanik	PD
Florencius Chikar	PD
Adi Santosa	PD
Yudi Hartono	FS,PD
Edwin Hadinata	PD,HS,FS
Asbani Wiryokusuma	FS
Gusti Hardiansyah	PD
Diding WS	PD

Triekasari Concession

Liu	LP

Tanjungpura University (UNTAN)

Mahmud Akil	FS,LP
Herujono Hadisuparto	PD,HS
Syamsuni Arman	FS,LP

YSDK

Marcell Lodo	LP

Yayasan Dayakology (IDRD)

Stepanus Djuweng	FS,LP
Kristianus Atok	FS,LP,HS,HT,PD,NW

Members of the EA team also met with formal and informal leaders and other members of the communities of Nanga Siyai, Nanga Apat, Belaban Ela, Belaban Dalam, Nanga Juoi, Landau Mumburg, Sungkup, Riam Batang, Tumbang Taburau, Tumbang Kaburai, and Tanjung Paku at the Bukit Baka/Bukit Raya project site.

MANADO CITY AND BUNAKEN, NORTH SULAWESI

Associates in Rural Development (ARD)

Graham Usher	AW
Rizal Rompas	AW
Aarty Pinatik	AK
D.L. Soleman	AK

BPPT

Siswanto Sewoyo	FS

BAPPEDA

H.A. Nusi	FS
Gobel	FS
Mieke Pangkong	FS
J. Tanghudung	FS
Sulyono	FS

Dinas Kesehatan

Sumarno	AK

Dinas Pariwasata

Nico Lumi	AK

Dinas Perikanan

Harold Marentek	AW,AK

Kanwil Parpostel

Benny Donakan	AK
Sushil Mankut	AK
Yabes Tosia	AK
Benny Donakan	AK
Sushil Mankut	AK
Yabes Tosia	AK

Kelompok Studi Lingkungan Hidup "Tumou Tou"

Marthen Sualang	AK

Lembaga Bantuan Hukum

Suwiryo Ismail	FS,AK

Murex Dive Center

Hani Batuna	AW,FS,AK

Perkumpulan Pecinta Alam Tangkoko

Yuri Sigarlaki	AK
Yodi	AK
Rudiwanta	AK

Sam Ratulangi University(UNSRAT)

Chan L. Lee	AW
Laurentins Lalamentik	AW
Marthen Rondo	AW
Janny D. Kusen	AW
Max Maanema	AK
Otniel Pontoh	AK

KSDA

Ramon Palete	AW,AK,FS
Boyke Pua	AW,AK,FS
Teni Rondonuwu	AW,AK,FS

Yayasan Nurani

Arnold Winowatan	AK,FS,AW
Roosye Repi	AK,FS,AW
Maryke Siwu	AK,FS,AW
Selni	AK,FS,AW
Henry Darungo	AK

Members of the EA team also met with formal and informal leaders and other members of the communities located on Bunaken, Manado Tua, Mantenage, and Nain Islands at the Bunaken project site.

WASHINGTON, D.C.

Biodiversity Support Program

Kathy Saterson	FS
Janis Alcorn	FS
Richard Richina	FS
Charles Zerner	FS

National Park Service

Alan Robinson (via phone)	FS

USAID Asia Environment Bureau

Molly Kux	FS
Jim Tarrant	FS
Tobey Pierce	FS

USFS International Forestry Support Program

Pat Durst	FS
Scott Lampman	FS

World Resources Institute

David Gow	FS
Emmy Hafild	FS

* Team Members

FS=Frances Seymour
LP=Lesley Potter
PD=Patrick Dugan
HS=Herwasono Soedjito
HT=Hernan Torres
NW=Nengah Wirawan
AK=Anita Kendrick
AW=Alan White

APPENDIX 8

SUMMARY OF RECOMMENDATIONS[1]

1 Bukit Baka/Bukit Raya Project Site

1.1 The EA team recommends that NRMP proceed with its current strategy of working with the P.T. Sari Bumi Kusuma (SBK) timber concession to develop improved production forest management practices.

1.2 The EA team recommends that in conjunction with the pilot testing of low-cost skidding techniques, NRMP seek authorization to test the manual conversion of logging waste into cants and roughsawn boards in collaboration with local communities.

1.3 The EA team recommends that NRMP facilitate the testing of the feasibility of sliced veneer as a downstream processing option for currently wasted timber and the wood of fast-growing species.

1.4 The EA team recommends that NRMP facilitate a study tour to the Philippines for MOF and SBK staff to observe operating skyline and other cable logging systems and to assess their feasibility for application within the SBK concession.

1.5 The EA team recommends that NRMP seek authorization to pilot test a postponement of *pembebasan* thinning treatments until the fifth year after logging to avoid unnecessary negative impacts on biodiversity.

1.6 The EA team recommends that NRMP contract with Tanjungpura University or other qualified institution to conduct a baseline hydrology study and continuing monitoring to document the impact of project-supported interventions to minimize soil disturbance from logging activities.

1.7 The EA team recommends that NRMP seek a review, by appropriate Ministry of Forestry officials, of existing plans for an industrial timber estate with transmigration (HTI-Trans) within the SBK concession, with a view toward obtaining an exemption from the requirement that a HTI-Trans project be implemented in the SBK concession area.

---

[1] Recommendations are listed in the order in which they appear in the text, and do not reflect a priority ranking.

1.8 The EA team recommends that NRMP's collaboration with SBK be deemed in compliance with Sections 118 and 119 of the 1961 U.S. Foreign Assistance Act (as amended) and Section 532(d)(3) of the 1991 Foreign Assistance Act and related Congressional guidance with respect to assistance involving industrial timber extraction in tropical forests. NRMP advisors should be responsible for periodic reporting on activities related to timber harvesting to ensure continued compliance with U.S. Government legislation.

1.9 The EA team recommends that NRMP not provide assistance related to timber production in the P.T. Kurnia Kapuas Plywood (KKP) concession. The KKP concession area, located on steep terrain in the middle of a nature reserve complex, does not lend itself to environmentally- or socially-sound logging, and USAID assistance would not comply with the legislation cited in recommendation 1.8 above. The NRMP/SFMP Joint Implementation Plan should be revised to clarify that collaboration between the two projects does not involve NRMP assistance to production forest management activities in the KKP concession.

1.10 The EA team recommends that NRMP consult with the staff of the GTZ-supported Social Forestry Development Project (SFDP; also known as "The Tengkawang Project") with the aim of learning from relevant experience and developing modes of cooperation between the two projects in the area of community-managed forest concessions.

1.11 The EA team recommends that NRMP assess the potential to assist Central Kalimantan villagers to optimize the management of rattan.

1.12 The EA team recommends that NRMP commission a study of the social and ecological dynamics of the local cattle industry in the West Kalimantan villages to support project efforts at community organization for fire control.

1.13 The EA team recommends that NRMP mobilize additional human and institutional resources, particularly NGOs and female staff, for field implementation of agroforestry and community development activities. To the extent that NRMP becomes involved with SBK rice intensification efforts, additional agricultural expertise will also be needed.

1.14 The EA team recommends that NRMP prioritize and accelerate existing plans to acquire baseline and thematic maps through coordination with relevant agencies and to develop additional maps utilizing satellite imagery, GIS, GPS, and aerial photography.

1.15 The EA team recommends that the emphasis of NRMP interventions related to protected area management be placed on activities promoting the active participation of community members in park planning and preparation for roles in park management.

1.16 The EA team recommends that the construction of any national park infrastructure (such as signs, trails, and guardposts) be preceded by a systematic process of consultation with affected communities, and that the placement of park personnel be preceded by training in participatory resource management approaches.

1.17 The EA team recommends that the construction, road rehabilitation, and regular maintenance activities for the proposed research station and its access road be limited to the dry season months.

1.18 The EA team recommends that NRMP advisors be responsible for designing a simple water quality monitoring system to ensure compliance with appropriate standards during the operation and maintenance of the research station and access road.

1.19 The EA team recommends that researchers be encouraged to employ local research assistants, and to share research results with local communities.

2 Bunaken Project Site

2.1 The EA team recommends that NRMP seek immediate, policy-level intervention from Ministry of Forestry officials in Jakarta to prevent irreversible developments on the islands that would conflict with the national park management plan.

2.2 The EA team recommends that NRMP support the formation of an informal working group among the various stakeholders in park management, including provincial planning, forestry, tourism, and fisheries agencies, in addition to the formal Park Coordination Committee proposed in the draft management plan.

2.3 The EA team recommends that NRMP facilitate team- and consensus-building among various stakeholders through the sponsorship of study tours to relevant positive and negative examples of coastal resource management in the Southeast Asian region.

2.4 The EA team recommends that NRMP staff and advisors continue to use every opportunity to go on record as being against resettlement alternatives for island residents.

2.5 The EA team recommends that NRMP expand its collaboration with NGOs to include organizations with community development experience, and support a program of field-based community organizers to facilitate meaningful participation in park planning and management.

2.6 The EA team recommends that NRMP add a full-time, internationally-recruited specialist in community development to the project advisory team.

2.7 The EA team recommends that NRMP set sectoral and geographical priorities for the phased implementation of park management activities. The EA team suggests that NRMP initially limit its focus to increasing local participation in reef fisheries management and ecotourism development, starting with Manado Tua and Bunaken Islands, respectively.

2.8 The EA team recommends that NRMP support the placement of researchers and/or community organizers in communities on Mantehage and Nain Islands to collect data on current patterns of marine and mangrove resource use to prepare for NRMP eventual expansion to those islands.

2.9 With respect to the proposed zonation system, the EA team recommends that:

- the marine zonation system should be simplified to community-managed sanctuary and sustainable-use zones developed in consultation with current resource users;

- the regulations regarding buffer zones in deepwater areas surrounding the reefs take into account the placement of Fish Aggregating Devices (FAD's);

- the land zonation system be limited to a tourism zone on Liang Beach, Bunaken Island. NRMP should also assist in the development of guidelines for shoreline development that would also apply to national park infrastructure.

- NRMP assist in the formulation of policies and regulations supportive of small-scale, locally owned and managed tourism facilities;

- gleaning be regulated with great care, as restriction of these activities would disproportionately affect economically vulnerable households; and that

- any livelihood enhancement activities should be targeted to households most likely to be negatively affected by resource use restrictions resulting from implementation of the management plan.

2.10 The EA team recommends that the construction of any national park infrastructure (such as signs, trails, and guardposts) and the use of patrol boats for law enforcement activities be preceded by a systematic process of consultation with affected communities, and that park personnel be given training in participatory resource management approaches.

2.11 The EA team recommends that the planned biodiversity survey be designed so that monitoring can build on the initial database and use the same data collection methods, and should be used as an opportunity to train a survey team from Sam Ratulangi University.

3 Recommendations: Proposed Gunung Palung Project Site

3.1 The EA team recommends that, prior to the formulation of a revised national park management plan, NRMP support diagnostic research on resource use by people in surrounding communities, their attitudes and social organization, and the nature of their interactions with park staff and other resource users in the area.

3.2 The EA team recommends that the revised plan include strategies for park management to:

- cooperate with local government officials and line agencies to prevent the inappropriate siting of transmigration settlements, roads, and other developments that constitute threats to the park;

- revise the park boundary, both to incorporate missing areas of ecological importance, and to excise community land inappropriately included in the park;

- negotiate exclusive exploitation rights for local communities in certain zones of the park in exchange for assistance in controlling access by outsiders;

- cooperate with local communities in the monitoring of wildlife of economic importance either as pests or sources of income;

- train existing and future park personnel in participatory resource management approaches;

- develop community-based tourism as a way of developing local support for conservation; and

- cooperate with the Cabang Panti Research Station in applied research of direct relevance to park management issues.

3.3 The EA team recommends that NRMP not initiate activities in the Gunung Palung reserve unless long-term resident advisors can be fielded to ensure the social soundness of project-supported interventions.

3.4 The EA team recommends that the draft management plan be subject to a comprehensive Environmental Assessment, emphasizing likely social impacts of the management prescription, and measures necessary to mitigate potential adverse impacts.

4 Recommendations: Institutional and Management Issues

4.1 The EA team recommends that facilitation of Ministry of Forestry support for NRMP field activities be given priority in the identification of suitable candidates, formulation of work plans, and evaluation of performance of the NRMP advisor located in the Ministry of Forestry.

4.2 The EA team recommends that the roles of long-term, field-based advisors be reoriented from direct project implementation toward facilitating of the involvement of other institutions as planners and implementors of project activities such as community organization. Accordingly,

- NRMP would have to commit significant financial and staff resources to developing the capacity of provincial NGOs (and/or other institutions such as universities and planning authorities) to plan and implement activities related to participatory resource management (requiring an additional long-term advisor at the Bunaken site);

- in the short run, long-term advisors at the Bukit Baka/Bukit Raya site would need to devote proportionally more of their time to developing plans with prospective MOF, NGO, and other field counterparts in the provincial capital.

- through the provision of separate office and living quarters, NRMP would have to establish an identity independent of SBK at the Bukit Baka/Bukit Raya site to avoid the appearance of conflict of interest, which serves as a barrier to the participation of MOF and NGO counterparts in field activities; and

- short-term technical assistance inputs would need to be selected and scheduled judiciously, so as to enable project staff, advisors, and NGO and other counterparts to adequately prepare for, participate in, and follow up to visits from short-term consultants.

4.3 The EA team recommends that recently-completed social surveys and planned biodiversity surveys be used as a basis for putting into place long-term monitoring capacity at the local level at each project site.

5 Recommendations: Policy Issues

In addition to NRMP's planned policy research agenda related to natural production forest management, the EA team recommends that NRMP support national-level policy analyses related to:

5.1 existing MOF policies constraining labor-intensive utilization of logging waste;

5.2 existing MOF policies mandating and current field experience with industrial timber plantations (HTI and HTI-Trans);

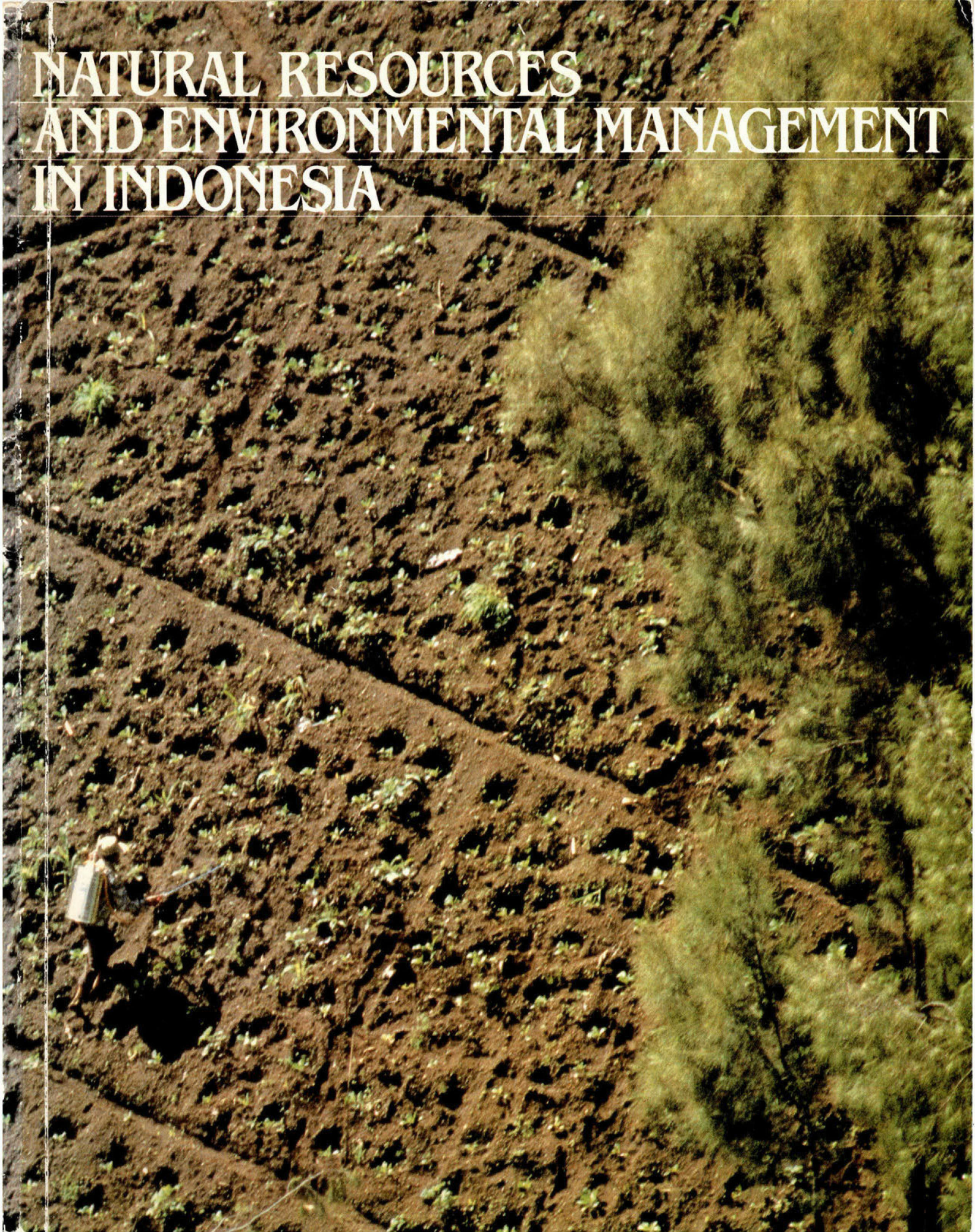
5.3 the institutional infrastructure necessary to support a national program of wood certification ("sustainable labelling") as a step towards meeting the ITTO "Year 2000" guidelines;

5.4 existing MOF policies mandating and current field experience with the HPH Bina Desa Hutan Program (which requires timber concessionaires to undertake rural development activities in surrounding communities);

5.5 existing civil service policies and practices constraining the employment of local community members, biologists, and social scientists in national park management, and alternative employment mechanisms; and

5.6 the legal status of communities within national parks, with special attention to the status of island residents within marine protected areas.

NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT IN INDONESIA



NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT IN INDONESIA: AN OVERVIEW

James Tarrant
Ed Barbier
Ronald J. Greenberg
Mary Louise Higgins
Stephen F. Lintner
Cynthia Mackie
Laura Murphy
Harvey Van Veldhuizen

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
JAKARTA, INDONESIA

October 1987

PREFACE

This report summarizes an interdisciplinary review of natural resources and environmental issues in the Republic of Indonesia, which was compiled in May-July 1987. It was prepared to support the United States Agency for International Development (USAID) Mission to Indonesia's program planning and to identify opportunities for development assistance in this sector. In addition, this review complies with the analytical requirements in the U.S. Foreign Assistance Act, Section 118, "Tropical Forests" and Section 119, "Biological Diversity." It is hoped that the report will be useful to the Indonesian government and development community in their efforts to promote sustainable development.

The review consists of a main report, seven annexes, and a selected annotated bibliography. The main report is a summary of the primary economic, policy and institutional elements structuring resource development in Indonesia, the environmental effects in major sectors of the economy, and recommendations to promote sustainable development and maintain the productive capacity of Indonesia's natural resources. The annexes provide a detailed analysis of these factors and the activities of international donors and non-governmental organizations in this area, reviews research and information needs, and makes extensive recommendations for donor action. The bibliography is a companion piece to the report and provides a guide to current institutions, key personnel, journals and libraries involved in natural resources and environmental management.

The team members are: James Tarrant, Team Leader (Natural Resources Management and Research Specialist, University of Sussex), Dr. Ed Barbier (Natural Resources Economist, International Institute for Environment and Development (IIED)), Ronald Greenberg (Natural Resources Officer, USAID/Indonesia), Dr. Mary Louise Higgins (Environmental Specialist, AID/Science and Technology Bureau), Dr. Stephen F. Lintner (Environmental Coordinator, AID/Asia and Near East Bureau), Dr. Cynthia Mackie (Ecologist and Forestry Specialist, AID/Indonesia), Laura Murphy (Environmental NGO Specialist, IIED), and Dr. Harvey Van Veldhuizen (Environmental Analyst, AID/Asia and Near East Bureau).

The main report was prepared by Ronald Greenberg and Wynne Cougill and is based on the detailed annexes. The authors of the individual annexes are: Natural Resources Policy and Economic Framework, E. Barbier; Institutional Processes, J. Tarrant; Natural Resources and Environmental Issues: Introduction, J. Tarrant; Agricultural Sustainability, R. Greenberg and M. L. Higgins; Forestry, C. Mackie and M. L. Higgins; Fisheries, H. Van Veldhuizen; Biological Diversity, J. Tarrant and M. L. Higgins; Industry and Infrastucture, H. Van Velhuizen and J. Tarrant; and Human Settlements and Health and Watershed Management, J. Tarrant. Research and Information Needs was prepared by J. Tarrant; NGOs, L. Murphy; USAID and Other Donors, S. Lintner and H. Van Veldhuizen; and Recommendations, all team members. The annotated bibliography was prepared by L. Murphy.

ACKNOWLEDGEMENTS

The natural resources and environmental management team wishes to acknowledge the assistance and cooperation of many dedicated staff of the Government of Indonesia, universities, research institutions, non-government organizations, and donor organizations who facilitated the development of this report. In addition, our thanks are expressed to our editor, Wynne Cougill, whose perserverance, skills, and management led to the completion of the report.

In particular, the team expresses appreciation to the following government officials for giving us their valuable time and guidance: Dr. Herman Haeruman (BAPPENAS and Ministry of Population and the Environment-KLH), Dr. Kismadi and Dr. Soeriaatmadja (KLH), Dr. Soetatwo Hadiwigeno (Dir., Bur. of Planning, Ministry of Agriculture-MOA), Dr. Ibrahim Manwan (Dir., Food Crops Research Institute, Agency for Agricultural Research and Development and KEPAS), Wartono Kadri (Dir. Gen., RRL, Ministry of Forestry-MOF), and Dr. Ir. Setyono Sastrosumarto (Dir. Gen., AFRD, MOF).

The following university and research institution staff also provided us with support: Dr. Didin Sastrapradja (LIPI), Achmad Soemitro and Ir. Oemi Hani'in Soesono (Gajah Mada University), Prof. Hasan Poerbo (PPLH-ITB), and Ir. Badruddin Mahbub, DPMA. The team would also like to recognize the valuable ideas provided by Agus Purnomo (Dir., WALHI-Indonesian Environmental Forum) and Emmy Hafield and Hira Jhamtani (SKEPHI-NGO Network for Forestry Conservation).

Considerable technical guidance and information were provided to the team by George Greene (CIDA-funded Environmental Management Development in Indonesia Project), David Boulter (FAO Forestry Advisor, MOF), Dr. Douglas D. Hedley (Sr. Agricultural Policy Advisor, Bur. of Planning, MOA), Dr. Steve Tabor (Economist, BINA Program Food Crops, MOA), and Stephen Berwick (Environmental Advisor, Bur. of Planning, MOA, IIED).

In addition, the team wishes to acknowledge the support of William Douglass, Division Chief, Regional and Resources Management and Richard Cobb, Office Chief, Agriculture and Rural Development, USAID/Indonesia who promoted this study.

Finally, a special note of thanks is given to the German development assistance team (GTZ) and the P.T. Kalimanis group who arranged for logistical support in East Kalimantan and shared their considerable experience in forestry and natural resource management issues. Without their generous donation of transportation and their patience, we would have not been able to complete our field work. We particularly wish to acknowledge Ir. Rachmanoedin Andi Abdoerrachman, Dr. Rainer Blank, Dr. Berthold Seibert from GTZ supported projects, and Mr. and Mrs. Jack R. Taylor, P.T. Kalhold Utama.

EXECUTIVE SUMMARY

Natural resources management practices in Indonesia are predominantly influenced by the government's economic policies, private business objectives, and the socio-economic interests of rural, and increasingly, urban communities. Present economic policies, particularly those which stimulate export earnings, favor short-term resource exploitation and under value the long-term benefits and costs of promoting sustainable development. Sectoral policies, which are frequently translated into inefficient production targets, are producing distortions in resource use, are stimulating the development of marginal land resources in the Outer Islands and upland areas of the Inner Islands, and are leading to rapid watershed and forest degradation. While the decline in government revenues has meant sharp reductions in sectoral budgets and funding for natural resources analysis, it has also highlighted the need to reduce inefficient and environmentally harmful programs and policies (e.g., subsidies on pesticides).

Because the Government of Indonesia is the predominant actor in resource allocation decisions, the structure and behavior of its institutions play a key role in natural resources and environmental management. The primary characteristics of these institutions are that sectoral strategy and policy formulation are highly centralized, natural resources are viewed as commodities for direct use, exports, or inputs for production and services, inter-Ministerial coordination is weak, and government actions tend to strongly bias economic forces. At the same time, most natural resources management problems and environmental effects occur at the local level, but there is little opportunity for local participation in natural resource policies and programs.

Ultimately, these economic forces, reinforced and often biased by government institutions, strongly influence individuals' actions and capabilities to manage natural resources, and frequently act as disincentives to sustainable resource use. The environmental effects of these factors can be readily seen in Indonesia and they are constraining sustainable development. Some of the major problems include:

- The deforestation of nearly 50 million hectares of Indonesia's highly rich tropical hardwoods since 1950 at a rate of .6 to 1.0 million ha annually. At current harvest rates and under present practices, it is estimated that within thirty years, all of Indonesia's concession areas may be selectively logged.

- The degradation of thirty six of Indonesia's 125 watersheds, in which 8.2 million hectares are considered critical. Erosion rates have reached 40 tons/ha, the utility of downstream infrastructure has been reduced, and hydrological functions have been threatened in the degraded watersheds.

- The loss of biological diversity and habitat of rare and endangered species from the conversion of forest land to agriculture. By the year 2000, an estimated 6 to 12 million ha may be converted.

- A nearly 200 percent increase in pesticide use since 1981, increased contamination of food items, and decreased effectiveness in controlling rice pests. In 1986 alone, 1 million tons of rice were lost to insecticide-resistant pests.

- Water quality degradation and declining water supplies as a result of poor upstream agricultural, industrial and urban management practices. This has led to high levels of heavy metals, pesticides, and sediment load, declining fish and shrimp productivity, and fish kills.

- Increasing quantities of liquid, solid and toxic wastes from industrial and processing activities. This is reducing the amount of potable water available for direct human consumption and is leading to increased morbidity and mortality from the spread of infectious diseases.

Additional constraints to mitigating these environmental effects include the lack of adequate research and information and weak arrangements to foster local community participation in resource management decisions. There is an urgent need to develop and employ resource inventories and methodologies for assessing the cross-sectoral impacts of resource utilization and to establish national monitoring programs for selected environmental variables.

It should be noted that the types and magnitude of these problems are generally not unique to Indonesia. Further, the government, development community, and non-government organizations have made significant progress in addressing these issues over the last decade. The Ministry of Population and the Environment, with limited authority and budget, has begun the process of institutionalizing environmental policy formulation and planning, basic environmental laws have been passed (1982), and in June 1986 regulations were implemented requiring environmental impact assessments for new projects. The donor community now is providing approximately $700 million for natural resources and environmental programs; 61 percent of this assistance is devoted to capital-intensive water supply, wastewater and solid waste management.

There still remain many challenges for the public and private sectors to undertake before sustainable natural resources management is attained in Indonesia. Constraints to sustainable development can be overcome through greater attention to natural resources policy formulation, implementation, and enforcement, strengthening the coordination of intersectoral goals and policies, increased focus on multi-disciplinary methodologies, decentralization of environmental planning and management, and developing resources-specific information management systems.

CONTENTS

1. NATURAL RESOURCES POLICY AND ECONOMIC FRAMEWORK

For natural resources management policies to be effective in Indonesia, there are two overriding needs. First, extensive analysis of the natural resource implications of macroeconomic, trade, and sectoral policies must be conducted. Second, more analysis of the microeconomic costs of environmental impacts is needed for project planning and policy making.

1.1 ECONOMIC CONDITIONS AND TRENDS

Economic Growth and Trade

Over the 1965-84 period, Indonesia's annual per capita growth rate averaged 4.9 percent, giving it lower middle-income status. However, in the mid-1980s real GDP growth has slowed considerably, largely due to the drop in world oil prices, and has probably fallen in per capita terms over the last two years. The result has been a current account deficit averaging around 4.6 percent of GDP and a considerable depreciation in the real effective exchange rate.

Population, Employment and Incomes

By 1985, Indonesia's population had reached an estimated 165.2 million, with an annual growth rate of 2.2 percent. In 1990, the population is projected to be 183.5 million. Around 63 percent of the total population is concentrated on the Inner Islands (Java, Madura and Bali), which comprise just over 7 percent of the country's total land area.

Approximately 55 percent of Indonesia's labor force works in agriculture, forestry, hunting and fishing. Agriculture cannot be expected to provide many new employment opportunities, and on Java (where about 57 percent of the agricultural labor force lives), increasing labor-substituting intensification in rice production may mean negative agricultural employment growth in this sub-sector. The incidence of poverty (44.6 percent) and underemployment are twice as large in the rural areas as in urban areas, yet nearly 80 percent of all Indonesians live and work in rural areas. With employment opportunities in rice production diminishing, there is great concern that slower economic growth and reduced public expenditures on construction, public works and services may mean less employment and income generated in rural areas.

Key Sectoral Trends

Agricultural policy goals to achieve self-sufficiency in rice were first met in 1984. This success has prompted the government to reduce incentives for increased rice production and diversify and expand its main agricultural export crops of rubber, palm oil, coffee and tea.

The expansion of timber exports, Indonesia's most valuable non-oil export, has been encouraged. In 1978 the government banned raw log exports and introduced policies promoting value-added wood product processing. This resulted in a steep decline in log exports and a rapid growth in processed wood exports accompanied by a short-term net loss in export revenues of $2.9 -3.4 billion because of falling forest product prices.

The government is also encouraging the production of shrimp, which is the major fishery export, in brackishwater ponds, and private investment in the fishing and processing of tuna, the second largest fishery export. Shrimp exports have expanded rapidly over the last five years and now account for about 4.5 percent of Indonesia's non-oil exports.

Since 1976, priority has been given to intermediate and heavy industry, with subsequent growth in the petrochemical, fertilizer, basic metal, cement, paper and wood processing industries. Value added in manufacturing grew on average by about 6 percent in real terms over 1984-85, and in 1986 there was a marked expansion in plywood, textiles, cement and steel.

Foreign Investment and Debt

Net foreign direct investment in Indonesia is currently running at $310 million a year, or about 10 percent of the country's total capital inflows. Cumulative foreign investment from 1967 to February 1986 reached $9.6 billion, amounting to approximately 12 percent of GDP in 1985. Of this total, 72 percent has been invested in manufacturing industries, 10 percent in mining, and 9 percent in agriculture, estates, forestry and fishing.

Indonesia's total external debt has increased considerably in recent years. As a result, debt servicing in 1987/88 is projected to be more than double the amount serviced in 1982/83, and is approaching 40 percent of total export receipts. Meeting debt servicing requirements under conditions of slow economic growth and reduced export earnings places a considerable constraint on government policy making.

1.2 MACROECONOMIC POLICIES

The general deterioriation in economic conditions has forced the Government of Indonesia (GOI) to adopt stringent economic austerity measures coupled with an overall economic strategy of export promotion and diversification. The implications for natural resource management are not yet clear and will require further economic analysis to find the right policies to sustain employment and incomes through the appropriate use of the country's natural resources.

Fiscal Policies

The decline in oil prices has meant less revenue from taxes on oil and natural gas. Because these revenues form a significant proportion of the total revenue available, over the last two fiscal years the government has had to make severe cuts in its development expenditure in order to maintain

its policy commitment to a balanced budget.

In some cases, a sharp reduction in sectoral budgets has meant some curtailment and reorientation of development activities that have been criticized for their negative environmental impacts. For example, funds for transmigration have been reduced to less than 20 percent of their 1985/86 level, making the planned targets for resettling Inner Island households on converted forest and marginal lands in the Outer Islands unattainable. Similarly, the decline in development expenditure has focused attention on the inefficiency of maintaining high subsidies for pesticide, fertilizer and irrigation use. Such subsidies have been criticized for worsening agricultural pollution problems and the misallocation of scarce resources.

On the other hand, the budget cuts may also impose constraints on the availability of funds to invest in additional programs necessary for sound natural resource management. Any reductions in such investments may mean less capacity to address many pressing environmental problems, to provide alternative strategies and policy options for sustainable resource use, and to promote the widespread dissemination, especially among rural households, of new practices and systems of natural resource management.

Trade Policies

The main focus of current Indonesian trade policies has been the diversification of exports. Both the expansion of commodity exports, which comprise over 60 percent of non-oil exports, and the emphasis on processed commodity exports have important implications for natural resource management.

The result of this diversification drive has been a substantial increase in the production of key exports from the agricultural, forestry and fisheries sectors. The crucial concern is the impacts of this expanded production on the allocation of land resources, on harvesting rates relative to regeneration rates, and on rural incomes and employment. In particular, the link between rural income and employment effects and unsustainable resource use needs to be explored.

An important aspect of the expansion of downstream commodity processing for export is its impacts on sustainable resource use rates: the rates of primary product exploitation will depend on the processing industries' capacity and efficiency, and market conditions for value-added export products. An additional concern must be the appropriate management and disposal of the waste by-products generated by downstream processing.

As part of its effort to stimulate export diversification, the GOI initiated exchange rate devaluations in 1983 and 1986. Between 1982-1985, the export volume of eight crucial agricultural, forestry and fishing exports increased by almost 50 percent, which was attributed to the 1983 devaluation, given the general world commodity slump. Similar results are anticipated from the 1986 devaluation. These devaluations have increased the domestic prices of imports competing with the emerging commodity processing industries, as well as making their value-added products cheaper

on foreign markets. If the devaluation induces a general expansion of labor-intensive industry, there may be additional indirect natural resource benefits by absorbing labor that would otherwise overexploit marginal lands.

Until early 1986, Indonesia imposed licensing restrictions on 1,300 import items. Beginning in May 1986, the government instituted a series of reforms to ensure adequate domestic supplies at low prices, to protect raw material supplies for domestic industries and to encourage downstream processing. These reforms included allowing certain exporters and suppliers of inputs for exports to bypass the import licensing and tariff structures, liberalizing or abolishing selected import licenses, and reducing or abolishing some tariffs. To date, the agricultural sector has been largely insulated from these reforms. By providing non-agricultural job opportunites, increasing rural incomes, and by affecting the terms of trade and thus the production of agricultural commodities, these reforms may have an important impact on natural resource use.

Economic Strategies

The government's two broad economic development strategies -- a reorientation of the economy towards producing tradeable goods and the promotion of agricultural diversification -- set the context in which natural resource policies in Indonesia must be formed today. These strategies also imply a greater reliance on market forces, albeit often distorted ones, for resource allocation and a greater penetration of the market economy into the millions of rural households whose individual economic decisions cumulatively affect the sustainable use of natural resources. In addition, the pursuit of these strategies will affect crucial issues of ownership, control and access to these resources.

1.3 SECTORAL POLICIES

The broad economic strategies outlined above and the general macroeconomic and trade policies derived from them, are often translated into very singular goals and targets for sectoral policies. Despite recent legislation requiring GOI departments to conduct environmental impact analyses on all major projects and investment programs, natural resource management appears to receive low priority in these policies' design.

Agriculture

The major constraint to incorporating natural resource management strategies in agricultural policies is that the overwhelming policy objective of the Ministry of Agriculture is to increase agricultural production. More recently, the focus has been broadened slightly to the goal of increasing rural incomes through greater agricultural production and the manipulation of prices. The issue of whether current patterns of resource use in some rural areas can sustain increased production, or whether current investment programs and incentive schemes to boost production are contributing to problems of soil erosion, water scarcity, devegetation and deforestation, is not being adequately addressed.

Government programs are increasingly supporting the development of non-rice commodities. In general, increased production of secondary and estate crops will mean further development of marginal lands: the Sumatran and Kalimantan swamplands (ca. 35 million ha), alang-alang grasslands (ca. 16 million ha) and the critical uplands, mostly on Java and Bali, which are defined as lands suffering from severe degradation because of erosion (ca. 10-40 million ha). The expansion of large-scale estate crop plantations will also require the conversion of Outer Island forestlands, which have poor quality soils. Even for rice, recent projections suggest that to maintain long-term self sufficiency, total wetland rice area must increase from 8.4 million ha to 10.3 million ha by the year 2000.

The government is also encouraging nucleus estates to increase estate crops on the Outer Islands, and to facilitate marketing, processing and inputs provision. This system groups small holders on one plantation site, with each small holder planting about 2 ha with an estate crop and a remaining hectare with food crops or home gardens. The program is being implemented, however, without adequate research on the suitability of soils, much of which is converted forestlands, and on problems of pest and disease attacks. Overfertilization is often a problem, as attempts are made to overcome poor soil quality and boost short-term yields.

Inputs also continue to be subsidized at a high rate. For example, in 1986/87 fertilizer subsidies to farmers reached $220.7 million, roughly 42 percent of the agriculture and irrigation development budget, and an effective subsidy of about 38 percent of the farmgate price (68 percent of world prices). If support for fertilizer production and procurement is included, the fiscal cost may be as high as $362.8 million. As a result, the consumption of fertilizer increased by 77 percent (12.3 percent p.a.) between 1980 and 1985. Given that fertilizer comprises less than 10 percent of the production cost of rice and that the largest production response is obtained at relatively low levels of application, such a high price ratio will tend to encourage inappropriate application and waste, with little stimulation to rice output.

Pesticide subsidies in 1986/87 amounted to $25.4 million, yielding a farmgate price subsidy of more than 40 percent. This compares favorably to the 1983/84 subsidy rate of around 80 percent; however, as with fertilizers, support for production and procurement may mean an even higher fiscal cost. Although the government has recently banned the use of 57 pesticides and is planning an integrated pest management program, the current subsidy levels will inevitably encourage inappropriate and excessive use. Moreover, while a reduction in subsidies may reduce the volume of pesticide use, it will not necessarily reduce the contamination of highly toxic low-cost pesticides.

Although public works schemes account for over 80 percent of irrigation costs, the costs charged to farmers for irrigated water are minor. Annual government-financed subsidies have reached $402 million, spread over 4 million ha. This subsidy level is causing a tremendous financial burden: in 1985/86, before the latest budget cuts, total O&M spending was reduced to $10.17 per ha, which is less than half the required level on average. Over the long run, failure to maintain the irrigation network will mean losses of

agricultural productivity and increased pressure to extensify production.

In sum, such a production-led approach to agricultural diversification, focusing on area targets for specific crops and high input subsidies, presents four formidable natural resource management problems. First, in addition to imposing a potentially unsustainable financial burden on the government, the input subsidies, particularly for fertilizer, pesticides and irrigation, are imposing considerable external costs in terms of agricultural pollution and resource depletion. Second, it is even questionable whether a production-led approach is suitable for the diversity of agro-ecological systems that characterize Indonesia's marginal lands. Third, existing secondary crop systems are extremely diverse and may not always be appropriate for the given agro-ecological conditions of the region and the socio-economic needs of farming households. Finally, failure to consider farming and cropping systems as the basis for agricultural development strategies means that many traditional agroforestry and home garden systems are not being adequately developed.

The need for agricultural diversification in Indonesia is self-evident. In addition to spreading the potential employment and income gains of rural development, increased production of non-rice crops offers more potential for post-harvesting domestic linkages with agricultural processing and export markets. The sustainability of such an effort, however, depends crucially on the government pursuing a more flexible approach than the production-led policies it is currently advocating. A more integrated agro-ecosystems or farming systems approach would require a greater investment in research, marketing infrastructure and extension; nevertheless, this could at least be partly financed by a reallocation of funds from the removal of pesticide subsidies, a gradual removal of fertilizer subsidies, an effective system of water charges (e.g., increased taxes on irrigated lands) and the removal of credit subsidies to sugarcane.

Forestry

The problem of properly managing forestry resources stems less from lack of funds than from a need to change both approaches to resource utilization and fundamental attitudes. Although official forestry policy appears to be well formulated, Indonesia's forests have been regarded primarily as a storehouse of raw materials to be converted to ready use, rather than a valuable renewable resource which could be managed for sustained long-term production. Changing this attitude is crucial if forestry policy is to develop appropriate approaches to the management of production forests including assigning and protecting conservation areas, establishing plantations, and clearing land for other uses.

However, in practice, implementation of forestry policy has run into many difficulties. A major problem has been the lack of reliable data on the actual utilization patterns of forestland. Only half of Indonesia's production and conversion forests have been subject to aerial photo surveys, preliminary ground surveys have covered only 70 million ha of forestry areas, and only 0.2 percent of forestland has been intensively surveyed. The result is that there is insufficient and uncertain information on forest

degradation, conversion and deforestation on which to base policy. What information does exist from independent research conducted by donor agencies, university research stations, private industry and provincial authorities is neither well-coordinated nor analyzed for policymaking purposes. In addition, decisions concerning forestry policy implementation are invariably taken at the center, often without any reference to the special forestry requirements of each province.

The most significant policy change with regard to production has been the 1980-83 phased ban on exports of logs: virtually all log production is now processed domestically and exported as sawn timber, plywood and veneer. From a natural resource management perspective, the question is whether value added processing will slow the rate of timber extraction and thus conserve a valuable resource for future exploitation. Official statistics suggest that total log production peaked in 1979, before the ban, at around 25.3 million m^3, and is now currently running at 15 million m^3 p.a. World Bank statistics based on industry figures, however, indicate a peak log production level of 31.1 million m^3 in 1978, which compares with the 1984 level of 28.2 million m^3. Much of the decline in log production over this period can also be attributed to depressed world prices for all timber products, and therefore, is not necessarily indicative of less exploitation due to the conversion to processing activities. Nonetheless, with favorable export trends predicted, Indonesian log production is now constrained solely by the capacity of domestic processing industries.

Although some concessionaires are following the government's selective cutting guidelines, there are poor incentives for enrichment planting for secondary forests or replanting clear-cut land. For one, although the selective cutting policy is based on a 35-year regeneration cycle, the lease on forest concessions is for only 20 years. The timber companies thus have no incentive to ensure the long-term regeneration of the logged forest; instead, their optimal commercial policy is to log the primary forest within the 20-year lease period, as market conditions and the costs of extracting from more remote areas allow. In some instances, concessions have been completely logged within five to ten years. The current reforestation fund policy has also failed to induce timber companies to replant their concessions. They have been paying \$4 per m^3 of extracted timber into an escrow account managed by the government. The companies are entitled to reclaim this money once they have replanted their land. In practice, however, there is little incentive to do this. The direct cost of replanting in 1980 was estimated to be \$500/ha; yet if a company has produced 45 m^3/ha from selective cutting, it would receive only \$180/ha back from the fund.

Nevertheless, the reforestation fund is now estimated to be around \$183 million. Frustrated with the lack of replanting by the timber companies, the government is embarking on its own replanting schemes and is considering using \$3 million from the fund to finance third-party reforestation. The objective is to expand the current area of timber estates from 2.2 million ha to 6.2 million ha by the year 2000, capable of yielding 90 million m^3 p.a. of log production. Almost all planting, however, is with fast-maturing softwood species. Although undoubtedly such a policy would provide an

important boost to Indonesia's pulp and paper industry, this makes little long-run economic sense because Indonesia's comparative advantage in export markets lies in its hardwood products.

Reliable estimates on how much of the standing stock of commercial timber remains are not available. Assuming that future demand for logs will be at the current near-capacity level of 40 million m^3 p.a. and a selective logging rate of 45 m^3/ha, then 889,000 ha of forests will be logged each year. As a rough estimate, assume that half of the concession area of 53.4 million ha has already been logged. This suggests that in around 30 years, all of the concession areas will be selectively logged once over. Thus, without a serious commitment to renewing its hardwood timberstands through (preferably) enrichment planting and with the current high capacity-demand for log production, Indonesia could eventually face severe depletion of its valuable hardwood production forests.

Indonesia's minor forest products industry earned $154 million from exports in 1985, approximately 12 percent of Indonesia's total forest product export earnings. Rattan, Indonesia's most important non-wood forest product, supplies about 90 percent of the world market, and currently realizes export earnings of $80 million. The recent ban on raw rattan exports is intended to boost production, employment and export earnings for the labor-intensive rattan furniture industry (as high as $270 million). From a forest resource management perspective, there is insufficient assessment of the rate of resource depletion and management needs.

To summarize, the actual costs of current patterns of forest utilization, including the prices paid for forest products, do not reflect the true costs of exploiting Indonesia's forest resources, especially its primary tropical forests, as an economic asset. Because forest stock is being inadequately replenished, this valuable capital stock is effectively depreciating in value. A major research effort is now being made to calculate the depreciation cost of net forest depletion; nevertheless, the accuracy of such essential analyses will require vast improvements in current inventories and monitoring of forest utilization activities.

Fisheries

The overriding government policy for the fishing sector is to increase production, especially of shrimp (off-shore and fish pond culture), tuna and other commercial species. While fish production, especially shrimp, accounts for 5 percent of non-oil export earnings, current fish production, at only 2.5 million tons, is insufficient to meet growing domestic and international demands. Increased fish production is seen as the most expedient way of raising the incomes and employment prospects of the 2.2 million fishing households and several hundred thousand processing, transporting and retailing workers involved in the sector.

The major natural resource management concern is that increased fish production and harvesting may be proceeding too fast and will lead to future problems of overfishing and coastal degradation. For example, the area of brackishwater pond (tambak) production has been expanding at the rate of

8-10 percent p.a., yet overall yields are only rising around 1 percent per year. The expansion of tambak area has been so rapid that average yields per hectare are being lowered or held back by the addition of less productive shrimp ponds. In addition, many of the natural breeding grounds of shrimp in coastal areas and mangrove swamps are being destroyed by tambak extensification. There are also indications that one impact of the government's credit subsidies has been to increase the size of tambak holdings - in some cases, to 50 ha or more. Regardless of the impact of yields, such larger holdings are extremely profitable because tambak produce high-priced giant tiger prawns. In contrast, there are currently severe obstacles to intensifying tambak production, including technical problems surrounding the establishment of larvae hatcheries, limited research into tambak intensification, limited supply of seed stock, water quality degradation and pesticide contamination.

Industry

Industrial expansion of heavy, intermediate and agricultural processing capabilities will continue to be important for Indonesia's economic development. With this continued growth, however, there will also arise problems of managing effluent discharges, particularly hazardous waste, water supply management and location.

Current industrial policy has no provisions to control industrial effluent discharges at point sources through regulation, pollution charges, damage suits and similar measures. Material costs are kept artificially low relative to other production costs and the price of final products through distortions in taxes, tariffs and import restrictions. This has created an incentive system biased against materials conservation and recycling, encouraging waste and pollution. In addition, government policies have reinforced a concentration of industries generating toxic and hazardous wastes in urban areas. A more appropriate locational policy would be to use tax incentives to relocate some major heavy industries in less populated and less ecologically fragile areas.

1.4 CROSS-SECTORAL IMPACTS

Natural resource systems and ecological functions are invariably interrelated; therefore, the uncontrolled environmental degradation generated by one pattern of economic activity will not only tend to feed back through natural processes and interrelationships to affect this activity but will also "cross over" to impair others. These cross-sectoral impacts, or externalities, are often pervasive where economic development depends on the successful and sustainable exploitation of the natural resource base. Moreover, cross-sectoral environmental impacts are characteristic of both areas with high densities of population and economic activity (Java) and areas with harsh environmental conditions and poor quality land (Outer Islands).

General Economic-Environmental Linkages

The general economic-environmental linkages giving rise to

cross-sectoral problems of natural resource degradation are often very complex. Problems such as deforestation can be traced back to the industrial, agricultural and fuelwood demands of a growing population. At the same time, the economic costs associated with deforestation do not stop with the loss of a potential commercially exploitable stock; they also include the disruptions to agricultural productivity from soil fertility loss, erosion and hydrological impacts; the health effects of disruptions to water supply, potability and disaster magnification; and the loss of other valuable functions, such as the maintenance of biological diversity, air quality and the microclimate. Together, these would represent the true costs of economic activities leading to deforestation and should be incorporated in any economic analysis of these activities.

Specific Linkages in Indonesia

Thirty six watershed areas in Indonesia, totalling 10.4 million ha, are classified as having critical lands within their boundaries. On Java, the area of critical upland is increasing at the rate of 1-2 percent p.a. and now totals over 2 million ha, approximately one third of Java's cultivated uplands. The general pattern there is one of poor, predominantly subsistence households seeking to increase their immediate basic food requirements by using cropping patterns that result in high soil erosion levels from their rainfed lands. In addition, significant erosion problems are caused by absentee and better-off farm owners cultivating highly profitable crops, e.g. potatoes, that cause soil erosion on their steep lands, and by the failure to manage state-owned tree plantations properly. Estimated sedimentation rates of rivers in Java from erosion vary from 10-40 tons/ha/yr. The direct user cost of upland erosion is the loss of agricultural output to upland farmers. Given an estimated 903,092 ha of critical upland farming area on Java, a rough estimate of the loss in farmers' incomes from the failure to control soil erosion is $139.8 million p.a. Although these user costs are significant, greater still are the externality impacts of the disruption of water resources in the lowlands from erosion runoff and sedimentation. These latter costs would include the disruption of irrigation, dams and water systems and supply, the losses to agriculture, aquaculture and fishing in the lowlands, the disruption of estuarine and coastal fisheries, the losses from diminished navigation and hydropower, and any magnification of natural disasters.

The uplands erosion problem, therefore, is part of the overall problem of water resources management. Any disruption to lowland water resources from upland erosion will inevitably induce greater costs in the allocation of Indonesia's already scarce water supplies. As Indonesia's population and economy continue to expand, water demands for various competing uses (drinking water and other residential uses, irrigation, aquaculture, industrial processing, power generation, recreation, transportation and waste disposal) will also increase. Already, there are water quality problems from nondegradable organic chemical compounds and heavy metals, agrochemicals, seawater infiltration and sewage in these water supplies.

A major economic problem facing the proper management of Indonesia's scarce water supplies and water catchment areas is that most of its users

are not paying the true cost of obtaining them. These costs not only include the annualized capital and operation and maintenance costs of supplying water but also any cross-sectoral impacts on other uses from any diminished availability and quality of total supplies. A major dilemma will be to weigh the costs and benefits of charging higher water rates for irrigation, which is the largest use of water on Java. The integrated river basin planning strategy is one of the better approaches for dealing with the problem of allocating scarce water resources, but unless the economic costs of current water allocation patterns are effectively analyzed and dealt with, scarcity of water supplies will be a persistent constraint.

The cross-sectoral impacts of the Indonesian government's pesticide subsidy include pest resistance and reversion to less productive varieties in response to repeated pest attacks, which result in decreased crop production, pesticide runoff, agrochemical industrial pollution, and the inappropriate stockpiling and handling of pesticides, which in turn can lead to human health problems, contamination of food and water supplies, and the disruption of other agricultural and fishing activities. The user costs of inappropriate pesticide use and application can be quite high. For example, in 1986/87, an estimated 50-60,000 ha of irrigated rice were lost to a new outbreak of the brown planthopper. At prevailing world prices, the corresponding loss of 1 million tons of rice meant an estimated cost of $180 million. The resulting 10-15 percent decline in yields from converting to the more resistant IR-36 variety meant another loss of about 1.2 million tons, or approximately $210 million. Given these direct user costs and the known but unquantified external costs of the pesticide subsidy policy, it is not surprising that the government is finally considering abandoning this policy in favor of a more integrated pest management approach.

2. INSTITUTIONAL PROCESSES AND THEIR RELATION TO ENVIRONMENT AND NATURAL RESOURCES

The principal institutional issue facing Indonesia in natural resources and environmental management is the urgent need to reorient the development process from one of concentration on economic growth alone towards a sustainable development path. This entails greater emphasis on issues of social equity, wider participation in the management of the economy and in socio-political processes, and structural changes in natural resources and environmental management.

Because AID deals primarily with the Government of Indonesia (GOI), the principal focus is on government institutions and practices. The institutions involved in the management of the environment and natural resources range far beyond the government, however. Natural resources are managed primarily by households and villages operating within social institutions, as well as through private individuals' rational decision processes on subsistence and profit. In addition, the government's management and control of natural resources is much less effective than its legal regulatory apparatus and program activities would suggest because of widely varying levels of socio-economic development, differing resource management practices, geographic dispersion, ecological variation throughout the nation, and low levels of trained personnel and researchers. This regulatory problem is exacerbated by the inherently dispersed and decentralized nature of natural resource and environmental management and environmental impacts arising from the development process. Thus, the larger societal and physical context for environmental and natural resources management in Indonesia must always be kept in mind.

2.1 GOVERNMENT STRUCTURES AND PROCESSES

General Characteristics and Trends in Institutional Development

The GOI's management of natural resources and the environment is centralized in that it follows the national five-year development plans (Repelita), Guidelines of State Policy, and sectoral strategy and policy formulation. By contrast, such management is dispersed because resource use and environmental impacts are primarily local and regional.

Indonesian government institutions' approaches to natural resource and environmental management have been crucially influenced by the nation's political economic history and its geo-political situation. The principal influences are the archipelagic nature of the country; a long pre-Independence history, during which political and economic structures promoted the extraction of both food crop and export commodity surpluses; the politically unstable post-Independence era; and the post 1966 period with its gradual reassertion of control over government institutions and society, with prominent roles played by the military and technocrats in deciding national policy.

This greatly simplified summary suggests several institutional threads related to natural resource and environmental management. First, natural resources are still largely perceived as an important means of generating national income for distribution to other economic sectors. Second, control over the disposition of natural resources, their regulation, exploitation and management is vested with the national government, regardless of who carries out actual production activities. Third, Indonesia's recent political history and centralized control of the economy facilitated the development of private and parastatal monopolies and private penetration of national resources management while reducing the development of long-term sustainable, decentralized and participatory resources management. The Indonesian political elite is generally aware of these problems, but has not yet developed appropriate institutional responses to them.

The Role of Foreign Donors in Institutional Development

During the New Order (post 1966) period, the most important donor activities have been and continue to be in shaping institutional capabilities and structures, and in policy dialogue, particularly sectoral and inter-sectoral aid flows and investments (e.g., population control, resource management, physical and social infrastructural development), personnel and procedural development, and research. Foreign donors, by virtue of their strong involvement in the development process, have tremendous potential influence over many strategic aspects of natural resources management.

Approaches to Natural Resources and Environmental Management

Natural resource and environmental management is dispersed over a large number of government ministries and specialized agencies. General supervision and coordination of policies and programs in natural resource management and the environment are entrusted to the State Ministry of Population and the Environment (Kependudukan dan Lingkungan Hidup or KLH). The potential advantages of this dispersed approach are that: internal integration and coordination of ministry policies, programs and impacts on natural resources and the environment are addressed throughout a line ministry's activities, and the burden of dealing with natural resources and environmental impacts at the regional and local level is simplified through the vertical integration of line ministries.

The disadvantages of this institutional approach are that: (1) inter-ministerial and inter-sectoral cooperation in the management and resolution of natural resource and environmental problems remain very weak, while most of these problems are inherently inter-sectoral; (2) management systems and poor internal coordination of line agency functions mean that program and project implementation is sometimes inefficient, field-level problems go unnoticed or unreported, and interventions are poorly designed and inappropriate for local needs, conditions, and capabilities; and (3) local and organizations have little leverage to develop appropriate, locally-controlled natural resource management programs.

Intersectoral Approaches to Natural Resources and Environmental Management

The GOI's response to ministerial rigidity and weak cooperation in managing environmental and natural resource problems has been to circumvent the ministries rather than reform them. In this vein, the creation of INPRES (Instruksi Presiden or Presidential Decree) programs in the early 1970s was aimed both at channeling financial resources to the local and regional levels outside of normal ministerial budgets to address inter-sectoral problems, as well as improving equitable economic growth and development.

Inter-sectoral approaches include special strategic programs such as the rice intensification programs. Even though the Ministry of Agriculture was designated the lead agency, special inter-ministry task forces and budgetary resources were organized under presidential supervision to tackle the problem. Another inter-sectoral approach is the integrated resource development project model, i.e., river basin or watershed management programs, both upland and downstream, aspects of the Transmigration Program, and large infrastructural projects involving inter- ministerial collaboration with special funding sources.

The principal institutional policy and planning mechanisms for inter-sectoral programs and projects are inter-ministerial coordinating committees and subsidiary management bodies. These committees are empowered to produce joint decrees on administration, policies, strategies and budget matters. The participating ministries form special project bodies under a lead agency, but these projects do not have any true autonomy. As such, these committees usually have not played a very effective oversight and coordination role.

Other major constraints to inter-ministerial coordination are: differing ministrial perceptions; conflicting ministrial procedures, regulations, and allocation of personnel and budgets; the lack of involvement of local and regional governments which have the actual responsibility for implementation, monitoring and maintenance; weak planning and technical capabilities of local government; and the control of budget and policy by Jakarta.

Sustainable Environmental Management and Government Institutions

The GOI considers natural resources to be commodities for direct use and/or export or as inputs into production and services. The environment is perceived as the natural and human-altered ecological systems within which human activities take place and its management includes the physical, social, cultural and political environments. Moreover, the environment is explicitly bound up with the development process. Hence, population, health, the quality of life, religion, culture and social psychology are all nominally subject to environmental assessment and they are within the GOI's view of its scope of authority and regulation.

The evolving approach of the government to environmental management is one that seeks a balance between persuasion and concensus-oriented informal actions and formal regulatory procedures. However, because the environment is viewed so broadly and so vaguely, KLH has had great difficulty in developing consistent and coherent monitoring programs and instituting supervisory procedures over government and private activities affecting the environment. This paradigmatic vagueness is exacerbated by the limitations of KLH's state ministry status, which prevents it from developing its own regulatory and operational capabilities.

In this atmosphere, the line ministries continue to approach environmental management from their own programmatic perspectives, making inter-ministerial coordination in research and data gathering, analysis, policy formulation and mitigation programs extremely difficult.

2.2 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS IN INDONESIA

In 1982, the Government of Indonesia enacted Basic Law Number 4 Year 1982 on Principal Provisions of Environmental Management. Among other things, this law established an environmental impact assessment (EIA) process. Regulation Number 29 Year 1986 was enacted to implement the impact assessment requirements of Law Number 4 and requires ministries to have environmental impact assessment processes established by 5 June 1987. EIAs' effectiveness to protect natural resources or deal with environmental problems remains to be tested.

The current regulation requires that an EIA be conducted by a project proponent as part of the feasibility study for projects that are expected to have a significant adverse environmental impact. An EIA is then submitted to the government official with the authority to approve the proposed project. The responsible office can then suggest an alternative location or design, approve environmental management or mitigation plans, and issue formal licensing.

A major purpose of the EIA is to quantify likely environmental impacts, but at this time data are rarely sufficient to quantify such impacts, nor are evaluations introduced early enough in the design phase. Other critical concerns with the EIA process are: (1) ministries' assessment and review procedures have not been standardized which could cause confusion and delays in inter-sectoral projects, (2) mitigation and environmental monitoring procedures have not yet been established, (3) there is a lack of trained personnel to plan, prepare, and review assessments at the provincial level and in the Indonesian private sector, (4) a process to screen siting and land use priorities is not in place, and (5) whether EIA results would be used in monitoring, field guidance, and other follow-through actions is not clear.

The EIA in Indonesia was developed as a design phase instrument for negotiation or reaching a concensus on minimizing negative environmental impacts before a proposed project reaches the final engineering and siting

stage. It could become a useful planning tool or it may end up imposing an added layer of licensing requirements without achieving its purposes.

2.3 KLH'S ENVIRONMENTAL MANAGEMENT NETWORK

Nearly ten years after it was created, KLH still has a small, though increasing, professionally trained staff. As a state ministry, KLH does not possess operational authority and cannot conduct projects and programs of its own in the regions, nor can it issue regulations. Instead, it must persuade other ministries to carry out these functions, often acting in close coordination with the ministries.

Recognizing KLH's initial limitations of authority and expertise, a decentralized support network on the environment was developed in which KLH would have a coordinating and policy formulation role. Four elements constitute the KLH network: (1) a system of 27 environmental studies centers which are part of the state university system, (2) a system of provincial government environment and population offices (BKLH or Biro Bina Kependudukan dan Lingkungan Hidup) located in the provincial capitals under the Regional Secretariat of the Office of the Governor, under the auspices of the Ministry of Home Affairs, (3) an informal network of non-governmental organizations (at present, these NGOs number 337 and are loosely coordinated by an umbrella organization, WALHI-the Indonesia Environmental Forum), and (4) a network of environmental experts and officers in line ministries, independent agencies and research institutes. This fourth part of KLH's network provides a means of consciousness raising, advocacy and facilitating inter-sectoral policy formulation and action.

2.4 RESEARCH, EDUCATION AND TRAINING INSTITUTIONS

Institutions which carry out environmental research, education, and training consist of: (1) environmental research centers located in Indonesian universities (research, education, specialized training and community service activities); (2) government and regional research institutions (occasional education and training programs); (3) NGOs (some action-research but much more public education and training); (4) line ministry research units working on specialized development project topics); and (5) foreign researchers (academic, contractual, and donor and non-donor sponsored research).

Integration of Research, Policy and Action Programs

The Indonesian government's environmental mandate encompasses basic research, applied research, policy-related research, and public education and information dissemination. The depth and coverage of research topics vary considerably because of the level of institutional development of research organizations and of their personnel, the national government development and research budgets and sectoral strategies, the degree of inter-agency coordination of research agendas and personnel, and the flow of information among research agencies, field projects and programs, and monitoring and evaluation efforts.

Research Personnel and Institutional Development

Like many other developing countries, the availability of good, professional researchers in Indonesia lags behind the demand for their services. While great strides in education have been made since independence, a number of institutional problems exist in the supply and utilization of research personnel in the fields of natural resource management and the environment. These problems include (1) a proliferation of institutions carry out ad hoc, uncoordinated and even redundant research; (2) senior researchers often hold too many positions or carry out too many projects at the same time; (3) the best graduates gravitate to the private sector and often out of serious research on natural resource management and the environment; and (4) a disproportionate number of research personnel are in Java.

National Government Research and Development Budgets and Sectoral Strategies

Most research on environmental and natural resources topics is funded by or sponsored by the government, and funding levels are dependent on overall government revenues and, ultimately, the OPEC oil price. Hence, research and development activities and institutions expanded greatly during the 1970s and early 1980s and have been sharply curtailed in recent years causing widespread disruption to existing programs and jeopardizing vitally needed new programs. The collapse of government research funding has been met partially by increased foreign aid. Much environmental research is viewed as experimental and the GOI prefers it be carried out with grant funds. Because grant funds are a small and declining portion of foreign assistance to Indonesia, this has meant that many environmental fields are greatly underfunded relative to research needs.

Incorporating a research component into a development project is often both necessary for the project's successful implementation (e.g., surveys, assessments, monitoring and technology development) and a useful way of giving researchers practical field experience. However, such research frequently ends with the project, which is disruptive, counterproductive to institutional development and not sustainable.

Links Among Research, Information Flows, Sectoral Policy and Action Programs

Much of the natural resource and environmental research in Indonesia (and throughout the world) has been reactive, highly sectoral, and usually directed by Jakarta-based institutions, while information needs are fundamentally local or regional. Frequently, policy makers and planners are provided with too much specific, localized information which cannot be translated into effective policies and programs, while local government officials complain of too little guidance from Jakarta or a lack of planning information.

The primary problem seems to be the inability to decentralize planning, budgetary, and management powers to local (particularly regional) government, concurrent with building up their capability to integrate research with planning. A further problem is the inability of research programs to respond to the problems of local communities, particularly those

that address the twin problems of population and poverty, e.g., watershed management, pollution created by urban industries, sanitation and waste disposal, rural industry and others.

Policy makers at senior levels of line ministry management are frequently confronted with crisis situations to which they must react quickly. Managers frequently are caught unawares and ill-prepared for crises, because research is often separate from policy and planning, weakly linked to local government, and their research staffs may be overburdened, under-staffed and ill-equipped to deal with urgent and usually complex problems. Building collaborative research networks, combining research bodies, such as the environmental study centers (PSLs) or other specialized institutes, public "self-reliant institutions" and local government extension personnel need to be tested more widely.

Education and Training Issues

The principal centers for environmental education are at universities with environmental study centers, most notably the Bogor Agricultural University (IPB), the Bandung Institute of Technology (ITB), and Gadjah Mada University. The Institute of Ecology at Padjadjaran University and the PUSDI-PSL of IPB emphasize academic, scientific aspects while others like PPLH-ITB emphasize action research and the socio-economic aspects of environmental education. A few Outer Island PSLs are developing greater natural resource and environmental education capabilities, such as Hasanuddin University in Ujung Pandang or Mulawarman University in Samarinda, but are still lacking sufficient trained personnel and educational resources. KLH has encouraged informal training arrangements between the stronger and weaker PSLs to strengthen their capabilities, but formidable logistics and budgetary problems remain constraints.

Environmental impact assessment courses have been used to build basic skills in environmental management among universities, government, private industry, NGOs and consulting firms. A major effort needs to be made to strengthen the PSLs and the Consultants Institutes to ensure that their training reflects the data and analysis needs of government agencies.

Long-term education in natural resource and environment needs further development. While a few Indonesian universities now offer PhD programs, most training in these areas occurs overseas. A major training need for the future is in inter-disciplinary applied research and education.

3. NATURAL RESOURCES AND ENVIRONMENTAL ISSUES

3.1 INTRODUCTION

The immense breadth of the Indonesian archipelago, the country's ecological and biological diversity, and the extent and depth of its resources base present tremendous development management problems. The most obvious signs of this diversity are found in the differences between the Inner Islands (Java, Bali and Madura) and the Outer Islands. On the Inner Islands, where 63 percent of Indonesia's people live on 7 percent of its land, soil fertility and the inherent land capability for sustained agriculture are far greater due to volcanism and centuries of careful resource husbandry. Java is also the historic and current focal point of political and economic decision making for Indonesia, and it is here that the largest concentrations of modern industry and business are found. However, most of Indonesia's natural resources are located on the Outer Islands in the form of oil, gas, forests, and minerals. Formidable communication and transportation obstacles for management and maintenance, combined with the nation's ethnic and cultural plurality, pose considerable problems in resource exploitation, economic development and political stability. Hence, the innate costs of sustainable development in Indonesia are higher than for many other nations. The following paragraphs briefly describe three factors that influence all of Indonesia's natural resources: volcanism, land use, and water resources.

Volcanic and Tectonic Influences

Volcanism, while contributing to the soil fertility of the Inner Islands, also poses a variety of social costs to development. The steep and relatively short drainage basins of the volcanic ranges, high rainfall, and deep but unstable soils have led to extensive, unstable farming of the upper watersheds, resulting in some of the highest soil erosion rates in the world, as well as extensive downstream sedimentation and flooding. The high likelihood of major volcanic eruptions and earthquakes, especially in the Inner Islands, further complicates regional development planning.

Land Use

Indonesia lacks a consistent, standardized land use evaluation and planning system. This lack of planning has contributed to the wasteful encroachment of urban, industrial and physical infrastructure on valuable agricultural and watershed protection lands, especially on Java and Bali, and has continually disturbed and seriously damaged fragile forest, coastal, and marine environments on the Outer Islands.

Water Resources

The major limitation to water supply in rural areas is access to surface water of acceptable quality. In Indonesia's more arid regions, crop production, patterns and intensity are limited unless irrigation systems and water storage systems are available. River flooding occurs frequently in

deltaic and lowland areas during the rainy season, and flooding is a frequent problem in Jakarta as a result of extensive exploitation of the watershed catchment areas. The incidence and extent of flooding have increased in some areas of Indonesia due to deforestation, the introduction of agriculture to sloping upland areas of river catchments, and increasing amounts of impermeable surfaces in urban areas and rural watersheds. These practices lead to accelerated runoff, increased discharge, and soil erosion, and changed hydraulic capacity of rivers.

Poor water quality is a pervasive problem in Indonesia's rural and urban areas, characterized by contamination with sanitary and solid wastes, and suspended sediment as a result of soil erosion. Groundwater supplies in rural areas are generally of good quality, but surface water is often contaminated by domestic liquid and solid waste, and turbidity. In urban areas, rivers, canals and streams are essentially open sewer systems. In Jakarta, groundwater is generally plagued by salt water intrusion and high iron content, while shallow wells are contaminated with bacteria and other organic pollutants. Even if Jakarta's Pejompongan treatment plant were able to meet government purification standards for drinking water, the treated water would likely become recontaminated due to poor maintenance, a pervasive problem throughout Indonesia.

3.2 AGRICULTURAL SUSTAINABILITY

When applied to agriculture, the term sustainability connotes the resilience of farming systems to fluctuations in environmental and economic conditions, such as extended drought, pest outbreaks, price collapses and household labor shortages. Agricultural sustainability requires three features in farming systems: animal and crop productivity, socio-economic viability, and the long-term maintenance or enhancement of the resource base.

Through the end of the century, the GOI will increasingly focus on diversifying agricultural production, promoting self-sufficiency, and generating export earnings. Success in achieving these goals will require attention to increasing population pressures and the development and management of marginal lands, particularly in the Outer Islands and upland areas. Current policies favoring production driven, target oriented, sectorally biased programs that have negative environmental and economic effects will need to be revised through research, improving natural resource management and by incorporating environmental principles into the planning process.

Three major types of environmental problems affect or are affected by Indonesia's current agricultural practices. These are loss of habitat and species and other negative effects from the conversion of natural systems to agricultural use, the degradation of the resource base as a result of poor management, and the secondary negative effects that spill over from one region to another or one sector to another (externalities).

Conversion of Natural Systems

It is estimated that between 6.4 and 11.9 million hectares will be needed for the expansion of food crops (about 1.6 million ha), estate crops (2.8-5.6 million ha), sponsored and spontaneous transmigration (1.6-4.0 million ha), and fisheries (.4-.7 million ha) by the year 2000. If the land converted for crop production is lower in quality than the land under present use, then the extent of the expansion could be greater by a factor of 5 to 10. While increases in yields per hectare can be anticipated for many crops, the extent of land conversion by the year 2000 will be great, and the potential environmental effects will be extensive.

There are several major, direct environmental effects of the extensification of any land use system, including the loss of a habitat, increased soil erosion, reduction in soil fertility and productivity, alteration of water systems, losses of rare and endangered species, and serious hydrologic problems in upper watersheds, leading to increased flooding and regional droughts. The severity of these problems depends upon site-specific conditions, the size of habitat conversion, the importance and quality of the altered habitat, and the size of remaining undisturbed reserves. Mitigation of these effects will require assessments of suitable incentives for both planting and continued maintenance, careful integration into existing farming systems, sound site selection that does not threaten existing forestland, and development of profitable yet environmentally sound agricultural processing.

Degradation of Resources

Resource degradation in agriculture results from inappropriate crop management, land use, and input management.

Inapproriate crop management is driven by centralized production targets and over reliance on monocultures. Production and area planted targets for most crops in Indonesia are set by the Ministry of Agriculture's (MOA) central planners. These targets are poorly coordinated within the ministry, based on yields from controlled research sites on fertile soils with high input levels, and are not adjusted to local agro-climatic conditions. Consequently, target levels poorly match actual per hectare yields.

Since program success is often measured by achieving target goals, local officials promote extending production into marginal lands. The outcome is increased pressure on upland areas, swamplands, and forests for intensive crop production and a gradual deterioration of the land. As Indonesia continues its efforts to diversify, these problems will grow rapidly and resource allocation conflicts will arise unless a mechanism is developed to resolve them.

Modernized agricultural programs have been characterized by an ever increasing use of monocultures, fertilizers, pesticides, and herbicides. Monoculture programs have improved yields, provided farmers with a competitive edge in marketing and mechanization, and may help control some

plant diseases. Heavy reliance on monocultures and mono-genotypic varieties has its risks since it leaves farmers vulnerable to pest outbreaks, price fluctuations, weather vagaries, and dependency on purchased inputs, and can lead to increased soil erosion, decreased nutrient uptake from the soil, decreased yields, and more rapid depletion of soil fertility. By contrast, traditional polycultures have been shown to be efficient in reducing losses from pest infestation and soil erosion, and to increase net returns by reducing input costs while improving soil fertility.

Inappropriate land use management practices differ greatly between the Inner and Outer Islands. (See the Watershed section for a discussion of Inner Island agricultural problems.) Agricultural systems in the Outer Islands include traditional shifting cultivation practices followed in remote forested areas, shifting cultivation with more modern equipment and more closely linked to commercial markets, food crop-grassland cultivators, migrant food and tree crop cultivators, livestock systems, and transmigration. Each of these systems has developed in response to bio-physical conditions interacting with varying levels of human use or demand. While these systems are rational responses to economic and bio-physical conditions, their environmental effects differ in both intensity and magnitude.

Traditional shifting cultivation systems are relatively stable and self sustaining because of the long fallow periods built into the cycle, adjustments to changing environmental conditions, limited production for other markets, and low intensity of use because of low population densities.

By contrast, shifting cultivators with access to chainsaws and outboard motors are cutting primary forest to produce surplus rice for nearby markets. The negative environmental effects resulting from this system are degradation of forest land, decreased biological diversity, declines in soil fertility, and increasing soil erosion.

A cropland/grassland system results from forest conversion. This system uses 2-6 years of rice production followed by the invasion of alang-alang grasslands. The 16-20 million hectares of alang-alang (primarily in Kalimantan and Sumatra) is spreading at a rate of 100-150,000 ha annually. This pattern is caused by too long a cropping phase and/or too short a fallow/succession phase, and results in rapidly decling crop yields, nutrient loss, soil erosion, and weed invasions.

A growing number of spontaneous migrant cultivators are converting forested land (primarily along newly opened roads) for short- and medium-term returns to meet a growing commercial demand for tree crops such as pepper for domestic and international consumption. Because of poor management practices, most of the sites are abandoned after ten years because of declining yields.

Over grazing of pasture land is the primary livestock mangement problem in Indonesia, particularly in the Outer Islands where livestock is free ranging and occurs on common land. The lack of a resource management system will lead to decreased ground cover, subsequent erosion, reduced water

retention, and declining soil fertility, while the heavy reliance monoculture tree crops has increased the risk of pest infestation and economic loss.

Transmigration has resettled over 5 million people and resulted in the clearing of approximately 1.4 million ha of land, 30-50 percent of it forested. Studies indicate that while it has established sustainable, productive agriculture at some sites, it has encountered numerous difficulties at many others. Some of the major environmental constraints are poor soil fertility, improper land clearing and preparation, poor drainage, salinity, acidic soils which upon exposure and oxidation produce acid sulphates and toxic aluminum, weed (alang-alang) and pest infestation, inappropriate emphasis on food crops, lack of access to markets, inadequate infrastructure, and technical packages designed for more fertile volcanic Javanese soils. Where these problems are severe, it has led to declining crop yields, abandonment of fields, and a conversion to shifting agriculture.

In summary, overall land degradation will depend on the length of time of cultivation, the management practices employed, the rate of vegetation recovery which will be affected by the surrounding vegetation, and the underlying soil conditions. While the development of small areas may not result in long-term irreversible environmental effects, an increase in spontaneous settlers' exploitation of newly accessible land without sustainable management systems can be expected to result in increased land degradation, soil erosion, and declining yields, continued extensification and conversion of forested land, and the spread of alang-alang grasslands.

Inappropriate input management results from the over application and mismanagement of pesticides, fungicides, herbicides, fertilizer, and water. These practices can result in serious environmental contamination, health effects and water quality degradation.

Pesticide use has increased steadily since 1974; between 1978 and 1982 it grew by over 237 percent for food crop protection, while between 1981 and 1986, it grew from 8,890 tons to 17,230 tons or from .93 kg/ha to 1.69 kg/ha. The primary pesticides now used are chlorinated hydrocarbons (DDT, endrin, dieldrin, heptachlor, BHC) and organophosphates (parathion, OMPA, TEPP), several of which are banned or identified as highly toxic in other countries. Diversification into secondary crops and intensification on marginal areas such as the uplands have witnessed corresponding increases in levels of pesticide use.

Increased rice production has been constrained by the outbreak of brown planthopper (BPH) transported viruses (mid 1970s), by tungro virus and its vector, the green planthopper (1980) and by another outbreak of the brown planthoppper (1986). The causes of the BPH outbreak have been attributed to the widespread use of susceptible varieties, continuous and overlapping cultivation, increased use of nitrogenous fertilizers, insecticide-induced resurgences and resistance, and the destruction of the natural enemies of BPH by non-selective insecticides. Losses from these outbreaks were estimated to be 364,500 tons of milled rice ($100 million) in the mid 1970s and 1 million tons in 1986.

The recent problems led to a presidential decree to implement a nationwide integrated pest management (IPM) program including the control of planting patterns to disrupt the cycle of the BPH; research, development, and planting of pest resistant high-yielding varieties; the eradication and sanitation of infested areas; and the banning of 57 insecticides for rice crop protection (but not for other secondary food crop use).

An additional danger results from long-term pervasive environmental contamination of food, soils, and water systems from unregulated or misused highly toxic pesticides. While there has been little systematic research on the extent of pesticide contamination, preliminary data over the past ten years indicate an increase in the frequency of poisonings; levels of DDT, eldrin and dieldrin, and endrin in vegetable oil, fried tempe, cassava, and other foods; and concentrations of diazinon, DDT, and dieldrin in food crops such as carrots, cabbage, and to a lesser extent potatoes. Residue levels in carrots have consistently shown contamination levels in excess of permissible WHO and FAO safe health standards.

Externalities

Resource degradation and extensification are direct primary environmental affects, while externalities are secondary, indirect effects that are passed on to subsequent users of a resource. Externalities result from farming practices that alter water flow patterns and degrade water quality by contamination with silt from excessive erosion, pesticides, fertilizers, and agricultural waste. Few data have been identified or collected to quantify the magnitude of these problems in Indonesia.

Thirty six watersheds in Indonesia are considered to have critical erosion problems; thirteen of these are in Java. According to 1987 figures, these watersheds encompass 8.2 million ha of critical land. Figures from 1984 indicate that these critical lands lie primarily on Sumatra (1,195,274 ha), Bali and Nusa Tenggara (656,620 ha) and Java (568,506 ha); of these, 3.0 million ha lie outside of forests. Estimates of soil erosion rates range from 10-40 tons/ha/yr, while other records indicate a steady increase in soil erosion from 1911 (1.1 mm/yr) to 1970 (6.3 mm/yr). However, no systematic monitoring and data collection has been undertaken to determine the actual erosion rates from upper watersheds.

Increased sedimentation has already shortened the life span of downstream reservoirs, decreased efficiency in irrigation channels, disrupted tambak and other fisheries systems, and resulted in filling of navigation channels. Recognition of the downstream impacts of erosion led to the development of management programs for the uplands in Java. To date, no program has been developed which addresses the inherent variability in biological, physical, and socio-economic conditions in upper watersheds.

Excessive and indiscriminant spraying of stable pesticides has caused the contamination of water bodies, increased concentrations in aquatic organisms which are important sources of fish food, reductions in fish

populations from endosulfan contamination, die-offs in fish ponds and tambak, and secondary outbreaks of rice pests (gallmidge) after aerial spraying for rice stem borer control.

Agroforestry and Silvipasture

Agroforestry and silvipasture are agricultural systems in which perennial crops and trees are interplanted with annual crops and/or fodder species to produce wood products, firewood, fodder, and to conserve soil and water resources. Their benefits include conservation of natural resources, increased productivity, and agricultural diversification. The development and dissemination of viable agroforestry and silvipasture technologies has encountered serious technical, institutional and policy obstacles, including the failure to identify appropriate cropping combinations for localized bio-physical and socio-economic conditions. In addition, research has not been synthesized, alternative approaches have not been assessed, field experiments have suffered from the lack of a multi-disciplinary approach and competing ministerial mandates, and a lack of attention to farmers' needs and market prospects.

3.3 FORESTRY

Indonesia's tropical forests contain the most biologically rich ecosystems in the world. The country's total forest area is estimated to be almost 144 million ha, which encompasses more than half of all the rain forests in tropical Asia. Forests are also the most important non-petroleum export resources in Indonesia.

Types and Distribution

The main forest type in Indonesia is the evergreen rain forest, which represents 73 percent of the country's total forest area. Other types include tidal and freshwater swamp, peat, mangrove, monsoon, heath and montane forests. The country's forests are classified by the Ministry of Forestry (MOF) according to potential use: 21 percent as protection forest, 13 percent as nature conservation forest, and 45 percent as limited production (21 percent) and permanent production (24 percent), although the estimates of the amounts of these forests vary in government reports. Further, these figures are not updated to reflect major forest losses.

Deforestation Trends

Since 1950, more than 49 million ha of forests have been converted to agricultural use or cut for commercial purposes (approximately 34 percent of the total forest land in Indonesia). At least 15 million ha of all production forests are already over-exploited and cannot be used commercially. Estimates of current deforestation rates range from 600,000 to 1 million ha per year. In contrast, between 1979 and 1984, only 250,000 ha were replanted after cutting.

Institutional and Policy Issues

Until 1967, the provincial forestry services were responsible for all aspects of forest management. Today, forestry bureaucracy is highly centralized, which effectively disengages the link between planning and implementation at the provincial level. Furthermore, a disproportionate number of MOF staff are located on Java, with a forester/forest land ratio of 1:76 compared to 1:471,000 outside Java. As a result of these factors, there are few incentives at the provincial level to enforce concession to regulations, forest policy tends to be formulated in the absence of considerations of how to accommodate the needs of local communities, the opportunities for stimulating small-scale forest industries are not recognized, and there is little coordinated planning between line agencies at the provincial level, which prevents the formulation of land development strategies for the multiple use of forest resources.

The dominant force driving the planning of industrial forestry programs is still the desire to expand timber production, which reflects the national interest in increasing non-petroleum exports. For example, the criteria for designating lands into different categories are based on potential uses for forestry products (a forest classified for conversion is selected because of its unsuitability for forestry and not because of its potential for agriculture) without any systematic consideration of the needs of other sectors or local resource management requirements.

These problems are complicated by weak technical skills in many of the forestry offices (particularly those outside Java), the lack of career incentives that motivate provincial staff to perform their jobs well, and the paucity of mechanisms for technical information to reach the forestry staff who most require it.

Sustainability of Forest Production Systems

The selective cutting system has been used in Indonesia since 1972. However, there are major economic disincentives for the private sector to follow this system and the ecological features of tropical rain forests present special technical difficulties for sustainable production under this system. Underlying the issue of the sustainability of selective logging is the dearth of basic biological and ecological data on Indonesia's tropical forests (according to FAO estimates, less than half of the country's forests have been inventoried using aerial photos and ground reconnaissance). Further, half of the 64 million ha of Indonesia's production forest may contain substantially lower volumes of commercial timber than the government estimates, leading to logging targets that cannot be met by following the selective cutting guidelines.

Although there are no reliable estimates of the total actual extraction from selective logging, the extraction rate could be as high as 55 to 60 million m^3 per year. The production of round logs from both selectively logged forests and plantations was recently reported to be 63 million m^3 per year. Using the Repelita IV plan, which targeted 40.9 million m^3 for

1988/89, it can be roughly estimated that within 30 years, all of Indonesia's concession areas will be selectively logged at least once.

In addition to Indonesia's high extraction rate, several other factors pose constraints to sustainable timber production under this system. They include: the lack of regular monitoring and management of logged forests, the unpredictability of dipterocarp tree production (the dominant canopy-level species in much of Indonesia), poor timber removal techniques (which kill, on average, 40 to 55 percent of the remaining trees), and fire hazards.

Reforesting logged forests, either through enrichment plantings or the establishment of timber estates, is the responsibility of private concessionaires. The economic policies that effectively constrain the timber industry from adopting such measures were detailed in the economics discussion. The GOI's efforts to reforest are devoted primarily to fast-growing softwood trees rather than hardwoods.

The plantation program has emphasized the rapid expansion of planting area, rather than increasing the productivity and efficiency of existing plantations and logged forests. Technical information has not been collected or evaluated for assessing the economic prospects of different tree species, the suitability of plantation species for local ecological conditions, the risks and alternatives to monoculture stands, appropriate methods for clear cutting, and the management requirements for established plantations. Moreover, the large-scale planting of softwood trees will not meet the demands of Indonesia's growing wood processing industry. In addition, there are serious biological risks associated with the policy to invest in large monocultures of a few species, many of them from other tropical regions (exotics).

The reforestation of critical, degraded lands presents even greater technological challenges. The state-owned forestry enterprise in Java, Perum Perhutani, has many failed plantations in eroded upland areas. These sites were essentially abandoned because of their high initial capital investments and the prospect of slow tree growth rates. Further, plantations in highly populated areas are subject to illegal cutting by rural people.

Environmental Effects

Logging roads and skidding tracks can leave up to 50 percent of a forest in bare ground and exposed, open thicket. A study in Kalimantan found that soils compacted from logging operations reduced water infiltration from 6.0 cm^3 to .28 cm^3 or zero, with consequent high erosion rates and a serious disruption of the hydrological cycle, leading to more severe flooding and drought events. In Kalimantan, the silt load in streams has increased 33 fold in some logging areas. In addition to the losses incurred to the long-term value of forest concessions, the effects of erosion, siltation and flooding are suffered by communities themselves.

The process of deforestation and land colonization in Indonesia's tropical forests has serious consequences for species extinction rates in Southeast Asia. The lowland dipterocarp forests of Indonesia are the reservoirs of extraordinary species diversity -- for example, in a 1.6 ha plot in Kalimantan, over 230 species of trees larger than 30 cm in diameter at breast height were found, the highest recorded tree diversity in the world.

The process of spontaneous land settlement which follows in the wake of logging often leads to more severe, irreversible deforestation than actual logging practices. The failure to anticipate the sudden influx of settlers along logging roads reflects poor regional planning in the Outer Islands. This is compounded by the designation of forest lands for the transmigration program in areas that are unsuitable for sustainable agriculture.

Migration into areas recently opened for selective logging is due to the construction of primary logging roads, the development of better infrastructure, and new prospects for employment and trade. In the absence of careful planning and technical guidance, settlers have no incentives for sustainable land use practices, including the deforestation of large tracts of land through illegal cutting. A case in point is East Kalimantan, where the combination of an extraordinarily severe drought in 1982 and 1983, large areas of degraded logged forest, and rapid population expansion led to one of the largest forest fires in recorded history. Approximately 3.6 million ha of land were affected, resulting in economic losses in excess of all timber export earnings from that province. Although indigenous shifting cultivators were blamed by officials for starting the fires, the underlying causes were rapid land clearing and destructive cash cropping by immigrants to the area.

3.4 WATERSHED MANAGEMENT

Watershed management encompasses a continuous process of inventorying, planning, and support for the sustainable use of the natural resources found within an area drained by a river or river basin system. In particular, watershed management focuses on the conservation and sustainable development of the land and water resources of a river basin, emphasizing understanding of the cross-sectoral, systemic linkages of human use of resources and their distribution and quality aspects.

Characteristics of Indonesia's Watersheds

Indonesia has an estimated 125 defined river basins, thirty six of which require urgent rehabilitation, conservation, and development. The most intensively utilized and the greatest percentage of degraded basins are found on Java and Bali.

There are three categories of Indonesia's watersheds: densely populated, humid Inner Island watersheds; sparsely populated, humid Outer Island watersheds (Sumatra, Kalimantan and parts of Sulawesi, the Mollucas, and Irian Jaya); and sparsely populated, drought-prone Outer Island watersheds (East and West Nusa Tenggara, East Timor, and parts of Sulawesi and Irian Jaya).

Inner Island watersheds have long-developed intensive sedentary agricultural systems, even in upland areas, a high level of physical infrastructure, and in the middle and lower reaches, industry and cities. Outer Island watersheds are heavily exploited for large-scale timber harvesting, timber plantations, transmigration settlements, nucleus estate crop schemes, mining and energy development, and indigenous and other shifting cultivators. In the drier watersheds, sedentary farmers, shifting cultivators, and ranchers use the land.

Watershed Management Policy

Watershed management policy is based on integrated river basin planning. Regional governments are responsible for river basin management, with assistance from national government conservation, rehabilitation, agricultural and rural development programs. Implementation of these policies depends on close coordination and cooperation among national, regional, and local governments; however, past efforts to gain cooperation have been less than successful.

Frequently, watershed management discussions, programs and funding are focused on resolving the problems on the Inner Islands. Outer Island resources management issues are currently receiving less attention and in some cases (e.g., East Kalimantan) the lack of a coherent, regionally developed watershed or regional management program can be expected to have disastrous environmental effects.

Basic Issues of Watershed Management in Indonesia

The two most important underlying causes of watershed degradation in Indonesia are the extensification of agricultural production systems and resource extraction activities into marginal lands, and inappropriate land use management programs.

Extensification into Marginal Lands. Marginal lands are defined as lands incapable of sustaining intensive agricultural crop cultivation under current technology. Whether land is marginal depends upon how it is used. Lands which would be marginal for intensive cultivation may have a range of other economically productive uses, notably watershed protection, selective production of wood and other forest products, or stable pasture lands. Likewise, some marginal lands may be able to sustain certain kinds of agricultural production under proper land management. In this respect, the concept of marginal lands as a static category may not be very useful for the economic management of watersheds.

Critical marginal lands include those state and privately-owned lands which have been degraded to a point at which their productivity is markedly declining or which have already been abandoned. Critical non-marginal lands include those lands which may still have deep, fertile soils and good crop yields but whose land management practices are producing significant soil erosion. This soil loss is critical to the extent that it produces actual or potential significant downstream sedimentation which threatens the

economic viability of important infrastructure, such as dams, irrigation structures and settlements.

The GOI uses a number of internally inconsistent definitions of critical land. Moreover, the determination of critical lands is often based on inadequate data and analysis. Finally, there are a number of misperceptions on the relationship of critical land to watershed management. These include:

- Critical lands are assumed to be major contributors to both soil erosion and downstream sedimentation. However, there are critical lands both inside and outside upper watersheds, and some are hydrologically unstable. Unfortunately, data on the location of critical lands are not broken down by type and specific watersheds.

- Critical lands are assumed to be waste lands and, hence, economically useless. In fact, some critical lands are part of a well-managed shifting cultivation system or are under low-intensity sedentary agriculture. Some critical lands are not marginal but rather are high erosion producers under existing farming practices.

- Upland farmers are assumed to be the main contributors to soil erosion and downstream sedimentation as well as a principal cause of critical land formation. In fact, natural processes, such as volcanism, mass wasting, forest fires, and the underlying geology, account for some of the soil erosion and land degradation. The activities of timber concessionaires, quarry and mine operators, large-scale cash and estate crop operators, and state forestry operations are also significant contributors. Finally, erosion from poorly sited buildings, pathways, sports fields, small cisterns and rural roads may cumulatively be the causes of large amounts of erosion. Because it is not known which land management practices cause critical land formation and systematic inventory efforts have not been carried out to determine these cause-effect relationships, much money may be wasted on inappropriate mitigation strategies.

Beyond the issue of critical lands, there is a problem of extensification of inappropriate land use management systems in a variety of fragile ecosystem types. These include subsistence and cash crop farming systems in tidal swamps, other wetlands, upland and high mountain lands, logged-over tropical forest lands, conversion forests, and drought-prone lands.

Land Use Management Program. The principal watershed management program, which is advocated by the Ministry of Forestry (MOF), is based on tree planting or mixed tree crop/annual crops on terraces along with the construction of physical infrastructure (check dams, gully plugs). The paradigm continues to be that deforestation is the main cause of soil erosion. Several GOI/donor watershed management projects have demonstrated, through a combination of bench terracing, intensive food crop and forage/livestock production of slopes of 50 percent or less, and the

establishment of fuelwood, cash tree crop and forage/livestock systems on slopes greater than 50 percent, that upland farming households' incomes and employment productivity can be raised by a factor of 2 to 5. In general, the combination of bench terracing and new cropping patterns has the capacity to absorb two to three times as much labor/ha/year, generate two to three times as high a daily wage, and provide net incomes five to six times above the farmers' previous crop income.

Tree crop systems can be useful on unstable volcanic soils for stabilizing soil, reducing erosion, facilitating water retention, and improving soil fertility. However, the use of terraces on relatively thin soils with impermeable sub-soils may actually increase the likelihood of landslides. Furthermore, some researchers report that tree crop systems are difficult to sustain without proper incentives and extension unless they have direct economic benefits to the farmer.

An alternative to the MOF approach has been the integrated watershed management project model which has a basin planning body and inter-ministerial committees to coordinate the national-level cooperation of the seven major ministries involved and local governments. Poor coordination has led to a notably ineffective and occasionally fractious project management system and inter-ministerial conflicts. Part of the reason for these conflicts arises from multiple project goals (e.g., promoting both soil and water conservation and improving agricultural systems) and inter-ministerial debate over the relative emphases of sub-programs and treatment technologies. Much of this debate implicitly involves budget shares and departmental power.

Both of the current approaches are further constrained by the lack of community participation in the design and implementation of programs; insufficient efforts prior to implementation to undertake and apply baseline studies on existing productions systems, household resources, and income strategies; and high operation and maintenance costs and poor replicability of the programs; and lack of research on the general causes of erosion.

Despite some impressive accomplishments, the main objective of upper watershed development projects has been to increase the productivity of upland farmers and to reduce soil erosion. These projects by and large do not deal directly with major cross-sectoral impacts. Amelioration of these impacts is assumed to follow from the control of erosion in the uplands, yet few studies have been conducted to test this hypothesis and to calculate the economic benefits that accrue to lowland populations. If such benefits are occurring, they should be used to calculate the appropriate levels of input and labor subsidies required at the upland project sites, as this would mean that some of the benefits from improved upland soil conservation are being captured by others not sharing in the cost. In addition, such information should be used to improve the coordination of soil conservation and sedimentation control measures throughout the watershed catchment. If upland watershed management efforts are to be used as the basis for an entire watershed management approach, then the lowland cross-sectoral impacts of upland erosion will need to receive greater attention.

Even in concentrating on uplands soil conservation problems, uplands watershed management projects have tended to focus on owner-operator farming households on private land. Absentee landholdings under tenant farmers, the landless, relatively prosperous farmholdings and public lands are either excluded or do not participate because of insufficient incentives, yet their contribution to soil erosion problems may be significant. In general, farmers completely dependent on a small area of steeply sloping land, with no alternative cropland or employment opportunities, cannot afford the three-year wait from planting tree crops on this land. In contrast, results from other projects would suggest that farmers who profitably exploit erodible crops, e.g., vegetable production on steep slopes, have little economic incentive to participate in soil conservation projects as currently designed.

Finally, given the high population densities in most of the degraded watersheds, greater investments should be made in programs to improve off-farm employment. To be economically sustainable, these activities should be designed to complement agricultural development. Subsidizing such an investment package could be justified in terms of the resource sustainability, income and employment benefits of ameliorating the cross-sectoral impacts of watershed degradation.

3.5 FISHERIES

The most biologically diverse part of the Indo-Pacific biogeographical province lies within the 6,800,000 km^2 marine surface area of Indonesia's declared Exclusive Economic Zone. The high productivity of Indonesian waters is due to the large proportion of shallow sea (15 percent of the surface area is less than 200 m deep), the occurrence of upwelling in certain areas, and nutrient-rich runoff. It is estimated that current marine fisheries production is 25 percent of potential maximum sustainable yield (MSY). Of the total fisheries production in 1984, 75 percent was from marine fisheries, 13 percent from aquaculture, and 12 percent from capture fisheries.

Indonesia's rich fisheries resources are threatened by declining water quality, habitat alterations, and inefficiencies in regulation and management. These threats are common in varying degrees with respect to marine, estuarine and freshwater fisheries.

Water Quality

In Indonesia, the major problems with marine and estuarine water quality include: sedimentation and turbidity in coastal waters of Java, Eastern Sumatra, Kalimantan, and Bali as a result of severe erosion problems in watersheds; the contamination of tambak (brackishwater fish ponds) by pesticides used on adjacent agricultural lands or carried by freshwater supplies; and severe industrial pollution in urbanized port areas, particularly Jakarta Bay. The major problems with freshwater quality result from: contamination by pesticides, sanitary wastes, industrial wastes, and sediment loads.

Marine Systems

The most serious threats to marine water quality in Indonesia appear to be discharges of industrial and human wastes, particularly in industrialized seaport areas; turbidity and sedimentation from riverine discharge; oil spills from shipping and offshore oil extraction; and dumping of industrial wastes at sea. These threats are currently most acute in the Java Sea and nearshore areas.

Data collected and analyzed on 157 samples of fish and shellfish taken from Jakarta Bay showed that WHO standards for heavy metals were exceeded in 76 percent of the samples for cadmium, 51 percent for copper, 44 percent for lead, 38 percent for mercury, and 2 percent for chromium. PCB and DDT in the Bay's waters reach 9 and 13 ppb, respectively, exceeding the limit of 0.5 ppb considered to be the threshold of pollution. Carbofuran is believed to be the cause of a large fish kill in the Tanjung Priok region of the Bay in August 1986. Although data on other industrialized seaport areas of Indonesia are limited or nonexistent, these areas are also of concern with respect to water quality and pollution discharge.

Turbidity and sedimentation in the marine environment are particularly acute around river mouths and near muddy shorelines along the Java Sea. Although the volcanic soils of much of Java and Sumatra are prone to erosion because of active volcanic eruption, high slopes in upper watersheds and high rainfall, natural sediment loads of rivers and streams in these provinces are exacerbated by poor land use practices.

The impact of oil spills on fisheries has not been examined in Indonesia, although the species that are probably at greatest risk are those whose eggs or early larval stages are found in the surface microlayer. Oil spills have occurred in the Java Sea and offshore oil production sites, and tar balls have caused problems on recreational beaches, as have oil slicks. Likewise, there is little information available on the deliberate dumping of waste materials in ocean waters, although there is anecdotal evidence. It is estimated that approximately 360 m^3/day of unmanaged wastes are deposited in Jakarta Bay.

Estuarine Systems

Sedimentation is a major problem in most estuaries at the mouths of river basins with heavy human settlement in Indonesia. For example, the northern part of the Riau Province's coastal zone was once a well known fishing area, but the combination of oil drilling in the area and heavy sediment loan in the Rokan River from new settlements have virtually eliminated brackishwater fisheries there. Pesticide residues in water and those absorbed to sediments are of particular concern in estuaries around Java and in estuaries at the mouths of rivers draining agricultural land. Also of concern is the discharge of effluents from industrial facilities located in estuarine areas, particularly around Jakarta Bay.

Freshwater Systems

The production of fish in freshwater systems has declined steadily in Indonesia. Field production of carp is low due to poor water quality and diseases, and cage culture and capture fisheries in rivers have declined in part because of lowered water quality. The major causes of these declines include contamination by pesticides, sanitary wastes, industrial wastes, and sediment loads. In lakes and reservoirs, the primary problems appear to be sedimentation, especially in Java, as well as infestations of water hyacinth and excessive loading of nutrients and total organics. Fish kills as a result of urea and ammonia discharges from a large fertilizer plant in Sumatra have been observed, and arsenic, phenols, and chlorinated phenols discharges are suspected of causing fish kills in Kalimantan.

Experimental work and field observations suggest that river fisheries in Java have been greatly affected by high suspended solids concentrations caused by land erosion. The concentrations in Java rivers range from 1500-30,000 mg/1, compared to 150-10,000 mg/1 elsewhere in Indonesia.

Late in 1980, catfish in ponds, open water, and rice fields in Indonesia suffered from an outbreak of disease. Although no hard evidence was available, pesticides, high organic loads, and low pH were suspected to be factors in the outbreak.

Habitat Alterations

In addition to chemical alterations of habitats by pollutants, the physical alteration of mangrove and tidal wetlands by logging or the construction of tambak and new settlements, the destruction of coral reefs through mining and dynamite fishing, and impoundments and other water diversions have probably contributed significantly to the decline of fish populations.

Many of the marine shrimp species and milkfish depend on mangrove habitat as nursery or spawning areas. The conversion of mangrove swamp to tambak, particularly in South Sulawesi, can be expected to have a negative effect on the natural production of milkfish and shrimp fry. Because the technology for hatchery production of milkfish fry has not proven successful, the loss of mangrove habitat will significantly affect culturing this species in tambak. Tambak culture in mangrove areas is also often hampered by acid sulphate soils, which reduce productivity, and peaty soils, which make pond construction and maintenance difficult.

Coral mining near Jakarta Bay, Kalimantan, Lombok and Bali has been extensive. Coral blasting by fishermen is widespread, even though illegal, and has been particularly severe around Pombo Island, a proposed marine reserve, and several other areas of Indonesia. The use of cyanides and other poisons by artisanal fishermen, especially for the aquarium fish trade, has been noted in a number of locations. The destruction and alteration of coral reef habitat through these practices is particularly harmful to fisheries production because the damage is long term due to the slow growth and regeneration of coral colonies.

Management

The most important environmental issues associated with fisheries management in Indonesia appear to be ineffective habitat management and the overexploitation of some stocks. Fisheries managers need to give more attention to the degradation of water quality and destruction or alteration of critical fishery habitat as part of their overall management strategies. Unless critical habitat is protected and properly managed, fish stocks and production will continue to decline and activities that focus solely on research, marketing and infrastructure will be of little value. A critical weakness in habitat management in Indonesia is based on the fact that provincial authority extends only to the waterline. As a result, nearshore coastal habitats are not subject to local government management.

Overall, the exploitation of marine resources represents about 25 percent of the estimated MSY; however, the exploitation is unevenly distributed with respect to the types and distributions of fish and shellfish resources. Overexploitation of fish stocks is particularly severe in certain sectors of marine fisheries, which in 1984 represented about 75 percent of total fish production in Indonesia. Demersal (bottom feeding) fish and shellfish production in the Java Sea, for example, fell dramatically until the trawling ban was imposed in the early 1980s. Last, coral reefs near large human settlements, especially around Java, Bali, and the larger towns in the Outer Islands, are generally characterized by the near extinction of giant clams and the absence of large fish as a result of overfishing.

3.6 BIOLOGICAL DIVERSITY

The Indonesian archipelago contains the highest or second-highest number of species and varieties in the world. The country is particularly rich in endemic species (those found only within a single, restricted area). Despite this richness and the importance of biological diversity in agriculture, forestry and fishing (three of the nation's largest employment and income sectors), few resources have been devoted to taking inventories, classifying species, or to conserving habitats and germ plasm.

Yet as the nation's non-renewable resources are gradually depleted, especially petroleum and natural gas, and as it faces increasingly severe competition in export markets for manufactured and other processed goods, its biological diversity will become a more readily apparent comparative economic advantage. Without an increased awareness of the importance of biological diversity, as well as actions taken to preserve it, the likely impacts on both Indonesia's sustainable development and the nation's legacy to future generations will be serious.

It is difficult to quantify the economic value of biological species diversity for four reasons. First, the export price of commercially exploited species may not reflect the actual or economic scarcity value of the species. This is particularly true of Indonesia's hardwoods, which are, in effect, being "mined" in such a way that they may well become a non-renewable resource. Second, many wild species of flora and fauna pass

through informal markets or are consumed directly by collectors and hunters, precluding analysis of their value. Third, the local extinction or drastic decline in the numbers of a particular species may have very important ripple effects on the genetic viability of other species, thus affecting their economic valuation. Fourth, the vast majority of Indonesia's plant and animal species remain undiscovered or unclassified. While these factors complicate the economic assessment of biological diversity, they also clearly point to the linkages between development and conservation.

Tropical Forests and Forest Products

Due to the low individual/species ratio per hectare and current forestry policy which greatly limits the number of species that can be harvested as exportable quality timber, this resource is being very inefficiently managed. As a result, a much larger area of forest than necessary must be selectively cut in order to bring adequate returns on investment; this area is then often cut over again or converted to softwood plantations or other low-quality uses. The lack of inventorying and classification of hardwood species contributes to this low intensity management of the country's forests, as does the lack of enrichment planting (the deliberate replanting of harvested species in selectively cut-over forests), which increases the risk of further forest loss because of the uncertainties associated with natural regeneration.

The other major problem with current forest exploitation practices is their impact on other species of flora and fauna in the forest. A host of "minor" forestry products is in fact quite valuable and an important, though largely informal, source of income and employment. These include: rattan (Indonesia's $50 million rattan industry is threatened by the conversion of tropical humid forests where the canes grow), damars (these valuable resins are used as sealants, caulking, and in pharmaceuticals, paints and cosmetics), herbs and drugs (with the development of modern factories to produce traditional medicines, many of the species in demand are becoming rare), and wildlife (the large trade in endangered species in Indonesia is generally unregulated).

Marine and Coral Reef Species

The diversity of species in Indonesia's coral reefs and seas is not well known but is certainly quite large. As in other fields, the government takes a narrow, production-oriented viewpoint and has focused on a few species for intensive export-oriented production (shrimp, milkfish and tuna). For reefs, for example, the aquarium fish trade is completely unregulated and poses a potential threat to the biological interdependency of reef habitats, as does the poisoning and dynamiting of reef fish.

Germ Plasm of Cultivated Plants

Large numbers of wild and semi-domesticated varieties of cultivated plants exist in Indonesia. However, since the government began emphasizing high-yielding varieties of rice fifteen years ago, at least 1000 rice varieties have been lost. Little attention has been given to farmers' own

activities in the breeding and maintenance of genetic resources, although non-governmental organizations are interested in working with farmers to address their needs and interests and to give them individual power over these resources' management.

In general, little effort is made to develop indigenous plants and their potential for fodder, soil conservation or other uses, or to investigate the economic potential of underexploited species. Rather, there is a disturbing tendency to rely heavily on exotic species, which are often susceptible to local pests and diseases and may actually reduce the biological diversity of some habitats. This problem is complicated by the lack of rice and non-rice breeders, taxonomists, other staff and funding.

National Parks and Reserves

The current strategy for preserving Indonesia's "option values" in biological diversity is through the establishment of national parks and forest reserves. Currently, about 18.7 million ha of Indonesia's forest lands are in these categories of land use. Future plans include the designation of 19.5 million ha of protection forest, 6.7 million ha of nature reserves, and 9.3 million ha of marine reserves. Aside from the lack of clear guidelines on how these areas should be selected and managed, the government's plans have been seriously set back by the budget austerity policies in place since 1984. These problems are exacerbated by poorly trained and motivated staff, the uncertain legal status of some parks and their exploitation by branches of the Ministry of Forestry, and the removal of indigenous peoples (who usually know and understand forests) from parks and reserves.

3.7 INDUSTRY AND INFRASTRUCTURE

As Indonesia shifts toward economic diversification and modernization, its industries' generation of liquid and solid wastes is a growing concern. The major problem at present is the lack of adequate treatment facilities, followed closely by an apparent reluctance of the government to come to grips with increasing evidence that pollution, particularly of water resources, is causing problems. Other issues of concern include limited attention to zoning issues and occupational health and safety, as well as poor site selection, inappropriate design, poor construction standards, and inadequate operation and maintenance practices.

Pollution

Indonesia's most serious pollution problems can be attributed to the processing of agricultural and forestry products, mining, manufacturing, and the petroleum and petrochemical industry. These problems are exacerbated by the country's lack of sanitation and waste disposal facilities. The analysis of industrial pollution in Indonesia can only be a qualitative one at this point because of the paucity of data on the subject, the government's reluctance to release data that have been collected and general lack of knowledge on the interactions of selected pollutants.

In addition to the use and disposal of toxic chemicals, the production of effluents and toxic wastes for agricultural and forestry industry processes is a very serious and fast growing problem in Indonesia. Discharges from large-scale and small cottage industries pollute rivers and other water bodies through uncontrolled discharges. These include: high biological oxygen demand loading and depressed pH in receiving waters from cassava and palm oil processing, alcohols and mineral spirits from molasses processing, pentachlorophenol (a highly toxic carcinogen), and coral reef damage, bark and sawdust from wood treatment.

The major pollution problems associated with mining include erosion resulting in turbidity, sedimentation and the loss of fertile soils; degraded water quality from carcinogenic heavy metals leaching from waste rock; loss of usable land as a result of the absence of land reclamation; and fugitive dust emissions. The results include adverse human health effects, reduced water quality and fisheries habitat, and degraded agricultural land.

Industry

With rare exception, industrial process wastewater from Indonesia's major manufacturing centers is discharged untreated into rivers or directly into the ocean. At present, the Industrial Estate Rungkut in Surabaya is the only known operational treatment plant for industrial wastes in the country.

Industrial pollution is particularly severe in Jakarta Bay and in the rivers and canals that drain the city of Jakarta. The concentrations of cadium, chronium, lead, chloride, ammonia, detergent, phenol, oil and grease in these waters all exceed permissible levels. In addition, groundwater quality in Jakarta has deteriorated significantly as a result of excessive withdrawal and pollution by industrial and sanitary waste discharged to surface water throughout the watershed. In Jakarta Bay, mercury, lead, copper, zinc, PCB and DDT concentrations exceed the water quality criteria established by the Indonesian government. As a result of these and other problems, the Ministry of Population and the Environment has identified ten industrial zones where hazardous waste disposal is a critical problem.

As an important producer of oil and gas, Indonesia faces pollution problems from oil spills and wastewater effluents from plants and refineries. Specific problems include oil slicks and tar balls on beaches around Jakarta Bay, adverse impacts on coral reef habitat in East Kalimantan, and the establishment of a major refinery adjacent to the only significant mangrove estuary on the south coast of Java.

Zoning

The most important industrial zoning concerns in Indonesia are: the removal of land from agricultural production, decreased watershed protection as a result of site location or expanded work force, the conversion of coastal habitat to industrial uses, and the location of potentially hazardous facilities near human settlements (e.g., the proposal to site a

large nuclear power plant on Java by the end of the century). Several ministries have now begun to meet to formulate a special planning concept for integrated industrial development in Indonesia.

Industrial Health and Safety

Because of the high population density in industrialized areas of Java, the exposure of workers to hazardous materials and working conditions is an important environmental concern, specifically in regard to respiratory diseases from extensive cement operations. Pesticide contamination through skin contact and ingestion is a concern in the agricultural sector. Although there is much knowledge of environmental health issues in the academic community, the linkages to applied research are not strong.

Infrastructure

The country's extensive resources and their distribution over many islands at varying levels of socio-economic development pose a formidable range of infrastructural environmental impacts. First, Indonesia's oil, gas, coal and other minerals are principally located in relatively unsettled areas where they heavily affect forest, coastal and marine environments via access roads, railways, surface mining, processing and storage facilities, and power facilities. Second, the rapid development of forestry products industries in Kalimantan and Sumatra required the sudden infusion of infrastructure in fragile forest environments, causing soil erosion in addition to problems of forest products waste handling and disposal. In addition, the lack of maintenance of timber roads may lead to erosion and landslides. Timber roads also have become easy conduits for illegal logging and settlements. Third, impoundments and irrigation systems constructed on the rainfed uplands, compounded by inappropriate land use and management, are a significant cause of landslides and erosion. The steady increase in the number of very large dams for power, flood control, fisheries, and water supply on Java is a major source of encroachment of agricultural land and the displacement of population. The potential problems in this area include poor siting and maintenance, and the eutrophication and/or contamination of reservoir water from natural and industrial pollution sources. Fourth, adverse impacts from the construction of pipelines, roads and telecommunications facilities on both Java and the Outer Islands include land displacement, adjacent erosion, leaks and explosions, and aesthetic losses. Last, the major cities on Java and some of those on Sumatra and Kalimantan are already facing serious health and environmental problems owing to the lack of waste disposal and sanitation systems or their poor maintenance. The development of sustainable infrastructure in this area depends on: 1) the development of non-polluting industrial technologies or the incorporation of systems of waste material recycling at the point of discharge, and 2) the incorporation of active public participation in the design of urban community sanitation and waste disposal systems to ensure their proper siting, operation and maintenance.

3.8 HUMAN SETTLEMENTS AND HEALTH

The influence of economic development on the growth and distribution of human settlements and the resultant environmental impacts are interesting in the case of Indonesia because of its island nature. The growth of new settlements, as opposed to population increases in existing settlements, is particularly noteworthy in the Outer Islands due to new resource exploitation technologies (in oil, gas, minerals and forest products, for example) and transmigration. The rapid growth of new settlements on the Outer Islands has often been poorly planned, with the exception of some petroleum-related settlements in remote areas, or highly disruptive to existing settlements and the surrounding environment.

Several other types of settlements in Indonesia have damaging effects on the environment and the physical quality of life. For example, ribbon development following major highway construction and follow-on settlements in areas where roads have penetrated previously unsettled areas (e.g., Aceh) have led to a flood of roadside houses and commercial establishments exploiting the nearby environment. For settlements around industrial areas, the immediate environmental impacts arise from land conversion and later the progressive degradation of air and water quality. This pattern can be seen in Java's coastal cities (Jakarta, Semarang and Surabaya) and inland cities (Bogor and Bandung) alike. The environmental impacts caused by seasonal, commuting and permanent migrants to settlements around resource extraction and processing industries include land conversion, rapid land price speculation, degradation of air and water quality, increased social disorder, and rapid, unplanned physical development. This pattern can be seen in the oil or steel "boom" towns in Sumatra, Kalimantan and Java.

Indonesia's large population has also led to the growth of human settlements in environmentally unstable areas throughout the country, but especially on Java and Bali. The types of inappropriate settlement patterns include settlement on active volcano slopes, upland and mountain slopes prone to erosion, and lowland, flood-prone or swampy areas.

Administrative Aspects of Settlements

To reduce the administrative responsibilities of the village government, the Ministry of Home Affairs adheres to a rigid policy of splitting up and creating new villages when they have reached a pre-determined population size. Often, the effect is to disrupt important resource management relations in the village or throw them back to the household level, and to damage village and sub-village organizations such as cooperatives, farmer associations and extension groups. Arguably, this practice is counter-productive to a sustainable development strategy which requires continuity in economic relationships.

In the cities, squatter settlements, which are almost always illegal, are not served by public services such as health and education. Nevertheless, squatter groups such as scavengers are important to urban resource and environmental management. In Bandung, for example, scavengers collected as much household and commercial garbage in 1982 as the city's

garbage collection system. Although Bandung's official response to its scavengers has been a negative one, Surabaya has embraced the concept of assisting scavenger groups to help manage the environment.

Household Resource Management and the Environment

In Indonesia, the largest resource management sector is the millions of urban and rural households. To a much greater extent than in industrial countries, Indonesian households have more autonomy as economic production and service enterprises. The vast majority of manufacturing and service enterprises in Indonesia employ less than five people; many of these are household-based enterprises.

To some extent, the Indonesian government recognizes this and a few programs are oriented to the household as a resource and production management unit, for example, the Family Welfare Education program (PKK). Unfortunately, this program does not very effectively address the household's actual economic and technical production needs, largely because it is inappropriately designed. To a considerable extent, household resource production activities may be assisted only at the local, community level through the support of self-help organizations and independent cooperatives rather than the unwieldy central government approach.

Health

The main causes of overall morbidity in Indonesia are diarrheal and infectious diseases, while the major contributors to morbidity are upper and lower respiratory infections (which have risen rapidly in prominence in the past fifteen years), skin and eye infections, intestinal parasites, and vector-borne diseases, especially malaria. The highest risk groups are poor children under the age of five and poor women of reproductive age. These two groups comprise a third of all deaths in Indonesia.

The principal causes of this morbidity and mortality pattern have very strong relationships to environmental conditions and poverty. They include: high population densities (Java and urban areas), high environmental fecal contamination (urban and some rural water supplies, food contamination), unprotected water supplies, poor hygiene practices, sub-standard housing, and high vector densities.

Malaria seems to be a significant, though declining, health problem in Indonesia. On Java and Bali, a long history of vector control has reduced the incidence of malaria to around 1 case/1000 individuals. Its incidence is higher on some of the Outer Islands, but vector control in those areas has low priority with the Government of Indonesia, except in Timor. In addition to the very weak community-based malaria control and prevention programs in Indonesia, there has been a rapidly growing vector resistence as the consequence of long and widespread spraying with DDT and other pesticides. This, in turn, has led to a more expensive and toxic, but less effective, use of secondary pesticides and other controls.

The major causes of diarrheal diseases, which resulted in approximately 400,000 deaths in Indonesia in 1982-83, are lack of access to clean water, poor sanitation, poor hygiene and poor nutrition. At present, only about 10-12 percent of Indonesians have access to clean water and slightly more to acceptable latrine facilities. These diseases are preventable through proper management of the built environment. However, this would require massive investments to provide latrines, sanitation services, clean water and other water use facilities, along with a serious commitment to maintaining these facilities.

The main respiratory disease in Indonesia related to the built environment is tuberculosis. The prevalence of infection ranges from 30-36/1000 population, although reliable estimates are lacking. The main causes of this disease appear to be housing quality and density of settlements. Estimates of lung cancer and other respiratory ailments from industrial and automobile pollution were not available and may not exist apart from a few micro-studies.

4. RESEARCH AND INFORMATION NEEDS

4.1 GENERAL NEEDS

In the area of natural resources, there are two general information needs for Indonesia. First, there is an urgent need to develop and employ agreed-upon methods of inventorying and classifying natural resources. Until resources are more completely inventoried and classified, rational policies on depletion rates, sustainable yield rates, land use planning and regional development cannot be formulated. Second, research on methodologies for assessing the cross-sectoral impacts of resource utilization is urgently needed. For this purpose, information on the physical properties of resources in specific environments and for specific uses is needed.

For the environment, there is a general critical need for a better environmental information system, including on-line computer-based systems available to all ministries or network-based systems based on individual ministries' data bases. The indexes for such systems should be kept at the Ministry of Population and the Environment. Also, more attention needs to be paid to improving information flows from specific locations to national-level agencies and vice-versa. There is also an urgent need for more specific definitions and classifications of human ecosystems according to their carrying capacity limits under a range of assumptions. Last, applied research is needed on which government agencies should have key management roles for specific production systems as well as a more clear delineation of the responsibilities of individual ministries consistent with sustainable development policies.

4.2 SPECIFIC NEEDS

Natural Resources Policies and Economics

The most important needs in these areas relate to the cross-sectoral impacts of government economic policies on natural resources and environmental management. Very little government analysis seems to be directed toward these problems; this weakness is perhaps greatest in the National Planning Board and the coordinating ministries. The major areas in which research and information is urgently needed to examine cross-sectoral impacts are subsidies for agriculture and industry; the sustainability of export diversification policies, the economics of forestry policy, the economic costs for the transmigration program, the economics of river basin management, and the development of integrated farming systems that are not dependent upon subsidies.

Institutions and Their Relationships to Natural Resources and the Environment

First, policy analysis and action-research should be conducted on the most effective and appropriate roles of government agencies, the private sector, and non-government organizations in natural resource and environmental management. It is suggested that the environmental research

centers work with provincial government and population offices in this survey and analysis. Second, current and proposed research and the data bases available within the ministries should be better catalogued and documented. Third, more systematic peer review and scrutiny of research designs and data are needed, and the relevance of research to action programs should be continuously assessed. Last, more attention should be paid to low-cost research methods and participatory action-research in order to obtain more representative research results on more human ecological problem areas.

Geography and Land Use Classification

One of the highest priority needs in this area is for land capability studies and their integration into a uniform land use planning system. In addition, there is a need to develop methods of anticipating and dealing with natural disasters such as volcanic eruptions, floods, forest fires and landslides.

Water Resources

In the area of water supply, research should focus more on low-cost, easily maintained water supply systems for households, industry and irrigation. In the area of water quality, because huge investments in urban water systems are being planned and undertaken, the focus of research should be on operation and maintenance systems involving the close participation of the water users. Also, research into appropriate water quality indicators and point source pollution is necessary for any environmental management program.

Agricultural Sustainability

In the area of the viability of monocultural production systems, information is needed on cross-sectoral impacts of target-driven systems, including agricultural pollution, socio-economic impacts, and loss of genetic variability of indigenous horticultural varieties of plants. In the area of employment and income linkages in agriculture, research and information are urgently needed to assess the potential and current situation of building up forward linkages in post-harvest processing, storage, and the marketing of agricultural production in rural villages and market towns. This need is increasingly important as traditional wage labor opportunities continue to decline. In the area of marginal land agriculture, groups like KEPAS are beginning to address the sustainability of modern agricultural systems on marginal lands and the impacts of traditional cropping systems that are being transferred to new and different agro-ecosystems. This research should be expanded and linked to government policies and programs for exportable crop diversification, estate crops, agroforestry, transmigration and others. In addition, much more attention should be given to research into traditional agricultural systems. In the area of extension, training and organization, much greater emphasis on socio-economic, anthropological and action-research approaches in traditional and improved community management systems is urgently needed.

Forests and Forest Environments

The primary research needs in this area are: forest survey methods and the classification of species; up-to-date, continuous and more complete forest inventories; basic and applied research on dipterocarp growth and reproduction cycles, on natural and enrichment forest regeneration, on the effects of different cutting methods and cycles, and on the economic and commercial value of non-dipterocarp species; research on the current uses, value and management needs of minor forest products; research on better forest management; and research on national parks management.

Coastal and Marine Environments

The basic research needs in this area include: the effects of pollution on pond, riverine and paddy fish culture; the degradation rates of pesticides in various water systems; food chain linkages of pesticide contamination; the effects of mangrove conversion on coastal erosion and coastal fauna breeding; appropriate harvesting techniques; the effects of hazardous waste disposal on coastal environments; changes in reef habitats and environmental quality from coral exploitation, harvesting of coral reef fish and pollution of coral reefs; and the storage and preservation of freshwater and marine fish using low-cost methods.

Biological Diversity

Very little research has been done in this area given Indonesia's unique status in terms of biological diversity. In the area of taxonomic classification, working with indigenous tropical forest peoples to discover what they know of the flora and fauna and developing some research-cum-education capability to enable them to become conservationists in national parks and preserves is needed. In the area of in situ preservation, work should be conducted with the National Germ Plasm Commission to provide support for developing a network of provincial germ plasm preservation centers.

Industry and Infrastructure

Research should be conducted into the links between increasing emphasis on crop diversification and consequent changes in nutritional availability, the feasibility of community-designed and managed sanitation and waste disposal and resource recycling systems, and better public education and information on environmental health issues and preventive measures.

Watershed Management

In the area of river basin development and management, research needs include: the transferability of watershed management techniques, particularly to soil and water conservation technologies; research on the sustainable uses of different kinds of soils for both Inner and Outer Island watersheds; improved inventorying and classification of soils; and action-research on socioeconomic aspects of watershed management.

5. INDONESIA'S NON-GOVERNMENTAL ORGANIZATIONS (NGOS)

The citizens' environmental movement in Indonesia has been steadily growing since the Ministry of Population and the Environment was established in 1978. Today, it is estimated that there are over 600 NGOs working on environmental activities in Indonesia. These organizations range from small, unsophisticated grass roots organizations working at the community level to medium and large established organizations which operate at the national and provincial levels, to national-level issue-specific networks which undertake advocacy, research and "lobbying" activities. Many of these latter organizations also cooperate with international networks and funding agencies.

Indonesian NGOs differ from their western counterparts, which are generally concerned about the environmental impacts of industrialization and consumerism. The Indonesian environmental organizations seek sustainable development for the rural and urban poor who depend on the environment for their livelihood. To this end, they seek support from public academic institutions, and even the private sector, as well as the government through ongoing dialogue and low-key lobbying efforts.

The majority of Indonesia's environmental NGOs, especially the development and advocacy/public awareness groups, are based in Jakarta and West Java. Although increasing attention and support are being directed by NGOs and others toward developing efforts in the Outer Islands, there is concern that the West Java and Jakarta NGOs tend to cooperate for funding and increased strength, to the exclusion of the Outer Island NGOs.

Another area of concern has recently emerged among NGOs. In 1985 the government issued a decree calling for NGO registration with a governmental ministry. NGO spokespersons have expressed concern over the implication of this law, which may restrict NGO activities, especially in sensitive areas where criticism of GOI policies and implementation is inherent (e.g., transmigration, industrial development, forest mining and logging). However, some hope that registration may lead to better understanding and cooperation with the ministries, with the government's initial awareness of NGOs' existence and programs being the first step.

5.1 ASSESSMENT OF NGOS

Many NGOs have grown rapidly in the past five years, in terms of both quality and quantity. These organizations have also become a popular medium for the expression of public concern, as evidenced by the frequent publicity they receive and the increasing numbers of environmentally related articles in the media. NGOs have trained and developed their own staff and generated support in other sectors as well. Nationally, the strength of environmental NGOs has been recognized in several ways: by providing testimony to the Indonesian Parliament and their dialogue with ministries, for example. Internationally, many are represented and respected in NGO networks such as the Environmental Liaison Center, Pesticide Action Network and the Rainforest Action Network. The movement's greatest strength and most unique

characteristic, however, is probably the ability of its leaders to generate support and cooperation from all sectors. This is the result of NGO leaders negotiating compromises and seeking support from outside the movement itself.

Although the Indonesian NGOs have exhibited remarkable growth and have taken their place in the domestic and international scene, they have many weaknesses from a donor's viewpoint. The most obvious is what appears to be a lack of professionalism and experience among the NGOs in their dealings with donor and international agencies. This is true of the larger, more established NGOs who often become overburdened with funding requirements and projects, and the smaller NGOs which still lack resources or sufficient project management skills to enable them to maintain desired standards. On the lowest level, the grass-roots NGOs lack all capacity to handle the amounts of funding from large international donors. These weaknesses effectively limit the actual number of organizations that might meet donors' criteria to perhaps fifty to seventy. In addition to management problems, most NGOs also have shortcomings in conducting applied research and collecting data because of limited equipment, experience, and know-how. NGOs in general also do not document their experiences; often, the most effective NGOs are the least known because they do not take the time to promote themselves.

5.2 NGOS AND BIOLOGICAL DIVERSITY

There has been a recent increase in NGO activities in this area. In February 1987, the first Workshop on Community Participation in Germ Plasm Conservation was held, and NGOs attended a seminar hosted by scientists from the National Institute of Biology on the same issue. Many interested and qualified NGOs are anxious to get biological diversity projects underway. Some promising areas in which NGOs are currently working on a small scale include: social forestry in Kalimantan, community nurseries and seed banks, development of national park buffer zones, national park development through wilderness tours, research on appropriate indigenous farming systems, integrated marine and coastal zone habitat conservation and fisheries development, apprenticeship of NGO staff biologists and university and government collection and breeding agencies, a newsletter and publications on biological diversity, and national and regional networks for biological diversity.

6. CURRENT USAID AND OTHER DONORS' ENVIRONMENTAL ACTIVITIES

6.1 USAID ENVIRONMENTAL ACTIVITIES

Of the USAID/Indonesia Mission's thirty one projects for FY 87, two have a primary focus on natural resources management. One is designed to promote soil conservation and raise farmers' incomes by improving farming systems, technologies and management in upland watersheds and the other is designed to develop a plan for watershed management. Several project activities secondarily include elements of natural resources management. These include assisting the Ministries of Agriculture and Public Works to develop and conduct, respectively, environmental impact assessments, promoting the sustainable production of secondary food crops, and improving research capabilities in fisheries production. Through addressing vector control, a number of health projects focus on environmental issues at a macro level. By reducing the population growth rate, the Mission's family planning program reduces the growth in pressure to exploit resources with practices that degrade the environment. The Mission also provides grants to Indonesian non-governmental organizations in support of environmental activities. Last, AID/Washington's central funds support five projects with natural resources management activities in Indonesia, and through the ASEAN portfolio, AID regional funds support three such projects.

6.2 AID'S ENVIRONMENTAL AND NATURAL RESOURCES RESPONSIBILITIES

AID is under a court order to implement a program to assure that the projects it finances are environmentally sound. Several Congressional directives and agency procedures address environmental and natural resources management concerns, including 22 CFR 216, issued by AID in 1976, which establishes procedures so that decision makers can be informed of the environmental impacts of proposed projects.

Congress has passed a series of mandates authorizing AID to conduct proactive work in environment and natural resources, tropical forestry, and biological diversity. It has requested that annual reports and presentations be provided to Congress concerning AID activities to support these mandates. In addition, Congress has extended the principle of the review of projects to assure environmental soundness to include those projects supported by multilateral development banks. These are briefly discussed below.

As a result of considerable pressure from U.S. environmental groups, Congress passed the 1986 amendment to the Foreign Assistance Act. The amendment required that increased attention be given to the conservation and management of tropical forests in U.S. foreign assistance programs. This legislation requires AID to give higher priority to the conservation and sustained management of tropical forests by conserving forest lands not yet degraded and increasing production from lands already cleared, support projects that offer employment and income and that provide sustainable alternatives to shifting cultivation, conserve and manage watersheds and rehabilitate deforested lands, and others.

Acknowledging the critical nature of the problem of conserving biological diversity, Section 119 of the 1986 Foreign Assistance Act calls for AID to actively promote the protection and maintenance of wildlife habitat and the development of sound wildlife management and plant conservation programs. Four separate categories of action have been identified in the requirements of Section 119: protected areas management; special studies; maintaining or enhancing renewable resources, managing natural resources, or monitoring the quality of the environment; and genetic variation.

In 1986, Congress passed legislation requiring the AID Administrator to monitor the development activities of the multilateral development banks and identify projects that may or are known to have significant adverse environmental effects.

6.3 DONOR SUPPORTED PROGRAMS IN ENVIRONMENT AND NATURAL RESOURCES

A number of bilateral, multilateral and non-governmental organizations (NGOs) actively support environmental and natural resources activities in Indonesia. Active donors in this area include the Asian Development Bank, Australia, Belgium, Canada, Denmark, Federal Republic of Germany, Finland, France, Italy, Netherlands, Japan, Switzerland, United Kingdom, United States, United Nations Development Programme and the World Bank. Specialized studies and technical support are provided by the United Nations technical organizations and the World Health Organization. Important NGO funded programs are also supported by Biology Tropical, CARE, National Cooperative Business Association, Ford Foundation, World Environment Center and World Wildlife Fund.

About 61 percent of donor assistance in these areas is directed toward water supply, wastewater management, and solid waste management. Many of these projects are being supported by the UN-sponsored International Drinking Water and Sanitation Decade. Donor assistance in the area of water and waste management is dominated by the Asian Development Bank ($132 million) and the Netherlands ($179.6 million), with significant support provided by Australia, Canada, Federal Republic of Germany and Switzerland. The total assistance in this area is $415.4 million.

Around 10 percent of donor assistance directed towards the environment and natural resources goes to forestry projects ($71.1 million). The largest donor is the Asian Development Bank. In addition, the World Bank is now reviewing the feasibility of a major project in forestry which would support forest policy, inventory, planning and management.

About 13 percent of donor assistance in these areas ($87.5 million) is devoted to water resources and watershed management programs. The development of regional management plans is the focus of these donors' activities, with support being provided predominantly by the Netherlands.

Other environmental and natural resources programs account for 16 percent ($110.1 million) of donor activities in these areas. These activities include investments in the conservation of biological diversity;

additional activities in agro-ecosystems research; coastal, marine and fishery resources; integrated pest management; natural resources inventories; and industrial pollution control. In addition, the pending preparation of Repelita V, which will serve as the national economic development plan for the period 1989-94, has resulted in a number of donors supporting the preparation of sectoral reviews of the environment and natural resources.

7. CONSTRAINTS TO SUSTAINABLE DEVELOPMENT AND RECOMMENDATIONS FOR ACTIONS

Sustainable development is the management of resources so that the basis of people's future livelihood and welfare are not jeopardized. Management systems that ignore the future value of resources and lead to irreversible resource degradation work against sustainable development. In this context, many aspects of Indonesia's development strategy are not sustainable. This section examines the critical constraints to general and sectoral sustainable development in Indonesia based upon the analyses of the environmental and natural resources issues addressed here. Following this, recommendations are made to address these constraints.

7.1 GENERAL CONSTRAINTS TO SUSTAINABLE DEVELOPMENT

While the term sustainable development has been used in both Repelitas III and IV, little attempt has been made to refine and develop sectoral and inter-sectoral policies consistent with the concept. As a result, broad economic policies and strategies are often translated into singular goals and targets for sectoral policies, and natural resources management concerns appear to receive low priority. Moreover, the need for a coordinated intersectoral approach to environmental and natural resources management issues is lacking in Indonesia.

A number of formidable institutional constraints stand in the way of implementing a sustainable development strategy. First, the widespread lack of government ministries' internal integration leads to inefficient and wasteful uses of funds and personnel and the development of inappropriate policies. Second, the lack of commitment to cooperation and inter-departmental coordination on inter-sectoral projects, including those in which donors are involved, leads to the inefficient and ineffective use of aid funds with the result that the critical function of donor assistance is sharply diminished. Third, there is a low level of participation by the intended beneficiaries of development programs, particularly in natural resources management projects. Last, because of the lack of coordination and cooperation among ministries, planning and environmental impact evaluation capabilities at the critical local and regional government levels are very poor.

7.2 GENERAL RECOMMENDATIONS FOR SUSTAINABLE DEVELOPMENT

Recommendations for Donors

Three recommendations for donor action at a general level are made here. First, at the policy level, better donor coordination should be encouraged, particularly concerning the reform of institutional procedures. Second, at the project and program levels, donor assistance agencies should emphasize decentralization and local participation in their projects. Third, donor agencies should incorporate information management and

management information systems in all projects affecting natural resources and the environment to improve their cost-effectiveness and sustainability.

Recommendations for AID

For some time, AID has been trying to encourage the reform of development administration through its project design mechanism. We recommend that this be continued and also that AID take the lead with other donors and with key Indonesian agencies such as the National Planning Board to engage in a policy dialogue on institutional reform aimed at sustainable development.

7.3 SECTORAL CONSTRAINTS AND RECOMMENDATIONS

In addition to the broader area of economics and policy, seven key sectors have been identified where constraints to sustainable development are particularly critical. These constraints are summarized and followed by recommendations for donor action.

Resource Economics and Policy Constraints

Constraints: The widespread use of subsidies has led to increasingly negative sectoral and cross-sectoral impacts, especially in agriculture and industry. Heavy subsidies are becoming a major constraint not only to the viability of the agricultural sector itself, but also to the responsiveness of the development budget as a whole, especially in a period of static or declining government revenues.

Sustainable natural resource management is often thwarted by short-term management practices. A largely centralized development management approach has led to a distorted emphasis on "projectizing" the development process, which results in creating new projects for short-term employment and funding dispersal purposes. Too little emphasis is placed on the long-term viability of projects and programs, the potential for waste of funds due to poor project design, and the implementation of and attention to ongoing operation, maintenance and intensified use of existing project infrastructure. The short-term project approach frequently leads to a high likelihood of cross-sectoral conflicts, negative environmental impacts, and ineffective use of scarce human, economic, and physical resources.

Recommendations for Donor Action: The IGGI group of donor countries, through their heavy investment programs and policy dialogues with the GOI, reinforce distortive economic policies in the areas of natural resource use and management. Therefore, they should take the lead in promoting policy and institutional reform in this field. (1) Donor agencies should undertake policy dialogues and a review of their and the GOI's project design, implementation, and maintenance components of sectoral programs to encourage the sustainable use of resources and environmental safeguards. The key agencies on which to focus include the National Planning Board, Agriculture,

Forestry, Industry, Mines and Energy, Public Works, and Transmigration. (2) Donor agencies should emphasize stricter analysis of proposed projects from the viewpoints of resource and environmental economics, better accountability of funds, abolition of monopolies and commodity cartels, and education and training of government personnel in resource and environmental economics and management techniques.

Agriculture

Constraints: The principal constraints to sustainable development in agriculture are related to institutional practices and policies. They include: (1) the Ministry of Agriculture (MOA) remains oriented towards centrally directed primary production; (2) top-down institutional structures and policies (e.g., area targeting and subsidies) are unsustainable, particularly for non-rice cropping systems; (3) inattention to post-harvest processing and support for rural industries and services for agriculture and marketing; (4) agriculture R&D efforts have largely failed to incorporate inter-disciplinary approaches, thus threatening future sustainable production in the non-rice sector; (5) agricultural pricing policies and input provision systems are unsustainable and have serious negative cross-sectoral impacts; and (6) the current imbalance of inputs into agricultural policy formulation between the MOA and the National Planning Board is a impediment to rational sustainable program development.

Recommendations for Donor Action: Donors should: (1) promote integrated pest management and research and extension on pests of secondary and estate crops; (2) assist with the coordination of an integrated and focused program for agricultural research, particularly in the development of integrated farming systems and agro-ecosystems approaches; (3) assist in broadening the mandate of the MOA beyond a production-led approach to agricultural development and expanding its role in policy decisions made by the National Planning Board; and (4) make effective inter-ministerial coordination on environmental matters and the reform of procedures which inhibit coordination a higher priority for further lending in agriculture.

Recommendations for AID Action: AID should: (1) broaden its agricultural development policy dialogue with the GOI to include sound environmental and natural resources management policies; (2) support alternatives to pesticide subsidies by strengthening the GOI's capabilities to carry out research and programs in integrated pest management; (3) provide training, technical assistance and funds for selected policy studies to the MOA to strengthen its ability to conduct natural resources policy analysis, develop and implement environmental impact assessment procedures (an immediate priority), and develop a land capability and analysis program; (4) assist the GOI to develop a comprehensive strategy to institutionalize farming systems and agro-ecosystems research; and (5) support research on the sustainability of natural fisheries, with particular emphasis on the economic and environmental effects of habitat conversion on natural fish stocks, particularly for tambak in Sulawesi.

Forestry

Constraints: The forest exploitation side of forestry, and to a lesser extent, nature conservation, are major problem areas for a sustainable development strategy. The principal constraints on forestry in Indonesia include the following: (1) the lack of forest policies focused on long-term sustainable use; (2) lack of cooperation by the Ministry of Forestry (MOF) with other government sectors, especially in Outer Island forest management; (3) serious management deficiencies in internal ministerial integration and coordination, particularly among the R&D, inventory and classification, and exploitation sections, which magnifies problems of sustained use of tropical forests; (4) the lack of public participation in the formulation and evaluation of forest management policies; (5) the lack of direction and long-term planning for a research program on the effective regeneration of hardwood species; (6) inadequate staffing to effectively monitor harvesting, regeneration, and reforestation and enforce technical guidelines; (7) the approach towards establishing timber estates is technically and economically questionable (the emphasis on doubtful short-term gains at the expense of long-term viability of hardwood forests is of great concern); and (8) the lack of constructive involvement of indigenous forest-dwelling peoples in forest land management has serious economic and human rights costs and dangers.

Recommendation for Donor Action: The critical areas for donor action are in: (1) major reform of forestry policies; (2) forest inventorying, classification, and land use planning; (3) legal reform and clarification of concession agreements, rights, responsibilities and tenure; (4) intensive research on dipterocarp growth, reproduction, and ecology; (5) Ministry of Forestry forest management and technology; (6) development of national parks and reserves; (7) integration of forest utilization, national parks, and watershed management, especially on the Outer Islands; and (8) the technology and management of the Greening and Reforestation Program.

Recommendations for AID Action: Given its Congressional mandate, AID should: (1) promote donor coordination in developing a consensus on forestry policy reform for the 1988 IGGI meeting. Suggested issues are the decentralization of forestry policymaking and implementation; encouraging intersectoral cooperation on the optimal utilization of forestlands; designing appropriate incentive systems for managing production and reforestation programs and for protecting reserves and conservation areas from encroachment; and improving monitoring and inventorying of forestlands; (2) provide support for non-governmental organizations' activities and programs aimed at developing grassroots participation in forest conservation and management and alternatives to current forest utilization patterns; and (3) based on its watershed projects, AID should work with the Ministries of Forestry and Agriculture to develop appropriate agro-forestry systems for the protection of critical lands.

Coastal and Marine Resources

Constraints: The following constraints greatly affect the sustainability of production based on coastal and marine resources: (1) the

irreversible degradation of reef habitat leads to the permanent loss of fisheries, reduces income generation and employment from fisheries and tourism, and has serious long-term impacts on shore protection and coastal erosion and (2) the loss of mangrove habitat has a major impact on nursery areas for shrimp and other marine species and shore erosion and deltaic formations.

Recommendations for Donor Action: It is recommended that donor countries: (1) follow the research being undertaken under the ASEAN Coastal Resources Management Project, which will identify further research and action projects on mangrove forests and bay and estuarine ecology; (2) consider development efforts for coastal artisanal fishing communities which could significantly relieve environmental pressures on the coastal resource base; (3) improve donor coordination and concensus on industrial project lending policies; (4) address the problem of offshore solid toxic and hazardous wastes disposal, especially on Java; and (5) assist the GOI to develop intersectoral coastal resources management capabilities.

Recommendations for AID Action: Efforts should be made through the Fisheries Research and Development project to examine the sustainability and ecological impacts of marine and brackishwater fish habitats development.

Biological Diversity

Constraints: With the highest or second-highest number of species in the world, Indonesia's lack of attention to conserving these natural resources is alarming. The primary constraints to conservation are: (1) inadequate resources for inventorying and classifying species, and for the protection and preservation of habitats and germ plasm; (2) Indonesia's policies on tropical forestry greatly limit the number of species that can be harvested as exploitable quality timber, which results in excessive area cutting and greater species loss; (3) the government has taken a narrow, production-oriented viewpoint on the exploitation of marine resources; (4) Indonesia's germ plasm stock is being depleted because traditional practices and the impacts of new technologies have not been evaluated; and (5) the government lacks clear guidelines and adequate budget for the selection and management of national parks.

Recommendations for Donor and AID Action: It is recommended that: (1) any project involving national parks, forest reserves and protection forests should include an explicit component on the preservation of biological diversity; (2) agricultural projects should rigorously review the impact of their proposals on the preservation of indigenous germ plasm and local cultivars; (3) Indonesian NGOs should be strengthened to promote the conservation of biological diversity through policy and scientific studies, public education, training, and development of tourism; (4) an assessment of measures that should be taken to promote the conservation of germ plasm in Indonesia, including a detailed review of the potential for using AID's PL-480 funds to purchase and manage reserves considered to be of critical international importance, should be funded; (5) inventories of biological resources should be funded; and (6) AID should assist in the development of management plans for national parks and provide training for staff in national parks management.

Industry and Infrastructure

Constraints: A general constraint to Indonesia's sustainable industrial and infrastructural development is its reliance upon non-renewable resources, including energy. It is important that Indonesia carefully reviews the kind of industrial production technology it adopts or develops, and assesses its consequences for productive employment, dependency upon foreign inputs and expertise, and its cross-sectoral environmental impacts.

Specific constraints include: (1) water quality issues receive low priority and there is inadequate funding for research into the sources of pollution and the cross-sectoral impacts of industrial development; (2) the low priority on adequate operation and maintenance procedures and funding threatens water resources and infrastructure; (3) there is a general lack of knowledge and interest in material recycling which is a serious constraint to future urban and industrial development; and (4) the environmental impacts of agricultural chemical industries and agroprocessing industries are largely unregulated, which is leading to soil and water degradation and adverse health effects.

Recommendations for Donor Action: The team strongly recommends that donors carefully review their investments to see whether the above-mentioned constraints are being addressed. Of immediate concern is the need for action on the effective management of toxic and hazardous wastes which are becoming a major health problem and threat to water resources, coastal fisheries, and human health, particularly in the urban areas of Java. A second concern would be policy dialogue on the reform of the Ministry of Agriculture's policies to permit examination of backward and forward industrial linkages in agricultural production.

Human Settlements and Health

Constraints: The principal issue in the health sector relating to environment and natural resources is the Ministry of Health's (MOH) low level of involvement with other ministries whose activities have major health and nutrition impacts (Agriculture, Public Works, Industry, and Manpower). In addition, the GOI has not adequately studied the effects of pollution on human health, occupational health and safety issues, environmental problem with population migration, and women's changing roles and their impacts on resource use.

Recommendations for Donor Action: It is highly recommended that donors work with the GOI to: (1) take explicit account of community socio-cultural perspectives and attitudes on health and sanitation in the design and implementation of water supply and sanitation projects; (2) assist the GOI to improve occupational health and safety regulations and supervisory capabilities; (3) improve local and regional governments' analytical and planning capabilities in the envionmental effects of population migration; and (4) evaluate the impacts of development activities on women, the poor, and indigenous people, particularly in reference to health, nutrition, and population movements.

Watershed Management

Constraints: Several key weaknesses in the policy framework for watershed management constitute significant constraints to sustainable development in this critical resource and environmental management area. They include the following: (1) there is inadequate integration of total river basin planning and management. River basin master plans tend to be descriptive and static and only loosely connected with management needs and capabilities; (2) reference to watershed functions and plans in land use planning for sectoral development is generally lacking. This problem is very apparent in Outer Island watersheds; (3) inadequate attention is given to the middle and lower reaches of river basins in terms of soil and water management and research; (4) the government's approach to watershed management technology is too standardized and non-site specific. This problem is compounded by an assumption that there is a need for unsustainably heavy subsidies to promote technology adoption; (5) there is inadequate understanding of the basic sources and causes of upland erosion and appropriate remedies due to inadequate research on erosion, farming systems and socio-economic research and an overemphasis on construction activities. The failure to clarify ambiguous land tenure situations has increased the likelihood of destructive land use practices in the uplands; (6) there is insufficient monitoring of the effects of sedimentation rates on the economic life of impoundments; and (7) attention is lacking on the effects of agro-and other chemical and heavy metals waste disposal on water quality.

Recommendations for Donor Action: Donors should: (1) improve communication on issues surrounding land use planning, infrastructure design and siting, watershed management planning, and technologies and farming systems research on marginal lands within the river basin context; (2) emphasize policy dialogue with the National Planning Board's Watershed Committee and the Ministry of Population and the Environment on the state-of-the-art of Indonesian watershed planning and management; (3) support research and experimental action-research on water supply and quality in the upper and middle levels of river basins; (4) maintain and extend technical assistance and experimental projects on river basin planning and management with local and regional governments; (5) undertake experimental watershed management projects on Outer Islands; (6) work more closely with the Watershed Management Technology Center in Solo, Central Java to develop better watershed inventory methodologies; (7) support action-research, training, and the exchange of information on community environmental management systems which do not depend upon heavy external subsidies and imposed management systems; and (8) support policy analysis on the cross-sectoral impacts of upper watershed activities on the middle and lower reaches of watersheds.

Recommendations for AID Action: To assist the GOI in developing and implementing policies in natural resources management, AID should: (1) support investigations on the cross-sectoral and other impacts of upper watershed activities on the middle and lower reaches of watersheds. These investigations might initially be focused on Inner Island conditions and later be broadened to address Outer Island conditions. The Inner Island

efforts would include: (a) studies to test the hypothesis that reductions in on-farm erosion provide downstream benefits, (b) economic analyses to evaluate the appropriate levels of inputs and labor subsidies required to promote changes in upstream on-farm erosion and calculate downstream benefits, (c) analyses of investment programs needed to improve off-farm employment activities as a means to reduce pressure on resource use in upland areas, and (d) policy studies and a review of the GOI's proposal to begin a BIMAS uplands program. Efforts for the Outer Islands would include: (a) a study of general land use allocations and the cross-sectoral impacts resulting from inappropriate land use, (b) the relative contributions to resource degradation of different land management systems, and (c) the efficacy of current Outer Island resource management programs. In addition, AID should: (2) fund research to identify the causes of natural resource depletion and degradation, particularly for Inner Island soil erosion and Outer Island forestry resources; (3) assist the GOI to design appropriate natural resources management policies, fund micro-level analysis of natural resource allocation decisions at the village or farmer level to improve local participation in development programs; (4) develop an in-house capability to identify and analyze the linkages of its projects on agricultural planning and research, watersheds, irrigation and fisheries within a river basin planning and management framework; and (5) continue its involvement in programs that promote soil and water conservation, primarily through the Upland Agriculture and Conservation Project.