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**NATURAL RESOURCES MANAGEMENT PROJECT**

BAPPENAS – Ministry of Forestry  
Assisted by  
USAID

**BALANCING FOREST AND MARINE CONSERVATION  
WITH LOCAL LIVELIHOODS  
IN KALIMANTAN AND NORTH SULAWESI**

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## Preface

This report is one of a number of reports produced under the Government of Indonesia's Natural Resources Management Project (NRM) that is assisted by the United States Agency for International Development (USAID).

The NRM project, working with the Indonesian National Planning Board (Bappenas) and the Department of Forestry (Departemen Kehutanan), provides through a specially established project Policy Secretariat advice to Bappenas on natural resource issues relating to long and short-term national planning. In addition, working with the Department of Forestry the NRM project carries out field activities in two pilot project areas one in West/Central Kalimantan and one in North Sulawesi including the preparation of management plans for the Bukit Baka/Bukit Raya National Park in Kalimantan and the Bunaken National Park in North Sulawesi. Each report addresses an aspect of the planned NRM project activities that are agreed on and laid out in an annual NRM Implementation Plan and each report aims at providing specific recommendations for future work in the area addressed.

This report looks at the impact of the NRM project's planned activities on the local communities in the two pilot project areas in the Bukit Baka/Bukit Raya National Park on the borders of West and Central Kalimantan and in the Bunaken National Park in North Sulawesi. Its recommendations will be utilized to support the project's activities in these two areas.

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## ACRONYMS

HPH	Hak Pengusaha Hutan (Indonesia forest concession permit)
ITTO	International Tropical Timber Organization
IUCN	International Union for the Conservation of Nature
KKP	Kumia Kapuas Plywood (forest concessionaire)
NCR	Native Customary Rights
NGO	Nongovernmental organization
NRMP	Natural Resources Management Project
PHPA	Forest Protection and Nature Conservation Agency
RP	Indonesian Rupiah
SALT	Sloping Agricultural Land Technologies
SBK	Sari Bumi Kusama (forest concessionaire)
UNSRAT	Universitas Sam Ratulangi

# 1. EXECUTIVE SUMMARY: MAJOR FINDINGS AND RECOMMENDATIONS

## 1.1 Lessons from the Literature

Development wisdom has increasingly come to appreciate that the support and participation of local peoples in environmental management are crucial. In particular, the livelihood pressures and cultural traditions that underlie peoples' use of forest and marine resources need to be balanced with and integrated into environmental management activities. In order to accomplish these goals, it is necessary to develop a detailed understanding of peoples' resource use in proposed management areas. This understanding should entail special recognition that resource-based activities are very site and culturally specific, that they differ within villages as well as across villages, and that they are not static, but are creatively modified by people themselves in response to changing ecological and economic as well as political conditions.

When considering strategies for environmentally sustainable development, the following "lessons" are worth considering. First, social forestry (as well as social fisheries) projects are limited by the instrumental concern for community welfare - that is, local peoples' involvement is a utilitarian strategy or necessary (i.e., secondary) goal to protecting and improving forest or marine resource production (or protection).

Second, the use of both forest and marine resources entail a number of distinct technologies that dictate different management strategies.

Third, with regard to social forestry and agroforestry efforts in particular, the usual assumption is that shifting cultivation is "bad" and should be stopped. There is insufficient understanding of variations in this farming practice, its benefits (e.g. under low population densities its high productivity given low labor input), and hence how it represents a basis for developing more sustainable farming practices. Similarly, the locally specific conditions supporting successful agroforestry and soil conservation use are insufficiently understood, and limit their effectiveness.

Fourth, the collection and marketing of non-timber forest products can help balance forest biodiversity with local livelihood security through the designation of extractive reserves. However, whether the extractive zone concept can accomplish these goals needs to be examined carefully within particular ecological and socioeconomic contexts. For example, conditions in West Kalimantan suggest that forest products are likely to comprise one component in a diversified, multi-use (forest) management plan.

Fifth, where local peoples have been given a degree of management control and vested interest, there have been successful community projects that balance multiple use with conservation goals. These projects are particularly successful in areas where traditional management practices and local social/political institutions were understood and built upon.

And sixth, the awareness and procedures for integrating local communities into sustainable marine resource development are increasing, but at a slower rate than in the forestry sector. These efforts need to be encouraged. However, multiple-use approaches which integrate forestry and fishery management are particularly important and should receive high priority.

## **1.2 Research Findings and Recommendations for the Two Pilot Project Areas**

### **1.21 Section I: Bukit Baka/Bukit Raya**

In the Bukit Baka/Bukit Raya production and protection forests in West and Central Kalimantan, the threat to sustainable development comes from (1) logging (from the construction of steep logging and skid roads and the extraction of high value timber) and (2) agricultural practices of local communities (including destruction of primary forests for shifting cultivation fields and by uncontrolled fires). The realities are that both logging and shifting cultivation activities will continue. Therefore, the critical issue is how both of these activities can be modified to increase their environmental sustainability.

The following represent the major findings of the survey and other data-collecting activities and their implications for future NRMP activities.

**1. All households in the sample villages obtain their staple food (rice) through agricultural production.**

**However, household rice security is highest in the Central Kalimantan villages where logging pressures to date have been least severe, forest resources are relatively primer, and traditional agricultural practices prevail.**

**(Household) rice security is defined as having sufficient rice from either production of shifting cultivation (*ladang*) and/or paddy (*sawah* either rainfed [*tadah hujan*] or irrigated [*irrigasi*] fields) to meet annual (household) consumption needs.**

#### **Implication/Recommendation:**

- a. All agricultural development activities should recognize the primer importance to local peoples of protecting or improving household rice security.
- b. Development strategies cannot be uniform. They must build on the differences in resources, vulnerabilities, and livelihood strategies (especially for meeting food/rice security) within and across villages.

c. Integral, long-term shifting cultivation practices such as those still practiced in Riam Batang/Tumbang Taberau successfully meet current food security needs. Efforts need to be directed toward **modifying** rather than **transforming** these practices to protect food security while increasing ecological sustainability and to avoid forest fires. Such modifications could include:

- \* Instituting a fire permit system based on providing farmers with weather information forecasting rains and permitting burning under low-risk conditions, monitored by Sari Bumi Kusama (SBK) or Natural Resources Management Project (NRMP) fire control personnel.

- \* Encouraging agronomically and socioeconomically suitable soil conservation measures on steep slopes (such as grass bunds which are low input and have the added benefit of producing livestock fodder and green mulch - see below).

- \* Assisting with crop predation and livestock production problems (see below).

- \* Assisting with efforts to support and supplement agricultural production (such as through protecting the timber and non-timber forest product trade).

- \* Encouraging current planting of fallows with rattan, rubber or fruit trees.

d. Increasing the mutually beneficial aspects of forest extraction through:

- \* Coordinating future road building with the local community to avoid damaging farms (i.e., utilize local knowledge about the area and save money/confusion with providing post-hoc compensation.)

- \* Earmarking some of the profits from timber sales to support rural development in exchange for compliance with fire management and other conservation procedures (such as providing clean water/community well and continuing to support local education facilities).

e. Riam Batang/Tumbang Taberau may represent a viable area for developing a locally-managed forest and/or timber harvesting pilot project. Commercially valuable *Shorea* is an important wood for house and boat construction, and ensuring future supplies and extraction rights are major sources of concern to local populations. Designating certain forests and trees for local community forest management and use could possibly increase local community support for commercial timber concessions (and their other management/conservation efforts) without significant loss in income to the latter. Many issues need to be worked out including:

- \* Current extraction rates of *Shorea* for local use, sustainability rates and alternative wood sources.

\* How to develop village self-management efforts is a large and potentially contentious enterprise. This is because of the lack of clear village leadership (i.e., given the erosion of traditional *adat* leadership institutions and existing bad relations between the *kepala desa* and the local population in Riam Batang (see below)). As in all community development efforts, ensuring equitable distribution of pilot project benefits is both difficult but important.

e. Unless special efforts are made, rice security as well as local communities' access to important timber resources (as well as non-timber products) will be impaired. This will negatively impact future cooperation between local peoples, SBK and government personnel (i.e., teachers) in sustainable development efforts.

**2. There are vast differences across villages in terms of local governing institutions. For example, in Nanga Siyai the adat leader (known as the *temenggung*) leads the community, whereas in Tanjung Pako and Tumbang Kaburau, the *kepala desa(s)* hold power. In Riam Batang, there is no active *kepala adat* and the *kepala desa* has limited community support (i.e., because of disputes regarding compensation given by SBK).**

Implications/Recommendations:

a. Key local community people to orchestrate pilot projects and help support extension activities will vary from village to village.

b. The benefits from development activities will not automatically be equally distributed within villages without careful attention.

**3. In the rice self-sufficient villages of Central Kalimantan, income from selling surplus rice is currently the major form of (cash) income generation; supplementary income is earned from selling vegetables to the logging camps.**

**In the West Kalimantan villages, the major source of cash is through collecting and selling forest products, principally wood (and especially ironwood and meranti) for house construction materials, and, to a lesser extent, gaharu, gold and rattan. Much of these forest products are collected from the Bukit Baka/Bukit Raya *cagar alam* (nature preserve).**

Implications/Recommendations:

- a. Safeguarding the high production levels of swidden rice production will also safeguard access to income.
- b. We do not know how sustainable current forest product collecting rates are, and hence what the impact is on forest resources in the Bukit Baka/Bukit Raya *cagar alam*.
- c. Maintenance of extractive rights in the *cagar alam* are imperative to rice security (especially during "scarcity" months), to diversify incomes, and possibly to elicit support for other activities (i.e., such as modifying shifting cultivation practices).

**4. In accordance with the Government of Indonesia's HPH Pembina Desa program, the SBK has undertaken many outreach activities. These include 1) provision of teachers in local communities whose mission is not only general education, but agricultural education on alternatives to shifting cultivation; 2) construction of a demonstration plot at Km 28 on irrigated rice cultivation and some basic agroforestry and rainfed agricultural technologies; 3) provision of inputs including fertilizer, pesticides, and equipment (especially hoes); 4) extension education on an irregular basis in the villages and if farmers come to the demplot; and 5) seminar training for a small number of farmers.**

**There has been varied success with SBK's rice intensification efforts to intensify *sawah*. Problems include: 1) unfamiliarity with the technologies and procedures of irrigated/rainfed rice cultivation; 2) initial plots (40 X 45 m) were cleared from *imperata* grass with tractors reducing incentives of others to manually clear land with a hoe; 3) low yields the first year due to insufficient fertilizer and losses to insects and birds; and 4) inability to get all ones' rice from such a small plot, and hence the necessity to engage in alternate livelihood activities which in turn, further limit labor to open/enlarge ricefields.**

**Another limitation includes variable motivation (and resources) to intensify rice production from village to village, as well as by household, possibly in relation to current rice security levels.**

Implications/Recommendations:

- a. Extension efforts to intensify rice production are critically important in the West Kalimantan villages where:

- 1) rice security is most limited;
- 2) rice deficits are overcome through forest product collecting, whose environmental impacts and future sustainability are unknown;
- 3) motivation to develop rice farms is high;
- 4) and SBK has already begun irrigated and rainfed rice production-outreach activities which can be built upon and improved.

b. Rice intensification efforts are also important in the Central Kalimantan villages where proposed (1993/1994) logging near Riam Batang/Tumbang Taberau could limit their future rice security. However, under current conditions their motivation and labor availability to develop *sawah* is lower than in West Kalimantan.

c. The sustainability of *sawah* cultivation is questionable ecologically (the impact of petrochemical inputs on land and water - especially since the rivers are the major drinking water source) and economically (dependence on SBK and afterwards, could they be able to afford to purchase own inputs and could the supply in the area be secure). The future impact of logging on the entire hydrological system in the area and the ability to sustain irrigation development is a question one needs to address before investing and encouraging local farmers to begin *sawah*.

d. Despite the attempt to offer some alternative farming systems at the SBK-managed demplot (i.e., irrigated and rainfed *sawah*, terraced dryland fields, some agroforestry with leguminous trees, fishponds), these technologies are not varied enough to meet the particular needs of farmers with different ecological and economic conditions. They also have not been field tested, particularly under local resource and ecological conditions.

e. Field-testing of rainfed technologies need to be conducted on farmers' fields under farmer-managed conditions. A wider array of field-tested, simple rainfed technologies need to be included in these field sites. Species for inclusion in agroforestry field tests should be based on existing cropping patterns. These are "technology" issues that the long-term agroforestry advisor and/or short-term rainfed agricultural consultant (e.g. Bill Granert) can work on.

f. Additional issues to consider:

- \* Investigate the pros and cons of providing rice or income subsidies during the period when *sawah* fields are created or enlarged.

- \* How to limit dependence on SBK (i.e., such as by replacing petrochemical-based inputs with low cost, locally produced organic methods).

\* Examine ways to expedite expansion of *sawah* farms to farmers interested. The pros and cons of using chemical herbicides such as Roundup and/or tractors vis-a-vis manual hoeing procedures needs to be examined.

## **5. Cultivation of perennial crops, specifically rattan in Central Kalimantan and rubber in West Kalimantan, has intensified in the last 3 to 5 years.**

Planting rattan has become widespread despite currently low price for rattan in order to: 1) create a future stock for when the price rises; 2) stake land claims in the wake of future logging activities; and 3) supplement wild supplies for home use (i.e., making baskets, mats, tying in house construction, and edible shoots) and sale. Rubber is increasingly planted in West Kalimantan because it is perceived there to 1) grow well under degraded land conditions; 2) complement sedentary rice farming in terms of labor inputs and seasonal income generation; and 3) have a competitive price and accessible market.

### Implications/Recommendations

- a. Interest in perennial crop production should be encouraged, especially in improving the cultivation of rattan (e.g. trying other species than *sega*, improving nursery stock, transplanting problems) and rubber (e.g., acquiring better seeds and curing diseases).
- b. If marketing networks could be developed, there is a potential for cottage-based rattan industries. Further research is needed on the extent of existing rattan supplies and guidelines for managing future extraction, since most baskets are constructed out of a variety of rattan species and only one species -- rattan *sega* -- is currently cultivated.
- c. Fruit production is currently for home production rather than for market and is likely to remain the same given problems of transport and spoilage.
- d. Intercropping schemes with leguminous and multi-purpose tree species should be explored to aid soil fertility/soil structure of rainfed farms; and minimize dependence on petrochemical fertilizer inputs. Agroforestry species will differ by village and household, and therefore need to be locally-appropriate (i.e., also on environmental criteria).
- e. Leguminous/multi-purpose trees could be helpful in West Kalimantan to provide additional firewood and trees for fencing. Numerous species of firewood are still available in the forest and collected simultaneously when villagers either make swiddens or collect other forest products. However, the time and distance to the forests for the West Kalimantan villages are a constraint.

## **6. Marketing outlets for farm crops are limited to the SBK and Kumia Kapuas Plywood (KKP) logging camps, and to other local villagers.**

**Marketing at the logging camps is difficult due to far transport distances, and there is no guarantee all of one's produce will be purchased. Women tend to transport and market farm vegetables, whereas men take responsibility for many forest products (such as rattan).**

Implications/Recommendations:

a. Agricultural intensification of annual and perennial crops need to be constructed with keen recognition of their limited market outlets and transportation costs. However, all villagers expressed an interest in marketing surplus farm products as a means for earning supplementary income.

b. Women's marketing tasks need to be recognized and included in market studies and development schemes.

c. All villagers desire further road construction and view further market integration positively, and the responsibility of the logging companies to offer assistance. The willingness of the logging companies to coordinate road building with villagers' needs is unknown, as are the ecological impacts of increased road construction.

\* There is a serious need to investigate and possibly coordinate future road construction to meet logging and villagers transportation needs.

\* There is a need to weigh the cost and benefits of intensifying road versus boat travel.

\* There is a critical need for further study of market outlets for farm as well as forest products; and how to maximize local benefits (i.e., increase market security and avoid middle-men rents).

**7. The non-timber forest product trade currently provides supplementary income to villagers (though in the West Kalimantan sites this income is critical to purchase the staple food when rice reserves are gone). To date, transportation problems, insecure marketing outlets, and increasing pressure on forest resources from logging and the intrusion of outside collectors, among others, limit the economic benefit of collecting and marketing non-timber forest products.**

Implication/Recommendation

a. The non-timber forest product trade should remain a supplementary livelihood activity for local communities, not promoted as a substitute for subsistence agricultural production. Given the remoteness of the area and lack of external rice supply, farmers could not rely on

earning income from forest products to purchase rice (and as noted above, we do not know the sustainability of current (or increased) forest product extraction rates.)

b. Income from non-timber forest products could be raised by improving transportation from central village collection spots to the logpond at critical times (i.e., for marketing in Nanga Ella/Nanga Pinoh); and by arranging purchasing contracts in advance which set specific amounts and prices to be paid to collectors. This could help to overcome obstacles to marketing tengkawang, for example.

c. Other concerns are by specific products (e.g. ironwood, gaharu, illipe nuts, honey, damar, rattan, *jelutang*, etc.). See final report below.

**8. Livestock is raised by most households. Livestock (cows, pigs and chickens) are mostly for home use, though sold when an emergency arises. Livestock diseases are common.**

Implications/Recommendations:

a. Inoculations should be available at the demplot, the various logging camps, or made available to farmers for inoculating animals themselves.

**9. Employment opportunities from logging camps represents a possible means to diversify income generation.**

**The logging companies do provide employment. Villagers working for SBK are concentrated in the West Kalimantan villages where rice security is low, and where *sawah* cultivation has yet to fill in the deficit.**

**Employment opportunities with SBK are varied; though usually they involve low pay, high food costs, and occupational hazards.**

**Collecting forest products while working for the logging companies provides additional resources and incomes (especially rattan collecting, gathering honey, and hunting), but may create conflicts with local collectors.**

Implications/Recommendations:

a. Employment with SBK represents a temporary income generating activity, particularly among West Kalimantan villages.

b. The working conditions and pay scales of local peoples need to be better understood.

c. The possibility for job training to enable locals to compete for higher paid jobs (driving tractors/logging trucks, etc.) need to be examined.

d. The extractive activities of logging companies employees (as well as by other "outsiders") need to be examined, particularly their interaction with traditional forest access and control institutions. Procedures for strengthening the latter need to be developed, implemented and monitored.

**10. In the eyes of local communities, the legitimacy and authority of the logging companies are contradictory given their conflictual role in timber harvesting and development.**

Local villagers praise the logging concessions for 1) building roads; 2) providing markets for farm goods at the various logging camps; 3) providing agricultural extension and teachers; 4) giving small amounts of oil and food to villagers; and 5) providing employment opportunities (albeit many low paying and difficult ones). Villagers report SBK has given compensation for damaged land or trees when asked.

However, they criticize the logging companies for 1) constructing roads through and increasing access to their traditional "extractive forest zones" or farms; 2) not offering rides to villagers (i.e., on logging trucks); 3) making promises they do not keep (such as extending roads or building new *sawah*); 3) intensifying sediment-loading problems that dirties their drinking water and curtails their river-travel; and 4) not helping to provide alternative clean water sources. In addition, an employer from KKP has been charged with not meeting local customary fines for involvement with a local girl.

Implications/Recommendations:

a. In the spirit of Pembina Desa, the logging companies could install wells or piped clean water, provide basic medical assistance, and continue to support general and agricultural education.

b. Village land use maps need to be created and consulted when new logging roads are designed. As noted above, an attempt should be made to build roads which also aid villagers' transportation needs.

c. Systematic and well-publicized procedures need to be created for

\* providing compensation for damaged fields (i.e., that entail equitable distribution and not as it stands today, given to some villagers who request it);

- \* determining compensation on the basis of resource value;
- \* meeting local (*adat*) criteria for overseeing pre-marital relations between local girls and logging concession employees.

Further Recommendations:

- 1) Conduct additional household surveys in the West Kalimantan sites.
- 1) Extend household surveys to Central Kalimantan villages not as of yet contacted by NRMP, and likely to farm/collect forest products in the protection forest.

## 1.22 Section II: Bunaken National Park

In this section, the following is provided: a preliminary overview of the major issues regarding local communities in the Bunaken National Park, the additional data needed to understand and suggest solutions/pilot projects, and a plan for collecting these data.

**1. The major social actors that have impact on marine resources, and who therefore need to be involved in the Bunaken National Park management plan need to include:**

- \* fishermen
- \* resident communities
- \* diving clubs
- \* "nature lover" groups and other tourists
- \* tourist developers
- \* local NGOs
- \* government officials, especially PHPA (Forest Protection and Nature Conservation Agency)

Implications/Recommendations:

- a. While some data on the above groups (and on social issues in general) are provided by Colfer and Ngo (1990), they are restricted to the area of Bunaken and Siladen, and to Manado and Molas on the mainland. Much of it, while interesting, is not instructive for developing the management plan. Furthermore, they did not utilize sampling techniques which enable generalizations from their findings.
- b. With regard to the important "local" players identified above, the additional data would be particularly helpful:

\* how do each of these actors/groups currently use and/or benefit from the resources within Bunaken National Park?

\* how are each of these groups structured themselves: how are resources allocated, controlled and decisions made and implemented? Where are their conflict of interests within each of these groups, for example:

- government agencies (e.g. governor, PHPA, Dinas Wismata)
- various diving club operations
- local village politics  
(for example, the impact of the large power bases of Alfons Caroles on Bunaken and John Rahasia on Siladen)
- fishermen  
(traditional, commercial and variations depending on access to fishing inputs and techniques)
- household members differentiated by age and/or gender

\* how do each of these groups envision allocation, control and management of marine resources in the future?

\* how do current and future uses by these groups conflict or could conceivably be balanced?

**2. Despite government designation of land tenure, there are current conflicts between local communities and government regulations over who owns and controls island land and marine resources.**

Implications/Recommendations:

a. Clarification of jurisdiction over land and resource use in Bunaken National Park is necessary before NRMP management plans and specific pilot project activities can get underway.

b. Particularly on Bunaken Island, the issue of land jurisdiction needs to be clarified before a policy on what to do with existing local settlements is proposed by the NRMP (i.e., this involves 15 or so rustic cottages constructed without government approval prior/after (?) designation of Bunaken National Park - more discussion on this issue below).

**C. Human activities and their impact on coastal and marine resources are varied; some being more destructive of marine habitat than others.**

Implications/Recommendations:

a. Activities that destroy marine habitat require immediate action. These activities are site specific, involve different key actors/groups, and hence require a decentralized planning approach.

b. In Bunaken National Park, management of the following activities should receive the highest priority (and have been incorporated into the draft management plan through creation of use zones - see draft management plan by Usher):

- \* Mantehage Island: destruction of mangroves for firewood and furniture construction

- \* Manado Tua Island: coral mining for house and road construction, sedimentation from hill-slope agriculture

- \* Reef fishing on all the islands using destructive fishing techniques (dynamite, poison, *muri-ami*, and generally "over-fishing").

- \* Bunaken Island and others: people walking on coral reefs, collecting corals and small invertebrates, indiscriminate boat mooring on corals and anchoring, and destroying sea grasses for boat slips.

b. We need to identify how the above are related to subsistence food needs, supplementary income, and whether an alternative strategy could be substituted. Education campaigns that focus on increasing awareness of negative environmental impact are insufficient is the underlying problem is one of meeting livelihood needs. Real economic benefits are needed to serve as incentive to local residents to continue management regimes.

c. Management strategies including zoning regulations need to be examined in light of livelihood pressures and resource access/control issues. Eventually they need to be developed in consultation with key groups. Some ideas to investigate:

- \* developing alternative firewood sources, possibly through sustainable mangrove reforestation and charcoal production activities

- \* substituting other materials for coral in road and house construction

- \* promoting less destructive fishing techniques and in areas of less pressure (i.e., encouraging pelagic fishing)

- \* identifying and promoting sustainable hill-slope agriculture practices
- \* reducing pressure on both hill-slope agriculture and fishing by diversifying income generating activities. The following are ongoing activities that should be supported:

bee keeping  
handicraft development  
intensifying vegetable production

**4. Eco-tourism has been proposed as a means to balance local livelihood and resource conservation goals in Bunaken. Most park planning to date has focussed on the island of Bunaken because of its proximity to Manado and coral reef attractions.**

Implications/Recommendations:

a. The attention to tourism on Bunaken Island is overshadowing more pressing concerns such as developing strategies to manage habitat destructive activities noted above.

b. Decisions regarding tourism options are being discussed without sufficient data and analysis. This is particularly apparent with the issue of the homestays on Bunaken Island, and whether they should be removed or not. This question is particularly contentious given:

- \* The governor of North Sulawesi has already taken a (public) position to remove the homestays.
- \* No one to date has surveyed the backgrounds on who constructed the homestays, the legality issues of who controls the land, the economic feasibility of the enterprises, their ecological impacts, and who currently benefits from these facilities (i.e., local Bunaken residents vs. developers from Manado)?
- \* No one has apparently asked the residents of Bunaken Island how they would like to see marine and coral reef resources managed, or how they would feel (or expect to be compensated) if the homestay facilities were removed
- \* What alternative land use options could be envisioned, and what are the benefits vis-a-vis resident populations? Some alternatives include:

- remove cottages to offer pristine beaches only favoring day use: limited economic benefit to locals

- replace cottages with more modern and costly facilities: possible local employment (but not ownership or management)

- replace cottages with "traditional-style" fishing huts with high appeal to the "monied" eco-tourist rather than the low paying "backpacker" type: possible mutual benefit to both resident populations and others depending on how the operation is designed and managed

\* How this issue is resolved will likely determine future government, NRMP and local community relations, and the effectiveness of how each can or will be able to work together.

c. The limited availability of clean water on Bunaken needs to be addressed in weighing future tourist development efforts there.

**5. Awareness of park goals and emerging strategies for park management need to be communicated to key groups noted above, and their input sought. However, public involvement of this sort needs to be conducted in light of how jurisdiction questions raised above are sorted out.**

Implications/Recommendations:

a. Careful attention must be given to the relative input of each key group above.

b. Public meetings need to be held to communicate to local villages the desire of NRMP to support communities/individuals to sustainably use marine resources without loss of livelihood, and to seek their input into innovative strategies.

c. However, community meetings need to await clarification of jurisdiction over park resources

d. Community meetings should be led by someone with experience in how to lead/arbitrate group interaction

e. Related to d., need to identify community/individual incentives to sustainably use marine resources, and which ideally build on self-management (i.e., as opposed to relying on PHPA patrolling/surveillance). The latter is hampered by:

\* lack of a patrol boat

\* low incentive of PHPA field people to live at the new "post" on Bunaken Island and conduct patrols

**6. A serious lack of baseline data -- especially with regard the social aspects of coastal and marine resource used -- are critical to develop a management plan that emphasizes local participation and possibly local management. The data to be collected include:**

a. Demographic profiles of resident populations

\* Update on census, education levels, population trends

\* Household size and labor availability

b. Local economy

\* Sources of livelihood (especially the share of fishing vs. other enterprises and whether for food or supplementary income)

\* (Terrestrial) farming systems and problems)

\* (Seasonal) labor allocation to fishing and terrestrial food and income-generating activities

household stratification patterns, wealth indicators/levels

c. Fishing

\* Target species: pelagic, reef, deep demersal, invertebrate

\* Gear used: for each of the above (number of boats, size)

\* Organization: guilds, individual, charter

\* Catch rates: need to standardize CPUE to give comparability between different methods and target species (catch per unit effort: how many people fishing, time spent fishing, where, yield per hook/kilo)

\* Seasonality: how dependent are different methods and target species on seasons

\* By-catch: species caught either as by-catch (e.g. by nets) or caught opportunistically when encountered (e.g. dugong, turtles, clams, ornamental shells)

- \* Flexibility: how flexible are individuals in their skills. Do they specialize in particular techniques?

- \* Marketing: where do catches go: market (local or Manado) or for home consumption

- \* Limitations: What are limitations for fisherfolk, gear time, resources

- \* History: past catches

- \* Environmental: awareness of damage to habitat and populations

#### 4. Local social and political structures

- \* Local governing bodies (village councils, fishing guilds/coops, adat, etc.)

- \* Village politics

#### e. Conservation attitudes and practices

- \* Traditional resource access/control mechanisms

- \* Local institutions to build on

#### f. Development Priorities and Options

- \* Local rural development needs and priorities

- \* Ideas regarding tourism and other economic enterprises: seaweed farming, shrimp farming, handicrafts, others

#### g. Further Recommendations:

- \* Plans to conduct a socioeconomic survey in June/July 1992.

- \* While in Manado, I met with colleagues from Universitas Sam Ratulangi (UNSRAT) (i.e., from the Department of Socio-economics of Fisheries) to begin identifying students to provide further training in socioeconomic survey methodology, and who could help with data collecting on the above.

## 2. INTRODUCTION<sup>1</sup>

The objective of the short-term social science advisor is to help ensure that the implementation plan of the Indonesian Natural Resources Management Project encourages the active participation of local communities and addresses critical social issues. In addition, the social scientist will assist in identifying and implementing selected community-oriented development activities as part of the planning process.

In section 3, I discuss the major issues reported in the literature concerning the role of local communities in sustainable development and protected area management. In section 4, I outline my research methodology. In section 5, I report the results of field visits and social survey work and their implications for NRMP project activities. I begin with the communities located near Bukit Baka/Bukit Raya in Kalimantan, and then move on to those located within or adjacent to Bunaken National Park in North Sulawesi.

This report builds on the "Social Soundness Analysis" prepared by Carol Colfer and Mering Ngo, July 1990. It extends their work through:

- (1) revisits and updates on previously contacted communities;
- (2) additional visits to areas in both pilot project locales **not** visited by Colfer and Ngo (i.e., the villages of Riam Batang and Tumbang Taberau in Central Kalimantan, and Manado Tua, Mantehague, Nian, Araken-Wawontontulap, and Tanjung Pisok in Bunaken National Park); and perhaps most importantly,
- (3) systematically-collected qualitative and quantitative data on issues particularly germane to developing and implementing a management plan in both sites.

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<sup>1</sup>I wish to acknowledge the assistance of Mering Ngo for both providing important background information and logistical assistance with the Riam Batang "expedition"; Pak Syamsuni Arman for helping me to translate the survey questionnaire; Syahirsyah (Jimmy) and Rizal Bustani, my field assistants and companions throughout the field experience; Edo Ahda, a field extension worker at the SBK demonstration plot; PT SBK concession manager and staff for all their logistical support; and, of course, the time and patience of the many villagers we interviewed.

### 3. LITERATURE REVIEW: LESSONS LEARNED

Most of the people involved in this problem know what the problem is and what causes it - whether they are doing what they are doing for survival or for profit. What we must look for are viable alternatives. (Baker 1987:29).

#### 3.1 Local Communities in Sustainable Development and Protected Area Management

The last decade has witnessed a revolution in international development and conservation paradigms. Notwithstanding the successes of the green revolution, especially in Indonesia which reached rice self-sufficiency in the early 1980s, there has been major concern over the long-term sustainability of a highly commodity-oriented and input-dependent agricultural strategy. Questions have been raised over the economic as well as ecological sustainability of green revolution-type development programs, and especially over their suitability for marginal, sloping lands cultivated by resource-poor farmers with highly diversified farming systems.

Much research (including that conducted by this author 1984, 1991) now details how the limited ecological and economic resources of upland farmers constrain their choice of cropping patterns and soil conservation methods, for example, and underlies their continued exploitation of natural resources (see also Blaikie 1985). Consequently, many have called for a new agricultural development paradigm that builds on farmers' existing land uses and technologies, their indigenous knowledge systems, and which emphasizes biological or conservation farming techniques such as agroforestry over engineering and petro-chemical dependent farming systems (see Pearce, Markandya and Barbier 1989).

'Sustainable development' arose in the context of these changes and concerns. The concept received much attention as a result of the highly influential Brundland Report in 1987 (World Commission on Environment and Development, 1987). Today it has become a buzzword and catch-all for a variety of policies and activities. Importantly, the debate about what constitutes sustainable development and how it can be brought about has directed close scrutiny to defining "development" in terms of increased human welfare and to maintaining the productivity of the natural environment, as opposed to simply economic growth. While some argue that the concept of sustainable development naively obscures the fact that capital growth inevitably entails resource exploitation (e.g. Redclift 1987), others maintain that it has led to the identification of strategies that can simultaneously improve economic, ecological and human systems. All would agree, however, that the debate has increased the visibility of rural areas and rural peoples into development thinking, and brought attention to the importance of basing development activities on the resources and cultures of rural peoples. There is no doubt that the rise of sustainable development has led to heightened recognition of the important role social scientists can play in interpreting and possibly affecting development trajectories.

Concomitant with resurgence in attention to the environment has come increasing worldwide concern for atmospheric pollution and global climate change and loss of biodiversity (especially in highly species-diverse and oxygen-producing tropical forests). These factors have provided a tremendous boost to international conservation efforts.

How to incorporate concern for international conservation within the context of sustainable development is leading to a second revolution in development circles. It involves how to maintain the concern for rural welfare engendered in the sustainable development notion, while simultaneously conserving and/or protecting critical natural resources. This contradiction is particularly apparent in previous approaches to national park management based on the United States model which has excluded people from residence in and use of resources from national parks. This notion was embodied in the International Union for the Conservation of Nature (IUCN 1975) definition of a national park, and has subsequently been used as the basis for national park and protected area development around the world.

The U.S. National Parks model has been liberalized in recent years (especially in Alaskan parks where there are resident populations), and some revisions and supplementary policies are being made in the IUCN's exclusionary definition.<sup>2</sup> However, the exclusionary definition has been widely incorporated into protected area management strategies in many parts of the world with the result that resident peoples have been displaced or blocked from traditional uses of park resources and have suffered severe hardships and social impacts as a result.

In an important new book entitled Resident Peoples and National Parks: Social Dilemmas and Strategies in International Conservation, West and Brechin (1991) review the evolution of thinking on the role of local communities or 'resident peoples' in protected area management. They begin with the observation that resident populations are diverse and include: (1) tribal peoples (communities that are relatively isolated and politically autonomous), (2) acculturated tribal peoples (culturally and ethically distinct but acculturated to modern society), (3) peasants (subsistence agriculturalists frequently engaged in some cash cropping and market activities), (4) farmers and rural citizenry (farmers producing primarily for commercial markets or are employed as farm laborers), and (5) local entrepreneurs (persons engaged in commercial activities relating to the establishment of a protected area).

Some literature suggests that tribal or traditional peoples are more likely to live in harmony with their immediate natural environment than are peasants or migrants. While this may be true in some cases, reality suggests a more complicated picture. Under low population densities, tribal peoples practicing integral, long-fallow shifting cultivation may be sustainable. However, there are numerous examples of traditional societies where farming and/or other activities are over-exploitive and non-sustainable. These harmful activities are often the result of outside intervention which changes their traditional access to and control

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<sup>2</sup> This liberalizing trend is very apparent in the literature distributed by IUCN in preparation for their conference in Caracas, Venezuela in February 1992. Unfortunately, no conference materials were available for review and inclusion into this report.

over resources (Anderson and Grove 1987). In any case, West and Brechin (1991:6) suggest that:

these presumptions are diverting attention away from more central concerns: whether human residency in protected areas is ecologically incompatible with most conservation objectives; and whether it is politically unavoidable, given the realities faced by many developing countries.

We can add to their concern the question of whether human residency and resource use in production-oriented areas can also be ecologically compatible with production goals.

### 3.2 Balancing Conservation with the Needs of Local Communities

In recent years, the IUCN exclusionary definition of protected areas has been challenged, and new approaches are being sought which attempt to balance conservation with the needs and rights of (resident) local communities. While arguably a commendable goal, there are a number of issues that speak to both why such a goal is necessary but very complicated. These issues are summarized below.

One, the historical and institutional contexts of countries differ significantly and dictate different approaches to conservation. The "lock-it-up" preservationist model may work in the U.S., which is characterized by vast, sparsely settled land-use patterns and a predominantly urban population. This is in marked contrast with many tropical countries where large percentages of the population still live and subsist directly from the land and/or from forest products; and where human:land ratios are quite high.

Two, where national parks have been created and required relocation of residents have occurred, the social impact of displacement and relocation are not well understood. Likewise there is little understanding of the overall economic and political costs and benefits of relocating resident populations.

Three, the preservationist model has received considerable support from international conservation organizations who have eagerly proselytized the concept in an attempt to preserve natural wonders, wildlife, genetic resources and ecosystems around the world. Thrupp (1989) charges that members of Northern conservation organizations care more about cuddly endangered animal species than they do about the plight of poor men, women and children whose livelihoods are threatened by the designation of a national park.

Four, related to the above, northern conservation organizations (and governments) have pushed exclusionary goals in an attempt to pursue their environmental agenda. They have placed undue pressure on limiting tropical deforestation as a means to control global climate change instead of reducing fossil fuel emissions, the major source of CO<sub>2</sub>, in the north. Many have taken a highly managerial approach to redressing environmental problems rather than seeking to alter the maldistributive patterns of resource access and control between Northern and Southern countries (as well as within Southern countries) that underlie unsustainable

resource use. To many, the international conservation movement itself has become another form of cultural imperialism and means of northern hegemony.

Fifth, despite the above movements, in some areas of the world today cultural heritage preservation in the form of protecting the rights of tribal and acculturated tribal peoples is seen along with natural preservation as a legitimate policy of the protected area movement. In some areas, the cultural preservation argument has taken the form of maintaining some romantic ideal of primitivism, while in others it is surfacing in response to demands to self-determination by threatened aboriginal groups. In both cases, local communities represent an important force to be reckoned with.

Sixth, related to the above, local communities are increasingly perceived as a potential agent for marrying the goals of rural development and nature conservation through the vehicle of "ecodevelopment." Wildlife and nature tourism are big business, and a case has been made that setting up biological reserves will enable local communities to maintain their traditional way of life while managing resources and bringing in much needed hard-currency.

Finally, and perhaps most important of all, there is a growing and realistic acknowledgement that despite designations of parks on paper, and by government edict, the viability of protected areas is tied to the support and the fate of local peoples. The literature rebounds with examples of continued exploitation of natural resources by local peoples seeking revenue and/or sustenance from nearby resources despite legislation, boundaries, fines and other restrictive measures.

In the following sections, I identify and review specific management strategies that seek to respond to some of the issues noted above, and in particular attempt to balance protection (as well as sustainable development or production) with the needs of local peoples. The point I wish to emphasize is that to date, while there are grand and noble thoughts and some preliminary experiments in balancing the above, there are few rigorous examples and studies that document these claims. Nonetheless, the lessons learned from these initial attempts are summarized at the end.

### 3.3 Natural Forest Management: Local Community Management

There is considerable experience already with natural forest management systems and agroforestry in Asia, South America and Africa to suggest that consideration of the livelihood needs of local communities help determine the success of projects. A brief look at some natural forest management projects follows. They are reported in Buschbacher (1990) and come largely from South America.

I begin with the Palcazu Rural Development Project in eastern Peru, which was comprehensively designed to incorporate silvicultural, economic and social considerations. Silviculturally, the forest is being harvested by long, narrow clearcuts designed to mimic forest disturbances. The economic basis of the forest management plan is complete usage of

all wood larger than five centimeters in diameter. Large wood will be cut for saw timber, while smaller logs will be preserved for use as telephone poles and construction posts. Smaller wood will be converted to charcoal in portable kilns. All products will be initially marketed in the local region. Maintaining access to markets and competitive prices of wood products is a critical concern of the project.

The Palcazu Rural Development Project is based on collective management of communally owned lands of indigenous people. The project realizes that the long-term success of the forest management plan depends on the capability of these communities to manage the logging processing and marketing operations. But the project is willing to take this "risk", if you will, because it recognizes that the local people (in this instance, the Amuesha) must receive continuous benefits from the forest resource or they will return to their more traditional ways of burning and farming the clearcut areas. The jury is still out on the project.

A second example is the 60,000 ha Bajo Calima forest concession in northwest Colombia. This project exemplifies the failure to design natural forest management plans to be compatible with the surrounding population and economy. The concession has been practicing careful, low-intensity clearcut harvesting to supply a nearby pulp mill and achieved some success with natural regeneration. However, as regeneration has reached pole size four to six years after clearcutting, local people have entered the site via the old logging roads where they make heavy and repeated selective cuts for poles, mine props, and construction posts. This activity is extremely attractive to local people because of unemployment in the nearby city and proximity of highways. Most of the regeneration cannot return to mature forest and cannot be harvested in a second rotation.

In looking at the Bajo Calima forest concession, Buschbacher concludes:

The only solution to this problem would be incorporating local communities in continued forest management throughout the regeneration period. This amounts to an intensification of land use. A general conclusion, well illustrated by this case study, is that the extremely low-intensity land uses, often necessary to reduce costs in natural forest management systems, may be socially inappropriate in densely populated regions (1990:68).

And I may add, in areas characterized by a high degree of unemployment and widespread poverty.

Timber harvesting in Sarawak provides some of the most extreme cases of conflict between local communities and timber concessions. By law, logging concessions are not granted on land with Native Customary Rights (NCR). However, "native" populations (the most famous being the Penan) have expressed great concern and staged protests over the logging activities on forested land legally owned by the government but used by them. They are concerned about the harmful impact of logging on the decline of forest resources (including game meat, timber, non-timber forest products, and pollution of waterways). Primack (1991) writes that logging companies must legally compensate local villagers if they

use their NCR lands for roads, camps, log storage areas, or other activities. But that in practice, logging companies often make unofficial payments in order to generate good will and avoid later problems. He says that the most angry villagers are those who did not receive any initial payments, and will likely approach the camp manager on an individual basis. According to Primack (1991) problems usually result because of the inexperience of camp managers in dealing with native groups: for example, should camp managers strike individual agreements or deal only with village headmen.

Primack also notes that native leaders and villagers, at least in the cases reported in an ITTO report on logging practices in Sarawak, are generally in favor of the economic development and employment provided by the timber industry and government. Native leaders lament the loss of their traditional lifestyles and the painful transition from scattered, self-sufficient communities into individualized wage laborers immersed into destabilized cash economies. Native leaders from forest communities report becoming angered when (1) government and camp managers do not adequately consult with them before beginning commercial logging, (2) do not consult with them as to where to place roads and camps (often with the result that fruit orchards, graves and other sacred places are disturbed), (3) logging activities damage water, game, fish, and forest products they depend upon, and (4) they are not given satisfactory reasons why they themselves are not given government permission to begin commercial timber harvesting in forests surrounding their villages. They are also outraged at the environmentally unsound logging activities practiced by the companies, and the wealth that these people accrue.

### 3.4 Extractive Reserves and the Non-Timber Forest Product Trade

Another approach to maintaining forests and biodiversity while simultaneously providing a sustainable return to local peoples and government is the idea of extractive reserves. The concept theoretically provides governments of timber-producing countries the ability to decrease their dependence on timber export earnings, raise incentives to manage forests sustainably, and respond to mounting international criticism of their disregard for protecting biodiversity.

The non-timber forest product trade drew support initially from the experience of the National Council of Rubber Tapper's in Brazil. The importance of non-timber forest products in the domestic and national economies of Indonesia and elsewhere in Southeast Asia has also received increased attention (deBeer and McDermott 1989, Dixon et al. 1991, Peluso 1989, Peters et al. 1989). Considerable excitement has come from further research that suggest the long-term financial return from the harvest of non-timber forest products can outweigh the benefits of timber production or agricultural conversion from the same area of land (Alcorn 1989, Peters et al. 1989). In addition, increased availability of and demand for non-timber forest products could increase income security for forest users and enable them to assert their legal rights and defend their native lands (West and Brechin 1991).

However, the concept of extractive reserves and the promise of non-timber forest products do not provide the panacea some hoped it would (Browder 1990a). Their effectiveness is highly dependent on prevailing local ecological, socioeconomic and political conditions - many of which are particularly limiting in Kalimantan and are discussed in Salafsky et al. (1991). I summarize them below.

First, significant limitations have been found in the methods used to hypothetically calculate income from an average hectare of extractive reserves.

Second, the high species diversity and a correspondingly low density of forest plants found in the tropical forests of Kalimantan results in high search, travel and carrying time. This reduces the overall return per unit labor from the product and encourages harvesters to focus on the most valuable products such as *gaharu*, or those that have a predictable and/or patchy distribution.

Third, the fact that many species of trees in Kalimantan produce fruit only once every 3-5 years during a masting season means perishable fruit products are available in large quantity for only a short period when local markets are saturated and the glut causes prices to drop. Collection of non-perishable fruits such as illipe nuts (seeds of *Shorea* spp.) can offset some of these problems.

Fourth, there are problems with the lack of market demand for harvested products, transportation, and in monopolistic markets dominated by Chinese merchants. Marketing strategies could be developed to increase both domestic and export demand for non-timber forest products; and for reducing rents to middlemen (Jessup and Peluso 1986). Infrastructure could be improved to ease transportation problems.

Fifth, there is little incentive to conserve or manage resources in situations where there are no established rules governing resource use under common management. In other situations, traditional management rules have been curtailed by the intrusion of loggers and outside collectors. Peluso (1990) discusses the extraction of ironwood and *gaharu* as examples of the "boom and bust cycles" that follow where the resource is discovered, exploited, and its stock drastically reduced. Resource tenure needs to be granted and protected for open-access resources.

Sixth, it is unlikely that the value of extractive reserves and non-timber forest products (including rattan) can outweigh alternative land uses such as logging or agricultural conversion to cash crops (Siebert et al. 1992). In Kalimantan, villagers cultivate rattan, coffee and other forest products in multi-species agroforestry systems. Managed agroforestry systems offer many benefits over extraction from natural forests, including: 1) higher density of desired plants; 2) more staggered fruit seasons instead of the masting pattern; 3) reduced competition from animal predators; 4) clearly defined property rights; 5) reduced travel time by locating farms close to villages; and 6) providing specially selected products of higher quality (Salafsky et al. 1991). Even where extractive reserves are highly desired, it is unlikely

that local residents (such as Dayak communities in Kalimantan) have sufficient political clout to reduce current threats from logging activities.

Seventh, and importantly, there is little or no evidence on the long-term sustainability of non-timber forest product harvesting practices. The sustainability is questionable since some harvesting practices destroy the harvested plant or remove reproductive parts.

In light of the above constraints, it is unlikely that extractive reserves and non-timber forest product collecting will provide the answer to balancing forest conservation with local livelihoods. But rather they will comprise one component in a wider, diversified multiple-use management plan (Siebert et al. 1992, Salafsky 1991).

### 3.5 Social Forestry and Agroforestry

Social forestry refers to an approach to forest management and development that pays particular attention to 1) non-timber as well as timber products important for household use and sale; 2) equitable distribution of forest and tree products by different social groups (including commercial timber companies, community associations, households and members within households); and 3) the active participation -- ideally, co-management -- between local communities and peoples with formal organizations in resource management.

In Indonesia as well as elsewhere, social forestry represents a strategy for managing tree crops and forest resources -- one that seeks to reorient traditional or "colonial" bureaucracies based on top-down control and scientific forest management. The colonial, top-down approach has been criticized for stressing commercial timber production over trees grown for local use, for disrupting local management and tenurial traditions, and generally, for creating conditions where local peoples' livelihood and land use priorities cannot be sustainable (Blaikie 1985, Guha 1989). In particular, Peluso (1990) has produced many works that document how state forestry agencies in Indonesia have come to control land, trees and labor and sought revenue generation strategies -- especially through logging -- that do not benefit local village incomes. As a result, local peoples resist and even sabotage these efforts.

Given few viable alternatives for generating income, firewood and often food, local peoples cannot support logging and reforestation efforts as they have been proposed in the past. Social forestry seeks to promote activities that reverse the contradictory relations between forestry practices and local communities, and to replace them with relations and activities that are cooperative and enable local people (as well as commercial enterprises) to benefit from sustainable use of forest and tree resources.

Others have noted that social forestry concerns itself with "social" or human welfare issues only so far as it helps to achieve forestry goals. Social forestry arose not out of a social justice or social welfare agenda, but out of the need to increase public participation as a means to improve forest management. The secondary or "instrumental"

nature of the role given to local communities ultimately may limit the lengths social forestry projects will go to challenge the status quo; and hence limit their overall effectiveness (Sunderlin 1991).

One of the most glaring lessons to learn from the social forestry literature to date is the importance of granting a meaningful role to local communities in formulating goals, procedures and practices for carrying out social forestry projects. Doing so inevitably brings up issues of how resources -- such as trees and land -- are distributed within society. Case studies from around the world suggest that granting legitimate rights and roles to marginalized peoples such as shifting cultivators and other forest dwellers is often one of the most critical keys to the success of social forestry projects.

In general, the case studies abound with the new wisdom that social forestry projects need to 1) value local people as knowledgeable and rightful resource managers and users; 2) empower local communities to participate in selecting tree species and co-managing project activities; and 3) recognize that existing social relations including tree and land tenure, as well as gender inequalities, significantly affect forestry activities. One of the major lessons of the Ford-assisted social forestry project on Java was the difficulty in achieving equity goals -- that is, ensuring that the benefits of the program were distributed evenly among participants rather than flowing to the people who traditionally wield power and have influence in participating forest communities (Sunderlin 1991).

Gender differences exemplify how benefits do not per force flow evenly in social forestry projects. Fortmann and Rocheleau (1985) suggest the following insights: 1) women and men differ in terms of their resources and priorities and hence their participation will vary according to how well these differences are integrated into project goals and activities; and 2) women as a category are all not alike. Women's participation in agriculture and forestry differs by their social class and control of resources. Therefore, special arrangements are necessary to increase the participation of the poorest class of women (as well as of the poorest class of men).

Social forestry involves a variety of technologies to meet its aims. These include growing trees as part of home gardens, on particular farm parcels, farm woodlots, enriched fallows, or as monocrops on plantations or orchards. Trees cultivated in these ways can be managed by individuals, households, communities and/or in combination with external government and non-governmental development. These different management strategies go under a variety of names including community forestry and farm forestry.

Agroforestry represents a category of land use practices that has received great attention in social forestry efforts. Agroforestry combines the production of woody perennials with annual crops. Crop combinations occur spatially, that is, within a specified land area; or over time as in rotational systems. They are also integrated with other sectors such as livestock. In the case of the latter, trees may be grown as a source of animal fodder or stock may graze on grasses grown under tree crops.

Agroforestry is frequently touted as an appropriate land use for aiding the transition of shifting cultivation to permanent field agriculture. A closer inspection of the literature suggests two contradictory hypotheses about the applicability of agroforestry to resource poor farmers which would include many shifting cultivators (Belsky 1992). One hypothesis is that poor farmers give priority to meeting basic food needs and will not grow tree crops because of their competition with food production, especially when land resources are limited. The other is that tree cultivation and agroforestry are beneficial to low resource households.

Empirical studies provide support for both of the above hypotheses. For example, case studies report that tree crops are more likely to be grown by households with sizeable land or income. These households have access to irrigated rice lands and are more or less self-sufficient in rice. Rice self-sufficiency affords them security to devote remaining lands to tree crops.

Other case studies suggest, however, that tree crops are also grown by farmers whose resources are too limited to meet basic food needs through agriculture. Agroforestry may be desirable when land is limited because it provides higher returns than monocrops, or when labor is limited due to the need to engage in wage work. Arnold and Falconer (1989) argue that the low labor demands of cultivating trees enable part-time farmers to maintain land productivity without purchasing additional labor, fertilizer, herbicides and irrigation; and that income earned from tree crops may provide the capital to invest in agricultural assets. Furthermore, in addition to providing timber and fuelwood, trees provide a diversity of edible seeds, leaves, and fruits to supplement diets and are of crucial importance to eliminate seasonal short-falls and avoid emergencies; and trees also are an asset and source of insurance for poor people.

The major lesson learned from a review of the literature on social forestry projects and agroforestry is that the benefits and costs of agroforestry and tree growing in general are highly contingent on local social and ecological conditions. The value of trees as cash crops will depend on the particular tree species, whether it can be consumed domestically or must be exported, its current and future market value, and its cost and ease of transportation. Failure to consider these factors on a base by base condition, and at particular historical times, can mean agroforestry promotion will fail to meet the intended aims of social forestry programs.

Additionally, some preliminary work on agroforestry promotion among Dayak groups by local NGOs emphasized the following concerns which the NRMP needs to consider (Maessen 1991): 1) heavy rainfall and irregular water levels, 2) acidic and infertile soils, 3) poor transportation and marketing networks, 4) labor shortages (i.e., diminishing number of young workers), 5) increasing cost of subsistence and hence limited resources for reinvestment, 6) short-planning horizons and limited risk-taking, 7) focus on rice production, 8) limited education and skills in alternative agricultural practices (i.e., as opposed to shifting cultivation), 9) limited local agricultural organizations, 10) cooperatives are aimed more at

consumption rather than production, 11) low quality livestock and fodder, and 12) expansiveness of the area and limited infrastructure.

### 3.6 Sustainable Agricultural Conversion

Another approach to assisting shifting cultivators and to ease pressure on remaining forests is to use land more sustainably and productively. These goals may be met by modifying converted agricultural systems through encouraging *sawah* cultivation and/or through promoting certain rainfed agricultural techniques (especially those sustainable on steep slopes).

The downstream impact of deforestation associated with shifting cultivation, and with certain upland farming practices, has resulted in greater attention to the sustainability of upland farms. The failure of upland farmers and shifting cultivators to use soil conservation technologies such as bench terraces was believed to be linked to their traditional culture, static farming practices, ignorance, and even laziness. Empirical studies have shown, however, that engineering methods of soil conservation in particular are not adopted because farmers recognize the limitations of their own resources to support dryland terraces, because of labor conflicts, limited capital and debt, marginal and insecure land tenure, and their poor suitability to sites with high weathered, nutrient-poor soils and shallow topsoils (i.e., most of the outer island soils in Indonesia).

Investment in many soil conservation technologies is not economical for the private landowner; most of the benefits accrue downstream where soil erosion deposition place. These recognitions have supported policies and programs that temporarily provide subsidies or cost-sharing for soil conservation between farmers and government. However, subsidies (i.e., in the form of income, fertilizer or other agricultural inputs) do not in themselves ensure long-term use of bench terraces (Belsky 1991). On the other hand, Javenese farmers have built terraces where they support cropping systems that fit with local agronomic and market conditions, and bring high and reliable returns to labor (Barbier 1990).

### 3.7 Social Issues in Marine Conservation

The orientation of marine and coastal park management has only recently moved from an emphasis on protection and conservation to what may be called a "social fisheries" perspective. The overwhelming concern for protection is especially true for estuaries and coastal reef areas. The literature suggests the major threats to sensitive marine habitats involve too many people (i.e., involving excessive harvesting pressures) as well as insufficient planning and management. As was the case initially in forest environments, there is often insufficient understanding of the livelihood pressures that underlie peoples' unsustainable use of resources; and hence how these pressures need to be understood and integrated with conservation-oriented activities.

Policies, incentives and "social fisheries" strategies to involve local populations in marine protected area management are less developed than those found in the forestry sector. Nonetheless, a critical social component in the international marine resource literature is emerging, and some attempts at integrating local community interests have been attempted. For example, in a major IUCN guide for marine and coastal protected areas, the following observation is offered.

Safeguarding critical habitat for fish production, preserving genetic resources, protecting scenic and coastal areas, and enjoying our natural heritage all may require the strict protection of natural areas. In some areas, limited uses (such as fishing, rotational tree felling for wood chip and charcoal production, and use by tourists) may be permitted on a sustainable basis. ... The principal goal of area protection is conservation (Salm and Clark 1984:1).

Attention to local peoples in the above work is even more explicit in the section on how to manage protected areas for small islands. The primary goal is establishing upper limits for permanent human populations and tourists, a second goal is integrating human habitats into the economy of the islanders so that islanders have a vested interest in protecting and conserving them. In particular, the author, Rodney Salm, goes on to suggest that "In promoting wilderness values, as in extracting natural resources on islands, it is better if islanders benefit in the form of management and control rather than through merely providing services for visitors or through performing extraction techniques (1984:170)"; and furthermore, "(t)he principles for conserving nature on inhabited islands cannot be independent of the sociopolitical system of the islands who live there (1984:179)." To his credit, Salm includes the following quotation from Stratton (1976):

People can't change the way they use resources without changing their relations with one another...Most questions whether or not to save or use resources (growth questions, conservationists' questions) are really about who should use resources. They are just like other questions of distribution justice. They are therefore fit for regular politics.

Salm's orientation is noteworthy, and enlightening compared to the more typical neo-Malthusian perspectives on resource use and conservation strategies.

Additionally noteworthy are case-studies from the Philippines where a number of social fishery projects have been attempted. In the southern Philippines, two community-based marine reserves were set up to manage problems with blast fishing, small-scale muro-ami fishing, use of fine-mesh nets, and spearing and gleaning which effectively cleaned most of the edible reef organisms from the area. In Sumilon Island in Cebu, a portion of the shoreline was designated as a marine sanctuary and fishing was prohibited. In another area, traditional fishing using no destructive methods was allowed. Management efforts involved local fishermen, and the reserve caretaker had good relations with local fishermen. After the caretaker left, however, the project broke down.

In contrast, a community-managed marine reserve in Negros proved to be sustainable over the long run because of the following:

- 1) preliminary background socioeconomic and attitudinal information was gathered which enabled the project to integrate better within the community including placement and acculturation of two field workers;
- 2) informal education programs were developed and delivered about the local marine environment; and
- 3) a core group of local fishermen was developed who took real responsibility for co-managing the marine park along with outside agencies and development workers. The success of this effort rested in great part on the meaningful involvement of core management group in formulating and carrying out the park plans, and through the ongoing use of extension education in informing the local populations of the status of management efforts and policies (White 1989).

### 3.8 Eco-Tourism: Who Benefits?

In this section, I summarize some of the major benefits and caveats to eco-tourism or nature-based tourism. These are summarized from a 1990 study commissioned by the World Wildlife Fund and written by Elizabeth Boo. Boo includes the following as benefits of ecotourism:

- 1) it generates badly needed revenue for local and regional economies, stimulates economic activity, diversifies economic activity, and spurs growth in isolated, rural areas;
- 2) it heightens local awareness of the importance of conservation; and
- 3) it creates new incentives for government and local dwellers living within or adjacent to appealing natural areas to preserve them.

On the negative side, ecotourism:

- 1) generates an unstable source of income since it is greatly influenced by uncontrollable factors such as political instability, weather and international currency fluctuations;
- 2) increases tourism which places more demands on ecosystems and natural resources and which can destroy the attractions that draw people (e.g. overcrowding and environmental degradation of resources);
- 3) depends on seasonal business which is inefficient and costly to have capital equipment and labor idle during parts of the year; and in rural areas, nature tourism that coincides with peak harvest times or other important activities can result in labor shortages;

4) yields benefits and consequences (economic and ecological) that are yet to be realized and understood. This is a result of the fact that many parks are newly established and structures to support ecotourism are not yet in place; and a number of other concerns which include:

a. transportation systems are not able to connect parks to airports located in capital cities;

b. as of yet we don't know who is the "ecotourist": people go to protected areas for a variety of reasons and interaction with natural environments varies from casual observation to intensive research;

c. the means or procedures for collecting money from visitors to the park is not yet established (i.e., whether collection from tour operators, private international tour operations/conservation groups, or from private donations from enthusiastic tour participants);

d. there is a lack of trained guides, interpretive information, maps, promotional materials, and basic infrastructures such as visitor centers; and

e. food and lodging are often not locally available.

Most critical to the purposes of this consultancy, eco-tourism has yet to show positive benefits for local communities. Furthermore, it is unclear what measures need to be in place to ensure that benefits are equally distributed within local populations. Eco-tourism has been advocated as a means of raising local employment opportunities. But as of yet, there are few studies that assess whether and under what conditions this goal can be realized. This may reflect the fledgling nature of the enterprise.

The Monteverde Reserve in Costa Rica is frequently cited as an illustration of how a park can provide direct economic benefits to resident residents -- especially women. In this park, a cooperative of local women sells homemade souvenirs to tourists grossing about \$50,000 year. Boo (1990) suggests that to enhance local benefit, tourist facilities should be small-scale, low-impact lodging facilities; and if possible, locally owned and managed. How well employees are paid, and what kind of employment benefits are provided must also be addressed. Lastly, the example cited above is not the norm -- men tend to dominate over women in new development activities. How then can affirmative action procedures and priorities be enacted to assure employment opportunities do not discriminate because of race, class or gender.

Another critical variable for assessing the impact on local communities is the proportion of financial gains from eco-tourism that remain in local communities. In the past, many tourist activities involved substantial "leakages" out of the country. There is considerable evidence to suggest that large scale international tourism development is far less beneficial to developing countries than has been claimed. For example, the World Bank estimates that 55 percent of gross tourism revenues to the developing world actually leak back to developed countries.

### 3.9 Summary: Lessons Learned from the Literature

- The "lock-it-up" preservationist model may work in the U.S., which is characterized by vast, sparsely settled land-use patterns and a predominantly urban population. But it is doubtful whether it can work in tropical countries where large percentages of the population still live on and subsist directly from the land and/or forest products; and where human:land ratios are quite high.
- It is increasingly recognized that despite designations of parks on paper, and by government edict, the viability of protected areas is tied to the support and the fate of local peoples. The literature abounds with examples of continued natural resource exploitation by local peoples seeking revenue and/or subsistence from protected areas despite regulation, boundaries, fines and other restrictive measures.
- Where national parks have been created and relocation of residents have occurred, there is little understanding of the overall economic and political costs and benefits associated with the relocation program.
- Local communities are increasingly perceived as a potential agent for marrying the goals of rural development and nature conservation through the vehicle of "sustainable development" and "ecodevelopment." But despite these grand and noble thoughts, there are few rigorous examples and studies that document these claims.
- It is unlikely that extractive reserves and non-timber forest product collecting will provide the answer to balancing forest conservation with local livelihoods. More likely they will comprise one component in a wider, diversified multiple-use management plan. Nonetheless, extractive reserves are crucial to protect forest products against threats of commercial logging and to safeguard food and income security.
- Local populations must directly benefit from conservation activities to support them. Appeals to the future benefit or public good are unlikely to elicit support. If local populations have a stake in management, it will help to direct flows back to them and entail greater involvement and hopefully, greater benefit.
- Respect must be given for local land use practices and management customs. Wherever possible, pilot projects should build on these traditions. A primary example would be to

support traditional adat systems for managing forest access, ideally through co-management efforts.

- There must be a workable methodology for institutionalizing at least some local control (i.e., empowerment) over resource development activities that is also practical given actual state-society relations.
- "Participation" can become a veneer for cooptation when local people are not involved in deciding the objectives and procedures for development activities.
- The instrumental character of much of the recent concern for local peoples in social forestry ultimately limits its effectiveness.
- "Local peoples" are not a homogenous unit, but different ethnicities and cultures and economic classes stratified further along gender and age criteria. There may not be a consensus on the problems or solutions at hand. There is a problem how to locate a legitimate voice to represent the so-called "local interests".
- Because of internal differences and stratification patterns, we cannot be sure that benefits will flow evenly even if attempts are made to involve local communities. Development projects often benefit the more well-off, and overlook the question of how to reach the poorest of the poor.

#### **4. RESEARCH/CONSULTANCY METHODOLOGY**

I developed the research design for accomplishing my scope of work after consulting with long-term NRMP advisors. This was facilitated through my involvement in the January 6 - 11th meetings in Jakarta where we sought to develop the NRMP implementation plan, and through an initial field visit to the SBK forest concession in West and Central Kalimantan (i.e., with Mering Ngo, Fernando Portess, Lisa Curran, Monica Kusmati, and Steve Dennison).

My field strategy evolved as a result of discussions with Mering Ngo, the NRMP Social Forestry Advisor and co-author of the initial social soundness analysis; and after careful consideration of his Social Forestry Action Plan (draft - January 3, 1992). According to the latter, Ngo identified the following categories of data as critical for developing and implementing a social forestry component: mapping of village territory, community profiles, education and language status, oral history of local forest and tree product use, social structure, agricultural practices, income survey, and tenurial and resource use rights.

Given my expertise as a rural sociologist, with particular training in agricultural and natural resource sociology, and Ngo's in anthropology, we decided I would focus on obtaining the data on community profiles, forest and tree product use, agricultural practices

and household income (or livelihood sources). Mapping village territory and land use, as well as understanding the nuances of social structure and land tenure, require more long-term field studies and made more sense for Ngo to collect. In addition, the fact that Ngo himself is Daya' increases his suitability for collecting these kinds of information.

The villages I studied were the "target communities" identified in Ngo's social forestry action plan. It should be noted that there are very few other villages in the area.<sup>3</sup> I gathered data in all of the villages he identified for Central Kalimantan (Riam Batang, Tumbang Taberau, Tanjung Paku, and Tumbang Kaburau); and in four of the six villages he identified for West Kalimantan (Belaban Ella, Sungkup, Nanga Siyai and Nanga Apat). Although I did not conduct surveys in the two villages of Nanga Landau Mumbung and Belaban Dalam, I did visit them as they are located close to the other villages. The decision not to conduct special studies in these two villages was based on time limitations as well as on Ngo's observation that they do not seem to differ in important ways from the other villages, and hence the study's results could be generalized to them as well.

My field methodology involved key informant and group interviews, observation (i.e., of farms and farming practices), and a random household social survey. A combination of research methods was sought to increase the range and quality of the data, given the varied advantages and disadvantages of each method alone (see USAID methodology paper).

Two field assistants accompanied me and they focussed on conducting the household surveys. Both are final-year forestry students at the Fakultas Pertanian Universitas Tanjungpura, and both are excellent field assistants. I would recommend them highly for any future social as well as forestry research work the project undertakes.<sup>4</sup> We reviewed the questionnaire and I gave them some basic training in how to conduct surveys; (Syahirsyah (Jimmy) had already conducted surveys as an assistant to his father). To ensure reliability, I observed two-thirds of the interviews. The remaining time enabled me to follow-up with key informants, and for me to accompany farmers to their farms.

The interviews were largely conducted in Bahasa Indonesia. Most of the villagers we interviewed understand Bahasa Indonesia; older women who have never been to school are the exception. A small number of interviews were conducted in Bahasa Banjar. Occasionally, a translator from the village assisted with translating local dialects into Bahasa Indonesia.

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<sup>3</sup>From the SBK logpond to Km 24 I only heard of two other villages: Sepotir (Km 5) and Pinihin (Km 13). Sepotir is located at great distance from the production and conservation forests of the NRMP; and all of them already make *sawah*. There is a forest tract near Pinihin which, for some reason, still remains intact. Villagers from this village apparently practice shifting cultivation and collect forest products within this forest tract. In contrast to West Kalimantan, there are likely many more villages in Central Kalimantan along the -- river whose residents make farms and collect forest products in the Bukit Baka/Bukit Raya forests. Ngo has indicated an interest in investigating these areas in the upcoming months.

<sup>4</sup>One of the field assistants is the son of Pak Syamsuni Arman, who has a Ph.D from Human Ecology at Rutgers and currently teaches in the Department of Regional Development, Tanjungpura. He graciously offered to help me translate the survey questionnaire. He has indicated an interest in working with the NRMP, and would also be able to contribute considerably to any future social forestry-related research.

The Central Kalimantan households that were interviewed were selected in the following way. A list of households (*kepala keluarga*) was obtained from the village head (*kepala desa*). Each household was given a number. Numbers were then picked at random from a hat, and the household with that number was interviewed. We conducted this process in full view of the village at large, so that villagers could see for themselves how and why particular households were interviewed. I recommend this method not only to ensure randomness (and hence wider generalizability), but as a means to introduce the purpose of the study, involve villagers, and minimize confusion over who is and is not included in the survey.

How we selected households to interview differed in the West Kalimantan villages (Belaban Ella, Sungkup, Nagai Siyai and Nanga Apat). We arrived in these villages the last few weeks of February which is during the rice harvest from both shifting cultivation fields (*ladang*) and irrigated and rainfed paddy fields (*sawah*). During this time, many households temporarily reside near their rice fields. Households were randomly selected from farmers working at the ricefields (i.e., we conducted the interviews at the rice fields). We also held interviews at night with a random sample of farmers who had returned to the village. Given these conditions, as well as the larger absolute number of households in these villages, the percentage of households surveyed is smaller in the West Kalimantan villages than in Central Kalimantan.

One other important characteristic -- or criteria -- of how the sample villages were selected needs to be mentioned. This involves village location along the main SBK logging road. The geographic location of each village along the logging road is important as an indicator of (1) the extent of deforestation near and around the village and (2) distance to markets. First, from the logpond at the beginning of the SBK main logging road to approximately km 22 (where the KKP logging concession begins), the land on both sides of the logging road is denuded and covered with *Imperata* grass (*alang-alang*). The forest (i.e., primary and secondary forest) gradually appears as one moves along the logging road to the area currently being cut (approximately km 93). More specific matching of forest blocks cut (and their dates) with areas near and around the sample villages needs to be made to precisely identify the extent of remaining forests near the target villages.

Secondly, village location along the main SBK logging road indicates distance to markets. "Market" here refers to both the various SBK "camps" located at km 35 (headquarters), 54 ("Binhut" - the reforestation nursery), 72 (vehicles and logistics), 84 and 93; and to markets in larger towns. Km 0 is the SBK "logpond" which is a major entry point to the Melaluhi river and onwards to the larger towns and markets downriver at Nanga Ella and Nanga Pinoh. Information about village location and the number and percent of households surveyed within each village is summarized in Table 1.

For the Bunaken National Park component, I spent eight days in Manado: 1) gaining an overview of the major conservation issues by holding discussions with NRMP conservation advisors, PHPA staff, local diving operators, and local tourist-service providers; 2) collecting

secondary data on villages located within or adjacent to Park boundaries; 3) visiting all of the islands and some of the villages; 4) conceptualizing and beginning plans for designing and conducting an extensive socioeconomic survey; and with regard to the survey, 5) meeting with local UNSRAT University personnel to identify persons to train in social survey methodology and to assist us in conducting the survey at a later date (now tentatively scheduled for July 1992).

Table 1(1)  
Sample Village Location and Survey Information

Village	Location	Total No. Households	No. and % Surveyed
Riam Batang	Km 87, 2.5 hours from main log road		
Tumbang Taberau	Km 87, 2.5 hours from main log road (RB+TT=	47	20 42%
Tanjung Pako	Km 75, 15 minutes from main log road	58	14 24%
Tumbang Kaburau	Km 54, 2 hours from main log road	28	10 25%
Belaban Ella	Km 25, adjacent to main log road		
Sungkup	Km 24, 15 minutes from main log road (BE+S=	85	12 14%
Nanga Siyai	Km 17, 20 minutes from main log road		
Nangat Apat	Km 17, 1 hour from main log road (NS+NA=	88	15 17%

(1) The data for Riam Batang (RB) and Tumbang Taberau (TT) are presented together, as are the data for Belaban Ella (BE) and Sungkup (S), and for Nanga Siyai (NS) and Nanga Apat (NA). The justification is that these villages are located close together, they share forest and agricultural resources, and exhibit similar patterns of livelihood activities, etc. We begin with the villages located furthest away from km 0 (the logpond at Melaluhi River) (i.e., with the least amount of logging nearby and therefore, most abundant forest resources.)

## 5. RESEARCH/CONSULTANCY RESULTS: BUKIT BAKA/BUKIT RAYA Pilot Project

### 5.1 Village Backgrounds: Ethnicity, Settlement History, Local Government, Population, and Infrastructure

All of the villages surveyed are comprised of Daya' people. According to the work of Ngo, in the West Kalimantan villages, all are from the Limbai Kelait group. However, in the Central Kalimantan villages, there are different subgroups: Riam Batang and Tumbang Taberau are comprised of Dohoi (a sub-group of the Ot Danum group), in Tanjung Paku, the population are Pangin Daya' (also a sub-group of the Ot Danum group), and in Tumbang Kaurau, we find a mixture of the subgroups from the Ot Danum and the Melahui Daya' groups.

Each village is situated along a river bank (hence the reason why each village is named with "river" - *nanga* means river in West Kalimantan and *tumbang* in Central Kalimantan). During the war with the Dutch, villagers reported living in the interior.

According to the *temunggung* in Nanga Siyai, there is only one remaining group of forest dwellers in the Bukit Baka/Bukit Raya area. These people are called the Uwo' (or Wu'/Wo'). They are still hunter/gatherers. They are rarely seen; reportedly only by the Punan people. The Punan call the Uwo' "ghosts" because they can only see their shadows. This is because the Uwo' are reported to live in the canopy of trees, and can move along trees with the expertise of monkeys. They are reported to be very short in stature, less than 1 meter tall, and to color their lower legs and arms yellow. They use blowguns (*sumpit*) to hunt.<sup>5</sup> If they find something that someone has left in the forest, such as tobacco, they will take it but leave something behind as a form of trade.

I was told that the Uwo' used to live near Bukit Baka, but they have had to relocate to the more remote Bukit Raya as a result of logging activities. They continue to live in the interior as hunter/gatherers because they do not search for salt. The Punan used to live in the interior as well near Bukit Barisan. But now they have become acculturated and live in villages along the river and farm just like other Daya' groups. Their change of tradition was apparently as a result of their search for salt. There used to be two types of Punan: *Punan batu*, or "stone Punan" because they lived in caves; and the *Punan pohon*, or "tree Punan" who lived like the Uwo' in the tree canopy. Despite the tales of others who say there are still hunter/gatherer Punan, the *temunggung* from Nagai Siyai says they have all moved to the river; only the Uwo' hunter/gatherers remain and even then he is not certain of their current

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<sup>5</sup>There is a story about the Uwo' that has been passed down over the last generation. Villagers from Nanga Siyai used to go to Bukit Baka and Bukit Raya to hunt with rifles. They used to be attacked by the Uwo' with their poison blow guns. This happened because the hunters would sometimes take the pigs the Uwo' set out to trap. The attacks continued to happen until one time while they were bathing, the Uwo' picked up a rifle (*lantak*) and shot it, accidentally killing one of the hunters from Nanga Siyai. The sound of the rifle and fear of revenge scared the Uwo' so much that they stopped attacking hunters.

population or present culture. According to this informant, "surely we can only know about the Uwo' when the logging roads reach Bukit Raya, because after that they will not have any more place to run or hide."

Many older villagers in each location remember when their village was located in a different area (e.g. Tanjung Paku, Tumbang Taberau and Nanga Siyai). In these cases, the reasons for relocating the village involved exhaustion of local soils. I was told that Tumbang Taberau moved (i.e., next to Riam Batang) approximately 15 years ago because of poor soils and because they were also having land disputes with a neighboring village. One can see their former village site and ancestral lands (including a cemetery) from the river. Even today, land disputes continue as some elder villagers from Riam Batang claim that the newcomers never actually "paid" for the land where they constructed their houses.

Each village has a government appointed head (*kepala desa*) who is responsible for keeping village census records, and for being the "link" with the next higher level of government (the *kecamatan*). In some cases, there is also a local *adat* leader known in Daya' communities as the *temunggung*. The strength of the *kepala desa* and the *temunggung* varies across the villages. For example, there is apparently great support for the *kepala desa* in Tanjung Paku, but less so in Riam Batang. In the case of the latter, villagers complain that the *kepala desa* has pocketed money given by the manager of the SBK logging concession for compensation of land and trees destroyed by construction of logging roads. Villagers are very mad that the money has not been distributed to those who claim their property (*sudah hak milik*) had been damaged. Not surprisingly, they are lax to follow the instructions of the *kepala desa* in community development projects. In Nanga Siyai, in contrast, there still remains a segment of the traditional long house (*rumah panjang*). The *temunggung* in that village appears to have great community support.<sup>6</sup> Internal power struggles and the lack of a legitimate authority from each village to represent so-called village interests has serious implications for social forestry and other resource management activities, and will be discussed in more detail below.

Population statistics from the survey reveal significant population pressure as half of the population, on average, is under 14 years of age. This is a common age-structure in Indonesia. Population pressure is offset somewhat by outmigration and by (infant) mortality; each household reported at least one child death, and sometimes two; though the survey did not specifically collect data on infant mortality or out-migration.

Inmigration is most widespread in the village of Tumbang Kaburau. Over half of the households surveyed were not originally from that village; many had come from West Kalimantan. This trend can also be seen in the data on the average age of household "heads". While in the majority of villages the average age is around 44 years of age, in Tumbang Kaburau it is ten years lower. Migrants report that they came to Tumbang Kaburau for three

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<sup>6</sup>Local power structures (including the use of village councils) will be explored further by Ngo as a basis for understanding (and strengthening) local land and forest management bodies.

main reasons: 1) the proximity to the SBK "Binhut" camp at km 54 and their hope that they could acquire employment in reforestation activities; 2) the extensive logging activities near the village provides access to lands for making farms; and 3) the proximity to km 54 means a market outlet for farm crops. As it will be discussed in more detail below, market opportunities are severely limited in all of the villages and the logging camps represent in many cases the only market for farm produce.

There is a school in each village. In addition to teachers provided by the Indonesian government, SBK provides teachers in most of the villages (and two in Riam Batang/Tumbang Taberau). The SBK teachers define their mission as providing general education and "teaching farming alternatives and giving motivation to the villagers to stop practicing shifting cultivation."

Educational levels are very low. Most villagers report some education, with most finishing SD grade 3 on average. In order to achieve high school attendance, teachers in Riam Batang and Tumbang Taberau report temporarily closing school during high labor peak periods, such as when rice is planted and harvested. But in all other times, they and other teachers estimate that 95% of school children regularly attend school. The high value parents have for educating their children can be seen in both their willingness to return from their farms so that their children can regularly attend school, and the support they have for SBK because it provides teachers.

Other infrastructure is almost non-existent. There are no public markets, government structures or even small stores; a small store (*warung*) containing only a minimal amount of goods exist in Belaban Ella and Nanga Siyai only. In all other locations, store-bought commodities such as salt, cooking oil, dried fish, cloth and clothing is either bartered or purchased on the one to two times per year a household member makes the trip down the Melahui River to Nanga Ella or Nanga Pinoh. It is important to remember that to reach the Melahui River, villagers must either walk or hitch a ride along the logging road to the log pond at km 0, or attempt to use the riverways which, as it will be discussed below, are often too shallow for boats to use.

There is no *puskesmas* or other government medical facility in any of the villages. Hence there is no access to medicines or modern contraceptives. Women in the West Kalimantan villages especially asked me how they could get access to birth control; they were concerned about locating birth control methods that fit (*cocok*) with their bodies and about possible side effects. In Tanjung Pako the wife of the *kepala desa* told us that many women there (and in Tumbang Kaburau) use a form of local birth control.<sup>7</sup> There is apparently a

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<sup>7</sup>According to *kepala desa's* wife, one boils the bark or nut (no special name of tree given, just *pohon cabai*), and drinks the mixture after giving birth. The drink is supposed to help "clean out" the womb after child birth, and depending on the quantity of bark or nuts, determines the number of years the woman will not bear additional children. It should be noted that the use of this local method is quite restricted, and its true effectiveness unknown.

doctor at SBK's camp at km 54, but according to villagers, this doctor is for treating SBK workers and their families. The doctor will treat local villagers only if they have an extreme ailment. Given the large distances from most villages to km 54, villagers rarely make the attempt to seek medical treatment from this facility.<sup>8</sup>

There is electricity (i.e., from a generator) in only one of the study villages: in the long house in Nanga Siyai. The money to purchase the generator came from the villagers themselves.

Water for drinking and bathing comes from the rivers. The rivers also serve as the place for disposing human waste as well. No alternative water sources have been constructed such as a pump, though some households use discarded oil drums for collecting rain water to supplement water for dish washing, not for drinking.<sup>9</sup> I was told that rain water collected from roofs (most have rooftops made from wood shingles - some from corrugated tin) can be drunk if consumed quickly; but if stored for a day or longer, will cause stomach ailments.

In all villages, there was great concern over the declining quality of river water. Villagers complained of increasingly dirty water, especially during the rainy season; and they relate the decline to logging activities, soil erosion and increased sedimentation. The complaints were especially strong for the West Kalimantan villages where logging activities have occurred over the longest period (i.e., over 10 years). In these villages, I was told that they often cannot drink their usual river water during the rainy season, but must walk one half hour to a small tributary across the road to locate clean water. One villager from Sungkup said he had asked SBK to help them build a pipe from this tributary to their village (around km 24), but no assistance was given.

Villagers from Belaban Ella and Sungkup also complain that travel along the Ella Hula river is often impassable due to increased sediment-loading and declining depth of the waterways.

Consequently, their access in both directions (downstream to the Melahui river and upstream to the forests where they collect forest products) have been severely impaired.

## **5.2 Food Security and Household Livelihood Sources: the Centrality of Rice Production**

Rice is the staple food in all the villagers we surveyed. People aspire to eat rice three times a day. People report eating only fruit, root crops (especially cassava), or mixing corn with rice as a "meal" only when their rice supply is gone, and when they have no money to purchase additional rice.

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<sup>8</sup>I was also told that local villagers have received injuries while riding in SBK vehicles. In one instance where a man suffered leg injuries, SBK transported him to Nango Pinoh for medical treatment and they covered all of his medical costs.

<sup>9</sup>The oil drums are cleaned and painted before using.

The villagers' concern for attaining household rice security cannot be over-emphasized. By this I mean either producing enough rice themselves to feed their household between rice harvests (and longer if possible); or to ensure a secure source of income (and a secure source of rice) in which to purchase ones' rice staple. I found a surprisingly high willingness of farmers to depend on the market for purchasing rice if a secure source of income could be attained. In Tumbang Kaburau, one farmer told me "I would stop shifting cultivation tomorrow if I could be sure I could sell enough rattan to buy rice for my family." Given the remoteness of achieving secure incomes under current conditions, strategies for meeting household food security still revolve around subsistence agricultural production.

One of the most important findings of this study is the variation we find in household rice security across the different villages; and importantly, a correlation between household rice security with village location along the main logging road. These data are summarized in Table 2.

Table 2  
Household Rice Security(1) by Village(2)

<u>Village</u>	<u>% of Households Below Rice Security</u>	<u>% of Households Above Rice Security</u>
Riam Batang/ Tumbang Taberau	0	100
Tanjung Pako	15	85
Tumbang Kaburau	40	60
Belaban Ela/ Sungkup	83 (3)	17
Nanga Siyai/ Nanga Apat	80	20

(1) Rice security is defined as having sufficient rice from either production of shifting cultivation (*ladang*) and/or paddy (*sawah* either rainfed [*tadah hujan*] or irrigated [*irrigasi*] fields to meet household consumption needs from one harvest until the next.

(2) We start with the village **closest** to the forest (i.e., those further along the SBK main logging road with the least length of time and amount of logging in their geographic vicinity). See Table 1. for the actual location (km) along the main logging road.

(3) One household relied totally on purchasing rice from the money earned from collecting *gaharu*; but this income could not purchase sufficient amount of rice to last a year.

Rice security is highest in the villages located closest to primary forest, and in essence, where traditional, long-fallow shifting cultivation is still practiced. In contrast, rice security is lowest where forest degradation is most severe, and as yet, alternative rice production systems (for example, *sawah*) have yet to be widely established.

The following statistic can help to further illustrate how successful farmers from Riam Batang/Tumbang Taberau are at meeting rice needs through shifting cultivation, even during the 1991-1992 rice season which was burdened by a particularly long dry season. Preliminary analysis of rice production and consumption patterns in these villages suggest that a family of three, at minimal, consumed 400 gantung of padi over the last year. This translates into 300 kilos of unhusked rice (*beras*) per person per year (1 gantung *padi*=3 kilos *beras*). The national average is around 240 kilos *beras*. Over the last year, individuals in the Riam Batang/Tumbang Taberau area ate more rice than the national average. To what extent they ate less than the national average in supplementary foods is unknown; the data on forest product collecting suggests that they have access to many wild foods.

Variations in household rice security is also evident through the prevalence of rice storage huts known as *lumbung padi*. Rice storage huts are built in the village near the households' permanent dwelling, or behind the temporary huts (*pondok*) constructed on farms. In many rural areas, including one of the areas the author studied in Sumatra, there are no more *lumbung padi* anymore since there is rarely a surplus of rice to store.

Variations in village/household rice security are also related to forest resource use. In order to earn income to purchase additional rice after ones' own production has been consumed (typically during the months preceding the late February harvest), one of the only options for individuals in the study area is to gather forest products for sale. We will see this pattern below.

### 5.21 Major Source of Household Food and Income

As suggested above, rice is the major food consumed at each meal. Supplementary foods includes vegetables grown on farms or collected from the forest. The most frequent vegetable side dish is boiled cassava leaves; cassava is grown near houses, along the river banks, and in the *ladang* field.

Protein comes from consumption of wild pig, deer, *kancil*, and fishing. A few men own locally-made rifles. The majority hunt with spears. In Riam Batang, the most skilled village hunter reported killing 5 wild pigs within one month during the last major fruiting season (1991). Hunting is predominantly for household use, though surplus meat is frequently sold by households lacking rice security.

Fishing occurs in the rivers and usually involves setting up nets. Most people report being able to catch at least one fish each fishing "trip", and often more.

Tables 3 and 4 summarize the major source of food and income in the sample villages as reported by households. The important results to note regarding food is the importance of *ladang* farming in the first three areas as the major source of rice, and in the last two, the growing importance of *sawah* and purchasing rice. In terms of household income sources, the trends to note are the importance of income from selling *ladang* farm crops (mostly rice and vegetables) in the rice self-sufficient areas, and dependence on income earned from selling forest products in the other villages. Wage labor becomes important in the West Kalimantan villages.

Table 3

Major Source of Household Food in the Sample Villages  
(in percent)

Village	Rice from Ladang	Rice from <u>Sawah</u>	Purchase	Other
Riam Batang/ Tumbang Taberau	100	0	0	0
Tanjung Pako	100	0	0	0
Tumbang Kaburau	100	0	0	0
Belaban Ella/ Sungkup	75	17	8	0
Nanga Siyai/ Nanga Apat	20	40	40	0

Table 4

Major Source of Household Income in the Sample Villages  
(in percent)

Village	<u>Sell Ladang Crops (1)</u>	<u>Sell Forest Products (2)</u>	<u>Wage Labor (3)</u>	<u>Other (4)</u>
Riam Batang/ Tumbang Taberau	70	25	4	0
Tanjung Pako	79	1	7	14
Tumbang Kaburau	50	0	0	0
Belaban Ella/ Sungkup	25	33	33	8
Nanga Siyai/ Nanga Apat	33	40	13	13

(1) In Riam Batang/Tumbang Taberau and Tanjung Pako these crops are largely rice and vegetables; in Tumbang Kaburau these are rattan and vegetables; and vegetables in the remaining two areas.

(2) In all these involve ironwood (for shingles and house frames), *meranti* (house construction), *gaharu* (incense), and fishing.

(3) Mostly work for the SBK forest concession.

(4) Mostly crops such as vegetables grown on rainfed ricefields.

## 5.22 Marketing Agricultural Products

Markets for farm crops are local. Rice is sold within the village. The SBK logging concessionaire and its many temporary camps (along km 54, 72, 87 and 93) are the major markets for vegetables produced by local farmers. Women tend to be the ones to market vegetables, though this observation is by no means a fixed rule - if males are traveling past the camps and there is surplus to sell, they will bring along some goods to sell as well.

Marketing farm crops poses many problems. First, there are no "orders" placed. Rather, farmers travel to the logging camps when they have surplus to sell. Sometimes this creates a problem if many people go at the same time. They cannot sell all they brought. Some women report throwing vegetables overboard because they did not wish to transport them back to the village.

Second, the prices they get for their produce are very low. One woman estimated that a "full" boatload of vegetables will bring from Rp 5,000 to Rp 20,000. At most, she will market vegetables every other week (or two times a month). At best, this brings a yearly income of 12,000 to 480,000 Rp; with the true value somewhere in between. She says her pattern is typical of other women in Riam Batang.

Third, villagers are now dependent on the SBK (and possibly PPK) camps to locally market their farm goods. Other markets require travel to the log pond (at km 0) and a boatride to one of the adjacent. For residents of Riam Batang for example, this requires the 2 hour boatride to km 87, and then a hitch/walk or a combination of the two to the log jam. Not surprisingly, the presence of logging camps as an available market is viewed by the survey respondents as an important development; and especially as a means for women to earn income. When asked what activities would be particularly helpful to boost women's work and contribution to the household economy, marketing farm vegetables was the overwhelming response. Villagers have come to depend on the income they earn from selling vegetables to buy commodities from the camp canteen such as cooking oil, salt, sugar, soap, etc; and to pay school fees and purchase school uniforms.

### **5.23 Wage Labor**

In addition to marketing farm goods, villagers can earn cash income through selling their labor. However, the extent to which households across the different villages engage in labor markets vary, as do the type of wage labor activities they engage in. Table 5 summarizes the data on wage labor. We find households in the two West Kalimantan villages to be most involved in labor markets. This is consistent with the above trend: that is their lower rice security and hence the need to earn income in which to purchase food. In Belaban Ela/Sungkup, most earn labor from working with the SBK logging concession, whereas in Nanga Siyai/Nanga Apat wage earning opportunities also come from agriculture - especially weeding and planting new ricefields.

Those working for SBK involve the following jobs: night watchmen, guarding oil supplies, cruising trees, cutting timber, and doing menial labor in the camps such as cooking or skinning bark. Some villagers own chainsaws and take orders from SBK to cut wood, typically for use in constructing logging camps (there are 2-4 in each village). None of the women from any of the sample villages had ever worked at the camps, for example, as cooks.

Table 5

Household(1) Involvement in Wage Labor Activities by Village  
(in percents)

Village	% Households <u>Never</u> Wage Labor	% Households Worked <u>Wage</u>	% of Wage Labor for SBK
Riam Batang/ Tumbang Taberau	60	40	75
Tanjung Pako	64	36	60
Tumbang Kaburau	60	40	75
Belaban Ella/ Sungkup	25	75	89
Nanga Siyai/ Nanga Apat	33	67	50

(1) Whether any person residing in the household had ever worked for a wage (i.e., husband, wife, offspring, or other extended-family members).

The survey found variation in men's attitudes toward working for SBK. Villagers from the rice self-sufficient households in Central Kalimantan reported tremendous discontent with these types of employment. They claim to receive 2,500 Rp per day without food as a wage. When working, their only source of food must be purchased at the camp's canteen. They say their wages barely cover their food needs. One man from Tumbang Kaburau complained about the "occupational hazards" of cruising timber in primary rainforest. This included contact with large pythons and fear of meeting the lethal black cobra. Consequently, they prefer to work in their *ladang* fields and to sell farm crops. They said their search for cash income forced them to seek employment with the SBK logging concession.

Work with SBK was looked upon more favorably by villagers from West Kalimantan. This is due in large part to their more pressing need for cash in which to purchase rice (as opposed to supplementary items in the case of Central Kalimantan villagers). Many work for 1 to 3 months, especially in the months preceding the rice harvest (i.e., such as the months when this survey was conducted). Their attitudes also derive from culture. While in all areas the system of labor sharing (also called *gotong royong*) is still widely practiced, payment for agricultural field activities has been growing in the West Kalimantan villagers, particularly with the rise of rehabilitating grasslands for *sawah* cultivation. The *kepala desa* from Nanga

Siyai alone hired 15 people for 3 months to clear the *alang* grass from 5 hectares in order to begin a new *sawah*.

While working for SBK in the rainforest, employees also benefit from collecting forest products such as rattan, honey and wildlife. This is an important benefit for West Kalimantan farmers who live and farm far from the rainforest. Unlike farmers in the Central Kalimantan villages whose farms are located within or nearby primary rainforest, they cannot collect forest products while pursuing their forest farming activities. They must devote an entire day (or longer) to such forest excursions. On one occasion, a temporary SBK employee earned more money from collecting wild honey than he did from his monthly wages. I calculated his salary was Rp 2,000/per day times 30 days which equals Rp 60,000 (plus Rp 500 per day for food). This income was quite less than the 20 liters of wild honey he collected in the evening time (equalled 30 bottles worth Rp 6,000 each for a total of Rp 180,000). The income from honey does not include the large basket of rattan canes he also collected which he plans to make into chairs to sell in his village for Rp 10,000 each; nor the monkey skin he plans to make into a hat.

### 5.3 Agricultural Production: Shifting Cultivation, Enriched Fallows and Perennial Tree Cropping

In this section, I discuss agricultural practices of villagers from the sample villages; and in particular, their variations as we move along the logging road. These variations represent points along a continuum over time (i.e., as a proxy to access to forest resources), as well as across space (i.e., geographic location especially in relation to markets). A major contrast is the continuation of integral, shifting cultivation in the Central Kalimantan sites (i.e., where forest resources are most abundant) with various modifications in the other sites as they undergo a transition to sedentary farming.

**A major point that this report wishes to convey is the importance of understanding differences between households and across villages in their access to forests, and, as a result, in current farming and other livelihood activities. Building on these patterns is essential to developing pilot projects that meet the needs of local communities, and to eliciting their support and participation.**

#### 5.3.1 Shifting Cultivation: *Ladang* Farming

Historically, farming in the Bukit Baka/Bukit Raya region centered on the production of rice by shifting cultivation (*berladang pindah pindah*). More recently, outsiders and some local villagers as well, refer pejoratively to the practice as *ladang liar* or wild *ladang*. The shifting cultivation or swidden field is known as *ladang*. Technically, a *ladang* is the initial stage of the shifting cultivation cycle when the production of rice is the primary activity. A *ladang* field is cultivated for 1 to 3 years and left to fallow, oftentimes planted with some tree crops. If the field is planted entirely to perennial crops the field is called a *kebun*. We heard

many local names given to the stages from primary forest through cultivation, fallow and its succession to secondary forest or bush (*belukar*), but they are not reported here.

Integral or long-fallow shifting cultivation is still widely practiced in Riam Batang/Tumbang Taberau, Tanjung Paku and to a lesser extent, in Tumbang Kaburau and by some individuals in the West Kalimantan villages. Integral shifting cultivation in these areas involves the following.

Fields are cleared from forest from May through June. Small axes are used to cut the trees. Trees are cut to fall into the future farm spot. The cut vegetation is left to dry on the ground through July, and burning is timed to occur just before the rains begin, usually in late August/early September. Timing the burn is crucial to ensure that all the vegetation sufficiently burns (and thereby releases nutrients into the soil.) If the burn occurs too late and is prematurely put-out by the rains, the farmer may have to burn again and will lose soil nutrients and time. If the burn occurs too early, it is possible that the fire can grow too large and escape; the rains are the usual means for putting out fires. Another reason for felling large trees inwards is to create a fire ring around the field to limit the risk of uncontrolled forest fires. Nonetheless, many farmers report fire damage and, as it will be shown below, timing the burn represents a serious problem even for highly experienced shifting cultivators.

In traditional systems, there is minimal soil tillage. A hole is made with a dibble stick and seeds are planted. Typically men use the dibble stick while women follow and plant. Rice may be planted alone, or planted simultaneously with cucumber and corn in the same hole. It is important to emphasize that hoeing the ground (*cangkul*) is a land use that did not occur in the Bukit Baka/Bukit Raya area until hoes were brought in by the SBK concession - in Riam Batang, for example, villagers used hoes for the first time this past year.

One month of planting fields are weeded. Cucumber and corn can be harvested in three months; the local rice variety requires six months. As the rice reaches maturity, it must be guarded against predation by birds and this entails both direct guarding and use of scarecrows. The rice harvest occurs in February or early March. The *ladang* field "rests" for four months and the cycle is repeated the following May. A particular *ladang* field is cultivated for one to three years depending on the fertility and location of the parcel. After two or three years, weeding becomes too problematic, productivity declines and the farmer "shifts" production to another site.

Other annual crops in addition to rice are planted in walkways, or in small garden plots near the temporary work hut (*pondok*). Perennial crops such as durian, coffee and rattan (in Central Kalimantan) and also rubber (in West Kalimantan) are planted along the *ladang* field boundaries, and also around the *pondok*. Some rubber is planted as a monocrop (i.e., as a *kebun*). If the site is a particularly "good one", that is, located near a river which facilitates access, travel, water for drinking, and rich soils, the field will likely be recultivated in 7- 10 years. Hence it will not be widely planted to perennials. This is also the case if the land is

not privately owned (*sudah hak milik*) but belongs to the village (*tanah adat*) and is periodically lent-out for members of the *adat* group to temporarily use.

With regard to land tenure, most of the *ladang* fields in the Central Kalimantan areas fall into the category of customary use rights, where increasingly land has become privatized in the West Kalimantan sites. Though even in the latter areas, virtually no farmers have travelled to the *Camat* to register land titles. The lack of government-sponsored land titles could be (or may have been) used by the government and logging concessions to limit local access to and control over traditionally cultivated lands, or lands reserved for forest product collecting. Privatizing land is also justified by the government to encourage perennial crops and thus replace shifting cultivation with more intensive sedentary farming.

Field visits suggest that the average size of *ladang* fields is around 2 to 2.5 ha. For the *ladang* field, the majority of the area is planted to rice and other annual crops (the latter often spatially separated); and a smaller amount to tree crops. As noted above, some annual crops such as cucumber, corn and cassava are intercropped within the rice field itself.

According to survey data, seventy percent of currently cultivated *ladang* fields in Riam Batang were cleared from secondary forests, that is, fields where farms were previously made. This contradicts the popularly held notion that shifting cultivation inevitably leads to destruction of primary forest and biodiversity.

Three factors mitigate against *ladang* farming in primary forest. First, is the labor factor. It is extremely hard work to cut primary forest. This is one reason why farmers frequently leave the largest trees and simply plant around them. Most farmers use only a small axe, though there are some hand saws and chain saws in the villages. The labor requirement poses a serious problem despite the fact that clearing is frequently performed by a group of farmers who exchange labor. As noted above, it is not common in Riam Batang/Tumbang Taberau to employ people to work on ones' farms (though it is becoming more common in the West Kalimantan sites).

Table 6 summarizes the types of annual and perennial crops found in farms across the sample villages.

Table 6

List of Crops Planted in Ladang Fields

<u>Annual Crops</u>	<u>Fruit Trees</u>
Rice	Durian
Cucumber	Rambuttan
Corn	Nangka
Cassava (2 kinds)	Lansat
Tumeric	Mempelam
Onion	Mangga
Garlic	Banana
Taro	
Spinach	
<u>Sarai</u> (oil)	
<u>Lengkuas</u>	<u>Perennial Crops</u>
Squash (red and white)	
<u>Lia</u>	Rattan ( <u>sega</u> )
Beans (Long)	<u>Pohon Palam</u>
Sugar Cane	Oil Palm ( <u>kelapa sawit</u> )
<u>Kecipir</u>	<u>Tengkawang</u>
Ginger	Coffee
<u>Peringi</u>	Cocoa
<u>Gambas</u>	
Chili Peppers	
<u>Periak</u>	
Eggplant	
<u>Kemantan</u>	
<u>Bawang Kucai</u>	

Related to the labor issue is the time and effort required to travel to areas where primary forests still exist. A majority of farmers reported they travel to *ladang* fields by boat; many *ladang* fields are made along river banks, while others are located further in the interior. Farmers from Riam Batang/Tumbang Taberau still have access to considerable primary forest for making new *ladang* fields. but this involves travel distances of over 3 hours.

Given concerns over labor, farmers would prefer to expand existing *ladang* fields rather than clear new ones. However, about one-third of survey respondents report that they cannot expand existing boundaries because their farms already border other farms. If the cultivated *ladang* field is located at a great distance from the village, farmers are reluctant to expand farm borders and, in essence, to further intensify farming on parcels located far from their permanent houses.

The issue of farm location (and its distance from farmers' residences, markets and other farm parcels) is extremely important. The location of farms can help to explain why particular parcels are more likely to be intensively cultivated. This helps to explain why farmers are willing to plant perennial crops and/or to invest in soil conservation on some parcels and not on others.

Farmers practicing shifting cultivation agree that rice should not be cultivated for longer than 3 years on the same ground or yields will decline considerably (see Table 7). Rice production declines as a result of: 1) reductions in planting area due to increased weed invasion and 2) lower soil fertility (i.e., as nutrients supplied through burning vegetation in year one decrease in years 2 and 3).

Table 7

Yield and Planted Area Declines Reported for One Ladang Field

	<u>Amount Padi Planted</u>	<u>Yield in Area</u>	<u>% Decline Area Planted</u>	<u>% Decline in Yield</u>
Year 1	30 gantang	800 gantang	-	-
Year 2	20 gantang	500 gantang	33	38
Year 3	15 gantang	?	25	?

Farmers report that if rice is planted (in the manner described above) continuously for 5 years, alang-alang grass (*Imperata*) will become widespread. The lack of alang-alang in the areas farmed by Riam Batang/Tumbang Taberau to date bears evidence of their "longer"<sup>10</sup> fallow periods. However, the sustainability of such "long-fallow" shifting cultivation depends on maintaining the fallow period. This in turn depends on continued access to areas previously farmed, as well as additional areas. Given SBK planned cuts for forests near Riam Batang/Tumbang Taberau in 1993/94, the sustainability of their current farming practices - and their rice security - is in jeopardy.

### 5.32 Perennial Crops

As noted above, the "fallow" only refers to a cessation in planting rice; many perennial crops and trees continue to grow and bear products. In the Central Kalimantan sites, most farmers reported planting rattan sega (*Calamus caesius* and *C. trachycoleous*) and assorted fruit in their farms; and many plant coffee. In this area, they do not plant rubber

<sup>10</sup>I put "long" in quotations because integral shifting cultivators of the past fallowed their fields for 15-20 years. Given current pressures in the tropics due to logging, poverty and attendant increases in migrant shifting cultivation groups, as well as population growth, a 6 year fallow period now appears to seem "long."

because (1) there is no known market within a reasonable distance and (2) they do not have seedlings. No one expressed interest in obtaining rubber and planting it in their fields. In contrast, rubber is widely grown in the West Kalimantan sites.

Rattan has been cultivated throughout Central Kalimantan for decades (possibly centuries). I was told that most of the rattan cultivated in the area was sold when the price was very high. Farmers in the sample villages today are replanting, exclusively with the rattan species *sega*. Farmers claim to be planting rattan, as well as fruit trees, on every parcel that they own after rice and other annual cultivation ceases. Land that is not personally owned, but has been "borrowed" from the wider community, should not be planted to perennial crops but reserved for someone else to use to plant rice<sup>11</sup>. Some farmers prefer to plant fruit trees on their land because they bear annual products, while others say rattan is preferable because of lower labor demand (especially for weeding).

When asked to explain why they are planting rattan, farmers gave the following answers. First, they remember the high price rattan brought just 2 years before (1750 Rp/ 1 kg in 1990). Even though the price of (dried) rattan has dropped to only 500 Rp/1 kg at present, farmers plant rattan in anticipation of price increases in the future. Some are aware of the government's ban on exporting raw, unprocessed rattan poles and expect the price to rise as rattan-processing factories are established.

Second, farmers are planting rattan because they see the supply of wild canes diminishing. While they say that the majority of rattan species remain plentiful, they note that *uwi janan* and *uwi marau*, two of the largest diameter canes, are almost gone (see Table 9). These large rattans are not useful for making baskets or mats, but are valued for their edible fruits and shoots. The supply of rattan canes is diminishing due to collecting and to damage from logging activities - especially road building. One type of rattan, *uwi matahari*, has apparently become very hard to find because skid roads have ruined its primary habitat.

Third, farmers are planting rattan as a sign of land ownership. Whether this is to establish land ownership rights in the face of other villagers or intrusion of outside forest collectors, or because of increased logging, is unclear. According to local *adat*, the one who opens a *ladang* from the primary forest owns the land (*hak milik*). After the field is fallowed, others need to ask permission of the previous farmer if they wish to plant rice. Typically permission is granted to cultivate rice, but a rent is expected if perennial crops are planted.

To cultivate rattan *sega*, wild seedlings are collected and planted in small black plastic bags. They are carefully weeded and watered for approximately 8 months, and are then transplanted. The rattan seedlings are transplanted near young trees to ensure that there will be a means for the rattan to climb as it matures. After transplanting, it is important that

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<sup>11</sup>Additional work by Mering Ngo should help to explicate the different categories of land tenure. To date, I am not sure about what one calls land "borrowed" from the community for making *ladang* fields. *Tanah adat* seems to refer to the forest tracts reserved for the local community to collect forest products, and where shifting cultivation is not allowed.

rattan seedlings are weeded. Mortality of young rattan is often the result of competition with weeds. Rattan is often transplanted near river banks. This fact seems to contradict the notion that rattan is a forest garden crop and should be planted in buffer zones between the forest and forest extractive/farming areas. The NRMP needs to further investigate where wild rattan thrives (i.e., site preferences), its current abundance among both wild and cultivated populations, extractive pressures, and prospects of *in situ* management of wild populations and intensified cultivation benefits, and the constraints associated with these management approaches. These data are critical to the development of rattan pilot project (Siebert 1992).

Throughout the sample villages, one sees beautiful rattan mats and baskets. The interest in cultivating rattan and the apparent skills in rattan handicrafts suggests that pursuing a rattan handicraft project may be worthwhile. However, issues of supply, marketing, and the cost and benefits associated with markets need to be closely examined. For example, villagers report shortages of particular wild rattan species. One basket requires 2-5 different types of rattan, but as of yet only one species of rattan is cultivated.

Furthermore, most of the rattan handicrafts I witnessed are old, and villagers agree that they were made by their mothers and grandmothers (*nenek*). Some think the knowledge to make these mats, baskets, and other products has been lost while others disagree. The village head in Tumbang Kaburau claims that at present people are not eager (*jelas*) to make rattan products, but if there was a solid market with good prices, he thinks people would welcome the chance to produce rattan crafts to sell. He noted that many villagers know that rattan chairs are sold in the Kecamatan, but no one from this village has yet constructed rattan chairs to sell there or locally.

### 5.33 Livestock Production

Most households raise pigs, cows, and chickens for household consumption. Villagers sell livestock when additional income is needed. Pigs are fed boiled cassava tubers, corn and tubers from a type of taro (*keladi*). Chickens are fed left-over rice and corn; and they find supplementary food on their own.

Cows were provided by government-livestock programs in all of the sample villages except Riam Batang/Tumbang Taberau. The survey did not delve deeply into the advantages and/or problems with these programs. Farmers in the West Kalimantan sites where *sawah* fields are being developed expressed interest in obtaining *carabao* (water buffalo) as draught animals (i.e., to assist with preparation and plowing of ricefields). Large cows are also used (and desired) to help with hauling wood out of the forest.

Any livestock development efforts, however, need to consider the environmental implications of where livestock feed will come from. On the positive side, cultivation of fodder grasses such as *Setaria* sp. or elephant grass (*Penisetum* sp.) can be integrated into rainfed agricultural efforts involving grass bunds and/or terraces which simultaneously provide soil conservation (i.e., grasses provide barrier methods and protection for terrace risers). On

the negative side, *Imperata* grass in the West Kalimantan sites is frequently burned to produce young shoots for grazing. This practice contributes to grassland invasion and possibly uncontrolled fires.

Additionally, many households reported problems with livestock diseases. Livestock extension workers do not come to this area, and villagers report being at a loss as to how to treat livestock illnesses. Hence, when sickness occurs, many animals die.

One of the SBK teachers in Riam Batang launched an aggressive campaign to motivate people to build pig and chicken pens (*kendang*); as well as to tether cows away from the village. (The latter is particularly relevant in Tumbang Kaburau where livestock wander freely through the central village area). The teacher's purpose is to reduce animal destruction in house and village gardens he is seeking to develop, as well as to concentrate wastes for use as manure. There are also serious health considerations. About half of the households in this village have followed his advice. But there has been some aggressive opposition. At one community meeting I attended, a villager announced "even if you call the police I will not build a *kendang*." His reasons for opposing the stalls were not clearly stated. They may be related to 1) the extra work; 2) reduction in foods animals can obtain on their own; and 3) resistance to the SBK teacher's aggressive efforts to eradicate shifting cultivation and introduce sedentary farming practices. The tenacity with which people in Riam Batang/Tumbang Taberau hold onto current farming practices should be heeded, especially in the context of household food security.

#### 5.34 Agricultural Problems Reported by Farmers

Farmers throughout the sample villages were asked to report their major farming problems and concerns. These data are summarized in Table 8. It is important to note that most of these data refer to *ladang* farms, however, in the West Kalimantan villages, farmers have begun to cultivate *sawah* and some of the problems refer to these farms. More details on production of *sawah* are presented in the section on HPH Pembangunan Desa Binaan.

Table 8  
Major Agricultural Problems Reported by Farmers  
(in percent)

Village	Low Yield	Labor	Market- ing	Weather	No Answer
Riam Batang/ Tumbang Taberau	35	40	0	5	20
Tanjung Pako	29	36	0	14	21
Tumbang Kaburau	30	30	0	40	0
Belaban Ella/ Sungkup	42	42	0	16	0
Nanga Siyai/ Nanga Apat	40	60	0	0	0

In the Central Kalimantan villages, the major problems are low yield and labor, and to a lesser extent, the weather. According to farmers, low yields are largely the result of predation by wild animals (pig, deer and rodents) and insects. Given that their farms are located within or adjacent to mature forests, this is not surprising. Labor problems are connected with clearing and preparing new fields every 1 to 3 years. Farmers often complain about the strenuous labor demanded by shifting cultivation. Lastly, if there is a long hot dry season, farmers may plant too early and the rice crop will die. If they wait too long, they will have problems timing the burn.

In Belaban Ella/Sungkup and Nanga Siyai/Nanga Apat, the major problems reported are low yields and labor; and both of these are related. In these regions, shifting cultivation is in transition to sedentary farming. At this time, low production is the result of short fallow period, weed invasion and declining soil fertility; and possibly soil erosion. Low production also refers to incipient *sawah* fields. In this latter instance, low production is the result of the currently small size of *sawah* fields and insufficient fertilizer. The reasons why *sawah* fields have yet to be enlarged, and perhaps why more intensive rainfed (sedentary) farming practices have not yet been adopted, have to do with their high labor demands. In addition to farming activities, it must be remembered that these farmers are collecting forest products to earn income to purchase additional rice (and given the distance to forest resources, this entails separate forest product collecting trips).

In both regions, there are sufficient problems to suggest farmers would be receptive to change. In Central Kalimantan, this receptivity is offset somewhat by the high degree of rice security achieved through traditional shifting cultivation practices. Any proposed change would need to ensure food security. A major constraint to intensifying farming in both areas is labor. Pilot technologies and activities need to closely monitor labor demands to ensure that the proposed methods are realistic and consistent with available labor resources and labor allocation expectations.

Appeals to preserve the environment through more sustainable farming practices will likely fall on deaf ears. Motivation for changing farming practices will come through farmers' hope for increased and stable crop yields, and lower labor demands. These are the major criteria new rainfed or *sawah* production systems need to incorporate while simultaneously trying to meet conservation-oriented goals.

#### 5.4 Timber and Non-Timber Forest Products

Villagers throughout the sample villages in the Bukit Baka/Bukit Raya region collect forest products for both home consumption and market. These include both timber and non-timber products. Household use and dependence on forest products vary across villages and from household to household, as has been suggested above. These patterns have implications for the NRMP -- especially forest product collecting by residents from the West Kalimantan villages because 1) their high dependence on forest product collecting as a household's income earning activity suggests the importance of improving the trade to assist household welfare; and 2) forest product collecting is largely from the *cagar alam* which may pose problems regarding the conservation of biodiversity.

Unfortunately there is no data on the sustainability of current extraction rates or their impact on biodiversity. Lessons from the literature suggest that extractive activities are compatible with biodiversity goals, though there are no real hard data or case studies over time to substantiate this claim. The literature also suggests that forest product trade in general, and in Kalimantan in particular, should comprise one of many management options for sustainable development.

Three conclusions are worth noting at the onset:

- (1) Forest products currently play an important but secondary role in relation to producing rice. Therefore, the lion share of NRMP's effort should be directed toward ensuring food security in each area first, and to increasing the viability of the forest product trade secondly;
- (2) The logging concessionaires are harvesting trees that are used and sold by local communities, and logging activities in general are leading to a reduction in a variety of non-timber forest products through tree cutting as well as through road construction;

(2) Each forest product revealed problems with developing supplies, trade networks and secure markets. However, the products that seem to suggest the most likely future benefit, and which are currently important to the largest numbers of households (for home use and supplementary income), are rattan and various timber trees including ironwood and meranti.

In the following sections, I briefly discuss the various timber and non-timber forest products currently collected, used and/or sold by villagers in the sample areas; and their current constraints and possible areas for the NRMP to intervene. It is emphasized that this discussion is preliminary - very little distinction is given to the role of each product in the various villages and household economies. These sections are therefore included to provide a jumping-off point for further, more detailed study<sup>12</sup>.

#### Ironwood or *kayu besi/belian/ulin* (*Eusideroxylon zwageri*)

Borneo ironwood is a dense, dark wood notable for its durability and its attribute as a "sinker." It is a tree species (along with *tengkawang*) that is at present reserved for local use; it is unlawful for commercial timber companies to cut them. But it should be noted that local people are not allowed to go into production or protection forests to cut or collect products from these two types of trees.

Villagers use ironwood for house framing and roof shingles. A large sized ironwood tree takes an entire human generation to grow, and products produced from ironwood will last for 3 or 4 generations. Ironwood typically grows wild, although it has been planted as well. Inhabitants from each village area are entitled to harvest ironwood trees in nearby forest tracts reserved by local *adat* for forest products. Outsiders must ask permission from local village leaders if they wish to harvest an ironwood tree from these forest tracts, and pay a fine if caught doing so without proper authorization.

At present it is largely the residents of the West Kalimantan villages who cut and process ironwood boards and/or shingles for sale. Over two-thirds of the households in these villages who report relying on forest products for income to buy rice depend on selling ironwood. These villagers complain about the long distance (and time spent) travelling to locate and transport logs given their distance to forests. Hence they harvest ironwood from protection (*cagar alam*) as well as from production forests (logging concessionaires). Ironwood logs are transported on the river from the *cagar alam* to the village by tying them together with more light-weight "floater" trees, or by tying them to large rubber (truck) inner tubes discarded by the logging companies. As of yet there are no reports of intrusion by outsiders and violation of local *adat* laws regarding tree cutting as Peluso (nd) describes elsewhere in West Kalimantan. However, villagers do complain that the logging companies cut ironwood for constructing bridges and soil stabilizing structures along logging roads.

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<sup>12</sup>Very little information on product collection and/or processing is included here. See deBeer and McDermott (1989) for further details.

While at present there is no serious conflicts over supplies of ironwood, there is a strong possibility that conflicts over access to remaining trees could escalate in the future as households with limited food security seek income through selling ironwood, especially if markets expand or outsiders "discover" the area as a source of this valuable wood. If outside extractive pressures intensify, identifying and supporting local management practices would be a high priority for the NRMP.

### *Gaharu*

*Gaharu* is an important forest product collected for sale in the study area. *Gaharu* is the heartwood formed within diseased trees of the species *Aquilaria malaccensis*. Traditionally it has been shipped for incense to China and the Middle East. As with ironwood, these trees do not regenerate within a human lifetime and extraction rights are governed by local *adat* practices.

*Gaharu* is collected and taken to Nanga Pinoh or further down the Melalui river for sale. Given its high value to weight ratio, it is a highly valuable commodity. Consequently, there are reports of collectors from the West Kalimantan villagers entering the traditionally managed forest areas of other villages seeking *gaharu* without asking permission. This was a complaint registered in Tumbang Kaburau about collectors from Bellaban Ella.

According to collectors, the largest constraint to *gaharu* production is the time involved in locating the proper trees. This involves a great deal of time (especially for West Kalimantan residents) to travel to more forested areas, and to identify the trees containing the diseased heartwood. Another problem with *gaharu* collection is that the entire tree is felled in order to extract the heartwood. Unskilled collectors cut many trees before locating an individual with diseased heartwood.

### *Tengkawang* (illipe nuts)

The nuts from a type of *Shorea* spp. have historically been collected during boom harvest or masting seasons. Locally they have been used as a source of supplementary food, oil and animal feed. Illipe nuts are currently receiving great attention by the Indonesian government as a low-priced commodity for chocolate manufacturers, though they are also well-suited as a higher value emollient in natural skin conditioners which are receiving growing demand in the U.S. (Dixon et al. 1991). An illipe nut processing plant has recently been opened in Pontianak.

Despite the fact that the government talks of *tengkawang* as a forest product, most of *tengkawang* trees were planted during the end of the colonial era. Local informants report that their ancestors knew that the fruit had export quality because the Dutch were buying it. According to the *temenggung adat* from Nanga Siyai, the highest quality *tengkawang* is called *tungkul*. The nuts are large and the oil content high. The elders planted it near rivers. Three other types of lower quality *tengkawang* include: *crinit*, *bajau* and *pinang*. It is reportedly

best not to collect the nuts from the tree, but wait until the seeds fall to the ground. Otherwise the fruit will spoil quickly. The first and the last nuts to fall are the best seeds.

Villagers report many constraints to collecting and selling *tengkawang*. *Tengkawang* is typically harvested during the rice harvest season causing problems with labor availability. Local processing includes soaking, drying, crushing, cooking and extracting oil. The oil produced is considered higher quality than that produced from coconut. As a masting fruit, *tengkawang* generally is most abundant once every 4 years (though there is usually some available each year). Hence it cannot be relied upon as a regular or annual source of income. Furthermore, the fact that it fruits briefly and abundantly results in market saturation and low prices. Transporting the product to the logpond for boat travel to Nanga Pinoh or Nanga Elia is another large obstacle. Many villagers complain that drivers of logging trucks will not provide rides to people carrying sacks of *tengkawang* (perhaps because of fear that they will be accused of illegally collecting this product).

One man from the village of Sungkup told a particularly chilling story about his efforts to sell *tengkawang*. In 1991, during the last masting season, a Chinese trader from Nanga Pinoh came to the village and said he wanted to buy ten tons of *tengkawang* (Rp 800/kg). It was the period before many villagers had harvested their rice and income was greatly needed in which to purchase more rice. The man thought he could both help his village and make a profit by buying *tengkawang* from the villagers and bringing it to Nanga Pinoh to sell to the Chinese merchant. It took one month for the villagers to collect the nuts, and for the man to transport the bags to the logpond (remember there is no regular vehicle to carry him). By the time the man reached the market, the Chinese merchant had already bought his desired amount from another customer. The market price had declined so low (below Rp 500/kg) that the man estimated his total losses were around Rp 2 million (it costs Rp 50,000 just for the boat to carry the product from the logpond to Nanga Pinoh).

Transporting and marketing *tengkawang* remain serious obstacles to developing the trade. As is the case with ironwood and *gaharu*, if the marketability of these products increases substantially, strong safeguards would be necessary to support local tenurial and access regimes over planted and wild stock, and to ensure local control and benefit.

## Rattan

Wild rattans provide the majority of materials for the baskets, mats and binding observed in the sample villages. As noted above, only one species of rattan (i.e., *sega*) is cultivated. The majority of rattan collecting is for home use. Sale of rattan -- largely unprocessed canes -- was formerly an important source of household income. However, as a result of the presently low price of dried cane (under RP \$500/kilo), rattan is not widely marketed. However, as was noted above, villagers especially in Central Kalimantan, forecast a return to higher prices and are planting rattan *sega* in forest gardens.

Table 9 provides some very preliminary data on the local names of wild rattan types reported to me by villagers (and cross-checked), estimates of their current stock, and their uses. These data need to be verified, and species identification confirmed before any serious discussion ensues on how to enhance the local rattan trade.

\* Local names for Central Kalimantan. Uwi means rattan.

As Table 9 suggests, supplies of several local rattan varieties are nearly exhausted. Local informants claim that the loss of rattan is due to a reduction in forest area caused by logging, rather than from over-collecting. As of yet, there are no accounts of outsiders collecting rattan from areas claimed by local peoples.

Table 9  
Wild Rattans: Their Size, Supply and Use

<u>Local Names*</u>	<u>Size</u>	<u>Supply</u>	<u>Use/Other</u>
	1.small 2.medium 3.large	1.plentiful 2.threatened 3.gone	1.baskets 2.mats 3.tying 4.food 5.not economically useful
Uwi Ambon	1	1	5, some 1, not durable
Uwi Paku	1	1	5, some 1, <u>keras</u> like a nail
Uwi Kabingbong	1	1	3, small like a mouse deer
Uwi Landuk	1	1	same as above
Uwi Lalu	1	1	same as above
Uwi Potik	1	1	1
Uwi Tempayang	1	1	3
Uwi Tajang	1	1	1,2
Uwi Sori	1	1	3 (axe handles)
Uwi Anak	1	1	1,3
Uwi Tunggal	1	1	5, few <u>jijer</u> , short, non- durable
Uwi Tajam	1,2	1	1, known to slice hands
Uwi Payang	1,2	1	1,2
Uwi Krimbak	1,2	1	1,2
Uwi Tajang	1,2	1	1,2
Uwi Sega	1,2	2	1,2,3
Uwi Sega Bilu	1,2	2	1,2
Uwi Keladan	1,2	2	5, short, grows in mountains, black
Uwi Matahari	2	3	1
Uwi Luwa	2,3	1	1,2,3
Uwi Bilu	2,3	1	1,2,3
Uwi Labu	2,3	1	1
Uwi Runtik	2,3	1	1
Uwi Rua	2,3	1	4,5, obat malarial, not strong
Uwi Maro	2,3	1	4,5, some say can plant
Uwi Batu	3	1	4,5, 2 m longest
Uwi Dahan Pontong	3	1	1, leaves for hats, climbs up trees to leaves then drops
Uwi Dahon Betul	3	1	same as above
Uwi Marau	3	3	1, harder than Uwi Janan
Uwi Janan	3	3	1

## Honey (product of *Apis* spp.)

Wild honey is collected as a supplementary source of food and income. According to honey-collectors, there are certain tree species that are very attractive for nesting. These trees are called *manggris* (also *tapang* and *dohok*). They are very tall, and ghosts are said to inhabit them. Consequently, people are afraid to cut these trees.

Honey is collected at night by two or more people. One person remains on the ground and builds a large fire to attract the bees. Climbing "rungs" are constructed out of yellow meranti and are tied (using split rattan) to the tree trunk to create a ladder. The second person then climbs to the next holding a smoking stick - the smoke is supposed to incite the bees to leave the nest (and follow the fire to the ground) - and then the nest is cut down. One informant estimated that he was able to collect nine nests in one night producing about 20 liters of honey.

When honey is sold, the buyer tries to light the honey with a match. If the honey burns, then the quality is high. If it doesn't, it is likely that the seller has added water to the honey.

Discussions with experienced honey collectors suggest that the supply of honey has decreased since the logging companies have come. They claim that the loggers do not cut "honey" trees for timber, but that honey trees are felled in the course of building roads or harvesting adjacent trees. They also claim that as a result of logging, there are fewer "honey" trees, but the remaining nests contain more honey. One man explained that the higher production per nest is the result of bees concentrating in the few remaining trees.

## *Jelutong* (*Dyera costula*)

In the Central Kalimantan villages, some people tap large diameter trees for resin known as *jelutong*. The resin is used locally as an adhesive and for caulking the bottom of boats. Many collectors complain of diminishing supply of *jelutong* as a result of logging activities.

## Damar (*Dipterocarpaceae* spp.)

*Damar* is another form of gum resin tapped from large diameter trees and used for caulking the bottom and sides of boats. It is important to note that *damar*, a Malay word adopted into the European trade language to signify resin, is primarily produced by dipterocarps -- including *Shorea* -- the prime timber tree sought by loggers in the area.

## Gold

Approximately two-thirds of households sampled -- chiefly from the Central Kalimantan villages and especially Tumbang Kaburau -- pan for gold in nearby streams. The gold is sold locally or in Nanga Pinoh, or is used locally to manufacture earrings and rings. Panning for gold occurs during the dry season when the water level is low. It is also an activity that women and children dominate, and an important means for some households to raise additional income. Increased

sedimentation in streams has, according to some women, prolonged the work involved in panning for gold.

## Timber

Despite the current interest in non-timber forest products, it is critically important to remember that local communities depend upon timber products for both home use and as a source of income. In fact, after selling farm products, the next most important source of income in the Central Kalimantan villages is cutting timber and selling it in the form of boards or roof shingles. It is also important to note that the loss of timber trees cannot, in most instances, be replaced by locally available substitutes.

In addition to the wood species noted above, there are several other tree species that are currently harvested for boards. These include *benuas* (*Shorea*), *keladan* (*Dryobalanops* - a dipterocarp also called *Kapur*), *kasau* (*Kasai*=*Sapindaceae*, *Pometia pinnata*), *emang* (*Hopea* spp., a dipterocarp), *reng* (Latin name unknown, but said to be the wood used in building SBK temporary camps) and *sepetir* (*Kingiodendron* sp. - a legume) for house beams.

In the Central Kalimantan villages, timber is cut primarily for home use whereas in the other villages, most of the boards are cut for sale. However, the trunk of *benuas* is sold by Central Kalimantan villagers in Tb. Manjul (the trunk is also used for beams, and the bark is used for roofs and walls - the latter most commonly for the walls of a *pondok*).

*Meranti* (red and white) are the principal trees sought in the local timber industry. The trunk is made into boards (*papan*) and its bark used for constructing walls. Large diameter trees are necessary for locating bark wide enough to cover walls (usually for the *pondok*). Virtually all houses are constructed out of *meranti*, with house posts, beams, and shingles made from ironwood. *Meranti* (*puti* or white) is also used for making boats. We were told that there is no locally available substitute wood for boat construction. The value of these trees is very well known by villagers and they regulate appropriate uses of them. For example, *meranti* is never cut for firewood (see list of firewood species below).

It is important to remember that *meranti* is the most important commercial wood species being harvested by the logging concessionaires (they are allowed to cut dipterocarp trees 60 cm dbh or greater and non-dipterocarp trees of commercial value over 50 cm). Villagers know they are not supposed to cut the very large *meranti* trees but they say:

We use only a little, they (the loggers) take so much. What will we have later if they take it all?

Reduction in the availability of *meranti* will definitely impair household food security. As noted above, selling *meranti* and other woods are a major means by which many households meet short-falls in their household rice supplies. It is also a major source of timber for home and boat

construction. Finding (or purchasing) alternative timber to meet these local needs will definitely create serious hardships for these subsistence rice producers.

### Firewood

The forests of Bukit Baka/Bukit Raya provide many types of firewood. The following trees were cited by respondents during the survey as the most important firewood species<sup>13</sup>: keceban (*keleban*), mahabai (*mahawai*) (*Annonaceae*, *Polyalthia* sp.), kelampe (*Euphorbiaceae*, *Elateriospermum tapos*) sampotir, kecampai, kelambat, and purang padi (or pulang padi) (*Euphorbiaceae*, *Macaranga* spp.). Kalaban is apparently rated the highest. It is important to note that none of the trees commonly used for firewood are of commercial value.

Most of the villagers cut firewood from trees located near or remaining on their *ladang* fields. Otherwise they collect wood from trees lying on the ground which have already died or have been cut. To date, no one reported shortages or problems in collecting firewood. Sometimes in the West Kalimantan villages located far from forests, it may take too long to collect the more preferred firewood noted above and instead they will use dead rubber trees. Rubber is not favored because of its high resin content.

### Hunting

Hunting, especially in the Central Kalimantan villages is an important supplementary activity. Men hunt using spears and occasionally home-made rifles, and seek wild deer, boar, rabbit, *kijang*, and bear.

### Other

Various plants (such as ferns), herbs and the leaves of woody plants are consumed. Bamboo shoots are harvested from wild and planted stock and are widely consumed. The "cabbage" or *ubud* from rattan is also widely consumed by local communities. Mushrooms and other fungi are also often consumed. In fact, while staying at Binbat at km 54, local peoples (most likely from nearby Tumbang Kaburau) gathered and sold wild mushrooms to the SBK camp, which we were then served with our meals.

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<sup>13</sup>The Latin name is provided where known. Thanks to Lisa Curran for identifying these Latin names.

## 5.5 HPH Pembangunan Desa Binaan

### 5.51 Description of Program and Activities

According to a document distributed by the Alas Kusuma Group in February 1990<sup>14</sup> (the group that owns Pt. SBK), all of their subsidiaries are to be concerned with the local communities. They are instructed to: 1) raise their knowledge and income and 2) reduce forest wastage because of shifting cultivation. Various procedures are proscribed to achieve these ends including: inventorying areas involved in shifting cultivation, targeting and developing model farmer groups, and instructing the farmer groups in new sedentary (as opposed to shifting cultivation) agricultural methods that other farmers can observe and adopt on their own.

Under the Pembangunan Desa Binaan program, the logging company will help prepare a demonstration plot for cultivating field crops (including rice and vegetables), tree crops, and whatever commodity fits local conditions including livestock and fishing. Houses are to be constructed for farmer group members near demonstration farms to facilitate their work. Other assistance will be provided for improving physical infrastructure as well as for supplying agricultural inputs (seeds, fertilizer, pesticides, and equipment such as a hoe). Non-formal education activities will be developed to teach new farming practices. Monitoring and evaluation procedures will be ongoing.

Marketing of farm crops is envisioned as one means to raise farmers income and thereby reduce the attractiveness of continued shifting cultivation. The logging camps themselves will provide markets for surplus production.

In addition to these specific activities and goals, the logging company is supposed to take care and give advice to local communities in order to compensate for their low education and traditional cultures, and enable them to continue indefinitely to use modern farming techniques.

The SBK logging concession near Bukit Baka/Bukit Raya has instituted many of the activities noted above. Since 1982, demonstration farms focussing on irrigated and rainfed rice production have been developed at Km 13 (near Nanga Seladang), Km 23 (near Nanga Siyai/Nanga Apat) and at Km 75 near the village of Tanjung Pako. Where previously planting occurred without any land tillage, farmers are instructed in preparing land using hoes. It is important to remember that before SBK introduced the hoe, this farm implement was never used in these areas (i.e., shifting cultivation involves dibbling, not tillage).

Extension workers (many of whom SBK paid to receive agricultural training in Bogor) provide out-reach education on the problems of *ladang liar* (shifting cultivation) and demonstrate home gardens in addition to encouraging work on the (sedentary) ricefields. Participating farmers have been given roughly 45 by 45 meter plots to open ricefields, along with the petrochemical inputs

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<sup>14</sup>The document is entitled, *Pembangunan Desa Binaan Sebagai Salah Satu Bentuk Partisipasi Pemiliki HPH Dalam Rangka Peningkatan Sosial Ekonomi Masyarakat Sekitar Area HPH*. Disampaikan oleh Alas Kusuma Group, Jakarta, Peburari, 1990.

necessary to cultivate high yield rice crops (i.e., capable of two crops per year instead of the traditional one harvest). At 7 am, they ring a bell calling these farmers to work on their ricefields before beginning other work.

At Km 23, the SBK workers have developed demonstration plots using SALT (sloping agricultural land technologies) for use on upland areas unsuited for irrigation development. These include terracing hill-slopes with grass planted on terrace risers for protection (and fodder production), intercropping with leguminous trees (i.e., for green fertilizer) and fruit trees. They also have created a nursery especially for rubber trees for planting during traditional fallows -- ostensibly as a transitional stage from shifting cultivation to fixed-field farming involving perennial crops.

### 5.52 SBK Extension Workers' Reaction

Interviews with SBK extension workers at both demonstration sites, and with the manager Pak --- stationed at headquarters at km 35, revealed the following: There is a general consensus among SBK personnel that some local farmers are willing to try the new farming methods, but that the majority are *malas* or too lazy to do so. Some accuse the villagers of drinking too much rice wine (*tuak*). They acknowledge that many local farmers still have *ladang* fields and reserves of rice, and consequently lack motivation (and time) to invest in building new ricefields. And secondly, that given the small plots of rice land as of yet developed for the new rice technologies, even with two crops of rice, these fields cannot produce enough rice to meet households' rice needs.

SBK workers say that the local peoples do not want to enlarge new ricefields because of the arduous work entailed with hoeing. They acknowledge that the first fields opened for intensive rice cultivation benefitted from the use of tractors. As a result, other farmers are unwilling to manually prepare fields. (Note that preparing fields entails extensive weeding, often with deep-rooted fire climax grass such as *Imperata*, pulling out large stumps, hoeing, and preparation of seed beds before seedlings can be transplanted).

The SBK manager at Km 35 is concerned that the HPH Pembangunan Desa Binaan program is building too much dependence. He is concerned that farmers will be both unable and unwilling to purchase their own fertilizers and other inputs after SBK stops supplying inputs. For these reasons, he is reluctant to provide a tractor for opening up new ricefields. Similarly, for these reasons, he has funded at least 5 village heads (and also progressive farmers) to attend seminars in Bogor detailing farming practices suitable for upland and rainfed conditions such as those found in their communities.

Extension workers estimate that less than half of the households from Nanga Siyai have already begun sedentary rice farming. They acknowledge that many of these farmers have done so because they lack land nearby to continue *ladang* farming. They claim (and the survey confirm) that an even higher number of households from Nanga Apat have begun dryland rice farming. Given the location of Nanga Apat in the midst of extensive grassland, and the relatively small number of households above rice security, these are not surprising findings.

That many farmers are willing to try new rice farming techniques in West Kalimantan contrasts with lower adoption rates in the Central Kalimantan villages. The one exception is in Tanjung Pako where SBK has put its greatest effort into developing irrigated ricefields. Extension workers generally claim that the farmers in this village are "more motivated" than the others. In reality, there is a more powerful and well-respected village head in this village who eagerly supports the SBK program. Moreover, the proximity of this village to the logging road and to the SBK camp at Km 72, provides an accessible market for farm products.

It is noteworthy to add that SBK field-extension workers exhibit a high degree of what can be called "burn-out". This is particularly the case with workers living in the more remote villages of Riam Batang and Tumbang Taberau where traditional shifting cultivation remains the dominant form of agriculture, and where there is no strong local leader to support SBK's outreach activities. While acknowledging the low morale, it is important to note that SBK workers themselves state that they have higher benefits than government workers in parallel jobs. They acknowledge they have a full range of support services including vehicles, back-up technological support when requested, and an ample budget. Delays occur getting equipment because they must be shipped from Nanga Pinoh. Despite these amenities, they feel frustrated in many of their attempts to "help" the local people to give up shifting cultivation.

### 5.53 Local Communities' Reaction

At the onset, it is important to emphasize variation between villages and among households -- "local communities" need to be distinguished, at the very least, between (1) those in Central Kalimantan with continued access to forest lands and those in West Kalimantan with much more degraded land resources and (2) households above and below rice security. Both of these criteria help us to understand variations in peoples' receptivity to new farming technologies.

Given continued access to land, and the low labor to yield ratios afforded by shifting cultivation, farmers in the Central Kalimantan sites are unwilling to give up time-tested farming practices for new, unproven ones that involve considerably higher labor inputs. Moreover, they question the suitability of farming practices that involve great amounts of soil tillage. Many farmers note that disturbing the soil surface not only incorporates less fertile subsoils, but makes the topsoil more susceptible to erosion. To farmers whose fields are sloping, this is a particularly strong disincentive to give up shifting cultivation practices which do not subject soils to much disruption or extended use. The high labor demands involved with terracing, along with initial reductions in productivity, are further constraints to their adoption of SALT technologies.

As noted above, many shifting cultivators from the villages of Riam Batang, Tumbang Taberau, Tanjung Pako and Tumbang Kaburau express numerous problems with their farming practices including concerns with labor (i.e., especially the effort involved in clearing new fields, weeding and rebuilding work huts) and in fire management. As a result, I think it is fair to say that there is some motivation for changing farming methods if a viable alternative farming system could be identified. Given current agronomic conditions -- as well as limited marketing opportunities -- they don't see an alternative. For example, merely telling them to "stop burning" doesn't respond to

their need to improve soil fertility and clear fields of weeds before planting. Any attempt to intensify agriculture in the tropics must confront the reality of limited soil resources.

Building new farming practices on the expectation of adding petro-chemical inputs (especially fertilizer) is a constraint throughout the Bukit Baka/Bukit Raya area. Initially, there is a problem with lack of expertise in application -- e.g. where to put fertilizers and how much. Even with increased skill, farmers (and others) are right to be concerned with issues of supply, access, cost, and long-term ecological consequences. For those without access to insecticides, for example, many farmers noted incidences of severe pest infestation. And certainly the legacy of the green revolution elsewhere in Indonesia alerts us to the secondary-risks of monocultures and pest-resistance. The severe hydrological disturbances wrought by the construction of logging roads and deforestation raises additional questions on the long-term viability (and logic) of developing irrigation-dependent farming systems, let alone the complexities of developing so-called "hydrological" societies (i.e., coordinating irrigation requires considerable social cooperation and management).

In the West Kalimantan sites, it seems likely that over the long-run, permanent rainfed and/or irrigated rice farming will be adopted. This is because farmers have reached a situation where there are limited alternatives. However, at this stage, the small acreage in permanent ricefields cannot provide rice security and hence requires that households supplement rice production through cultivating *ladang* fields at distances from their homes, or collecting forest products for sale. Whether SBK (or NRMP) can help these households to expand their ricefields through the application of petrochemical inputs (such as Round-Up to eliminate *Imperata*), provision of tractors, subsidies in the form of rice or income while manually enlarging ricefields, or some other alternative needs to be considered and the opportunities and constraints of each method weighed.

One of the problems with SBK taking the lead in agricultural development is its ambivalent position vis-a-vis local communities. Simultaneously, SBK (and KKP over the long-run) is responsible for the deforestation which is setting their traditional life-styles into a state of flux, while at the same time offering them some assistance in the form of teachers, agricultural out-reach, roads, and even jobs. In Riam Batang, I was told by one man that he felt "broken hearted" because of unfulfilled promises by SBK to build a road from the village to km 87 and to begin an irrigated rice field project. This man feels used and abandoned, and deeply mistrustful of outsiders.

## **6. Implications for the Indonesia Natural Resource Management Project**

What are the implications of local peoples' variations in resources, livelihood strategies and involvement in HPH Pembangunan Desa Binaan? What are specific lessons for the NRMP?

First, the primary production goal at this time for most people in the study area is food or rice security. The HPH Pembangunan Desa Binaan effort, then, is on the right track by focussing on intensifying rice production (as a "food-first" strategy). However, we have seen various problems with specific technologies they have chose to intensify rice farming.

Second, given the more widespread occurrence of limited food security and thus need for alternative farming systems in West Kalimantan, it is advisable to target and focus sedentary agricultural development in the West Kalimantan villages. Enabling the villagers in Bellaban Ela and Sungkup to be more rice self-sufficient would also take pressure off forest product collecting in the *cagar alam*. Given limited market opportunities, developing rice-based production systems also makes sense.

Third, given the logic of a "food-first" approach, agroforestry systems need to be developed with this priority in mind. Tree species, intercropping patterns and spacing, and tree product use for home consumption need to be emphasized. Identifying trees with products for home use is particularly crucial, given the remoteness and marketing limitations in the region as a whole.

Fourth, the NRMP should build on SBK's existing outreach activities rather than beginning anew. Some of their limitations and successes associated with them have been raised in this report. Issues to consider involve avoiding dependence, building on current rice-focussed farming practices, and seeking low-labor and low-input-dependent farming systems. Careful attention to the environmental sustainability of agricultural technologies is critical to avoiding problems encountered in green revolution programs. Additionally, the question of how to avoid "burn-out" of field extension workers is worth considering.

Fifth, in the Central Kalimantan villages where shifting cultivation continues to provide sufficient rice, efforts should be directed at transforming those aspects of the practices that are problematic for farmers and in conflict with loggers. The most obvious first approach is better fire management. Helping farmers to better forecast the weather (for example, the onset of the rains) is a potential starting point. Adopting a fire burning permit system could represent another.

Sixth, given continued access to forest resources, and desire to create a more positive working relation between the logging operations and local communities, establishing a locally-managed timber operation is worth considering. This would ease the current competition between local communities and loggers over certain timber trees, and furthermore recognize local tenurial rights.

Seventh, the establishment of extractive zones is imperative to protect the forest product collecting activities of local communities which many households depend upon as their primary defense against hunger. Special efforts should be directed toward monitoring and aiding local management of rattan and certain timber species (especially ironwood and *meranti*) extraction. These forest products could be susceptible to harvesting by outsiders in the future, and hence, traditional resource management systems need to be recognized and formalized. Improved marketing of these and other forest products would also assist in raising the income of local communities.

## 6.1 General Comments

This report hopefully assists project advisors understand the tenaciousness in which shifting cultivators hold onto their traditional way of farming; the precariousness into which they are thrown when they can no longer practice shifting cultivation either as a result of deforestation or forest

exclusion, and hence their seeming "unwillingness" to adopt new farming practices such as sawah; and the varying roles agricultural development and the collection and marketing of forest products play in the livelihood strategies of peoples with varying degrees of rice security. These results may aid us in identifying alternative agricultural systems that can be developed based upon existing farming practices. And most importantly, it is hoped that this preliminary study helps to show the importance of discovering the farmers' view concerning potential ways of balancing forest protection with local livelihood concerns.

It is recommended that, if possible, additional households in the West Kalimantan sites be randomly selected and interviewed. These survey data could potentially shed more light on the constraints faced in the HPH Pembangunan Desa Binaan effort; and potential areas for NRMP to target future pilot project activities. It would also provide a means of monitoring project impacts over time. Lastly, perhaps the survey could be extended to villages that have not yet been contacted by NRMP personnel in Central Kalimantan. There are numerous villages noted on the map along the river Nanga Katingo whose farming and forest product collecting practices are likely to be impacted by the NRMP and its management plan.<sup>15</sup> I would strongly recommend the services of my two field assistants from Tanjung Pura University, and/or the initial faculty contact person, Pak Syamsuni Arman, to be enlisted in any further survey work.

## **7. Research/Consultancy Results: Bunaken National Park**

Given the brief and preliminary nature of my fieldwork in Bunaken, the comments provided in the executive summary represent the major results and recommendations. Additional information concerning resident communities within the park are provided in Table 10. In Table 11, the environmental implications of extractive and non-extractive activities are presented. As noted above, these can serve as guideposts for determining which activities should receive priority for NRMP projects.

Lastly, it is important to emphasize that my field visit convinced me of the complexity of issues faced in Bunaken with regard to local communities. I strongly recommend that a socio-economic survey be conducted before any field activities are recommended. Additional information as to the nature of political alliances within and across islands within the park, and their relation to state officials, also be better understood before the NRMP develop its management plan.

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<sup>15</sup>An expedition to contact these villages has been suggested by Mering Ngo.

Table 10.

Resident Communities in Bunaken National Park, 1991

<u>Village Administrative Unit</u>	<u>Total Individuals</u>	<u>Percentage</u>
Bunaken/Siladen	1,685.	16.2
Manado Tua	4,607.	44.4
Alungbanua	682.	6.5
Mantehage	869.	8.4
Nain	2,539.	24.5

**Source:** Kusen, Dr. Ir Janny D. et al. 1991. Survai Potensi Laut 1000 Ha Di Taman Nasional Laut Bunaken Kecamatan Molas, Kota Madya Manado, Propinsi Sulawesi Utara. pp.10 (Taken from Kantor pemerintahan desa masing-masing desa).

**Note:** These data do not include sizeable coastal populations on the mainland. The main coastal populations include Tanjung Pisok and Araken-Wawontulap. Similar data need to be compiled for these areas.

Table 11

Extractive and Non-Extractive Activities and  
Their Impact on Marine Habitat

**1. Extractive activities that destroy marine habitats:**

- \* cutting of mangroves by local communities for firewood and wood for constructing furniture
- \* coral mining by local communities for road and house construction
- \* collecting corals and small invertebrates by local women and children, possibly for supplementary food or for market;
- \* collecting or turning over small invertebrates by tourists
- \* fishing by local fishermen using "muro-ami" technique, dynamite or poison
- \* aggravating siltation by farming steep hillslopes without effective soil conservation measures

**2. Extractive activities that do not destroy marine:**

- \* fishing with pancing, panah or bubu

- \* sustainable hillside farming

- \* gathering invertebrate with bubu or panah

### **3. Non-extractive activities that destroy marine habitats:**

- \* building piers and settlements on the sea

- \* building settlements/homestays where there are presently none

- \* clearing seagrass to build boat slips

- \* indiscriminate dropping or dragging anchors

- \* mooring boats on the sea bottom

- \* walking on the sea bottom

- \* manipulative studies

### **4. Non-extractive activities that do not destroy marine habitats:**

- \* sunbathing on the beach

- \* photography

- \* scuba diving and snorkeling with care

- \* anchoring boat to bouy, or to existing jetty

- \* non-manipulative studies

Source: Graham Usher, Preliminary Management Plan for Bunaken National Park (translated).

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## **9. APPENDICES**

- 9.1 Bukit Baka/Bukit Raya Household Livelihood Strategies and Farming/Forest Product Preliminary Survey
- 9.2 Scope of Work for a Social Scientist/Anthropologist in Developing Management Plans for Field Activities Under the Natural Resources Management (NRM) Project

## Appendix 9.1

### BUKIT BAKA/BUKIT RAYA Household Livelihood Strategies and Farming/Forest Product Preliminary Survey

Survey Nomor \_\_\_\_\_ Date of Interview \_\_\_\_\_  
Nama Kampung \_\_\_\_\_ Nama Interviewer \_\_\_\_\_

#### KELUAGARNYA

1. Nama kepala keluarganya (KK) \_\_\_\_\_
2. Berapa umur KK \_\_\_\_\_ 2.1 KK ? Bapak Ibu
3. Berapa orang tinggal di rumah sekarang \_\_\_\_\_ (semuanya)
  - 3.1 Berapa orang umur 14 atau lebih \_\_\_\_\_
  - 3.2 Berapa orang umur dibawa 14 \_\_\_\_\_
4. Berasal dari: sini atau tempat yg lain. Dimana? \_\_\_\_\_
  - 4.1 Sudah berapa lama tinggal di kampung ini? \_\_\_\_\_ bln/thn
5. Kebutuhan makanan bapak/ibu didapat dari? \_\_\_\_\_
  - 5.1 dipakai nomor 1 yg pertama, 2 yg kedua, 3 yg ketiga  
\_\_\_\_\_ ladang \_\_\_\_\_ dari keluarganya  
\_\_\_\_\_ dibeli \_\_\_\_\_ dan lain-lain. apa? \_\_\_\_\_
6. Kebutuhan uang bapak/ibu didapat dari? \_\_\_\_\_
  - 6.1 dipakai nomor 1 yg pertama, 2 yg kedua, 3 yg ketiga  
\_\_\_\_\_ jual hasil hutan \_\_\_\_\_ jual hasil dibikin di rumah  
\_\_\_\_\_ jual hasil dari \_\_\_\_\_ gaji/buruh  
\_\_\_\_\_ ladang/kebun  
\_\_\_\_\_ dan lain lain. apa? \_\_\_\_\_
7. Hasil padi panen terakhir cukup untuk di makan berapa bulan? \_\_\_\_\_ Panen terakhir berapa? \_\_\_\_\_  
Berapa dijual? \_\_\_\_\_ Berapa dipinjam? \_\_\_\_\_  
Berapa disimpan sek? \_\_\_\_\_ Dimana disimpan? \_\_\_\_\_
  - 7.1 Padi itu dari ladang (kering) atau sawah (basa)?
  - 7.2 Sudah mengerjakan padi sawah? bel sud Demplot sendiri?  
Bagaimana pikiran mengerjakan padi sawah? Apakah masalah?
8. Bagaimana dapat makanan/uang bila sudah habis padinya?
9. Bapak atau Ibu atau anak sudah berkerja sebagai buruh?  
Sudah Belum Kalau ya, dimana?

9.1 Bapak/Ibu/anak sudah berkerja sebagai buruh di perusahaan kayu?

**PERTANIAN**

1. Apakah Bapak/ibu mengerjakan tanah? ya tidak

1.1 Kalau tidak, mengapa? \_\_\_\_\_

2. Berapa petak bapak/ibu punya? \_\_\_\_\_

Untuk setiap petak, jawab pertanyaan berikut ...  
(tulis petak 4,5,6 dibelakang)

petak nomor:	1	2	3
3. Berapa jauh dari rumah?			
4. Sudah berapa lama berladang disini (thn)			
5. Pernah ladang disini dulu? (y t) Berapa tahun yg lalu?			
5.1 Tumbuh-tumbuhan 1. hutan rimba 2. hutan sekunder 3. belukar 4. padang rumput/alang 5. apa yg lain?			
6. Tanah siapa? 1. hak milik 2. tanah adat 3. meminjam 4. menyewa 5. bagi hasil 6. apa yg lain?			

7. Apa jenis tanaman dan pohon tahun ini untuk setiap petak?  
 Disebelah setiap jenis tanaman Berapa? (B) Dimana tanaman? (DT)

- |           |            |
|-----------|------------|
| 1.banyak  | 4.sendiri  |
| 2.cukup   | 5.campuran |
| 3.sedikit | 6. batas   |

<u>Petak 1</u>			<u>Petak 2</u>			<u>Petak 3</u>		
Tanaman	B	DT	Tanaman	B	DT	Tanaman	B	DT

8. Pola guna tanah menurut waktu. Apa jenis tanaman-tanaman/dan pohon-pohon ditanam waktu petak itu masih baru, dan berikutnay?

petak 1.

---

petak 3.

---

yg lain

---

Selain petak #1:

	Petak #			
	2	3	4	yg lain
9. Tanaman/pohon sek. masih ada atau kosong? Apa?				

9.1 Kalau kosong, sudah berapa tahun kosong?

9.2 Kalau masih dipanen, dipanen tanaman atau buah-buahan apa?

10. Kalau tidak menanam pohon-pohon (misalnya karet, buah-buah, atau yg lain-lain), **mengapa?** (secara umum atau petak husus petak nomor berapa?)

11. Apa akan memperluas petak-petak tahun ini atau depan? Ya T  
Bapak/Ibu memperluas petak-petak setiap tahun? Kalau tidak,  
mengapa?

12. Apa ada rencana membuka ladang baru tahun ini? Ya T  
12.1 Kalau ya, membuka dimana? Dari tempat: 1.belum  
ladang 2.sudah ladang/pohon besar sek 3.padang rumput atau  
4.dll.?  
Mengapa disana?

13. Apa ada mengupah buruh? Sudah Belum Untuk berkerja apa?

14. Apa kesulitan bapak/ibu dalam berladang/berkebun?

14.1 Apa kesulitan bapak/ibu berladang/berkebun?  
Dipakai nomor 1 yg pertama dan 2 yg kedua dan 3  
yg ketiga.

\_\_\_ hasil kurang. Mengapa?

\_\_\_ tanah kurang subur

\_\_\_ rumput banyak

\_\_\_ biji kurang bagus/sulit mencari

\_\_\_ tanah lari/erosi

\_\_\_ binatang

\_\_\_ serangga

\_\_\_ dan lain-lain, apa?

\_\_\_ kurang tenaga

\_\_\_ memperdagangkan. Mengapa?

\_\_\_ ongkos pengangkutan

\_\_\_ harga rendah

\_\_\_ perantara

\_\_\_ status tanah. Apa? \_\_\_\_\_

\_\_\_ staus pohon saja. Apa? \_\_\_\_\_

\_\_\_ dan lain-lain. Apa? \_\_\_\_\_

15. Apa juga memelihara ternak? Jenis apa? Untuk apa? Kalau tidak, **mengapa**? Apa masalah yg dihadapi berkenaan dengan memelihara ternak itu? Dimana dapat makan ternak? Apakah ada masalah dapat makan ternak?
  
16. Apa yg diharapkan untuk memperbaiki pertanian atau pemasaran hasil?
  
17. Apa yg lain diharapkan oleh Ibu-Ibu untuk menambah mata pencaharian?

**HASIL HUTAN**

Hasil Dikum- hutan pulkan? ya/tidak	Siapa Dijual 1.pak ya/T 2.ibu .. 3.anak	Pentingnya Masih? 1.harian 2.kadang2 3.khusus	Hasilnya berapa? sampai panen padi terakhir? 4.habis
---	--	--	--

	D	S	D	Pent	Masih	Hasil Berapa	
						Jumlah	Harga
gaharu (digunakan apa?)							
jelutong (digunakan apa?)							
rotan (liar) (digunakan apa?)							
kayu besi (belian) (digunakan apa?)							
damar (jenis apa?) Agathis? (digunakan apa?)							
bamboo (digunakan apa?)							
buah pinang (digunakan apa?)							
tengkawang (digunakan apa?) (ditanam juga?)							
madu (digunakan apa?)							
benuas (digunakan apa?)							

Hasil Dikumpul- hutan pulkan? ya/tidak	Siapa Dijual 1.pak ya/T 2.ibu 3.anak	Pentingnya 1.harian 2.kadang2 3.khusus	Masih? 1.banyak 2.cukup 3.kurang	Hasilnya berapa? sampai panen padi ter khir?
--	---	---	---	---

D	S	D	Pent	Masih	Hasil Berapa?
---	---	---	------	-------	---------------

emas Harga (digunakan apa?)					Jumlah
daun tarapan (digunakan apa					
daun makan (sejenis apa?)					
daun obat (sejenis apa?)					
memancing (ikan)					
berburu (daging)					
Kayu dipotong Untuk kayu api? Dapat dimana?					
Kayu dipotong untuk pakaian yg lain.apa? Dapat dimana?					
Hasil dari hutan yg lain. Apa?					

2. Apa masalah yg dihadapi berkenaan dengan hasil hutan di atas pada umumnya atau secara khusus (dari daftar diatas)?

2.1 Untuk hasil hutan diatas, apakah ada masalah dengan...?  
Pada umum Hasil hutan  
(dari daftar)

(Prioritize)

- \_\_\_1.tenaga kerja
- \_\_\_2.persediaan bahan di hutan
  - \_\_\_persaingan di
  - \_\_\_2.1 " di desa ini
  - \_\_\_2.2 " dengan desa yg lain
  - \_\_\_2.3 " dengan perusahaan kayu
- \_\_\_3.memperdagangkan hasil
  - \_\_\_3.1 pengangkutan
  - \_\_\_3.2 harga rendah
- \_\_\_4.dan lain-lain. apa?

3. Kalau tidak mengumpul rotan sekarang, **mengapa?** Apakah pernah mengumpul rotan?

4. Kalau tidak mengumpul tengkawang, **mengapa?** Mengumpul tengkawang dulu?

5. Menurut Bapak/Ibu, apakah ada masalah sekitar atau mengenai lingkungan hidup? Kalau ya, menurut bapak/ibu, apakah penyebabnya? Bagaimana penyelesaian? (misalnya alang2, hutan/ikan berkurang...)



- 4.2 Kalau sudah menanam rotan, jenis apa yg ditanam? Jelaskan bagaimana cara menanam rotan? (Misalnya musim apakah ditanam? Apakah tanaman dipanjat? Berapa sering dibersihkan? dan lain-lain)
5. Berapa lama dari menanam sampai panen? Panen yg pertama dan panen yg berikutnya?
6. Berapa potong dapat diambil dalam satu batang? Berapa potong satu rumpun?
7. Apa masalah yg paling menonjol mengenai memhasilkan dan memperdagangkan rotan?

CATAHAN LAIN-LAIN YG DI ANGGAP PENTING DIBAWAH. TERIMA KASIH.

## Appendix 9.2

SCOPE OF WORK FOR A SOCIAL SCIENTIST/ANTHROPOLOGIST  
IN DEVELOPING MANAGEMENT PLANS FOR FIELD ACTIVITIES  
UNDER THE NATURAL RESOURCES MANAGEMENT (NRM) PROJECT

I. BackgroundA. Overview

The NRM project's long-term advisors and short-term consultants will assist their counterparts: Government of Indonesian officials, private sector staff, local communities, and environmental NGOs in developing a detailed implementation plan for the project's field activities. Advisors will begin work in November and complete the plan by April, 1992. Long-term advisors include: a natural forest management/agroforestry specialist, a nature conservation specialist, a social forestry extension specialist, a forest research specialists, and two marine conservation specialists. However, the short-term assistance of a social scientist/anthropologist is needed to assist the team to help ensure that the implementation plan (a) encourages the active participation of local communities and (b) addresses critical social issues (e.g., potential conflicts of access to forest lands or marine resources). In addition, it is important that the six month planning process include the implementation of selected community-directed development activities. This will help establish the advisors' credibility with their counterparts and strengthen their counterparts' enthusiasm to participate in planning and implementing project activities. Thus, the social scientist/anthropologist will assist in identifying and implementing selected development activities as part of the planning process.

B. Scope of the Study1. Field Sites

The Social Scientist/Anthropologist will examine the social aspects of planned project-funded activities aimed at developing improved policies and practices for managing natural production forests and protected areas. Project-funded activities will be implemented at three sites.

a. Bukit Baka/Bukit Raya, West and Central Kalimantan

At this site, activities will focus on (a) the development of improved policies and practices for managing natural production forests in cooperation with the P.T. Sari Bumi Kusuma and P.T. Kurnia Kapuas Plywood forest concession holders, and (b) the design and implementation of a multi-purpose of management plan for the Bukit Baka/Bukit Raya Nature Reserve complex.

## BEST AVAILABLE DOCUMENT

### a. Improve the Implementation of the Indonesian Selective Logging and Planting System

Project-funded activities to improve the implementation of the Indonesian Selective Harvesting and Planting system may include: (a) studying forest stocking levels and growth rates as well as research on forest ecology to determine silvicultural recommendations, (b) applied research on directional felling techniques to reduce the damage to residual trees and seedlings, (c) applied research on the timing and types of silvicultural treatments (e.g., harvesting and weeding/release operations conducted simultaneously to reduce operating costs and promote the growth of future crop trees), and (d) applied research on the design and construction of logging roads as well as log extraction operations to reduce soil erosion/increase production efficiency.

### b. Improve Shifting Agriculture Practices and Extraction of Non-Timber Forest Products

Research and pilot demonstration activities will test innovative extension approaches with local communities to develop sustainable techniques for agricultural production and extraction of forest products for local use. Activities will test ways to increase agricultural productivity (e.g., through agroforestry, livestock production and cultivation of high value crops/products). Advisors will assist in identifying incentives for community participation and local institutions to support community participation. One objective is to minimize the loss of forests from shifting agriculture/grassland fires and to improve the management of forests for the sustainable production of non-timber forest products (especially rattan).

### c. Multi-Purpose Management of Protected Areas

The project's technical advisors will assist the staff of the Directorate General for Forest Protection and Nature Conservation (D.G. PHPA), MOFr to work with local communities, private sector firms, provincial officials and local NGOs in designing and implementing management plans for three protected areas (two forest reserves and one marine reserve). The objective is develop innovative approaches for nature conservation that can be replicated in other protected areas.

The project will provide support for the testing of multi-purpose management approaches. Activities may include: boundary delineation; establishment of conservation posts and information centers; conservation extension for extraction of non-timber forest products and forest products for local use; development of sustainable agriculture and production of high-value products; forest and grassland rehabilitation; development of nature-based tourism (e.g., formation of marine tourism trade association); genetic resources exploration and development; training in conservation management and extension skills; and environmental awareness.

## II. Objective

To help ensure that the implementation plan encourages the active participation of local communities and addresses critical social issues (e.g., potential conflicts of access to forest lands or marine resources). In addition, the social scientist/anthropologist will assist in identifying and implementing selected development activities as part of the planning process.

## III. Tasks

To achieve the above objective, the Social Scientist/Anthropologist will undertake the following tasks.

A. Review background documents on the NRM project, including the project's social soundness analysis, information on the project's field sites as well as documents on promoting community participation in forest management and nature conservation development projects. Prepare a list of critical lessons learned to serve as guidance for project implementation.

B. Travel to the field sites, conduct rapid assessments of field conditions, and assist the project advisors to better understand social issues at field sites. Work closely with the project advisors and counterparts in planning project activities to ensure that the implementation plan encourages the active participation of local communities and addresses critical social issues. Prepare an update of the project's social soundness analysis to highlight additional information that could be important to project implementation.

C. Assist in identifying and implementing selected development activities that will involve and benefit local communities as part of the planning process.

D. Prepare a draft report of the above outputs/analysis and discuss with USAID and the GOI. Prepare a final report which incorporates comments/suggestions.

## IV. Reports and Deliverables

The Social Scientist/Anthropologist will prepare six (6) copies of a draft report containing the above outputs/analysis. The draft report is due 90 days after beginning work. The final report is due 100 days after beginning work.

## V. Personnel

The Social Scientist/Anthropologist must have at least a Master's degree in Social Science/Anthropology and at least five years professional experience in developing countries. He/She must have a demonstrated expertise in applying social science/anthropology skills in designing and implementing natural resource management projects. Previous experience in Indonesia desirable.

## VI. Role and Responsibilities

The Social Scientist/Anthropologist will work under the technical direction of the Chief of Party for the technical assistance contract with Associates in Rural Development, Inc. (ARD). He/She will also work closely with key Government officials, project advisors, community leaders, and private sector staff.

## VII. Logistics

ARD will be responsible for providing all logistical requirements.

## VIII. Level of Effort

Approximately 100 work days of assistance are required. Up to five work days can be performed in the U.S. prior to arriving in Indonesia. A six day work week is authorized.

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## NRM/ARD CONSULTANCY REPORTS

NO.	TITLE	AUTHOR
1.	Procurement Plan For Research Equipment at Bukit Baka and Equipment Installation at Samarinda Forestry Research Station	Roy Voss
2.	Agroforestry in Bukit Baka/ Bukit Raya	W.G. Granert
3.	Pengukuran dan Pemetaan Topografi Sebagian Daerah Taman Nasional Bukit Baka/Bukit Raya	Sahri Denny, cs
4.	Applied Research Recommendations for Production Forest Management An Economic and Ecological Review of the Indonesian Selective Cutting and Replanting System (TPTI) *	Lisa Curran & Monica Kusneti

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