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NATURAL RESOURCES MANAGEMENT PROJECT

BAPPENAS – Ministry of Forestry
Assisted by
USAID

AGROFORESTRY IN BUKIT BAKA – BUKIT RAYA

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I. GENERAL STRATEGY FOR TECHNOLOGY TRANSFER AND MULTIPLICATION

There are six basic step which project personnel or participants can follow which will lead to the selection, testing, evaluation and eventual multiplication of appropriate agroforestry technology throughout the project. These basic steps are:

- A. Start where the farmers are technologically and build on their expertise.
- B. Discover the constraints to agroforestry development in the villages and project site.
- C. Select appropriate technolog(ies) to overcome the constraints. Generally the simpler the technology the better.
- D. Test the technology on a small scale on farmer's fields.
- E. Evaluate the results with the farmer.
- F. Train trainers to multiply the technology. The trainers are the farmers themselves.

II. STRATEGIES TO PROMOTE INDIVIDUAL AND COMMUNITY PARTICIPATION IN AGROFORESTRY DEVELOPMENT

- A. PROMOTE PARTICIPATORY PLANNING, IMPLEMENTATION, MONITORING AND EVALUATION OF PROJECT ACTIVITIES.
 1. Use indigenous work groups to implement activities in the community.
 2. Develop the LKMD/LMD units in each village as the focal point for villagenatural resource mangagement planning, monitoring and evaluation.
 - a. Start with simple activities which have short duration, are more easily done by a group than individuals and are necessary. Start slowly, start small and build on successes.
 3. Develop a farmer based extension system to manage technology design, transfer, and evaluation.

- a. Reduce focus on demonstration farms and increase focus on individual farms in each village. Demonstration farms become seed, seedling production units. Establish clonal orchards for high quality cultivars. (See annex 3)
 - b. Shift to the development of farmer designed agroforestry/agriculture systems for specific sites and ecological situations. (see annex 6, agroforestry zones)
 - c. Shift focus on external extension system to internal system where formal SBK extension personnel become facilitators of the development process and assist the local population and eventually phase out.
4. Design training programs and activities to place emphasis on on-the-job training.
- a. Implement training activities on farmer's fields.
 - b. Train extension personnel with farmers from their villages to reinforce technology transfer.
 - c. Design training so eighty percent or more of the activity is practicum.
- B. IMPLEMENT ACTIVITIES WHICH ADDRESS PRIORITY FELT NEEDS OF THE COMMUNITY. (These may or may not deal directly with agroforestry. Viable examples are listed below.)
1. Potable water system development at the village level.
 2. Food self-sufficiency.
 - a. Rice production with emphasis on organic fertilizers and low input technology.
 3. Land tenure security.
 - a. Facilitate village land mapping.(see annex 7)
 - b. Facilitate discussion with appropriate government agencies, the concessionaire, political leaders, villagers, concerning village land claims.

- c. Work towards village forests reserves, concessions, access rights, equity distribution in a cooperative rather than confrontational atmosphere.
4. Development of income generating projects.
 - a. Handicraft production.
 - b. Livestock dispersal and production.
 - c. Industrial tree farming (alang-alang areas).
 - d. Graded trail construction
 - e. Rubber plantations.
 - f. Cooperative consumer store with branches in each village (if appropriate).

III. SHORT TERM STRATEGIES TO STRENGTHEN THE EXISTING EXTENSION SYSTEM IN THE AREA (SBK HPH BINA DESA PROGRAM) UNTIL COMMUNITY ASSUMES RESPONSIBILITY FOR A MAJORITY OF THE ACTIVITY.

- A. Provide support materials for field workers in the villages. (see annex 4a,4c)
- B. Institute field trips (cross-visits) to selected sites to observe successful technology and/or extension systems implementation and management. Extension personnel travel with farmers not as separate group. (see annex 4b)
- C. Provide special training in participatory extension system development and eventually shift the formal extensionist to a facilitator role.
- D. Implement a leveling of expectations exercise to determine what constitutes positive and negative attributes of an extension agent from the standpoint of project participants and SBK personnel. Then draft a common list of behavioral guidelines for all extension personnel whether farmers or externally hired. This list is followed when persons are in the project site.

IV. DEVELOP OPERATIONAL TIES BETWEEN THE NATIONAL PARK/ CONSERVATION PROGRAM AND VILLAGE COMMUNITY DEVELOPMENT IN THE BUFFER ZONE AROUND THE NATIONAL PARK.

A. Develop natural resource management and conservation in consonance with the village technical extension program with emphasis on ecologically sound, sustainable management systems.

1. Planning by ecological units such as watersheds, watershed catchments and subcatchments.

B. Design support structures financed by the national park which assist the local community development activities. Place emphasis on agroforestry activities.

V. DEVELOP SUPPORT STUDIES AND ACTIVITIES WHICH WILL ENHANCE THE SUCCESSFUL CHOICE OF CROPS INTRODUCED, INCOME GENERATING PROJECTS CHOSEN AND TECHNOLOGIES SELECTED.

A. Conduct in-depth marketing analysis to determine potential for income generation from locally produced, manufactured products.

1. Minor forest products such as essential oils, fibers, honey.

2. Handicraft for local and export market.

3. Value added processing at the village site.

B. Determine transportation options from the village sites, sites for market outlets.

C. Determine which government policies presently hinder the production of raw materials, semi- or finished products at the village level. Place this information in the hands of the field personnel who advise farmers.

VI. FIELD TRAINING SESSIONS ON KEY ASPECTS OF AGROFORESTRY DEVELOPMENT.

This part of the consultancy was achieved by working closely with both the long term social forestry and nature conservation advisors. Field training was held in two parts. The first was the day to day orientation and training for the long term advisors in agroforestry activity identification, implementation strategy formulation and activity scheduling. The second was the conduct of actual training activities for the staff of the Km. 54 reforestation station, the MIPH Bina Desa staff and local farmers from Nanga Sayai.

As a prelude to the training, the two long term advisors and I visited selected villages, SBK company facilities, interviewed a number of farmers and observed the general activities pertaining to agroforestry in the area. Through discussions with Mering Ngo, several constraints to agricultural development and a good working background to the social organization that exists in the area was obtained. This material was supplemented by conversations with Dr. Jill Belsky who visited the project site immediately prior to my stay.

The conservation advisor was extremely helpful in describing the initial activities associated with the formulation of the management plan for the actual national park covering the Bukit Baka/Bukit Raya area. Constraints were mentioned which must be addressed during the course of the project. We also discussed at length how the agroforestry activities at the village level would fit into the overall management of the national park since many of these activities will generally take place in the buffer zone around the park.

The field training for members of the SBK staff and local farmers was the most enjoyable part of the consultancy. The response for all parties was generally good with the farmers most enthusiastic. The training was conducted in two sites. The first at Km 54 for the reforestation nursery staff. This training was held Thursday, March 12, 1992. Ten SBK staff plus the two long term advisors attended. During the morning session the group was given a short introductory lecture to natural fertilizer production using the composting process. The importance of good potting soil for the reforestation seedlings produced by the nursery was stressed. After the lecture the group proceeded to the main nursery where a compost pile was constructed.

The afternoon session covered the skills associated with basic tree pruning. The field activity took place near the main staff house and the Albizzia falcata stand near the staff house.

Following the field activity the trainees participated in an exercise to determine the attributes of a good forester. This was done to try and determine their orientation to forestry and determine if they were just production oriented or if there was an indication of nature conservancy associated with the job. The results, in Indonesian, are found in Mering Ngo's report covering the event. Generally, the trainees looked at the forester as one who extracts timber from the forest.

The second training took place Friday and Saturday, March 13-14, 1992 at the main Bina Desa Demonstration Farm, Km 23. Participants included Bina Desa, Binhut (km. 54) and farmers from the four dusun of Nanga Sayai. The training covered the following: Introduction to contour farming, options to bench terracing, construction and use of the A-frame transit, planting hedgerow seeds of Flemingia macrophylla and Desmodium Rensonii, field layout of contour lines, seedbed preparation and the planting of napier grass. One hour was spent for the lecture presentation during the two days while five and one-half hours was actually spent in the field. Following the field work on day two, the participants met to discuss the results of the training. Questions as to procedures and the technologies used were answered at this time. There were 33 participants on Friday and 36 on Saturday.

The training sessions provided a good opportunity to interact with both the staff of the Bina Desa and the farmers who live in the dusuns surrounding the main Demonstration Farm. The enthusiasm exhibited by the farmers was very rewarding. The Bina Desa extension staff were a little more reserved as it was probably the first time they had participated in a training where farmers were also involved. The training focus, where learning by doing covered most of the training period, may also have been a new experience for extension personnel. (A detailed description of the training activities is found in Annex 4)

VII. IDENTIFICATION OF KEY AGROFORESTRY AND COMMUNITY DEVELOPMENT ACTIVITIES AND THEIR TIMING.

There are many activities which are possible at the project site. In keeping with the strategy of start slowly, start small, only a few new recommendations will be made during the first year. It should also be remembered that this is not a new site in terms of extension efforts. The SBK started their own assistance program several years ago and have concentrated on rice for self sufficiency. They have also added vegetable production as well as production of other field crops.

The activities suggested below will help to stimulate the participation of the local communities and strengthen the credibility of SBK field staff if they actively participate in the exercises.

The most immediate activities the project can implement which will be very beneficial to the local villages are: 1) Assisting the individual villages in the design, planning, and implementation of potable water systems; and, 2) assisting village mapping efforts.

The two activities can be used as training exercises to teach the local villagers participatory development methods as well as serve as the initial development activities for LKMD units.

Both above mentioned activities can be implemented through the LKMD organization. They will serve to strengthen the units management ability and develop a cooperative spirit amongst the local population.

In chart 1 are a number of activities which can be implemented over the next three years. There are key activities which deal with gathering information which will be helpful in decision making at a later date. Some are field activities which can be completed in a specific time span while others will be continuing activities once initiated.

The initiation of the farmer based extension program has many activities which are continually evolving. I have indicated general numbers as to the minimum number of farmers expected to join the project each year, the number of farmer instructors to be trained by the project. How fast a given village progresses is dependent on a number of factors including the economic level of village families and the amount of time they can afford to spend on individual activities. (see annex 9)

Please refer to the chart number one for the activity and the approximate quarter in which it should begin.

KEY AGROFORESTRY AND COMMUNITY DEVELOPMENT ACTIVITIES

	1992				1993				1994				1995	
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12		
Village Mapping and Land Use Map Formulation (3 Sessions-see Annex 7)														
Potable Water System Development														
Survey and Design														
Village Preparation														
Implementation														
Monitoring and Evaluation														
Maintenance														
Shifting Cultivation Studies														
Inventory of Village Skills														
Inventory of Crops and Cultural Practices Associated with Them														
Basic Agronomy Studies on Farmers Fields														
Identification of Perceived and Actual Village Leaders/Best Farmers														
Determination of Major Constraints to Agroforestry/Agricultural														
Leveling of Perceptions between Villagers and Extension Personnel as to														
What Constitutes a Good Extensionist														
A. Extensions Expectations														
B. Farmers Expectations														
C. Development of Common List of Acceptable Behavior														
Market Analysis for Minor Forest Products and Agricultural Crops Initiation of														
Farmer Based Extension System														
A. Identification of Potential Farmer Instructors														
B. Farmer Instructor Training														
C. Fielding First Group of Instructors														
Strengthening of SBK Extension System														
Strengthening of LKMD in All Villages (Through Development Activities)														
Initiation of Indigenous Work Group Organization for Natural Resource														
Management at the Farm Level														
Survey and Program Development for Possible Cottage Industries and														
Handicraft Production														
Land Tenure Determination and Conflict Resolution														
Technology Implementation Suggestions														
Soil and Water Conservation														
Rice Production with Organic Fertilizers														
Rubber Production Enhancement														
A. Specialist Survey and Design of Program														
Graded Trill Development														
Testing of Different Legume Hedgerows/Covercrops														
Home Garden Development														
Fishpond Development														
Animal Health Program Initiation														
Animal Husbandry (Dispersal) Specific Animals Subject to Village Preference														
Clonal Orchard Development														
Nursery Management - Village Level														

ANNEX 1

General Schedule

William G. Granert - Agroforestry Consultant

Natural Resource Management Project

February 1992

- 19 Travel to Jakarta, Indonesia via Singapore
- 20 Office of Associates in Rural Development; meetings with Colin MacAndrews, Tom McKenzie, Erik Scarsborough; read monthly reports of Potess and Ngo.
- 21 ARD office. Meetings with Dr. Jill Belsky about her trip to Bukit Baka/Bukit Raya. Studied background material on West Kalimantan.
- 22 ARD office. Visit to GOI offices to secure travel papers; discussions with Jill Belsky and Mering Ngo.
- 23 Further discussions with Jill Belsky at hotel.
- 24 ARD office. Formulated list of constraints/problems based on consultants reports. Discussions with Lisa Curran.
- 25 ARD office. Meetings with Tom McKenzie/Lisa Curran. Travel papers ready for trip to Bukit Baka.
- 26 ARD office. Trip to airport for flight to Pontianak, flight cancelled due to runway accident in Pontianak. Returned to hotel/read papers published by Mering Ngo.
- 27 ARD office. Drafted ideas for agroforestry extension system. Meeting with Tom McKenzie, Mering Ngo.
- 28 Trip to airport for 1100 flight to Pontianak. Flight delayed until 1400. Met Dr. Chuck Peters and wife at airport, made arrangements to meet them in Pontianak. Evening meeting with Dr. Syamsuni Arman, Chairman, Center for Regional Development Studies, Tanjungpura University, Pontianak.

- 29 Meeting with Bapak Herman Praytno, PHPA, Pontianak. Visit to Tanjungpura University. Met with Herujono Hadisuparto, Ph.D.Ir., Forest Hydrologist, Faculty of Agriculture. Visit to Gunung Peniraman outside Pontianak with Dr. Arman.

March 1992

- 1 Visit to Rasau Jaya to see agroforestry/agriculture systems in early transmigration area with Elysa Hammond. met with agriculturist (BPP) Abuas Somaee.
- 2 Visit to Kota Balu/Pansibilan outside Pontianak to see agroforestry areas on peat soils. Visit to private nursery of Pak Baharudin (grafted fruit trees).
- 3 Visit by boat to village of Punggur, Kec. Sungai Kakap. met with Proyek Penelitian Punggur Project Manager, Yasin H.B./observed climax stage in agroforestry system of local villagers.
- 4 Trip to Bukit Baka with Mering Ngo who arrived previous evening. Stayed at Camp 35, headquarters SBK.
- 5 Visit to village of Tanjung Paku at Km 74. observed agroforestry system, demonstration farm of Bina Desa. visited SBK nursery at Km. 54.
- 6 Visited main demonstration farm SBK Bina Desa program at Km 23; visited village of Nanga Sayai.
- 7 Visit to Camp 54. discussions with Pak Cucu Sunardi, Pimpinan Pelaksana and Pak Kuswadi, Kasi Perencanaan. Discussed training at Camp 54 and demo farm, Km 23.
- 8 Returned to Camp 35, worked on training program. Conference with Mering Ngo and Fernando Potess.
- 9 Attended meeting of village self-help group, KLMB at village of Nanga Sayai. Visited village of Belaben Ella, talked with villagers at local store.
- 10 Visited Camp 54 to observe nursery operations, check areas for tree pruning/composting exercise.
- 11 Visited area for research center with Mering Ngo, Fernando Potess, Mike Johnson, Hydro Power Consultant. Visited alternate site for center at Km 64.

- 12 Morning training for 10 SBK reforestation workers and staff in compost production. Afternoon training on tree pruning; exercise: qualities of a good forester.
- 13 Training at Km 23, main demonstration farm for Bina Desa, Camp 54 staff and local villagers from Nanga Sayai.
- 14 Continuation of training started previous day/follow-up discussions with farmers.
- 15 Drafted results of training exercises. Discussions with Fernando Potess, Mering Ngo on agroforestry implementation strategies.
- 16 Trip to Pontianak. Boat to Nanga Pinoh, boat to Sintang. Bus to Pontianak. Observed possible sites to visit with farmers from Bukit Baka.
- 17 Met with Jerry Bisson, USAID, Colin MacAndrews, Tom McKenzie, David Ostermeier, USAID, Roy Voss. Started to consolidate data from trip.
- 18 Discussions with Fernando Potess. Lecture to senior students at Tanjampura University - Agroforestry technologies used in the Philippine setting and application to the BB/BR project.
- 19 Purchase of training and nursery materials/supplies to be shipped to Bukit Baka. Visit to nursery of Pak Baharudin with Fernando Potess.
- 20 Trip to airport, flight to Jakarta. Check-in at hotel.
- 21 ARD office. Extend visa to Indonesia. Discussion with Colin MacAndrews about consultant's final report.
- 22 Draft report.
- 123 ARD office. Work on report draft.
- 24 ARD office. Briefing for ARD staff/USAID.
- 25 Final draft preparation.
- 26 Final draft submission.
- 27 Flight to Manila and Cebu.

ANNEX 2

DETAILED OBSERVATIONS DURING VISIT TO BUKIT BAKA/BUKIT RAYA

I. ACTIVITIES IN AND AROUND PONTIANAK, WEST KALIMANTAN

1. Meetings with Dr. syamsuni Arman, Chairman, Center for Regional Development Studies, Tanjungpura University, Pontianak. Pak Syam and I had dinner discussions my first night in Pontianak. He explained some of the activities in which he is involved. These include looking for funding for a water development project for local villagers whose water source, a small hill, is being quarried for crushed rock by the government highway projects. He also is looking for ideas on how to increase cattle production on the peat soils in the area. The major constraint appears to be enough fodder especially during the wet season when the ground is continually flooded.

Pak Syam accompanied me to see Pak Herman Prayitno of PHPA. They are good friends and a meeting was easily arranged. It was also proper that I should introduce myself to Pak Herman since he is the person government representative directly responsible for the Bukit Baka/Bukit Raya area.

Pak Syam accompanied me to see some farming areas on the road to Sintang. This was my first introduction to the peat farming systems situated along the road sides.

From discussions it appears that Pak Syam is interested in working on the Bukit Baka NRMP project. He is one of the two PhD. holders at the University Department of Agriculture and Forestry. He is very familar with the marketing situation in the region and might possibly fit into a marketing study analysis. He would also require very specific terms of reference and reporting schedules. He is a local resource which would be available if the project choses to use his expertise.

2. Meeting with Dr. Herujono Hadisuparto, a forest hydrologist from the University of Tanjungpura. Pak Heru presently works with the faculty of agriculture but will move to the faculty for forestry when the agriculture department is split into agriculture and forestry. I asked him about the services which the agriculture department might provide. He suggested the following:

- a. Conducting short course training at the university for extension personnel or other interested parties.

- b. Trouble shoot agricultural problems when necessary at the Bukit Baka site.
- c. Form part of an evaluation team for the project.
- d. Hire personnel from the University either full time or part time to work on specific aspects of project implementation.

3. Meetings with Dr. Chuck Peters and his wife Elysa Hammond. These were very productive meetings along with field trips to agroforestry sites in the area accompanied by Elysa Hammond. Elysa's project site which she is studying for her Ph.D. is located in Punggur kecil, Kec. Sungai Kakap and is located 16 km south of Pontianak. Her project manager is Yassin H.B., who speaks good English and is a resident of the community.

According to Elysa's description, the area is part of the peat ecosystem which covers 17 million hectares in SE Asia with the largest portions in West and South Kalimantan, South Sumatra and Irian Jaya. Although peat swampland is considered marginal for agriculture, numerous government development schemes, particularly transmigration projects, have been attempted in these sites. Few have succeeded: Rasau Jaya, (which was visited) provides a prime example in the area.

However, within these coastal peat areas exist many thriving farm communities which have been developed and populated by so-called "spontaneous transmigrants". These pioneer farmers are largely composed of Buginese, Banjarese and , to a lesser extent, Madurese people who have become quite adept at creating agroforests in peat swamp soils. Such production systems merit study although, to date, little to no ecological work has been done on traditional farming systems in peat swamp sites.

Elysa is studying the development, ecology, and management of the langsung-durian kebuns in Punggur Kecil, a farming community of 7000 people. Working with local farmers and based on a chronosequence of field sites, she will describe the five basic stages of this production system which 50+ years of kebun development.

I was able to visit the site, talk to the lead farmer in the study, watch langsung being harvested, and observe the stage five of the agroforestry system during a one day visit.

This site would be an excellent place for a cross-visit for farmers from the Bukit Baka area. The local community also has a good community volunteer work day during which such activities as canal excavation are implemented.

Visit to Rasau Jaya. This is an old transmigration area that was not very successful. Originally the government bulldozed the land for housing and told the transmigrants to clear their own land for farms. The peat, which ranges in depth from 0.5 to 7 meters must first be oxidized by fire and exposed to light until most of it is gone. The peat is very low in nutrients, and has a low pH (3.5-4). While sweet potato, cassava can be planted, it may take up to twenty years before rice can be grown and then with some difficulty.

We did have a chance to talk to the BPP extension agent in the area and observed the Sorjan system. This is a rice based integrated cropping system. We observed rice in the lowland sections, with corn, soybean and peanuts on the raised portion. This technology may be applicable at the Bukit Baka site.

Visit to Kota Balu. This is a good site to observe the first three stages in the five stage succession on peat soils. There are examples of peat which is newly cleared and crops planted, rice in the second stage and then coconuts and coffee in the third.

The two above mentioned sites are excellent for farmer cross-visits.

Elysa's husband, Chuck Peters is working on minor forest products and sustainable agroforestry systems outside Sanggau, West Kalimantan. He also has two years of marketing data for the minor forest projects in West Kalimantan. This information and a continuation of his work in marketing of minor forest projects would generate very useful information for the project.

4. Visit to Private Nursery of Pak Baharudin. This former banker started his own nursery as a hobby and has now developed it into a full time business. He also collects native fruits from West Kalimantan and plants specimen trees on his two hectare lot in Pontianak. He also has grafted rambutan, langsung, durian and other fruit trees for sale. Pak Baharudin provides training for university students and private individuals. From discussions with him, he would be more than willing to assist the project in nursery management and plant propagation. He is also willing to travel to the site and/or hold training in Pontianak.

This is one local resource which can be of great value to the project now and in the future.

II. ACTIVITIES AT BUKIT BAKA/BUKIT RAYA AND SURROUNDING AREA

1. Visit to Tanjung Paku. This visit was made on March 5 with Fernando Potess, Pak Cucu and Mering Ngo. We observed the village from the top of a small hill and then proceeded to the village center. Most of the adult males were out in the forest gathering tenkawang. A short walk brought us to the demo farm created by SBK. They excavated a diversion canal and irrigated an area for rice. The diversion canal is starting to silt in and will need cleaning in the near future. The canal walls are also eroding and should have grasses planted as a cover to prevent it. The rice field seemed to be doing nicely. There was a small area adjacent to the sawa which the farmer had planted to rattan (sega). The plants appeared to be doing well. The seedlings came from an area on the opposite side of the village where there is a natural rattan nursery. Wildlings are collected at this site.

The village extension agent showed us a small nursery with durian seedlings in plastic bags, a small garden plot which had a good mixture of vegetables in the same bed (beans, eggplant, mustard, bitter melon), and a small nursery shed.

Livestock was found in and around the village. There were chickens, pigs, cows, ducks (and a few dogs). When asked about animal diseases, a local villager said chickens were sick on a yearly basis especially at the start of the dry season. They appeared droopy. Pigs have some kind of skin disease which is cured by using local plants.

There was a big load of bamboo on the main village pathway. This plant seem to be scarce in some villages and would be a good crop to plant, especially along the river banks.

We talked to two SBK extension people who work in the village. When asked what they were interested in as training topics they replied: rice production, rubber production, cows and legumes.

2. Visits to reforestation nursery at Camp 54. This area was visited a number of times during the stay at Bukit Baka. There were several observations that were made during these visits. These were:

- a. The nursery is generally well laid out although there appears to be too much shade and few areas for hardening off trees which will go to the outplanting areas.
- b. The potting soil is gathered from the forest floor to a depth of several centimeters. It appears that there is little organic matter in it. Addition of this material may be one way to improve the quality of the seedlings of all the species planted in the area.

- c. There were piles of bags and soil that had been cleaned out of beds and thrown away. When we made the compost pile I had a chance to look at these and found many useful bags, still full of soil, buried under the pile. Seems like a waste of money and time to gather more soil fill the bags when there could be salvaged and used again.
- d. On one trip I showed the nursery personnel the damage from the Mahogany tip borer which has infested the young Swietenia plantings. One tip was dissected and the larva of the insect found in the young stem. I explained how we interplanted legumes such a Leucaena inbetween Manhogany to reduce the infestation in the Philippines.
- e. We picked out a site for a small tenkawang nursery which should give the project some seedlings ready to plant in about eight months. The area will be taken care of by two nursery workers who we will hire on a part time basis. Mering and Fernando will keep track of the site and will work out a suitable distribution system over the next few months.
- f. The nursery does have some of its larger trees identified with signs. This is a nice gesture on the part of the company. If more visitors are brought to the area I am sure they will be interested in some of the local trees.

3. Visits to main demonstration farm at km. 23. HPH Bina Desa Program of SBK. This farm was visited several times and was the training site March 13-14. There were several observations made during these trips. These were:

- a. There are a variety of activities which have been instituted at the farm which demonstrate various technologies farmers can use. These include production of vegetable crops, lowland, irrigated rice, corn, legumes, rubber, fish (in ponds), bench terracing, legume hedgerows, forage grasses. The site also has staff quarters and an office building.
- b. The bench terracing area was carved out of a small hillside. Calliandra and Cassia siamea have been planted along the edge of the bench and a small canal excavated at the back of the terrace to help drain water after heavy rains.

I looked at these structures very carefully since they are, at present, the major soil conservation option shown to the farmers. There are several features which need to be improved to strengthen the impact on local visitors. These are:

1. Deepening and widening of the drainage canal at the back of the terrace. Presently there is evidence that water overflowed the canal and washed down the bench riser. Soil was eroded in the process.
2. There are areas where the hedgerows are planted thickly enough to hold the soil at the edge of the terrace and other areas where there are no trees at all. Care must be taken to ensure the hedgerows are thick, well maintained (no skips) and pruned at the proper time.
3. The area below the hedgerow, the riser, must be stabilized with grass or other suitable cover to prevent the eventual erosion and collapse of the terrace face. This is a frequent maintenance problem where terraces with tall riser are built.
4. The soil on the benches appear very nutrient poor. I suspect the subsoil was placed on top of the top soil during construction. Tons of organic matter is needed to rejuvenate the soil. The amount of hedgerow leaf material from present stands is not going to be enough to do the job.
5. It would be interesting to know how much work actually went into the bench terrace construction. Farmers might also like to know. A simple chart with the labor requirements and costs would be useful for comparison with other systems.
6. Other than cover cropping, the bench terracing was the only soil conservation measure I saw. The farm should have a variety of treatments so the farmer will have several options to consider for his/her own farm.
7. Just above the terracing there was a stand of napier grass and what appeared to be NB 21, a napier hybrid (this should be checked). Napier or elephant grass, as it is sometimes called, is excellent forage and a stabilizer for bench terrace risers. It does require maintenance or it will eventually take over the area. It would be advisable to secure some of the better clump grasses such as Guinea grass or Vertiver grass to serve as alternatives to the napier if the farmer so desires.

8. There is the start of a grafted rubber nursery near the office building. This is a positive development since there are many new clones which are high producing. The process to get this material out to the farmers as soon as possible should be formulated and discussed with them.
9. There was a demonstration of beans growing on a X shaped trellis. I suggested that more plants could be grown between the rows and under the X itself. Two farmers who were with us seemed interested.
10. There is the start of a good demonstration integrating livestock systems. In this case it is ducks and fish. These systems are easily replicated on farmers fields. The farm needs some very simple, low input examples to encourage the spread of the technology. I did not see any Azolla integration. This should be added as soon as possible for it will give the farmers an alternative to commercial fertilizer now used in the sawa. Azolla is an aquatic fern with a symbiotic blue-green alga which fixes nitrogen. The plant make a good organic fertilizer and food for livestock, thus the advantage of using it.
11. On a hillside, a short distance from the farm, an area has been marked for planting with a covercrop, probably tropical kudzu. The area is presently covered with alang-alang grass. Careful records should be kept as to the labor requirements needed to prepare, plant and maintain the field so farmers will, again, have some idea of the implementation costs. The project should secure seed of several types of creeping legumes, as well as other upright species to plant in the area. The more choices the farmers have as to which species to use to remove the alang-alang the better. Seed of velvet bean was distributed to a representative of each dusan during the farmer/staff training for testing in alang-alang fields. The demonstration farm was also given some seed to try out.
12. The new garden plots near the fish pond have been laid out diagonally across a slight slope rather than on the contour. After two rains there is a good amount of topsoil which has already washed down to the corner of the larger plot. This actually serves as a negative demonstration for the farmers. If soil erosion control is supposed to be practiced by the farmers, then certainly the demonstration should make sure all crops, regardless of whether or not they are annual or perennial, are planted on contours or otherwise protected from erosion.

- 13. The large fishpond near the office is a good idea although more work is needed to make it truly functional. The center should explore how to incorporate more systems with the fish.
- 14. Tree pruning is needed on almost all the trees at the site, from the grafted rubber to the Gmelina along the driveway. It does not appear this is a priority technology. I showed some farmers and staff basic removal of stumps. We also looked at infections which had already worked their way into the trunk of the tree. If a tree is going to produce year after year, it cannot be sick with a heart rot infection.
- 15. We saw rice varieties planted at the farm and adjacent to it. They have IR 64,72, an hybrid called Cimanderi and the local varieties. It is interesting to note that the newer varieties are much shorter than the native varieties. It will prove intersting to see how many farmers adopt the higher yielding varieties. One consideration, pointed out by Mering, is the fact that local villagers harvest the rice by cutting off the head, which is normally at shoulder height. This is then transported back to their houses. The newer hybrids will require people to bend over to a further extent than they do now.

4. Visit to village of Nanga Sayai. This was an interesting visit for me because the village contains the first long house I have seen in person. We were able to meet the Adat chief. One farmer also allowed us to go into his "apartment" to observe the physical layout of this half of the long house. We saw the rattan rugs which Fernando had ordered from one of the villagers. Beautiful work! It took about two months to make. There are some real artisans in this area. The potential for handicraft, I am sure, is here. With a little effort and guidance many fine products could come out of the village.

We visited the farming areas around the village and discovered to rather interesting multiple cropping in a newly cleared alang-alang field. The farmer had a mixture of the following: cassava, lemon grass, tumeric, sugarcane clumps, banana, pineapple, taro, sesame, tenkawang, rubber and a little alang-alang which had not been removed.

We passed rubber which was just starting, about three meters tall and planted right in the alang-alang field. There was little preparation except the the actual planting area around individual trees. No covercropping was evident, nor maintenance brushing. In

some areas the trees are being attacked by termites. These are what appear to be healthy trees. Some rubber is surrounded by ferns which have not been cleared. We also observed scars on the trees where the tapping was not done very well. The project could make a sizable impact here by bringing in a good field person who works with rubber farmers. There is a need to improve tapping, clones used, budding either in a nursery or in the field, collection and primary processing. Some farmers do not have the simple hand driven rubber press. The project might consider putting one in villages where they are needed. The cost could be amortized over a number of years.

There are a number of small rubber nurseries, either natural under existing trees or made by collecting the rubber seeds and then planting a little plot. The trees for these nursery areas will later be outplanted in nearby fields.

In some of the rice fields we did find smut which seemed to be spreading. This might cause a problem in the future.

5. Meeting with the Lembaga Keta Haanen Masyarakat Desa (LKMD) in Nanga Sayai. This was an important meeting attended by Mering and Fernando and the members of the village organizations called LKMD. This is the group which Fernando hopes will become the focal point for natural resource management at the village level. Those present from the village included the head of the Adat council, the Kapala Desa, four Kapaladusum and 12 village officials.

The two long term advisors took turns introducing aspects of the project to those present. The concept of the nature conservation area, the buffer zone and the assistance in production forest management were some of the points covered. The rationale for the research station was discussed. Fernando did most of the briefing with Mering helping translate some of the more difficult words and more abstract concepts.

The group then discussed the viability of having a core group chosen from the LKMD meet on a weekly basis for planning and implementation of resource management activities in the villages. This group may also function as a monitoring and evaluation entity at the village level.

The response to the project and using the LKMD as the village group was very good. In the near future this group will begin the task of creating a land use map for each village. We will also use the opportunity to strengthen the group through a series of training exercises.

6. Short visit to Belaben Ella. On the way back from the visit to Nanga Sayai we stopped at the village store in Belaben Ella. We ended up staying for two and one-half hours. It was one of the situations where much good conversation was generated between the villagers and the advisors. When we arrived there were five or six persons in the store. When we left there were twenty-five or so, many of them children. During the course of the conversation, local delicacies (snacks) were brought out. Seems there was a party the night before and one that evening. Someone also put out a bottle of rice wine. (Which everyone sampled)(Slightly). There was a home made guitar which we asked to see. This lead to bringing out two home made instruments, a bamboo flute and a bamboo instrument called a serunai. We were all treated to a song by two of the local farmers, each playing one of the instruments. We asked if there were others and the owner replied no but one could be made. However there was no bamboo available at the moment. This told us something about the bamboo situation in the area. It certainly appears this would be a good crop to plant.

7. Trip to research center site. We took one morning to accompany Mike Johnson to the proposed research complex site so he could determine the feasibility of a mini-hydro plant for the area. We hiked in along the old logging road. There was plenty of wildlife present, including wild pigs, hornbills, monkeys and other birds.

Along the way we observed the former skidding trails used to extract the logs. There was very bad erosion, sometimes more than two meters deep along the old skids.

The overall site is beautiful and should make an ideal site for the research efforts of the project. The virgin forest is near enough and the water suitable drinking as well as other purposes.

8. Field training of SBK personnel and local farmers. Please refer to annex 4.

9. Comments about the project vehicles. I am sure glad they arrived a few days before I did. Otherwise transport to the different sites would have been difficult. The vehicles will be very useful when trainings are held and farmers happen to live a long way from the training site.

As with most new cars there were problems with loose screws, things falling off the car, the engine not tuned the way it should be for the kind of work these cars will do. Sukarman will take care

of all the problems in the near future. I was just thankful they were there. I should mention a very close monitoring of all trips has been instituted by Fernando and all the drivers oriented to it.

10. Trip from Km. 35 to Pontianak. This was an experience in itself. We left the main camp at five in the morning. It was raining. In fact it had been raining since one A.M. It is a good thing the SBK drivers are well trained. The river was higher than when I arrived two week before so it was a little more difficult to get into the boat for the trip to Nanga Pinoh. We discovered the boat cover leaks a little bit and the draft created by the speed of the boat brought the rain under the cover. Rather a humorous situation. We, Mike and I, who were sitting in the back seats were wet. Fernando was dry in the front seet.

After looking at the weather, we decided not to wait for the plane at eleven but instead, rented a boat to Sintang. This was an interesting ride. The rain was off and on during the trip. In Sintang we rented a bus which normally carried 28 passangers. There were three of us and the driver and his assistant. The trip was very smooth and took about seven and one-half hours.

Along the way I was able to observe some of the agricultural activities which might be of interest to famers should we bring them to Pontianak. All told, the trip was very worthwhile.

I should mention that all throughout the stay at the SBK concession I was treated with the highest respect and courtesy by all the employees. Everyone went out of their way to make my stay as enjoyable as possible. The company can be proud of the personnel they have in the field.

ANNEX 3

FOCUS SHIFT OF DEMONSTRATION FARMS

The SBK HPH Bina Desa program has established a demonstration farm at Km. 23. The personnel have set up a demonstration of bench terracing, fish ponds, gardens, grafted rubber, a small area of cover cropping, lowland rice and annual crop production. There is also a staff house and office with a meeting place for gatherings.

; The alang-alang which originally covered the site was removed with tractor power and a regular paid staff is used to maintain the project site. The site also has equipment, fertilizer, insecticide, for the job it has to do. From the farmers standpoint implementing what they see may not be possible. Several points should be considered when the demonstration farm is looked at in the overall technology transfer process.

First, there is a very high cost in the maintenance of the demonstration farm, both in terms of salary, equipment and time. The time and staff that works on the demonstration farm may be more profitably spent working in the villages with individual or groups of famrers.

Second, inputs such as labor, animal (or tractor) power, insecticides, fertilizers, seeds, and other planting materials are necessary to make the farm a success. These inputs, though, are not generally available to the farmer and therefore the question becomes whether or not the technology is replicable for a large number of farmers. At present SBK is handing out chemcial fertilizer but plans to reduce and eventually eliminate this subsidy. There does not appear to be many alternatives for local villajers to replace the fertilizer. If the demo farm continues the use of commercial fertilizer and the farmers have no access to it. The demo farm production will continue to be high while the local production on irrigated sawa will drop dramatically.

Third, the focus in the SBK extension program appears to be on the demo farms, whether these are small sites in villages and the larger demonstration center. This is where new developments and innovations are placed. This process actually distracts from the ingenuity of the individual farmer who, if placed in the right atmosphere, can originate more practical and better innovations for his own agricultural development. The demonstration may also mask problems that are found in the field because of the internal focus rather than focusing on what the farmer is accomplishing.

Fourth, when the project is terminated or the present policy which requires logging companies to establish HPH Bina Desa programs is changed, what will happen to the demonstration farm? Who will take care of it and at whose expense? How will the costs of establishment be recovered?

To overcome the above mentioned problems and place the focus on the farmer and his technology it is suggested that the focus of the demonstration farms be shifted to plant and animal propagation areas until such time as the farmers are able to take over the tasks at the village level. The farm in this instance would be responsible for generation of seed for rice, corn and other annual crops, initial grafting material of high producing rubber and fruit, fish fingerlings and other livestock.

The technologies used to produced the seed and animals could be used as a demonstration but the focus would be on initially supplying farmers with needed farm materials. The focus in the villages would be on development of farming systems which can more easily be employed by the farmers and replicated in other areas.

The seed/plants that are provided to the farmers should not be given out for free. Farmers should be able to purchase seed at affordable prices. If necessary credit mechanisms can be formulated. In this way the former demo farm will be able to recover some of the cost needed to run the operation.

This shift in orientation will also reduce some of the pressure on the demo farm to always have the best examples present for the farmers to see. At present there are several negative demonstration which farmers should not emulate. These include poor drainage canals on the bench terraces, hedgerows which are not properly maintained, large skips in the contour lines, poor soil fertility as a result of the bench terrace construction, minimum riser stability which will eventually lead to crumbling of the front part of the terrace and garden plots which show increasing soil erosion and whose beds are not situated on the contour in spite of the fact there is slightly sloping land.

It is strongly suggested that part of the demonstration farm be turned into a clonal orchard where the best fruit, rubber, fiber and fast growing legumes are planted. The area can also be used as a site for species trials for varieties which may be applicable to the area but have not been introduced into the locality.

The seed production areas can be used to generate material for seed starter packages which a farmer can take back to his village and try out, evaluate and start his own seed source.

Annex 3-3

Fifth, all areas are high technical input. What is not found are crops that are raised with without external inputs, including mechanization, chemicals and improved planting materials.

ANNEX 4

DESCRIPTIONS OF TRAINING SESSIONS MARCH 12-14, 1992

THURSDAY, MARCH 14, 1992

Time 0800-1100 hrs. A forty-five minute lecture was given to ten participants in the training. The topic was natural fertilizer production using the composting process. To start the session the question was asked, "What person was responsible for fertilizing the large trees which grew around the camp?" This led to a discussion of the natural nutrient cycling in a forest and how this process could be concentrated in a nursery setting. The Indore composting process, using various layers in a compost pile was explained using a diagram and a white board. All the translations of the consultants comments were done by Mering Ngo, the social forestry advisor.

Following the lecture, the group proceeded to the main reforestation nursery for the composting practicum. The previous day the basic materials for the compost pile bin were gathered by two nursery workers. These consisted of round poles, two meters in length. Four bundles of napier grass tops were also gathered and placed at the composting site.

The training participants constructed a compost bin 2x2 meters. Materials for the pile were gathered from the surrounding areas. These consisted of leaves, twigs, top soil, partially decayed materials from the forest floor. In addition, leaves were gathered from the branches of pruned Albizzia trees.

The initial compost layer was made by cultivating the soil to a depth of twenty (20) cm in the area where the pile would be made. The first layer on top of this soil was composed of branches and other larger organic material, including fallen leaves. The second layer consisted of chopped, fresh napier grass leaves and fresh legume leaves (Albizzia). The third layer was top soil from the forest floor.

Normally, a compost pile would have a layer of ash or lime on top of the soil but none was available. This was explained to the participants. The point of using what materials are available was emphasized.

Three more layers were added to the first before it was time for the noon break. The height of the pile stood at approximately 0.75 meters with a four square meter base.

Time 1300 - 1600 hrs. After lunch the group met for a short lecture on the basics of tree pruning. The importance of good tree care was discussed in relation to fruit as well as forest trees.

The trainees proceeded to the area adjacent to the staff house where the Acacia mangium and Eucalyptus sp. were planted along the entrance road. These trees were in bad condition, especially their shape and amount of infection found in branches. All trees had been pruned simply by slicing off the branches with a long knife. No attention had been paid to the form or health of the tree. One branch stump was pruned correctly and then a longitudinal section made. The growth of the infection was observed by the participants. Each trainee was then asked to practice pruning one or more branches.

It was observed the guy wires holding the radio antenna were also incorrectly attached to surrounding trees. The trainees were given a demonstration on how to correctly tie a wire to a tree using a piece of hose or rubber from a tire as a buffer between the tree and the wire. The two guy wires in the area were then correctly attached to the trees.

The group requested we look at the trees in the Albizzia stand about fifty meters from the staff house. This is one of the demonstration areas for the reforestation projects. The trees are planted very close together and exhibit many double stems. The day before some of these had been removed but the procedures used will lead to infection and possible death of the tree in a few years. This will severely reduce the value of the trees if they survived until harvest.

The group was given a demonstration on removing the stump from the second stem and then painting the trees wound to prevent infection. Several of the trainees practices on near-by trees.

After the pruning practicum the group returned to the lecture area. Each trainee was given a piece of paper and asked to write what they thought were the most important characteristics of a good forester. The answers were collected and Mering Ngo consolidated the findings on the white board.

The exercise was done to gain some insight into what the local staff feels is a good definition of a forester and the characteristics he should have. We were curious to see if anything about being a forest conserver surfaced amongst the characteristics.

The results (in Indonesian) are found the in the monthly report of Mering Ngo.

GENERAL OBSERVATIONS / RECOMMENDATIONS

1. The participants generally worked well in the field and were not afraid to "get their hands dirty". There was generally good interest in the material presented and in the field exercises.

2. The compost production could easily be worked into the regular nursery management program with little cost to the company. This would involve establishing covered compost bins at strategic points in the nursery. Whenever the crew cleans the area, all organic material, used soil or other organic materials could be placed in the pile and left to rot.

Screens could be purchased and the used to selectively sift the organic material. When the smaller particles are gathered, they may be mixed with the potting soil (which is now just raw soil and nutrient poor) to enhance its nutrient value.

3. Tree pruning should be practiced on a regular basis and all employees who work in the nursery should be taught the basics. There are many trees which are now damaged and will be damaged in the future if simple care is not taken to ensure proper maintenance methods.

In the reforestation stands, trees should be thinned out and those with double stems should have one removed. This task will be made easier with a small chain saw rather than parang (bolo, machete), which takes too much time a leaves a rougher cut. The knife can be used to smooth the surface of the wound.

All cut or wounds larger than two and one-half centimeters in diameter should be painted to prevent infection from starting in the wound. Coal tar is appropriate for this purpose.

4. It was not clear what training the local employees go through but the project may wish to institute a regular nursery management skills training for the local staff. This may take the form of one or two hour classes on a weekly or bi-weekly basis and then worked into their regular activities in the nursery.

FRIDAY, MARCH 13, 1992

Time 0745 - 1200. Mering Ngo, Fernando Potess and I arrived at the main demonstration farm at km. 23 at 0745, after a short trip from the main camp at km. 35. Some farmers and staff were already present. Two project cars were sent to pick-up the other farmers. The round trip took one hour.

The actual program began at 0930 with a short introduction to the two day activity and an introduction to the short-term agroforestry consultant. Mering Ngo did the translation for the participants.

A short introductory lecture was presented covering the need for local resource managers (farmers) to obtain the good harvest from their farms. Soil erosion when the forest cover is removed and the consequent loss of production was illustrated. Slowing down the destructive force of the rain by dividing the sloping land into smaller units was discussed. The bench terracing option was mentioned along with its high labor input. Alternatives to bench terracing were then discussed. These included hedgerows and covercropping. Contour lines were illustrated on the blackboard and the A-Frame transit introduced to the farmers. A comparison between a highway transit and the A-Frame in terms of cost was made.

It should be noted that the Bina Desa financial officer, Pak Agung said the material on contour farming and the A-frame had already been introduced to the farmers but they were not interested. It was not clear how the materials were introduced nor to what extent. This information should be confirmed and a comparison made with the training results.

The consultant demonstrated, with the help of a Bina Desa staff member and one farmer, how to construct the A-Frame transit. Following this demonstration, the larger group was divided into subgroups of five or six persons. Each was given the materials to make one A-frame for their group. After each group finished, their A-frame was checked for correct construction.

The entire group then proceeded to the hillside one hundred meters from the Bina Desa building for the start of the practicum session. The time was 1030 hrs.

The first field task was the calibration of the A-frame to determine when both feet were level. This was done by the consultant with the help of two farmers. Each group was then asked to calibrate their own A-frame transit. The calibrated instrument was used during the remainder of the morning.

Five starting points were selected on one side of the field. Each group was requested to clear the along-along grass and small bushes and mark the contour line using the A-frame transit. Five lines were so demarcated during the morning session and work continued during the afternoon period.

Time 1400 - 1530. The groups worked on individual contour lines and started the cultivation of a one meter wide seedbed following the contour line.

During all the field work, the two long term consultants worked with their assigned group as well as other groups. They answered questions and generally observed the response of the local villagers to the training methods and content.

At 1530 hrs. the farmers were driven back to their respective villages after the field exercise in the afternoon.

SATURDAY, MARCH 14, 1992

Time 0830 - 1130. The three project advisors arrived at the site at 0715 and the cars were immediately sent to pick up the farmers. The training session started at 0830. A short lecture was presented to the participants on the planting of double hedgerows using both Flemingia macrophylla and Desmodium Rensonii. These two upright legumes plants are used for hedgerow planting along contours. They are used for animal feed (especially Rensonii) and organic fertilizer. The seeds were brought from the Philippines where they are in extensive use.

Following the lecture, at 0900, the group proceeded to the field site to continue working on the contour beds. Each group worked on their own line. When most of the groups had at least fifty meters finished, the consultant demonstrated how to plant the seeds. To illustrate the potential hedgerow production and allow the farmers to judge the merits of both species, the plantings were alternated every six meters throughout the length of each contour line.

Napier grass, from an adjacent area, was planted below the bottom line of the double hedgerow. This grass is excellent in holding the soil and providing good forage for cows, goats and to a lesser extent pigs. Two ways of planting the grass were illustrated. Pak Agung showed the farmers how to plant laying the stems on the ground while the consultant used a forty-five degree planting methods for the cuttings. The farmers will have to decide which methods works the best and which one they can adopt for different situations.

After each double row was planted, a light mulch of cut grass was placed over the seeds. This will help protect the seeds from heavy rains while they are still young. All groups completed their

contour lines. A final counting of the number of meters for each groups was made and the data recorded. The groups then returned for lunch.

Time 1330 - 1530. The group met to discuss the results of the training. One question that was asked by the farmers is who will manage the training site. This was answered by the consultant when he stated the material was planted on the demo farm and will act as a seed source. Therefore it should be taken care of by the regular staff. Further trainings would be held on farmers fields and there the farmer would be responsible for the maintenance.

A new covercrop seed was introduced. This was velvet bean, Mucuna purians. It is similar to tropical kudzu (Pueraria phaseoloides) which is already planted at the farm. It is, however, easier to handle since it does not produce roots at each node. To clear it all the farmer has to do is cut the center plants and the runners will die. The seed was handed out to each dusun for trial planting in alang-alang fields. Seeds were also given to the demo farm for trail plantings.

The farmers were each given a packet of Flemingia and Rensonii as their graduation certificate. These seeds will be taken back to the villages and hopefully planted. Seed sources can be developed at the village site if the farmers are careful with their planting material.

The training was officially over at 1530. Farmers left for thier homes via project vehicles or on foot for those living nearby.

SUMMARY OF THE TRAINING DATA

PARTICIPANTS

	FRIDAY	SATURDAY
BINA DESA STAFF	2	4
BINHUT (KM.54) STAFF	7	5
FARMERS	24	27
FARMERS BY DUSUN		
NANGA APAT	3	3
NANGA SIYAI	7	7
NANGA LANDAU MUMBUNG	6	6
BELABEN ELLA	8	11

FIELD TRAINING DATA

A. CONTOUR LINES: DOUBLE ROWS FLEMINGIA = 146 METERS
 DOUBLE ROWS RENSONII = 146 METERS
 SINGLE ROW NAPIER = 175 METERS

B. FIELD TIME:

FRIDAY AM 1030 - 1200 25 PERSONS
 FRIDAY PM 1330 - 1500 35 PERSONS
 SATURDAY AM 0900 - 1130 36 PERSONS

C. LECTURE TIME

FRIDAY AM 0930 - 1015 25 PERSONS
 SATURDAY AM 0830 - 0845 36 PERSONS

D. MAN HOURS OF FIELD TRAINING:

FRIDAY MORNING - 37.5 MAN HOURS
 FRIDAY AFTERNOON - 52.5 MAN HOURS
 SATURDAY MORNING - 90.0 MAN HOURS
 TOTAL 180.0 MAN HOURS OF TRAINING

E. MAN HOURS OF LECTURE

FRIDAY MORNING - 18.75 MAN HOURS
SATURDAY MORNING - 9 MAN HOURS

F. MAN HOURS OF DISCUSSION

SATURDAY AFTERNOON - 72 MAN HOURS

G. TOTAL TRAINING - 270.75 MAN HOURS OR 33.8 MAN DAYS

H. DIAGRAM OF THE FIELD CONTOURS:

OBSERVATIONS AND RECOMMENDATIONS

1. The two day training was a good introduction to the farmers of the area. From what the consultant observed they were all hard working and interested in the training exercises. One group would not stop working at noon on Friday but insisted on making "just one more measurement" with the A-Frame.

2. Farmers were teaching other farmers during the field periods. This was especially true when new farmers joined the second day and if one farmer was having difficulty with some part of the exercise.

3. There was good participation from the SBK employees, especially those from Binhut (km.54). Credit must be given to their leadership. The technicians from Bina Desa Demo farm were a bit reluctant to join in the activities during the first day but did so during the second. The consultant suspects that they were a bit taken with the fact that they would be trained right with the farmers. This format for training is not generally used in the area or for that matter in the country. However, if the farmers and the extension staff are going to build respect for each other then exercises must be developed where they learn to cooperate and share experiences with one another.

4. The interest of the farmers was accented by the fact that three additional farmers showed up the second day to volunteer their services. It should be noted that nobody was paid for the work and the work was done at the demonstration farm. This is a credit to the farmers who sacrificed two days of their time to join in the training. It was also stipulated that each farmer would be responsible for bringing his own food for lunch. The project supplied coffee and cookies for the snacks.

5. During the training, Fernando talked with each farmer and asked if they would be interested to have him and Mering come to their dusun once a week to continue the training. This time the activities would take place in the villages and on the fields of the farmers.

6. The *Flemingia* and *Rensonia* should be planted and then evaluated as to how well they do in the area. These are two new species for the site and should fit in closely with the two species already present, *Calliandra calothyrsus* and *Cassia siamea* (Thailand acacia). I would suggest that *Gliricidia sepium* and *Leucaena diversifolia* be obtained to add a fifth and sixth species option in the site. All these are legumes although the *Cassia siamea* does not fix nitrogen so it must be treated like a heavy feeding grass rather than a legume.

The maintenance of the hedgerows should begin almost immediately with the weeding and replanting of skips in the contour line. There should be enough seed to do so. The germination of the Flemingia may be low. In this case new seed should be obtained and the area replanted to obtain a fair estimation its capability in the site.

7. The farmers may not initially have a high priority in contouring the hillsides if their main concern is lowland rice. The contour planting of legumes can be associated with the production of organic fertilizer. These hedgerows can be planted on level areas adjacent to the sawa and a cut and carry to the field system used. To remove the alang-alang, the Flemingia will do well if it is allowed to grow to its full height and planted four to five meters apart. The canopy will close and shade out the grass beneath it.

8. Enough emphasis cannot be placed on the weekly follow-up of the trainees in their own fields as a way to stimulate involvement in the project and continue the enthusiasm shown during the two days of training. There is a tremendous resource in these farmers. It will express itself if the proper opportunity is created for the individual expertise and industriousness to be exhibited and the project staff is willing to enter into a partnership with the local villagers. I have no doubt that Mering and Fernando are very capable of facilitating this type of activity.

ANNEX 4 c

AGROFORESTRY TRAINING

SUPPORT LOGISTICS

TRAINING EQUIPMENT / SUPPLIES SET *

I T E M

-
- 20 Plates - Plastic 8" DIA
 - 20 Cups - Plastic
 - 30 Saucers - Plastic
 - 30 Juice Glassess - Plastic
 - 30 Spoons
 - 30 Forks
 - 8 Spoons - Serving
 - 8 Forks - Serving
 - 1 Box For Training Utensils
 - 8 Water Containers - Table Pitcher
 - 2 Water Containers - Field 5 Gal
 - 2 Water Containers - Field 2 Gal
 - 1 Thermos (hot)
 - 1 Airpot
 - 1 Kettler (For Boiling Water)
 - 2 Rolls - Manila Paper (Large Sheets)
 - 6 Document Keepers
 - 10 Sets Cloth (For Cloth Charts) 1m² X 5 pc/chart

*/ 1 Set Kept at Bien Desa Km 23, One Set at Km 54.

ANNEX 4 a

AGROFORESTRY TRAINING

TRAINING AND EXTENSION EQUIPMENT / SUPPLIES

- A. ITEMS FOR GENERAL USE - Kept at Camp Km 54/Bina Desa Km 23.
 - 1. Public Address System (Karaoke-Portable) 2 (Km 23 / Km 54)
 - 2. Megaphone (Battery Operated) + Batteries 2 (Km 23 / Km 54)
 - 3. Extension Cord - 10 m 2 (Km 23 / Km 54)
 - 4. Tape Recorder 6 (Km 23 / Km 54)
 - 5. Blank Tapes 30(Km 23 / Km 54)

- B. ITEM FOR VILLAGE EXTENSION PROGRAM STRENGTHENING
 - 1. Thumb Tacks 2 Box / Village
 - 2. Small Cabinets 1 Village
 - 3. Zip-Lock Freezer Bags 200 / 20 each village
 - 4. Eraser (Blackboard) 2 / Village
 - 5. Chalk-Colored 2 Box/Yr/Village
 - 6. Chalk-White 3 Box/Yr
 - 7. Stappler 1 Large / Village
 - 8. Stapple Wire 3 Box/Yr/Village
 - 9. Marking Pens - Assotered Colors 2 Box / Village
 - 10. Refill Ink for Making Pens 1 Bottle each color / Village
 - 11. 2 or 3 Hole Paper Punch 1 / Village
 - 12. Two or Three Ring Binder 1 / Village

ANNEX 4 b

AGROFORESTRY TRAINING

LIST OF POSSIBLE FIELD TRIP SITES

A. Sintang - Pontianak

- Oil palm plantations
- Black pepper gardens
- Rubber plantations - cover crops
- Contoured hillsides (small scale)
- Chicken production
- Small scale water impoundments

B. Pontianak

- Pontianak - urban exposure
- Punggur agroforestry site
- Pak Baharudin's nursery
- Tengkwang/other oil nut processing plant
- Plywood saw mill
- Trip to ocean outlet via Kapuas river

C. Indonesia

1. World Neighbors Funded Projects - NTT, Flores, Sumba
2. Dry Land Farming Bali / Animal Production
3. Baptist Rural Life Center - Indonesia (Exact Address To Be Identified)
4. Bogor / Jakarta (Urban Exposure)

ANNEX 4 c

AGROFORESTRY TRAINING

SUPPORT LOGISTICSTRAINING EQUIPMENT / SUPPLIES SET *

I T E M

20	Plates - Plastic 8" DIA
20	Cups - Plastic
30	Saucers - Plastic
30	Juice Glassess - Plastic
30	Spoons
30	Forks
8	Spoons - Serving
8	Forks - Serving
1	Box For Training Utensils
8	Water Containers - Table Pitcher
2	Water Containers - Field 5 Gal
2	Water Containers - Field 2 Gal
1	Thermos (hot)
1	Airpot
1	Kettler (For Boiling Water)
2	Rolls - Manila Paper (Large Sheets)
6	Document Keepers
10	Sets Cloth (For Cloth Charts) 1m ² X 5 pc/chart

*/ 1 Set Kept at Bien Desa Km 23, One Set at Km 54.

ANNEX 4 d

AGROFORESTRY TRAINING

VILLAGE NURSERY ESTABLISHMENT SETS
(Per Village)

I T E M	N U M B E R	

Shovel-Round Point	5	
Shovel-Edging	2	
Hoe (Cangkul)	5	
Pruning Saw-Bows		1
-Hand (Curved)		1
-Pole Cu Her		1
Budding Knife		1
Water System (For Box Reservoir/Delivery System)		1
55 Gal Drums		2
Nails:		
- 4"		4 Kg
- 3"		3 Kg
- 2"		2 Kg
- 1"		2 Kg
Cross Cut Saw		1
Hammer (Claw)		1
Sprayer-Backpack		1
Pails-Plastic 3 Gal		3
Large Pail 15 Gal with cover		2
Lock Set		1
Hinges (Door)		3
Blackboard 1/4 Plywood 4' x 8'		1
Screen (Galvanized) Mesh 1"		2 m
	1/2"	2 m
	1/4"	2 m
Poly Bass 7" x 10"		5.000
4" x 6"		10.000
5" x 8"		5.000
Fertilizer Urea 45-0-0		3 Bags/Year
Triple Super Phospate 0-26-0		3 Bags/Year
Potash 0-0-60		1 Bag/Year
Seeds		25 Kg Assorted
Fungicide 1 Kg/Yr		1 Kg/Year
Insecticide		1 L/Year
Green Slate Paint for Chalk Board/Brush		2 Liters, 1 Brush
Compost (3000 Rp./m3)		50 m3
Tree Paint (Coal Tar)		1 Gal/Yr
Liquid Fertilizer (Foliar)		4 l/Yr

BEST AVAILABLE DOCUMENT

ANNEX 5

VILLAGE CROPS / ACTIVITY MATRIX

TENKAWANG COLLECTION									
DURIAN									
LANGSAT									
RAMBUTAN									
EXPERIMENTAL SAWA (DEMO)									
FARMER OWNED SAWA									
SHIFTING CULTIVATION IN PRACTICCE									
PREDOMINANT LAND COVER :									
a. ALANG - ALANG									
b. PRIMARY FOREST									
c. RESIDUAL FOREST (LOGGER OVER)									
d. TRANSITION FOREST TO ALANG-ALANG									
RUBBER PLANTING									
GAHARU GATHERING									
RATTAN PLANTING									
LIVESTOCK :									
COW									
CHICKENS									
DUCKS									
PIGS									
GOATS									
FIRE CONTROL									
FISHING									
HUNTING									
TRANSPORT RIVER									
ROAD									
PATHWAY									
AGRICULTURAL CROPS									
RICE CULTIVATION - UPLAND									
- SAWA									
CASSAVA									
BANANA									
MANGO									
ORANGES									
LEMONS									
CACAO									
CORN									
COFFEE									
COCONUT									
PAPAYA									
KAPOK									
BAMBOO SHOOTS									
GRASSES FOR CATTLE									
VILLAGE	ENCANA	TANJUNG BAKU	TUMBANG KARUHAI	SELARANG	SUNGKIUP	NANGA ABAT	NANGA LANDAU		

ANNEX 6

AGROFORESTRY ZONES KM 0 TO KM 95

The following are agroforestry zones found adjacent and in the SBK, KKP concessions. For each type of zone there should be careful consideration in formulating recommendations as to crops, technology introduced/promoted and management system changes. Careful study is required in the systems, especially those where the villagers are presently self-sufficient in rice and other basic food requirements. To change these systems without a detailed understanding of processes involved could have disastrous results for the local villagers.

ZONE 1 - Swidden at present but will change to sedentary land management in a few years, especially after the logging company harvests the area or uses the area for other government required uses such as the HTI. Careful consideration must be given to continuing the system on a limited basis.

ZONE 2 - Existing ladangs (farms) which are now more permanent and are undergoing "enriched fallow" with the planting of such crops as rattan.

ZONE 3 - Actual residual forest (already logged areas) where farmers now collect tenkawang, ironwood, and other minor forest products including animals for food.

ZONE 4 - Farming areas around villages proper which may be developed for income generation, food or other products, including livestock.

ZONE 5 - Alang-alang (Imperata) areas which are now in fire climax grass with or without small forested areas. These areas can be made productive with both annual and perennial crops if the fire is controlled. These areas would produce multi-use farming systems which may include commercial volume of such crops as rubber, pulp wood, timber, fruit bamboo and livestock forage.

ZONE 6 - River, stream, creek banks which serve as a buffer zone for farm fields. These areas have a potential for specialized crops such as bamboo.

ZONE 7 - Home gardens which can use alley cropping for fertilizer and other perennial crops mixed with annuals whose produce is used for home consumption and/or sale.

Annex 6-2

ZONE 8 - Natural unlogged forest which the concession is not going to use which could be used and managed by the villages under a sustained management system.

ANNEX 7

OUTLINE FOR MAPPING EXERCISE

Session One

I. Introduction to Mapping

- a. Reasons for making a map. discussion in terms of village needs.
- b. Kinds of maps
 - 1. Topography maps
 - 2. Cadastral for private lots .
 - 3. Road/street
 - 4. Airline routes
 - 5. Production mapping, such a skb maps
 - 6. Other kinds of maps
- c. Map symbols
- d. How to read a topo map
 - 1. Gullies
 - 2. Ridges
 - 3. Slopes
 - 4. Rivers/creeks
 - 5. Map scales
 - 6. North-south orientation
 - 7. Other points to consider
- e. Mapping a village area: ask participants what they would find useful to include as a starting point
- f. Field exercise: mapping a dusun in an alang-alang area.
- g. Assignment for each group: make simple map of village center and bring to the second session.

Session Two

II. Determining village boundaries

- a. Examination of results of first exercise: each group presents their map. Evaluation and correction if necessary

- b. Purpose of village boundaries: discussion with group
 - 1. How does one determine village boundaries?
- c. How to plot boundaries on a large scale map
- d. Estimation of position of farm lots on the map
- e. Designation of areas for land use inside boundaries
- f. Field exercise: marking boundaries in village in along-along areas
- g. Assignment: make map of your village boundaries with all important land marks indicated in their relative position. include as many ladang and other land use areas as possible.

Session Three

III. Village land use map

- a. Review of home assignment and presentation of maps: corrections and additions
- b. Place all village maps on larger make overlay.
- c. Add all outside entities, concessions, ranches, roads, etc.
- d. Determine if there are areas of conflict between villages, between concessions and villages
- e. Develop a final map and distribute to all villages equipment/supplies which may be useful
 - 1. Assorted maps of the: world, SE Asia, Indonesia, Kalimantan, SBK concession, topo maps of sections in SBK concession.
 - 2. Globe
 - 3. Large sheets of paper
 - 4. Plastic overlay sheets
 - 5. Marking pens: assorted colors
 - 6. Note books (small)
 - 7. Bond paper
 - 8. Blackboard/chalk/eraser
 - 9. Snacks (if necessary, everyone brings own lunch)

ANNEX 8

RECOMMENDED LIST OF REFERENCES FOR AGROFORESTRY EXTENSION SYSTEM
IMPLEMENTATION AND AGROFORESTRY TECHNOLOGIES

1. BUNCH, ROLAND. 1985. TWO EARS OF CORN-A GUIDE TO PEOPLE CENTERED AGRICULTURAL DEVELOPOMENT. WORLD NEIGHBORS, OKLOHOMA CITY, OKLA. (Mering Ngo and Fernando Potess both have English versions of this book. Contact Larry Fisher, World Neighbors, P.O. Box 471, Denpasar, Bali, Indonesia. for information about the Indonesian translation.)
2. SOIL AND WATER CONSERVATION FOUNDATION. 1991. THE PHILIPPINE WATERSHEDS DEVELOPMENT PLAN, VOL. V, AGROFORESTRY ANNEXES. (A copy of this technology manual is in the ARD library and a copy is with Fernando Potess in Bukit Baka)
3. SELECTED TECHNOLOGY SHEETS FROM THE INTERNATIONAL INSTITUTE OF RURAL RECONSTRUCTION, 1990. Silang, Cavite, Philippines. (On file in library)
4. SEYMOUR, FRANCES. 1985. TEN LESSONS LEARNED FROM AGROFORESTRY PROJECTS IN THE PHILIPPINES. (Copy in library and in Pontianak)
5. LESSONS LEARNED FROM COMMUNITY-BASED UPLAND PROJECTS: THE RRDP EXPERIENCES IN AGROFORESTRY. 1990. USAID funded project in the Philippines. (Jerry Bisson has copy. There are also copies in the library and in Pontianak)
6. Sajise, Percy E. 1988. UPLAND DEVELOPMENT: WHAT WE HAVE LEARNED FROM OUR EXPERIENCES. RRDP PAPER (Copy in library and in Pontianak)
7. Granert, W. and Percy Sajise. 1990. AGROFORESTRY MANUAL. RRDP PROJECT DOCUMENT. USAID MANILA. (Copy in library and in Pontianak)
8. SOIL AND WATER CONSERVATION FOUNDATION. 1991. THE PHILIPPINE WATERSHEDS DEVELOPMENT PLAN, VOL. VI. LIVESTOCK ANNEXES. (This is now being photocopied in Pontianak. A copy will be brought to Jakarta office)

ANNEX 9

COMMENTS ON IMPLEMENTATION OF THE FARMER BASED EXTENSION SYSTEM

1. During the first year of implementation the extension agent is to observe all the farmers with whom he works and select those which he thinks will make good farmer instructors. Generally for each group of twenty farmers two or three may qualify and want to enter the training program.

2. A training program is designed for the second year. All those farmers who have the potential may join. The training takes place throughout the year. The major criteria for success is the implementation and maintenance of a technology(ies) by the farmer on his own field.

During the year, several evaluations are made and a candidates progress discussed with him/her. At the end of the year there is a general evaluation. Those selected are then graduated as farmer instructors. Generally, thses persons are volunteers with a high status in the community. Some may be hired from two days a week to full time. This will depend on the individual project and its funding.

3. It is estimated that each year two to three new trainees would be identified and go through a training period. Not all those who enter the program are able to obtain the rank of farmer instructor. The criteria used for selection is generally formulated by the community since these persons will be working and living there.

4. Each farmer instructor can handle ten to twenty other farmers. This number can be increased if there are work groups in the area. There may be farmers who become specialists in specific fields such as animal husbandry, a particular crop, training, water development.

5. As the number of farmers grows, the activities of the formal extension agent are reduced until the entire program is turned over and managed by the farmers themselves. This is a built-in phase-out mechanism.

6. It should be noted that during the first three or four years each formal extension agent should be doubling the number of farmers he assists until about 160 is reached. The extra farmer added each year are serviced by the farmers instructors.

ANNEX 10

GENERAL PROJECT RECOMMENDATIONS

1. The project should have a Global Positioning System at the site as soon as possible. The instrument will be very important when the actual national park is mapped and important when formal maps are made of the villages. Individual land holding can be accurately positioned on the maps with a minimum of effort.

2. The field staff should have good cameras, telephoto lenses and plenty of film to record the events as they take place. This is important when dealing with farmers. Photographs stimulate interest. By developing prints into 8 x 10 enlargements excellent teaching tools are created. These pictures can be used to stimulate conversations, point out problems and successes in the field as well as introduce new topics.

3. If there are school teachers there should be books which the children can use. The project should consider ways to start small village libraries. There are a number of sources of free books or those that cost a minimal amount. These libraries are a good way to stimulate activity in a given village.

4. Each village should have some kind of forest reserve through which it has access to natural resources. Various avenues to reach this goal should be explored on all operational levels.

5. The boy and girl scouts are an excellent pathway to teach nature conservation. These groups are generally found through the country. The project staff and consultants may consider sponsoring a troop on an experimental basis. If it works other sponsors will be easy to find.

6. The project might consider an environmental internship program for those persons ages 14 to 20. This can be a summer income generating opportunity as well as an way to teach the teenagers about the environment, conservation, and agroforestry. If a stipend is given, they can use to start projects, go to school(?) or help their parents.

7. The possibility of a village being contracted to reforest along-alang areas should be studied. The program is functional in the Philippines. The vast along-alang areas near the Bina Desa demo farm could be very productive. A village, if the activity is implemented correctly, could generate income for many years through the growth of trees to produce resins, oils, wood, fiber, fruits.

8. I cannot too strongly stress the need for intensive market studies on minor forest crops and agricultural produce. The major incentive to developing a good, sustainable farm is the economic return for labor input. Therefore when we make recommendations as to what to plant we should have some idea of what the market will look like a few years from now.

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