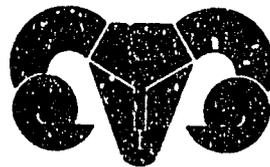


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**Preliminary Sociological Examinations of Outreach Project  
Membang Muda (OPMM)**

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## ABSTRACT

This paper is a preliminary examination of the SR-CRSP sponsored Outreach Project Membang Muda. With the introduction of SR-CRSP technology adjustments by households to previous labor practices must be made. This paper analyzes what some of those adjustments have been in terms of farming practices and labor allocation to specific household tasks and economic activities including care for small ruminants. We examined six different household types within the plantation for comparison purposes. Four different surveys were administered to the six different household types. Each household type was represented by 12 respondent households. The first three survey groups were Nucleus Estates Small Holders (NES). The last three survey groups concentrated on permanent laborers of the rubber estate. We found that two main substantive issues need to be investigated further in the OPMM project: overtapping and the problem of carrying capacity of the plantation for sheep in different stages of the trees' development.

## **Preliminary Sociological Examinations of Outreach Project Membang Muda (OPMM)**

### **Introduction**

Indonesia is one of several countries which has emphasized projects designed to help disseminate specific technology to farmers. One such project that has been widely implemented by the Indonesian government is the Nucleus Estate Smallholder (NES) scheme. The NES provides land, new high yielding rubber tree clones, housing, credit, and extension services to its participants. In essence, it is a modern "homesteading" scheme. However, the NES project represents a major departure from previous policy in that it is the first smallholder rubber development project whose intention is to provide the above services to a group of households over a relatively small area. Additionally, NES participants--most often from the poorest economic strata of Indonesian society--are to receive a certificate of ownership after a specified period of time working the rubber trees. Though the NES is composed primarily of the "economically weak" it includes many different types of people--from those with no previous rubber experience to former plantation laborers. With the introduction of the NES concept in 1977, Government participation in estate plantations has expanded rapidly through Public Estate Companies (PTPs). These provide support to the smallholders surrounding a Nucleus Estate site (World Bank Report, 1991).

One major problem faced by NES participants is they have little or no income generation from their rubber trees during the early, immature period of the trees' growth (1 to 5 year old). This is a difficult time for the NES farmers as they are struggling "to make a go of it" in rubber harvesting. And as many NES participants have had little or no experience in rubber harvesting, it is also a critical time for the trees (that they are not tapped too early) as well as the farmers (that they survive long enough to get their first harvest). It has been observed that during this early, immature period of the trees' growth, grasses are abundant under the trees as a mature leaf canopy has not yet developed which shields the sun and thus inhibits the growth of grasses under the trees. Consequently, to augment the income of NES participants in this early growth period when the trees are not yet ready for harvesting, attempts have been made to integrate small scale sheep production to utilize the grasses under the young rubber trees. It is hoped that sheep production will provide additional income for NES participants during one of the most difficult periods of the NES scheme--getting started--and thus keep the participants in the program.

This integration of sheep and NES sites has been tried in several places to date. One such place is in Membang Muda, Gunung Lonceng, North Sumatra. Known as the Outreach Project Membang Muda, (or OPMM) OPMM is, in fact, an "on-farm" research project used to test and demonstrate the effectiveness of this sheep/rubber integration within a government sponsored program--the NES. The results of the OPMM project have potential national level impacts as it represents a sustainable and readily adoptable technology for smallholder families. At this time, however, such integration practices have only been tried on a small scale such as in the Membang Muda NES.

OPMM has two unique characteristics. First, it targets smallholder rubber producers; and second, a state rubber estate company (PTPIII) provides backstopping through loans and extension services, both of which are essential to the success of the project (Sembiring and Scholz, 1991).

### **Objectives of the Study**

The objectives of this study were twofold: (1) to gain a better understanding of the manner in which smallholder rubber farmers and plantation laborer households respond to new technology and productive resources--the SR-CRSP sheep and its support services, and (2) to evaluate the project and identify its strengths and weaknesses. Both objectives will help improve the development of the project in the future.

### **Theoretical Framework**

As the objectives stated above indicate, the analysis was to be carried out at the household level. This level of analysis reveals how participating households have adapted and responded to the project and SR-CRSP technology to date.

As the OPMM farmers are part of a larger peasant economy particular to this region of Indonesia, any analysis of these farm families needs to consider the theoretical literature concerning the nature of peasant economies and the role of peasant households within them. This speaks to the notion that the two--the peasant economy and the peasant household--are inseparable. Consequently, actions from the peasant household will be closely tied to the existing ecological, social, and political constraints the local peasant economy engenders. For the purposes of our study and for future use by the SR-CRSP, this inseparable connection must be considered as any rapid change in the larger environment of the peasant household requires a dynamic response by the household to adapt to the change. It is for this reason we treat the peasant household as the basic unit of analysis and as a production unit versus individual members of the household.

Using the peasant household as a unit of analysis is also theoretically justified through the work of Friedmann (1986). She argues that the peasant household acts as the focal unit when it comes to questions of labor allocation. In essence, the household operates as a domestic economy where all major production inputs are supplied by every member of the household, each playing a role in the production process with roles being determined by the perceived economic importance of the production activity. Older members of the household will allocate the majority of their time to primary economic activities, while younger members are responsible for secondary or supplemental economic activities. Thus, the amount of labor allocated by a household and the various ways it can be allocated will be determined by the total amount of labor available to the household and the different ages of the laborers. The availability of labor, and hence the potential amount of labor that can be allocated, is contingent upon the demographic characteristics of the household. The demographic structure (i.e., size, age, and gender) of households thus plays a major role in the amount of labor allocated and how it will be used. As mentioned by Guest (1989:105) "the size of the household can be expected to affect the amount of labor available. The effect is in terms of gross amounts of labor

used; the larger the household the greater the availability of labor and therefore the larger the total amount of labor allocated for production activities."

Furthermore, Chayanov (1966) argues that demographic differentiation occurs throughout the life cycle and dictates the extent of the household's participation in the larger economy. It means that family size and age-sex composition have direct effects on labor inputs for the peasant household. Thus the more capable members available in a household, the greater the economic activities of the household. In sum, household size and life-cycle stages of family members affect the general labor allocation strategies that peasant families can follow. In situations where strategies of diversification of production are desired (for example, integration of small ruminants with rubber trees), smaller and younger households are forced to allocate several occupational roles to individual members, while larger households can create individual "occupational specialization" with household members undertaking different tasks.

### **Importance to the Indonesia SR-CRSP in Sumatra**

Consideration of household demographics and labor allocation are two important areas of study for the sociology component of the Indonesia SR-CRSP in Sumatra. Documenting how peasant households have responded to induced changes--like the integration of hair sheep under rubber trees--will help the other components of the Indonesia SR-CRSP in Sumatra understand how labor allocation strategies of smallholder rubber producers affect the adoption of the SR-CRSP technologies being produced. Additionally, this information can help identify appropriate target groups for SR-CRSP technology. Indeed, the purpose of the "On-Farm" projects like OPMM is to observe the application of the SR-CRSP technologies in a natural setting. Consequently, when sociological factors such as family demographics and labor allocation strategies are accounted for under these natural conditions, more accurate assessments of the effectiveness and viability of the products of the other SR-CRSP components can be achieved. In other words, the technologies being developed as part of a holistic SR-CRSP package may be more appropriate for certain groups over others. The sociology component can address this. If these differences are not accounted for, the package as a whole or various parts, may receive undue criticism as to its overall appropriateness. It may simply be a matter of the overall appropriateness for different groups.

### **Research Design and Data Collection**

Introduction of SR-CRSP technology has and will continue to create adjustments by households to previous labor practices. We were interested in analyzing what some of those adjustments have been. Additionally, since major changes in farming practices often require significant adjustments in the amount of labor and the times when it is required and by whom, we wanted to examine a wide spectrum of household types within the plantation to see how each has or may adjust. We administered four different surveys to six different household types. Those groups which had received SR-CRSP or SBPT sheep were given the same survey as those which had their own animals (one survey for NES and one for Permanent labor respectively). Each household type was represented by 12 respondent households. The number of respondent households was limited by the number

of farmers who had received sheep from the project--twelve. The six survey groups are as follows:

- 1) Nucleus Estates Small Holders with SR-CRSP Sheep--Out Reach Project Membang Muda (OPMM).
- 2) Nucleus Estates Small Holders without SR-CRSP Sheep or other animals--Membang Muda.
- 3) Nucleus Estates Small Holders without SR-CRSP Sheep but with their own animals (Sheep, Goats, or Cattle)--Membang Muda.
- 4) Permanent Laborers which received SR-CRSP sheep in 1988.
- 5) Permanent Laborers with no animals.
- 6) Permanent Laborers with their own animals.

The first three survey groups (1 through 3) were Nucleus Estates Small Holders. The last three survey groups (4 through 6) concentrated on permanent laborers of the rubber estate. These are people who are provided housing by the plantation. Their main livelihood and potential pension comes from a monthly salary from the rubber estate and not from ownership, or eventual ownership of land. In 1988, twelve permanent laborer households received sheep from the SBPT. Though the SBPT has maintained extension links with these households through an estate extension worker, direct linkages have not been maintained. In all six survey groups, the issues of land ownership, additional income generating activities or plans for such, household labor activities, and household expenses were examined. Additionally, labor allocation and various problems associated with the keeping of animals were explored for those who had animals.

The OPMM project was developed in September, 1991 when twelve smallholder families were chosen to receive 4 ewes and 1 ram with the condition that after four years, they are to give 8 ewes back to the project as payment. OPMM is located in Afdeling B about 18 kilometers from the main office of PTP III Membang Muda. There are 77 households in afdeling B involved in the larger NES project. In this plantation area, the government estate company (PTP III, in Membang Muda, North Sumatra--about 250 km from Medan) is responsible for administering credit and extension services to OPMM participants and about 700 other smallholder rubber farmers who are also part of Indonesia's resettlement scheme (Scholz, 1992).

The data from all six sample groups was collected through surveys and in-depth interviews. Two project extension personnel conducted the surveys with the project participants and laborers in OPMM. Data collected in the survey included: household composition, all sources of household income, farmer's knowledge on raising small ruminants (i.e., breeding and nutrition), farmer's attitudes on raising small ruminants, and problems and constraints in raising small ruminants. The survey also recorded labor allocation for various activities for all family members above the age of eight.

All activities of household members were categorized into domestic and non-domestic activities which included: rubber production, other on-farm work, household work (cooking, washing, tending children, wood gathering and other chores) and school

(both regular and religious school). Rubber production was an aggregated variable constructed from: maintenance of stands, tapping own rubber, and working on own rubber. Interviews took place in the afternoons and evenings at the rate of approximately two households a day for each interviewer.

## **Research Results and Discussion**

### **Characteristics of Household and Land Ownership**

Household characteristics are reported in Table 1. The average age of the household head (considered in this report as the male head of the household) was 38.8, while the average years of formal education of the household head was 6.3 years. The average household size for all groups sampled was 6.5 members with the number of adult men and women at 1.6 and 1.5, respectively and the number of children at 3.5. The median household size for rural Indonesia is 4.5 persons (BPS, 1982), which is slightly lower than the median size of 6.8 found in our samples. In terms of occupational background of farmers before they became NES participants, most were landless laborers working either as casual labor (24%), temporary labor for a plantation company (51%), or as retirees from the plantation (12%). Among the respondents, only 35% had been farmers.

Table 2 shows that only 35% of the respondents owned land outside the NES, with an average of 0.54 hectares<sup>1</sup>, land owned per household. The largest amount of land owned by any household was 0.96 hectares (owned by a permanent laborer with project sheep) while the smallest amount was 0.24 hectares (owned by a permanent laborer with no small ruminants). Many NES participants bought land or inherited it from their parents which was located outside the NES to be used for economic production, while hired laborers inside the plantation company usually bought dry land for housing to use at retirement (age 55) when they had to remove from the estate company lands.

In North Sumatra's villages, the position of the household in relation to its access to resources is an important determinant of what type of household economic strategies are adopted (Handayani, 1991; Handayani, et al., 1993). Easy access to adequate land for agricultural pursuits can facilitate household members' involvement in household agricultural production or enable the household, as a production unit, to invest funds raised by sale of agricultural products for other types of economic enterprises like raising small ruminants.

### **Household Labor Allocation**

Labor allocation patterns for household members for domestic and non-domestic work are presented in Table 3. The average household head allocated nearly 9 hours a day (8 hours and 36 minutes) in domestic and non-domestic work. Of those interviewed, NES participants spent about 6 to 7 hours in rubber production activities, while plantation laborers worked about 8 hours every day. Furthermore, most wives of NES participants assist their spouses in the field harvesting rubber, whereas wives of plantation laborers usually had a part time job as a temporary worker in the plantation. Consequently, they work everyday for 4 to 5 hours earning around Rp. 1500 per day in wages.

NES farmers are assigned two hectares of high-yielding rubber tree clones. These are normally tapped every other day. Tapping consists of removing a thin paring of bark between 15 mm to 20 mm in thickness. The cut is made on a quarter or perhaps a half circumference of the trunk of the rubber tree at an angle which permits the latex to flow down along a vertical cut into a collecting cup. The tapping panel itself runs from top left to bottom right in order to cut a larger number of the latex-bearing vessels running in the opposite direction (personal communication with Assistant Afdeling B). Tapping is done in the early morning when the tree is in turgor and the flow of latex is the most rapid. The harvesting of produce, or tapping, of any one group of trees averages about twenty five years, after which the old trees are up-rooted and the grounds replanted with new trees. Thus, in a normal day, a farmer spends around seven to eight hours working on 500 - 550 trees per hectare, rests a while, and then collects the latex from the collecting cups. After carrying the latex buckets to collecting tanks, the farmer goes home and starts working again for another two to three hours at clearing grasses which grow around the trees. Usually family members assist in collecting latex and/or clearing grasses as the job of tapping itself requires a great deal of skill.

For household work or domestic activities like cooking, cleaning house, washing clothes, etc., women play the major role. The mother spends about 8 hours a day doing house work. In the survey, labor allocation on domestic and non-domestic activities did not take into account child-care activities. Yet, child care is very time-intensive for women, particularly during the first few years of a child's life. It is difficult to assess the extent to which child care represents a constraint to women's income earning activities, especially for women who live inside the plantation company in which they are typically employed as temporary laborers for the plantation company. Although the job is often very hard for women, it is often the only opportunity for them to bring in extra income for the household, especially since most of them are located on an isolated plantation perhaps miles from larger communities. In support of the above argument, Handayani (1991), found that income earning activities declined when very young children (less than 3 years old) were present in the household.

Male children spent less than 2 hours per day and female children almost 3 hours in domestic work. Male children in the NES area usually help their parents collect latex or clear the grasses from around the rubber trees. While female children, after they reach age of 12, usually begin to substitute for their mother doing the domestic activities leaving the mother more time and opportunity to pursue economic activities for the household. In Table 3, schooling activities were not included, most children who attended primary and secondary schools spent about 6 hours everyday in school.

### **Household Income**

In rural Indonesia, household income normally comes from many sources. Each head of household and their spouse were asked to report all their income-earning activities for the period of June 1991 to June 1992. The income sources were divided into six categories: (1) selling of latex for NES farmers and salary for laborers from the plantation company; (2) selling of food/garden products; (3) remittance from household members who no longer live at home; (4) trade; (5) pension or retirement payment; and (6) livestock production (livestock products reported to be sold to market during a one year period).

Although farmers' incomes are derived from many sources, selling latex and salary from the plantation company, was the main source for both the NES farmers and the laborers in the plantation company. It consists of about 64% of their total income. The average annual farmer's income in 1991-1992 was Rp 2,354,000. (see Table 4). Laborers involved with the small ruminant project had the highest income, while laborers who did not own small ruminants had the lowest; they earned about 70% of the average income earned by all categories of the respondents. These findings are low compared to previous studies (see Sembiring and Scholz, 1991). These inconsistencies can, in part, be a result of the method used in this study. It is very difficult for NES participants to remember exactly how much money they earned every month during a one year period. Furthermore, the problem became even more complicated as the farmers were reluctant to reveal how much of their income comes from selling latex to local markets which, according to the PTP's by-laws, is illegal. NES participants must sell their latex to PTP to pay off the government loan given them through the PTP. At the end of the month PTP deducts 30% of the farmers' income for loan payment. We were forced to use PTP's payment record as a measure of yearly income, which, as already mentioned, does not accurately reflect all income from rubber sales (Arsyad, 1985). However, yearly household expenditure (Table 5) showed fairly consistent findings with previous studies (Sembiring and Scholz, 1991). For example, household expenditure patterns reveal that groceries are the largest single expenditure for the household and, the second largest is rice. From those two items alone, farmers spent about 53% of their total income. Furthermore, farmers spent about 13% for children's school expenses. Table 5 also shows that all households had some disposal income. Taking into account 10% inflation per year, the income of NES farmers and plantation laborers is around twice that of smallholder rubber households (Agricultural Statistic, 1990). However, NES farmers' income is still below World Bank standard (\$ 1,500 per year per household).

### **Small Ruminant Activities**

Table 6 shows that 83 percent of non-OPMM and non-project laborers owned their animals and 17 percent engaged in sharing arrangements. The OPMM farmers received 4 ewes and 1 ram from SR- CRSP/SBPT, while the plantation laborers received various numbers of animals from the plantation company itself (PTP III) since 1988. NES farmers had the most experience in raising small ruminants (36 months), while OPMM farmers had the least (8 months).

OPMM households had an average flock size of 10 sheep. For the OPMM, in general, there was some progress in the project in terms of farmers' willingness to learn more about small ruminant technological practices disseminated by the field staff. For example, after 8 months the flock size increased by 100%. While, non-OPMM and non-project laborers did not raise sheep, they did raise goats with an average flock size of 7 goats (see Table 6).

Table 7 shows that small ruminant activities such as cutting grasses and grazing animals, are male dominated activities, females play a very minor role in small ruminant activities--especially older females. Furthermore, as small ruminant production is a secondary economic activity, children played the major role in raising small ruminants, especially the male children who spent about 4 hours a day in small ruminant activities

(for a detailed discussion see Brown and Handayani, 1993). As shown in Table 7, eighty-eight percent of the male children were involved in raising small ruminants. From in-depth interviews, we found that cutting grasses was a male activity, performed primarily by the head of the household and his sons who were over 14 years old. Grazing animals was also a male responsibility, however, female household members were responsible for small ruminants if there was no male household members around. Females usually helped clean the barn and feed and water the animals. Table 7 shows that the head of household spent a little over 1 hour per day on small ruminant activities, while male children spent an average of 4 hours and 12 minutes a day on the same activities. Less than 50 percent of the women participated in small ruminant activities. Total average time spent by women in small ruminant activities was 38 minutes per day.

In terms of feeding management for the small ruminants, most farmers practiced mixed management feeding systems i.e., cut-carry and grazing systems and some also gave rice bran as a feed supplement. Table 8 shows that 100% of OPMM and NES farmers cut grasses from their neighbor's plantation areas. Eighty seven percent of them grazed their animals in the neighborhood and 13 percent in their own plantation area. All farmers in the NES area cut grasses and grazed the animals not far from their house with an average of 1 kilometer in distance (Table 8). This finding is very striking, as we assumed that integration of the sheep and rubber trees was an effort to maximize personal land utilization. There are two possible reasons why farmers were grazing their sheep on their neighbors land. First, the distance between their house and rubber trees is an average of 3 to 5 kilometers, and their neighbors which are under different NES scheme--called PRPTE--have younger rubber trees with more grass around them. Second, since the age of their own rubber trees are around 12 years old, there are fewer grasses growing on their own lands due to a developed canopy in the older trees which shades the ground under the trees. This problem creates tension between neighbors and OPMM farmers. Last year one incident regarding the grazing of sheep in a neighbor's rubber trees was reported. Although research on carrying capacity has been done (Scholz, 1992), further investigation needs to be conducted to determine the actual carrying capacity of the land under the rubber trees for sheep for each stage (or age) of the rubber trees' growth cycle.

On average, only 50 percent of the farmers knew the quality of grasses. From the interviews, we found they did not know the quantity and quality of different grasses and feed supplements necessary for minimal nutritional requirements based on the physiological status of the animals. Farmers usually gave the same feeds to all their animals, regardless of their physiological status. Therefore, the farmers need more information about the feeding requirements for different types of animals. Sixty nine percent of the farmers did not know why they had to give feed supplements to their small ruminants.

Table 8 also shows barn-management practices by farmers. Seventy five percent of the farmers mixed their animals in the barn. This practice is not recommended by the breeding program as it will create inbreeding problems. Ninety six percent of the farmers give water to their animals.

Table 9 showed farmers' knowledge on breeding management. On average only 56% of the farmers knew the age of their ram the first time it mated, where 65% of them knew the age of their ewes at first mating, and 50% of the farmers knew at what age their ewes gave birth for the first time. In general, since only half of the farmers had some knowledge about breeding management, improvement of farmers' knowledge on breeding management is essential for both the farmers and the project.

Loss due to death has been relatively high. Table 10 shows that 65 percent of the farmers encountered some diseases in their animals. The highest percentage of animal diseases were reported by NES farmers (83%). The most common health problems found in the flock were diarrhea and bloat. Ninety percent of the farmers reported that during the past year their sheep got diarrhea or bloat. The OPMM farmers and the plantation laborers in the project bought anthelmintic from the extension worker every three month. Since, the only extension services for those who live in the plantation compound was that which was provided by the plantation company, about 33 % of the laborers who are not involved in the project got some extension service help. Yet in the NES, 100% of these farmers used traditional medicines to cure their animals ver us medicines provided by extension service personnel. When asked why they did not ask for help from the extension services (which is provided by the Indonesian government at the sub-district level), 70 percent of the farmers said it was too expensive.

The overall loss due to death of their animals has been relatively high (46%). Labor in the project experienced the highest percentage of loss due to death (75%). The lowest amounts of death were found in the OPMM project. Only 25 percent of the OPMM farmers had experienced loss in their flocks. Forty two percent of farmers said that diarrhea was the main cause of loss.

Table 11 shows farmers' perceptions on the factors that limit the possibility of raising small ruminants. Sixty three percent of the farmers said they needed more capital to increase the number of their animals, and only a small percentage of the farmers thought they had problems with finding grazing areas and/or the availability of grasses. Only a few OPMM and NES farmers said that they had problems with the availability of labor to help raise their small ruminants (38%); and all laborers in the plantation company said they didn't have any constraints in available household labor. However, from our field observations, labor availability was only a problem for young families since raising small ruminants is only a secondary or complementary source of household income. More affordable extension services needs to be provided, as 57 percent of the farmers felt there was a lack of extension services in their area. Almost half of the farmers said diseases were a major factor to increasing their small ruminant productivity.

In terms of the farmers' perception toward limiting factors to increase their family's welfare, Table 12 shows the most common problem was lack of inexpensive credit. This was especially true for NES farmers (65%). This was followed by availability of farm land (42%). Other factors reported included capital, extension services, and family labor. In general, farmers' perceptions are important in predicting the behavior of members of their households and their willingness to consider changes in

current practices. By understanding the farmers' perceptions, practitioners can improve, modify or change existing production system.

Table 13 shows the existing credit system for the different farmers. On average 67 percent of all households borrowed money. Laborers in the project had the highest percentage of borrowing at (92%) compared to the NES farmers who had the lowest household borrowing at (42%). The most common source of credit for all farm households was the cooperative (Koperasi Unit Desa/KUD). All laborers in the plantation company could borrow a specific amount of money at a low interest rate (2.5 percent per month). For NES farmers, only about 50 percent of them borrowed from their own KUD. If the farmers borrowed money from a money lender, the interest rate could range from 5 to 20 percent per month. Therefore the existence of a healthy and reliable KUD is essential for NES farmers. Among households that borrowed money, 45 percent did so for basic household consumption and 33 percent did for children's education.

### **Overtapping**

The issue of overtapping is a very important one for the sustainability of the OPMM project. One of the objectives of the OPMM is that the integration of sheep and rubber trees will increase farmers' income and create economic diversification for smallholders in tree crop projects. Overtapping can reduce the life-span of a plantation by as much as half its normal life. This is a very serious problem in Membang Muda. As Scholz (1992:3) stated: "The rate of overtapping is increasing and the seriousness of this situation cannot be overemphasized." Scholz's study used interviews with several farmers about their income and household expenditure pattern and informal interviews with PTP III employees. It reveals some indirect problems of overtapping. Although all respondents agree overtapping will reduce the life-span of the rubber trees, from the interviews it seems there is no single agreement on a definition of what constitutes overtapping. As indicated by one PTP employee:

Overtapping can be explained in two terms. First, in relation to a technical definition. According to the PTP, when the age of the rubber trees reaches 5-6 years old (or 1-2 years after they begin to produce latex), farmers or tappers should cut a 1/2 spiral every four days (S2/D4) at 1.5 mm deep. When the age of the rubber trees reaches 8 to 19 years old, the farmer should tap their rubber every 3 days. After the rubber trees are about 20 years old, the farmer can tap their trees every two days (S2/D2) or what the PTP calls "Alternative Tapping Systems" or "ATS." However, in the NES, since they first begun tapping, farmers have practiced S2/D2. As a result they used a lot of skin from the trees and it will reduce the life span of the trees. I don't know the reasons why the PTP is recommending this practice to the farmers. The second reason is related to the social and economic well-being of the farmers. PTPs are not responsible for the selection of the NES participants<sup>2</sup>. Consequently, most NES participants previously were landless farmers with no steady job. They have diverse backgrounds and previous occupations. Most of them are poor (see Table 2). Consequently, some of the participants are greedy and want to get as much as possible out of their rubber trees without considering their own future.

However, there are different views from the NES participants about the issue of overtapping. In general, farmers feel there is no such thing as overtapping. What farmers appear to be doing is selling half of their latex to the PTP to repay their loan and then selling the other half to the outside markets for a better price. They understand that what they are doing is illegal pursuant to their contract with the PTP. As one farmer's spouse put it:

We know that we broke the rules but what else can you do if you have children crying because they're hungry. The payment from the PTP is only enough to buy bare necessities for less than two weeks and you have no land to plant anything on except rubber trees. Therefore, I have to take some of our latex to the market every once a week to sell it and buy some rice, cooking oil and other household necessities.

Others said:

Although we know selling latex to the local market is illegal, we are still going to do it. The reason is very simple, we get cash--now--and a better price compared to the PTP price<sup>3</sup>.

From our survey, it showed that the problem of overtapping is not a simple matter that can be explained only through latex production (Scholz, 1992). In sum, there are four substantive issues that need to be investigated to get a clear picture of the process of overtapping and why and how farmers are doing it. Those issues are: (1) Land conversion; (2) Participant selection; (3) Pricing formula; and (4) Smallholder loan repayment.

Speaking to the methods of this future research, we feel a participant observation approach would be the most appropriate (see Brown and Handayani, 1993). However, interviews and surveys could also provide some tangential evidence on the process of overtapping.

### **Conclusion**

This research has provided a preliminary social and economic assessment of the OPMM project. The areas where the project was operating shows there is a serious need for further development in on-farm small ruminant research from each of the disciplines involved in the project (in particular the nutrition and forage management, breeding, sociology and economics components). However, two main substantive issues need to be investigated regarding the problem of overtapping and the problem of carrying capacity of the rubber trees for sheep in different stages of development of the trees. These must be addressed if the project is to expand at a larger regional or even national level.

## Notes

- 1) NES participants received 2.0 hectares of rubber-trees land and 0.04 hectares of land with a house on it from the Indonesian government.
- 2) According to the World Bank Document (1989:121), there are participants who fall outside of the prescribed age bounds, who do not reside in the project areas and who have arrears on loans, typically BIMAS rice loans, to the state commercial banks. The requirements for NES participants are that: (a) the participant meets prescribed eligibility criteria i.e., is between 18 to 45 years old, married, engaged in farming, domiciled in the project area, of good character, not participating in other tree crop projects and is not in arrears on other bank debt; (b) the plantings meet the required quality standards; (c) the State Auditing Agency (BPKP) has audited the accounts establishing each individual's loan account; and a credit agreement is signed by the participant acknowledging his debt and the terms of payment obligations.
- 3) Based on a pricing formula issued by the Ministry of Agriculture, the agreed price is paid to the smallholder and a negotiated portion of the smallholder's earnings are paid directly into a bank account for loan repayment. The pricing regulations seek to ensure that for compulsory sales to the nucleus estates they will receive a reasonable return and an adequate incentive to invest in the processing facilities, and that there will be sufficient savings generated to repay the small holders' loans. However, there have been numerous reports of farmers selling their rubber outside the plantation to get a better price or better services on the private market. The use of the Joint Marketing Office (JMO) price as a reference standard is a poor practice, since these prices tend to be out-of-line with spot-prices provided by private traders.

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TABLE 1

Household Characteristics and Main Occupation of Farmers Before becoming NES Participants or Laborers in the Plantation.

Variables	Over all	OPMM	NES w/SR*	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR
Ave Age of Head House	38.8	38.5	37.0	42.2	38.2	37.2	39.8
Education of Head (yr)	6.3	6.5	6.0	5.3	7.3	5.8	6.8
Family Size	6.5	6.8	6.8	7.4	5.9	5.5	6.4
Ave.# of Adult Men	1.6	1.7	1.3	1.7	1.5	1.4	2.0
Ave.# of Adult Women	1.5	1.3	1.2	1.5	1.8	1.3	2.0
Ave.# of Children	3.5	4.2	4.4	4.3	2.8	2.8	2.4
% Occupation Farmer	35	42	25	58	25	25	33
% Casual Labor	24	42	25	--	17	17	17
% Temporary Labor in Plantation	51	16	42	25	58	58	50
% Retired from Plantation	12	--	8	17	--	--	--

\* SR = Small Ruminants (w/ = with; wo/ = without)

TABLE 2

## Landownership Outside the Plantation.

Variables	meter2	Percentage (N)
OPMM	5000	33.3 (4)
NES with SR	4450	33.3 (4)
NES without SR	----	-----
Labor in Project (with SR)	9600	58.3 (5)
Labor non Project (with SR)	5333	25.0 (3)
Labor without SR	2400	25.0 (3)
Average for Total Sample	<b>5400</b>	

TABLE 3

## Time Allocation of Household Members on Domestic and Non-Domestic Activities, in Hours and Minutes per Day (%)

Household Members	Overall	OPMM	NES w/SR*	NES wo/SR	Labor Proj	Labor w/SR	Labor wo/SR
Father***	8.36 (98)	7.45 (92)	8.40 (100)	8.30 (100)	9.00 (100)	9.00 (100)	8.00 (92)
Mother***	8.07 (100)	6.50 (100)	8.35 (100)	8.40 (100)	8.15 (100)	8.29 (100)	9.30 (100)
Sons **	1.45 (88)	1.08 (83)	1.27 (91)	2.15 (91)	2.10 (91)	2.14 (83)	3.00 (83)
Daughters **	2.55 (92)	1.49 (92)	2.33 (100)	3.30 (83)	4.14 (83)	3.02 (100)	3.55 (92)

\* SR = Small Ruminants (w/ = with; wo/ = without)

\*\* Sons' and Daughters' activities are only for household activities such as washing dishes, cleaning houses, sweeping floor, washing clothes. Schooling and small ruminant activities are not included in this category.

\*\*\* Domestic and non-domestic activities for father and mother include working in the plantation.

TABLE 4

Farmer's Yearly Income in Rp.000 X 1,000,000\*\* (N)

Sources	Over all	OPMM	NES w/SR*	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR
Sell Rubber /Salary	1517 (64)	1225 (69)	1898 (76)	2271 (86)	1571 (53)	1001 (39)	1135 (69)
Sell Rice	282 (9)	237 (13)	76 (3)	360 (14)	240 (8)	309 (12)	109 (7)
Remit- tance	120 (4)	--	--	--	240 (8)	480 (19)	--
Trade	254 (8)	--	--	--	311 (10)	211 (18)	239 (14)
Retire- ment	259 (8)	144 (8)	150 (6)	--	438 (15)	396 (15)	168 (10)
Sell Animals	252 (8)	178 (10)	376 (15)	--	186 (6)	269 (10)	--
Total	2354	1784	2500	2631	2986	2586	1651

\* SR = Small Ruminants (w/ = with; wo/ = without)

\*\* Exchange Rate August 1992 \$ 1.00 = Rp. 2017

TABLE 5

Farmer's Yearly Household Expenditures in Rp. 000 X 1,000,000\*\* (% of total)

Variables	Over all	OPMM	NES SR	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR
Rice	459 (24)	570 (31)	547 (30)	635 (26)	331 (21)	311 (22)	360 (23)
Grocery	540 (29)	497 (27)	450 (25)	700 (29)	500 (32)	534 (38)	560 (37)
Schooling	245 (13)	205 (11)	282 (16)	319 (13)	250 (16)	243 (17)	171 (11)
Social Activities	138 (7)	147 (7)	137 (7)	108 (5)	126 (8)	135 (10)	174 (11)
Agricultural Input	168 (9)	93 (5)	125 (6)	285 (12)	--	--	--
Animal Input	28 (1)	30 (2)	--	--	25 (2)	--	--
Cigarettes	141 (5)	175 (9)	101 (5)	143 (6)	106 (7)	128 (9)	192 (12)
Others	159 (8)	150 (8)	202 (11)	208 (9)	216 (14)	68 (4)	110 (6)
Total	1878	1867	1844	2398	1554	1419	1567

\* SR = Small Ruminants (w/ = with; wo/ = without)

\*\* Exchange Rate August 1992 \$ 1.00 = Rp. 2017

TABLE 6

Animal Status, Farmer's Experience in Raising Small-Ruminants, and Average Number of Small Ruminants owned by Farmers. (N)

Variables	OPMM	NES w/SR	Labor in Project	Labor outside Project
Animal Status				
% Owned	---	83 (10)	---	83 (10)
% Sharing	---	17 ( 2)	---	17 ( 2)
Credit	100 (12)	---	100 (12)	---
Farmers Experienced (mo.)	8.0	36.0	21.0	21.0
# of Sheep	10 (12)	---	11 (12)	5 ( 3)
# of Goats	6 ( 4)	8 (12)	8 ( 6)	6 (10)
# of Young Sheep	5 (12)	--	4 (12)	3 ( 1)
# of Adult Sheep	5 (12)	--	7 (12)	2 ( 2)
# of Young Goats	2 ( 4)	4 (10)	3 ( 6)	3 (10)
# of Adult Goats	4 ( 4)	4 (12)	5 ( 6)	3 (10)

TABLE 7

Time Allocation of Household Members on Small Ruminant Activities, in Hours and Minutes per Day (%)

Household Members	Overall	OPMM	NES with SR	Labor in Project	Labor outside Project
Father	1.14 (52)	1.18 (92)	1.07 (58)	1.18 (33)	1.10 (25)
Mother	0.38 (46)	0.36 (83)	0.30 (50)	1.05 (33)	0.26 (33)
Sons	4.12 (88)	4.42 (83)	4.08 (92)	4.38 (92)	3.23 (83)
Daughters	2.36 (38)	2.11 (33)	4.00 (17)	1.36 (42)	2.37 (75)

TABLE 8

## Feeding Management Practices (%)

Variables	Over all	OPMM SR	NES Proj.	Labor SR	Labor
Places to cut grasses:					
Own plantation	71	--	--	75	67
Neighbor's plantation	100	100	100	--	--
Open fields	29	--	--	25	33
Distance (Km)	1.7	1.4	2.1	1.5	1.7
Quantity/SR (Kg)	3.1	2.7	3.2	3.5	3.0
Whether they choose grasses	50	100	42	42	17
Grazing: own plantation	13	17	8	--	--
Neighbor/ estate	94	83	92	100	100
Distance (Km)	1.1	0.9	1.0	1.0	1.3
SR given feed supplement	44	100	17	42	17
Reason no feed supplement expensive	17	--	17	--	--
Enough grass	26	--	17	42	17
Don't know	69	---	66	58	83
Barn system individual	8	--	--	8	--
Group	46	75	--	17	--
Mixed	75	25	100	75	100
Whether SR given water	96	100	83	100	100

TABLE 9

## Farmer's Knowledge of Breeding Practices

Farmer's Knowledge	Over all	OPMM	NES SR	Labor Proj.	Labor SR
Rams 1st Mating (%)	56.1	58.5	75.0	50.0	41.0
Ave. Age of Rams 1st Mating (mo.)	10.6	10.1	11.5	10.0	10.6
Ewes 1st Mating (%)	64.6	75.0	75.0	58.3	50.0
Ave. Age of Ewes 1st Mating (mo.)	7.9	7.1	10.4	8.6	5.5
Ave. Age of Ewes 1st Birth (%)	50.0	50.0	50.0	50.0	50.0
Ave. Age of Ewes 1st Birth (mo.)	13.7	13.8	15.7	12.5	12.7
Ewes Mated After Give Birth (%)	66.7	66.7	75.0	66.7	58.3
Ewes Mated After Give Birth (mo.)	2.7	2.5	3.4	2.0	2.7

TABLE 10

## Farmer's Knowledge of Diseases and Prevention

Farmer's Knowledge	Overall	OPMM	NES SR	Labor Proj.	Labor SR
Animals got diseases last year (%)	64.6	75.0	83.3	58.3	41.7
Type of disease:					
Diarrhea	89.8	83.4	75.0	100.0	100.0
Bloat	16.7	8.3	25.0	---	---
Poison	8.3	8.3	---	---	---
Help from extension (%)	72.2	100.0	---	83.3	33.3
Reason if no expensive	70.8	---	100.0	---	41.6
Distance	58.4	---	---	---	58.4
Type of Medicine:					
Anthelmintic	63.9	91.7	---	75.0	25.0
Traditional	52.1	8.3	100.0	25.0	75.0
Animals died last year (%)	45.8	25.0	50.0	75.0	33.3
Reason animals died:					
Giving birth	16.7	---	---	16.7	---
Diarrhea	41.7	---	33.3	58.3	33.3
Bloat	8.3	8.3	8.3	---	---
Poison	12.5	16.7	8.3	---	---

TABLE 11

Farmer's Perception Toward Limiting Factors of Raising Small Ruminants. (Reported in percentage of respondents.)

Variables	Over all	OPMM	NES w/SR*	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR
Lack of:							
Capital	62.5	41.6	66.7	100.0	50.0	50.0	66.7
Labor	37.5	33.3	41.6	---	---	---	---
Extension Services	56.7	16.7	75.0	83.3	---	50.0	58.3
Diseases	44.4	33.3	41.6	8.3	91.7	41.6	50.0

\* SR = Small Ruminants (w/ = with; wo/ = without)

TABLE 12

Farmer's Perception Toward Limiting Factors as NES Participants and Laborers in the Estate Company. (Reported in percentage of respondents.)

Variables	Over all	OPMM	NES w/SR*	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR
Lack of:							
Land	41.7	25.0	66.7	33.3	---	---	---
Capital	33.3	8.3	25.0	66.7	---	---	---
Extension Services	22.9	16.7	16.7	50.0	---	8.3	---
Labor	23.6	50.0	16.7	8.3	33.3	25.0	8.3
Credit System	65.3	58.3	58.3	58.3	50.0	91.7	75.0

\* SR = Small Ruminants (w/ = with; wo/ = without)

TABLE 13

Types of Credit Systems Utilized by Farmers. (Reported in percentage of respondents.)

Variables	Over all	OPMM	NES w/SR*	NES wo/SR	Labor Proj.	Labor w/SR	Labor wo/SR Farmers Owed
\$ (%)	66.7	66.7	41.6	41.6	91.7	66.7	75.0
To Whom they owed:							
Bank	8.3	--	--	8.3	--	--	--
Traders	8.3	--	--	8.3	--	--	--
Money Lenders	20.8	--	--	33.3	--	8.3	--
KUD	58.3	50.0	--	8.3	100.0	58.3	75.0
Relative/ Neighbor	25.0	8.3	41.7	--	--	--	--
Reason to Borrow money:							
Neces-sities	45.0	50.0	--	58.3	33.3	41.7	41.7
Schooling	33.3	8.3	41.7	--	58.3	25.0	33.3
Total owed (Rp000)	122.7	215.7	86.0	192.8	119.5	65.6	56.7
Interest Rate/ month	5.7	5.5	12.8	8.5	2.5	2.5	2.5

\* SR = Small Ruminants (w/ = with; wo/ = without)