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The Contribution of Women to Rural Household Income: Case Study of Sosa Transmigration Unit in North Sumatra[1]

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Abstract

This paper evaluates the contribution of women to agricultural household income in a mixed farming system of oil palm plantation, small ruminants, chicken and food crops. The research survey included a sample of 40 household wives from transmigration families, of which 30 were sheep credit project participants. Women in this study, who averaged 30 years of age, spend a daily average of four hours for agricultural production, three hours at the plantation for wages, and five hours on household chores and social activities. Their contribution to household income is approximately 30% per month. Women from the sheep credit project are devoting more hours per year to sheep production activities compared to the rest of the family members. In addition, the majority of the women in the study area report that they are one of the key decision makers in livestock production and marketing. This research also shows that integrating sheep production in the plantation family farm has high potential of earning extra income. Recommendations are made to intensive extension services for sheep management, and to include implementation of women farmers in projects by delivering sheep to farm wives.

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Introduction

Women constitute, on average, 66.3% of the agricultural labor force in developing countries (ILO, 1985). This labor contribution level may be higher in sub-Saharan Africa and in East and Southeast Asian nations, particularly for subsistence food crops (Carloni, 1987). Traditionally, rice-based production systems have always used more female labor, and the amount of female labor has increased as intensive irrigated systems have been implemented (Boserup, 1970; Rosenzweig and Schultz, 1982; Sen CP1983). Additionally, women in small agricultural households of rice-based farming systems supervise agricultural labor and make farm decisions besides their work in the field (Unnevehr and Stanford, 1983).

Recently, there has been a recognition of the high economic cost to society of ineffectively employing the human resources that women farmers represent (Baum and Tolbert, 1985). The economic and equity issues related to female labor in agriculture strengthen the argument for improving women farmers' access to agricultural extension services and for providing women with the means to participate in economic development on an equitable footing with their male counterparts.

As in other developing countries, agriculture in Indonesia provides the greatest job opportunities, employing 60% of the population in 1992. Characterized as rice-based farming systems, Indonesia's agriculture sector employs a significant number of rural women. During 1990, women accounted for slightly over 50% of Indonesia population. Seventy percent of women live in rural areas, of which 68% are engaged in agriculture. The participation of women in agriculture is estimated to reach 24.4 million by the year 2000, up from 12.2 million in 1990 (Minister of State for Women's Affair).

However, women in Indonesia continue to lag behind men in social status. They also lack opportunities for education and training, and are often neglected in technological improvements in agriculture. Studies indicate that in Indonesia, women are heavily involved in farming activities especially in livestock production (Sabrani et al., 1982; Wahyuni and Gatenby, 1985; Brown and Handayani, 1993). Therefore, contributions of female labor to rural family income are likely to be significant. Additionally, many of Indonesia's sheep credit projects illustrate that women's

productivity can be improved significantly with a relatively small investment. With that investment, women may contribute substantially to Indonesia's agricultural development. For that reason, detailed information is needed regarding women's contribution to household income, family labor arrangements, and decision making patterns to pinpoint the need for programs in rural areas. The research reported in this paper investigates women's contribution to household income in a small-scale farming system by studying the labor allocation and family income of the Sosa Transmigration Unit in North Sumatra. The results of this case study will generate information for more effective strategies to improve rural household income in the study area and other rural sectors which have a similar farming and socio-economic systems.

Study Area

Revenue generated from agricultural households in developing countries often depends on allocation and availability of the family labor. The preferred study area comprised a small-scale mixed farming system which included multiple crops and livestock production in order to understand the family labor allocation among different types of farming activities. Therefore, **Transmigration Project areas in Sosa, Sumatra** was selected for having a combination of perennial crop, annual crop and small ruminant production.

The Transmigration Project was established by the Government of Indonesia (GOI) in an effort to alleviate poverty and reduce population pressure on Java by encouraging landless farmers or poor people to move to the less populated islands of Indonesia. The Project helps transmigrants settle in new homes by involving them in plantation work and giving them 2.5 hectares of plantation land, of which 2 hectares were for plantation and the other .5 hectare for food crops and housing. In 1991-92, 75,250 families were successfully transferred from Java to other provinces of Indonesia. Although the numbers were not large compared to the whole population, this program was designed to attract other Javanese people to move to outer islands even at their own expense.

The GOI has developed nearly 10,000 hectares of land for oil palm plantation areas in Sosa, South Tapanuli in Sumatra for the Transmigration project. From early 1992, the Department of Transmigration began to relocate families from east Java to Sosa. By August 1994, there were five transmigration units established in Sosa with a total of 3,000 families. Once oil palm trees become productive, two years after the move, 30 percent of the production goes to PTP[1] for cost sharing and the family gets 70 percent of the value of the production from their 2 hectares of oil palm production. The families are entitled to keep their 2 hectares of oil palm areas after the revenue received from these transmigrant families has repaid the plantation's establishment cost. In addition to land, the transmigrant families also received one year's supply of food and payment for work in plantation.

Transmigration project areas also have been a part of the government's Livestock Service Program, which distributes livestock to poor farmers to improve the living standard of farm families[2]. Under the government's Livestock Service Program, the Research Station of Animal Production (SBPT) in Sei Putih, in collaboration with the Department of Transmigration, has been attempting to integrate sheep[3] into the farming systems of the people in Sosa II Transmigration Settlement Unit since August 1992. The objectives of the sheep credit program are (1) to encourage the transmigrants to optimize resources used to increase productivity, (2) to increase knowledge and skill of the transmigrants in sheep farming, and (3) to increase the role of the farmers' associations in raising the efficiency of sheep farming.

The type of sheep provided by SBPT are for meat only and are included as a part of the on-going farm level research project of the Small Ruminant Collaborative Research Support Program (SR-CRSP) in Sumatra. SR-CRSP, stationed in SBPT Sei Putih, is dedicated to improved genetics and breeding, nutrition, animal health and management of sheep. Testing and performance of new technologies in sheep production

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[1] PTP = Perusahaan Terbatas Perkebunan (Translation to English = Government owned plantation co. Ltd.)

[2] A total of 449,435 head of cattle, 62,327 buffalo and 160,444 sheep and goats were distributed to 360,284 farm households (DGLS, 1993).

[3] Many sheep projects in Indonesia over the past decade have successfully helped rural households to improve income and almost all of the participants were able to pay back sheep/goats within the specific time frame.

have been continuously evaluated in both on-farm and research station projects since 1988. The arrangement of sheep credit and the technology transfer program explained in the following section were designed by SR-CRSP and have proven successful in other parts of North Sumatra. These accomplishments led the Department of Transmigration to provide additional funding for sheep production in its designed cropping system of the Sosa Transmigration area.

Families who participate in the sheep credit program (participants) receive a package consisting of one ram and five ewes, and must grow at least .1 hectare of grass and legumes. The participants are required to pay back double the original number of ewes within three years. The animals paid back by each family are distributed to new interested farmers in the transmigration area. Participants are requested not to sell ewes before returning the required number to the project. Farmers are allowed to keep or sell rams at any time.

In addition to the initial flock, the Transmigration project provides the financial assistance for sheep housing. SBPT contributes the design for sheep housing, extension services including mineral blocks, and technical guidance on sheep management practices. Several sheep credit packages have been delivered to the Sosa II Transmigration Unit: two deliveries in fiscal year (April/March) 1992-93, one for 80 families and the other for 40 families. From the first two deliveries, the project was able to use the returned sheep to make another delivery to 50 families in fiscal year 1994-95.

Data Collection

The main purpose of this survey was to evaluate women's contributions to farm households both as laborers and as decision makers. The study also planned to evaluate the contribution of small ruminant farming to household income. Field testing of the draft questionnaire took place at Galang district in North Sumatra during the third week of April 1994. Final design for the survey was completed and conducted in Sosa Transmigration Project area during the first week of May 1994. The survey was enumerated by three trained scientists from the Research Station of Animal Production (SBPT) in Sei Putih. The survey included a sample of 40 wives from transmigration

families, of which 30 were sheep credit project participants. The women were interviewed and gave responses to questions on household background, source of household income, expenditures, decision making pattern and family labor utilization.

Results

a) Family Characteristics

The survey results indicated that there were not many differences in family characteristics between the sheep credit project participants and non-participants (Table 1). The average age of husbands and wives for both participants and non-

Table 1. Household characteristics for Sosa Transmigration Unit II: sheep credit participants vs. non-participants

	Average			Max.	Min.
	Participant	Non-Participant	Total		
Age of Husband (yrs.)	34.7	34.5	34.7	60	23
Age of Wife (yrs.)	29.5	30.1	29.7	50	20
Female > or = 14 yrs.	0.0	0.0	0.0	1	0
Male > or = 14 yrs.	0.3	0.1	0.2	2	0
Female <14 & > or = 7 yrs.	0.5	0.4	0.5	3	0
Male <14 & > or = 7 yrs.	0.7	0.3	0.6	3	0
Children < 7 yrs.	1.3	1.4	1.3	3	0
Total No. of Children	2.8	2.2	2.7	6	0
Husband's Education*	5.4	5.5	5.4	12	0
Wife's Education*	4.5	4.9	4.6	15	0

*Years in school

participants were 35 and 30 years, respectively. The oldest husband in the survey was 60 while the youngest was 23. The oldest wife was 50 and the youngest was 20. Among all the families surveyed, 87% of husbands and 75% of wives were literate. Participating families had a greater number of children averaging 2.8 as compared to 2.2 for non-participants. The disparity in the number of children was due to the fact that families with a higher number of children were given priority in selection of sheep credit participant farmers. The majority of the children from both groups were under age seven, reflecting the predominance of young couples in the study group.

b) Family Labor Allocatio

Oil palm production is planned to be the primary farming activity in the project area. Generally, harvesting of oil palm commences from the fourth year of planting. On average, the fruit bunches can be cut at an interval of 10 days throughout the productive palm life (NES project[4]). However, labor input is constantly required in the plantation for maintenance such as weeding, fertilizer application, and pest and disease control. At the time of this survey, the oil palm plantations were not yet at the productive stage. During this period, transmigrants were hired as wage workers by the project to work on the plantation as field maintenance workers. The wage rate ranged from 400-625 Rp.[5] per hour depending upon the task each worker performed. The survey record showed that each person's working days per month varied from 15 to 20 days. For the 30 participating families, husbands worked in the plantation an average of 5.2 hours a day, 18.7 days a month, and wives worked an average of 2.5 hours a day, 10.7 days a month. For the 10 non-participating families, husbands averaged 4.5 hours a day, 14.4 days a month, and wives averaged 3.0 hours a day, 16 days a month.

These families also depended on food produced on land provided by the project for their own consumption and/or to be sold at the market. Therefore, food crop and livestock production were common as secondary economic activities in the study area. Table 2 reports the family labor allocation in average hours per year for different farming activities. The results were derived from the individual responses to the question of average hours per day and number of days per season devoted to a given agricultural activity. In both participant and non-participant families, the whole family contributed some labor to food crop production. The survey showed that all the transmigrant farmers were growing rice for their own consumption combined with one or more other crops such as peanut, corn, soybean and chili.

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[4]Smallholder Development Projects, Sumatra, available from the library at the National Rubber Research Institute of Indonesia in North Sumatra. The date of this publication is estimated to be late 1960.

[5]During May 1994, exchange rate was US 1$ = Rp. 2200, therefore, prevailing agricultural labor wage is approximately US $ 0.18 - 0.28 per hour.

Table 2. Family labor allocation of participant and non-participant farmers from the Transmigration project in Sosa

Farming Activities / Family member	Average hours per year		
	Participants	Non-participants	Total
• **Plantation**			
Husband	1166.88	777.60	1069.56
Wife	321.00	576.00	384.75
Male children	0.00	0.00	0.00
Female children	0.00	0.00	0.00
• **Food Crop**			
Husband	774.93	902.80	806.69
Wife	643.80	361.40	573.20
Male children	41.03	11.40	33.62
Female children	0.50	0.00	0.38
• **Livestock**			
• **Sheep**			
Husband	404.13	0.00	303.10
Wife	509.60	0.00	382.20
Male children	157.67	0.00	118.25
Female children	0.00	0.00	0.00
• **Chicken**			
Husband	40.80	0.00	30.60
Wife	37.20	0.00	27.90
Male children	39.00	18.00	33.75
Female children	15.00	0.00	11.25
• **Total**			
Husband	2386.70	1680.40	2202.94
Wife	1511.60	937.40	1368.05
Male children	237.70	29.40	185.20
Female children	15.50	0.00	11.63

Livestock production activities involving sheep and chicken were found in the participant group while only chickens were raised in the non-participant group. For sheep production, husbands, wives and male children gave their time, wherein the women's labor contribution was the highest among them. For chicken production in the participant group, all the family members provided labor while in the non-participant group only female children were the primary source of labor.

c) Women's Labor Allocation

In order to obtain an estimate of how women spend their time in different activities, the survey asked wives to describe their activities on the day before the

interview took place. Women were also asked how many hours were spent on each farming operation per season. The results from this question were also used to verify the consistency of women's labor allocation patterns reported in Table 2. The comparison of daily activities of women from participant and non-participant groups are presented in Table 3. The survey record in Table 3 showed that women in both groups contributed approximately three hours of labor to plantation activities, and 2.5 hours to crop farming

Table 3. Estimated women's daily activities of participant and non-participant farmers from the Transmigration project in Sosa

Activity	Average hours		
	Participant	Non-participant	Total
• **Plantation:** Daily	2.47	3.00	2.60
• **Crop Farming:** Daily	2.15	2.67	2.26
• **Livestock:** Daily	1.50	0.44	1.27
• **Post-harvesting** Daily	0.73	0.89	0.77
• **Household chores:** Daily	4.79	3.33	4.46
• **Social function** Daily	0.09	0.00	0.07
• **Total** Daily	11.73	10.33	11.43

activities on a daily basis. While women in the participant group spent nearly five hours on household chores, those in the non-participant group spent around 3 hours on house work. In general, women from the participant group spent less time in plantations and more time in the livestock activity than those of the non-participant group. It should be noted that families in the study areas were predominantly young couples, so that the women's labor allocation pattern presented here depended upon particular stages of a family and will likely change over time.

d) Household Income

Wives were asked to provide average monthly or yearly revenue from various income generating activities by individual family members. The survey results indicated that all of the transmigrant families had higher incomes than what they could possibly make in East Java, and with much greater potential to improve their living standards in the future. Table 4 reports the monthly income of participant and non-participant families in the oil palm plantation of the Transmigration project in Sosa. The survey showed that working on a oil palm plantation generated a primary source of income for both participant and non-participant families accounting for more than 60 percent of the total family income in the majority of transmigrant families. Income for participants, however, is likely to change once they have repaid the loan for sheep and begin livestock production for their own livelihood.

Husbands and wives from the participating group were making more income from farming activities, 80,497 Rp. and 28,908 Rp. per month respectively as compared to their non-participant counterparts earning 58,565 Rp. and 24,850 Rp. per month. In fact, without income from renting tools[6], non-participant husbands and wives would make much less income than participant husbands and wives. In less than two years, the participants were able to return an average of 3.15 head, at the time of survey, valued at Rp 236,250. The animals in their possession averaged 11 head, valued at nearly 0.7 million Rp. In addition to making more income now, the sheep project participating households have potential of making much more in the future.

e) Gender Roles in Decision Making

The decision making patterns in farm production, sales and household expenditures for both participant and non-participant families from the Sosa Transmigration project area are recorded in Table 5. Generally, husbands played a decisive role in crop production activities including land preparation, seed application, and chemical application. The survey results of participant farmers indicated that the

[6]Tools used in agricultural production such as plow and harrow.

Table 4: Monthly household income of participant and non-participant farmers from the Transmigration project in Sosa

Source of income /family member	Average Rp/month		
	Participants	Non-Participants	Total
• **Farm Income:**			
Plantation:			
Husband	51,013	45,525	49,641
Wife	19,708	24,850	20,994
Crop production			
Husband	5,459	5,790	5,542
Wife	9,200	0	6,900
Male Children	2,710	0	2,068
Female Children	0	0	0
Livestock production[7]			
Husband	24,025	7,250	19,813
Wife	-	-	-
• **Non-Farm Income:**			
Renting tools			
Husband	0	24,600	6,150
Wife	0	18,000	4,500
Other Non-Farm Income[8]			
Husband	97,258	7,500	74,819
Wife	82,708	0	62,031
Other Non-Farm Income[9]			
Husband	1,258	0	944
Wife	2,708	0	2031
• **Total income**			
Husband	177,755	90,665	155,983
Wife	111,616	42,850	94,425
Male children	2,710	0	2,068
Female children	0	0	0
Household income[10]	**292,081**	**133,515**	**252,476**
• **Total income**			
Husband	81,755	83,165	82,108
Wife	31,616	42,850	34,425
Male Children	2,710	0	2,068
Female Children	0	0	0
Adjusted household income[9]	**116,081**	**126,015**	**118,601**

[7]Although there is reported livestock activities for women and male children, there is no reported income for these two groups.

[8]Three individuals dominate the non-farm income: one participant household had husband and wife making 2.8 mil and 2.4 mil Rp., respectively. The non-farm income for non-participants came exclusively from one retiree.

[9]Excluding the three highest non-farm income individuals explained in footnote 8.

[10]Including the three highest non-farm income individual explained in footnote 8.

sheep packages were delivered to the male head of the household. However, joint decisions making prevailed in livestock farming. Seventy-seven percent of the 30 families stated that both husband and wife made joint decisions, while 20% stated that husband alone made decisions for livestock production and marketing. Joint decisions were also made for household expenditures and sales of farm produce in 60% of the families surveyed. All of the families stated that husbands and wives made a joint decision to resettle. In fact, the wives' desire to look for a more decent life and for a better future were the primary motives behind the decision. Most were satisfied with the new location and willing to stay in the new location permanently.

Table 5. Decision making pattern in agricultural household, Sosa Transmigration Area

Activity	Decision makers			Respondents
	Husband	Wife	Both	
Land preparation	29 (73%)	1 (3%)	10 (25%)	40
Seed application	28 (70%)	2 (5%)	10 (25%)	40
Weed control	17 (43%)	9 (23%)	13 (33%)	39
Chemical application	25 (63%)	4 (10%)	10 (25%)	39
Livestock farming	6 (20%)	1 (3%)	23 (77%)	30
Sales of farm produce	9 (28%)	3 (9%)	20 (63%)	38
Household expenditure	5 (13%)	9 (23%)	26 (65%)	40

Wahyuni, Knipscheer and Gaylord's (1987) research on women's decision-making role in small ruminant production in Indonesia found that husbands and wives have very different perceptions of the wife's relative participation in the decision-making process regarding the management of sheep and goat smallholdings. Their study showed that women's participation in decision-making, as reported by men was markedly lower than the women's participation as reported by women. The authors also stated that the wives of small ruminant smallholders may be equally as important as their husbands in the decision-making process in mixed farming systems in West Java. Their study illustrates the importance of collecting data from both husbands and wives in a family

to avoid the possibility of bias. Since the data presented in Table 5 is wife's perception only, there may be bias in the survey results.

Summary and Discussion

Agriculture was the primary source of employment in the Sosa Transmigration Unit in Sumatra. The farming system in the study area included palm oil as a tree crop, rice as the base annual food crop and small ruminant/poultry production. In this agroforestry farming system, the primary source of income was to be generated by the oil palm plantation. However, during the time of this survey the oil palm plantation was not yet in production. Hence, members of the transmigrant families were working as wage laborers at the plantation and growing annual crops and livestock. Families who received sheep were repaying their loan and building their flock size. Participant families had returned an average 60% of their loan and had high potential of earning income from sheep production. After two years of participation in sheep project, farmers owned an average of 11 sheep valued at .7 million Rp.

Wage revenue from the plantation was the largest component of adjusted household income. At the same time, women's contribution to household income is reported to be as high as 30% with women providing a daily average of four hours for agricultural production, three hours at the plantation for wage, and five hours for household chores and social activities. Given that the majority of the transmigrant families were predominantly young couples, the women's labor allocation pattern presented here depends upon the particular stages of a family and will likely be adjusted with time.

Although the role of women in agricultural production especially for small ruminant production leaves as significant, the survey found that women in the study area were not members of any farm or community organization while their husband were members of a village association. This situation suggests that although women make significant contributions to agricultural production and household income, women's access to extension services remain limited.

From the survey it was observed that a key reason to migrate was wives' desire to pursue a better future in the new location. Not only were women the force behind the family's decision to resettle in the new location, they also participated in all phases of farming activities. Just like women in many developing countries, they spent many hours each day on a wide spectrum of tasks: feeding and over-seeing the livestock, barn cleaning, tending crops, food processing, marketing, cooking and child rearing.

In order to improve the living standard of rural populations, the significance of women's contribution to the agricultural family labor and income must be recognized. One way to do that is to encourage women's participation in the extension services both as agents and as farmers. Since women already spend more than 11 hours on crop production, household chores and social activities, there may be little incentive to devote time to additional activities unless the extension services are creative enough to encourage regular participation.

This study also found that women were one of the key decision makers in the livestock production. While their husbands were cutting grass for sheep, they set aside one to three hours per day to clean the barn, provide cut grass and feed supplement, and over-see the livestock in the grazing areas with their children. In fact, these tasks were critical in improving productivity of small ruminants. From the experiences of SR-CRSP in Sumatra, some of the challenges for higher productivity in small farms were internal parasites and inbreeding. Both of these problems are management practice related. For example, although anthelmintic medicine for internal parasites are given to sheep in a three month interval, if grazing areas are not rotated as recommended by animal scientists the parasite problems will not be solved, and sheep will not attain their potential growth rate.

Previously, there were not any commercial small ruminant farms in North Sumatra. Research scientists from the Animal Research Institution in North Sumatra observed that the average number of sheep or goats was five or six per farm. Presently, farmers in the study area have an average of 11 sheep per farm. Some farmers in other sheep projects had as many as 90. This transition from subsistence to commercial sheep farming is encouraging for the well-being of farmers, and suggests the need for more intensive extension programs for small farm sheep production.

In conclusion, this study documents the contribution of women to the family labor and household income in the Sosa Transmigration area. The significance of women's role in small ruminant farming is also highlighted. Areas in need of improvement are extension networks wherein participation of women farmers is encouraged for effective and rapid adoption of improved small farm management and production practices. At the same time, institutional support systems for policy decisions such as women farmers' projects can be experimented by delivering sheep packages to farm wives. These programs could be socially acceptable as well as economically feasible. In addition, the sheep raising systems adopted by women may be different than what we have observed when the sheep package was delivered to husbands of a family. The information generated from women farmers' leadership research would be very useful for the effective implementation of future technology transfer programs and rural development projects.

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