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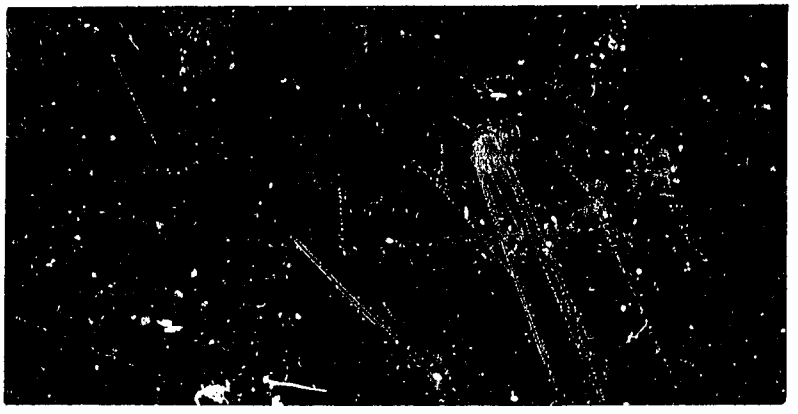

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SOCIAL ASPECTS OF SMALL RUMINANT PRODUCTION: A COMPARATIVE STUDY OF WEST JAVA, INDONESIA*

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ASPEK SOSIAL USAHA TERNAK RUMINANSIA KECIL:
STUDI BANDINGAN DI JAWA BARAT, INDONESIA

(SOCIAL ASPECTS OF SMALL RUMINANT PRODUCTION:
A COMPARATIVE STUDY OF WEST JAVA, INDONESIA)

SUMMARY

Suatu penelitian yang bertujuan untuk menemukan karakteristik sosial, ekonomi dan biologis usaha ternak ruminansia kecil telah dilakukan di Jawa Barat. Seratus empat puluh lima peternak domba terpilih sebagai sampel di Kabupaten Garut selaku wakil daerah dataran tinggi. Kabupaten Cirebon sebagai wakil dataran rendah diwakili oleh 100 peternak. Sampel dibagi dalam 5 strata menurut luasan lahan pertanian yang dimiliki. Variabel yang diamati meliputi kontak institutional, pola penyebaran tenaga kerja keluarga, pola pembuatan keputusan dan sikap serta nilai tradisional yang berkaitan dengan usaha ternak ruminansia kecil. Walaupun terdapat perbedaan sosio-historis kedua masyarakat peternak yang diteliti, keduanya adalah masyarakat patrilineal.

Hasil pengamatan menunjukkan perbedaan yang jelas antara kedua daerah. Daerah dataran tinggi lebih menonjolkan usaha tani campuran (multicropping), sedangkan daerah dataran rendah lebih mempercayakan usaha tani padi secara monokultur. Pola pemilikan ternak ruminansia kecil di dataran tinggi lebih ditandai oleh pola pemilikan individu, sedangkan pola pemilikan bagi hasil lebih meluas di kalangan peternak dataran rendah. Namun demikian, di kedua wilayah tidak terdapat kaitan yang nyata antara luas lahan pertanian yang dimiliki dengan jumlah ternak kecil yang dipelihara.

Pola pembagian tenaga kerja keluarga di kedua wilayah menunjukkan kesamaan. Kegiatan memelihara ternak dan usaha tani dibagi menurut umur, jenis kelamin dan posisi dalam rumah tangga. Kaum pria dan wanita membagi kegiatan bertani relatip sama, namun dalam beternak kegiatan kaum pria lebih menonjol. Di daerah dataran tinggi, peranan kaum wanita dalam kegiatan di luar usaha

tani dan beternak lebih tinggi daripada kaum pria. Tetapi bagi kedua daerah, peranan kepala keluarga jauh lebih menonjol dibandingkan dengan anggota keluarga lainnya. Kepala keluarga sangat menentukan dalam memutuskan untuk menjual hasil tani-ternak dan juga menentukan penggunaan uang yang diperoleh dari hasil penjualan tersebut.

Kebanyakan peternak lebih menyukai kredit yang ditawarkan oleh institusi pemerintah dan merekapun sangat responsif terhadap saran yang diberikan oleh petugas penyuluhan. Namun dalam praktek, kebanyakan tidak dapat mengambil kredit dari institusi pemenrintah, sehingga banyak diantara mereka menyandarkan kebutuhan kreditnya kepada pelepas uang lokal. Demikian juga halnya dengan jarangnya petugas penyuluhan mengunjungi desa mereka, peternak terpaksa mencari informasi dan saran dari tetangga.

Alasan utama bagi peternak di dataran tinggi untuk beternak domba adalah sebagai tabungan, karena domba mudah diuangkan dalam waktu singkat. Mereka juga jarang mengkonsumsi daging domba yang mereka hasilkan sendiri meskipun mereka merasa bahwa menyajikan daging merupakan hal yang penting. Sikap peternak yang positif terhadap usaha modernisasi pertanian dan peternakan tercermin dari pendapat dan sikap mereka terhadap usaha taniternak di wilayah yang bersangkutan.

INTRODUCTION

Farming systems is a term that has arisen in the last decade in an attempt to recognize the complex and diverse nature of agricultural production particularly in the tropical and subtropical regions of the world. The farming sytems approach tries to locate crop and animal production, marketing and other household activities within a context and emphasizes the importance of understanding the entire system, including its biological, socioeconomic and institutional components, in which agricultural production occurs.

The typical farm in such a setting is a small, family operated enterprise producing largely for family subsistence. Often several crops are grown and multiple cropping and intercropping are widely practiced. While some of the farming systems literature recognizes the close interaction between animal and crops in the agricultural system found in the humid tropics, most farming systems research has focused on intensive crop production.

The complex function of animals as consumers of the by-products from crop production, suppliers of traction power for field preparation, sources of fertilizer and sources of protein for domestic consumption or sale has not been examined. This study analyzes the role that animals play in such a situation. In developing an understanding of that role, cognizance has to be taken of both biological and non-biological factors. Biological factors must be viewed in terms of the farmer's goals and priorities, which figure as importantly as objective physical and biological considerations in his decision about how to farm. Furthermore, the analysis of farming

systems properly begins with the significant interaction of people with plants, people with animals, plants with animals, and so forth.

The analysis will focus on : (1) characterizing the social organization of agricultural production in general, and small ruminant production in particular; (2) examining the reasons why farmers raise small ruminants and the role that animals play within a system dominated by intensive crop production and (3) identifying the decision making process among farmers to determine their receptivity to new technology and/or management techniques.

This report will examine both social and economic roles of the animals. The farmer's feelings about animals, as expressed in the attention and care given to them, is an important component of animal farming. Furthermore, the feelings also influence the position of animals in small farm enterprises.

This report will focus on the following :

1. Determining how animal farming (sheep and goats) fits into traditional strategies of production and its role and influence in rural social life.

2. Examining the different role of animal production in two different societies and under different categories of land ownership.

3. Identifying important factors underlying the dynamics of animal production in upland and lowland villages.

This research expects to find variations concerning sheep and goat production depending upon whether the producer is a landless peasant or if he is a land owner. It also expects to find variations among the role of family members in decision making process and to describe the role of each member in both farming and animal production

activities. The division of labor among rural farmers will be examined and compared by categories of land ownership and region.

This study seeks to document : (1) the pattern of crop and animal farming and its role in rural social life, (2) the decision making process within the rural family, and (3) the role of family members play in both farming and animal raising activities. Knowledge of these issues will be crucial if attempts are made to improve or modify the existing production systems. By focusing on two sites, which differ considerably from each other, it will be possible to make comparisons between two different production systems.

Two distinct area of West Java, Indonesia - a lowland and an upland area were chosen as the study sites. An upland area, represented by village Sindangratu and Tenjonegara, which are inhabited by a nomadic-origin Sundanese peasants, is dominated by sheep farmers. Intensive intercropping of a variety of crops is the main agricultural characteristic. The crop by-products serve as an important source of animal feed.

In contrast with the upland villages which are inhabited by the Sundanese, the lowland vilages represented by village Kertasura and Purwawinangun, are inhabited by various ethnic groups. Besides the coastal Sundanese, the Javanese and Chinese have inhabited this region for centuries. Therefore, the social condition and tradition are somewhat different from those found in the upland communities. While wet rice plantation is the main agricultural activity in this area, goats are kept along with sheep. Usually, sheep are grazed and goats are kept in confinement as are the sheep in the upland area.

Comparing and contrasting these two areas will provide a number of insights into two different farming systems which are typical of much of Javanese agriculture. An analysis on the role of animal production in Javanese villages will be useful in developing animal production strategies which take into account the different roles of animals and the effects of cultural background and ecological factor had on animal production. Since the major concern of this study is sheep and goat production, the results could be applied to improve animal farming in other areas with the same social and physical conditions. Examining the institutional contact between farmers and society should provide insights which could aid those seeking to implement future programs to improve crop and/or animal production to maximize the chance of success. Finally, the findings from this study will provide basic information about the farming systems and cultural milieu of upland and coastal West Javanese societies which should be of considerable value to planners of future projects. It will also point to possible problems associated with atempts to incorporate new technologies into those societies.

METHODOLOGY

Three sources of data were used for this study : the baseline survey data, field observations in selected villages taken during the August - December 1980 period, and previous research reports. By combining three different data sources, collected by different methods, it is possible to address a number of questions. Cultural and social background data will be examined from observations and review of literature, while specific patterns of behavior will be analyzed from field survey data. The remainder of this section details the organization of the baseline survey.

One of the initial SR-CRSP activities undertaken in Indonesia was a baseline survey designed to characterize the social, economic and biological aspects of small ruminant production in Java. The baseline survey was a joint activity of the SR-CRSP economics, sociology, breeding and nutrition projects. It also incorporated animal health issues. West Java was chosen as the field study site and the survey was expected to provide baseline data to measure the impact of future interventions.

The participation of so many disciplines, each with its own vested interests, resulted in a large, time consuming questionnaire which, because of its size, had to be administered in modular form. In addition, a monitoring (primarily biological and economic) program was set up so that the care of animals could be observed throughout the year rather than a one-shot basis. The baseline survey work was begun in mid-September 1980 and the last module was completed about six months later.

Two sites were chosen in West Java, one in upland and one in a lowland area. The selection of two diverse study sites allowed for comparison of two different conditions in which cultural and social backgrounds, farming systems and animal raising methods, and agricultural and physical backgrounds were quite different. A pre-inventory survey of all sheep and goat farmers in each area was conducted to determine the distribution of farmers in terms of farm size and livestock holdings.

The interviewers were BPT staff. All were fluent in the local village language and lived in the village during the data collection period. The village staff received one month of training prior to being placed in the villages, including 2 weeks of practice field work. The interviewers lived in the village for 3 - 4 weeks and became known to the villagers before they started the first interviews. During the first week of interviews, two BPT supervisors were present to answer questions and direct the interview process. After that, supervision was conducted at least once a month by visits to the study sites, discussing and solving problems found in the field. This also allowed for correction of problems discovered in previuously collected questionnaires. Because of their position as "outsiders" working for a government institution, the interviewers were excluded from decisions made by the village level administrations, but they were expected to cooperate with the village leader and his staff in the conduct of any ongoing rural and agricultural development activities.

THE SAMPLE

Since farm size varied in both study sites, and was thought to be an important variable, an effort was made to insure that farms of all size were represented in the sample. Thus the final sample was stratified on the basis of land ownership as follows :

1. Under 200 square meters,
2. 200 - 1,500 square meters,
3. 1,500 - 3,500 square meters,
4. 3,500 - 10,000 square meters (10,000 square meters equal to 1 hectare; one hectare equals about 2.4 acres).

NATURE OF DATA COLLECTED

The baseline survey included both social and economic data collected from all the respondents. The sociological data mainly included information on contacts with government and non-government institutions, migration out of the local communities, attitudes and values and family nutrition and consumption patterns. Only the most relevant data to the objectives of this study were analyzed. These included, farmer's contact with institutions, labor allocation, decision making, and attitudes and values of modernity.

During the data collection period field observations were conducted which gathered information on farmer's daily patterns of work and local customs and traditions related to both crop and animal raising. Exsisting literature on village life was also reviewed to provide additional insights into West Java Agriculture.

Three major sets of variables will be examined to characterize animal and crop production within the two sites :

1. Crop and animal management. An effort was made to determine who within each family and village was responsible for animal and crop management decisions.

The issues examined included : (a) decision making in crop and animal production, (b) involvement of family members in animal care, and (c) decision making in selling crops or livestock and determining what to do with the proceeds.

2. Technology transfer constraints. This study examines the farmer's attitudes toward, and extent of contact with, various institutions as well as institutional constraints to the adoption to the new technology. The following variables were considered : (a) attendance at extension meetings and demonstrations by the government, (b) assessment of which institutions give the best information about farming systems, (c) assessment of the degree of farmer's trust in the credit systems.

3. Attitudes and values (Garut). Because of political considerations, the portion of the survey seeking data on the respondent's attitude and values could not be administered in the lowland villages in the Cirebon site. However, attitudes and values were studied among Garut farmers, since the baseline in that region was conducted prior to that in Cirebon.

This study examined : (a) farmer's attitudes toward agriculture and animal production and extension activities, and (b) their traditional and modern attitudes and values.

AN OVERVIEW OF THE RESEARCH SITES

THE HIGHLAND SITE

Location and Physical Features

The two villages chosen in the Regency of Garut lie in the central part of West Java in the mountaneous region south of the town of Garut. These villages are typical upland villages in West Java in most respects. Inhabited exclusively by the Sundanese, the villagers' main economic activity is agriculture.

Located about 89 kilometer from Bandung, the provincial capital, the villages lie at an altitude of 600 to 700 meters (1,800 to 2,000 feet) with a cool and pleasant climate. Sindangratu is located 2 kilometers from the nearest paved road, and Tenjonegara is 7 kilometers away. There is a road leading to the villages which can be used by automobiles, but only with difficulty during the rainy season. Motorcycles are the most convenient means of reaching those villages during wet season. The road only leads to the village leader's office in both villages. The remainder of the villages can only be reached by walking. The absence of a dependable all season road resulted in a reduced flow of information into the villages and inhibited the communication between the villages with the outside world during the rainy season. Table 1 shows the physical features of the study sites.

Although several creeks are found in these villages and were used to irrigate rice fields, all inhabitants carried water for their daily needs from wells and natural springs. In Sindangratu the villagers got water from wells and springs while in Tenjonegara at a higher

altitude, there were no wells and villagers relied on springs for all their water.

Role Structure

Role structure is also strongly maintained in everyday life. Since water for daily needs had to be carried from a communal water pipe, every household member performed a particular task pertaining to water. Fetching water was generally considered as woman's work because of the proximity of the water source. Ninety-nine percent of the respondents got water less than one kilometer from their house. Furthermore, drinking water holds a vital role in every household in rural area and the wife, who was responsible for food preparation got the drinking water. If she was unable to fetch it because of illness or another reason, a daughter obtained it (Table 2).

THE LOWLAND SITE

Physical Features

Kertasura and Purwawinangun were the coastal villages chosen in the lowland site, located in the Regency of Cirebon, in the northeastern part of West Java. The villages are located about 135 kilometers from the provincial capital (Bandung), and they are 15 kilometers from the city of Cirebon, a trading port with a population of about 500,000. Situated at an altitude of 0 to 4 meters (12 feet), they have a hot and relatively dry climate. They are divided by a major road which connects the cities of Cirebon and Jakarta, the capital of Indonesia. Infrastructural development and relative ease of

communication had created a situation somewhat different from that of the upland villages. A junior high school is located in Purwawinangun which is easily reached from either village by foot, bicycle or vehicle. Other facilities such as health center, local bank and post office can be reached from both villages without any difficulties. The physical features of the Cirebon villages are indicated in Table 1. Economically, these villages had more opportunities to develop. Fishing and wet rice agriculture were the main activities in this area. While irrigated wet rice was widely practiced, dirty irrigation water could not be used for household purposes. The only sources of water for daily needs were wells which often produced brackish water.

Family Structure and Daily Activities

While the husband in a Javanese family was the head of the household, the wife did not have an inferior status since she was expected to work together for the maintenance of the family (Koentjaraningrat, 1967: 260-261). Nevertheless, a son's role in the Javanese family was usually stronger and more prominent than that of a daughter as evidenced by the "delegation of authority" where a son was given more responsibility in non household tasks and daughter in housework as indicated by who fetched water (Table 2). Since more than one nuclear family often joined together in one house, the role of other household members in fetching water was more apparent than for Garut (Table 2).

FARMING SYSTEMS

Since wet rice fields constituted only 21 percent of the total village area (or 24 percent of the cultivated land) in Sindangratu, and 7 percent (12 percent of the cultivated land) in Tenjonegara, it is difficult to conclude that rice production was the main activity in both villages. Although rice was considered as the basic staple among the villagers, the contributions of the rainfed (i.e. non irrigated) fields was very important. On them, four or five crops were often grown simultaneously on the same parcel of land. Cassava, potatoes, sweet potatoes, bananas, beans and vegetables were grown mainly to fulfill daily needs, whereas oranges and tobacco were grown as cash crops.

Farm sizes in both Garut villages were small. In 1980, the average farm land owned by each farmer was .08 hectares (.19 acres) rice field and .26 hectares (.62 acres) dry field in Sindangratu, and .07 hectares (.17 acres) rice field and .48 hectares (1.15 acres) dry field in Tenjonegara, respectively.

In contrast to the Garut site, wet rice cultivation dominated the farming method system and was the main agricultural activity in the Cirebon villages. Wet rice field consisted of 100 and 88 percent of the cultivated area in Kertasura and Purwawinangun, respectively. Variation in crops grown on a piece of land was not found as it was in Garut. Intercropping and multicropping were not widely practiced. Rice farming monoculture was the main activity in the study area, although cassava, bananas and beans were grown as well. Vegetables were rarely grown.

Size of farm varied from zero to several hectares with the average of .5 hectares (1.2 acres) of rice field in Kertasura and .28 hectares (.67 acres) in Purwawinangun. Two patterns of level of technology were found in the study villages. The first one was characterized by the use of modern technology, and the other was a combination of new and traditional techniques.

New technology in rice farming, in the form of high yielding varieties with the accompanying package of fertilizer, pesticides, etc. had been introduced to rice farmers, and the farmers in the study area were familiar with such technologies. The use of machinery, such as hand tractors, was also introduced and some wealthy farmers owned them and rent them to other farmers. But animals were still the most common mean of ploughing rice fields. Only larger farmers could take economic advantage of the machinery used in farming activities, while smaller ones received little.

ANIMAL RAISING

The study villages in Garut site are located in the home of the Priangan fighting sheep of the Regency of Garut. Besides native chicken, sheep are the most common animals kept in Garut villages. While neither of these villages raised sheep for fighting, it was a common practice in the region and the champion animals command a very high price. The phenomenon of sheep fighting blends elements of sociology and economics as it confers on the successful owners a high status within the village in addition to making the animals extremely valuable.

Since land is very limited in most of West Java, animal feed is collected from a variety of sources including roadsides, rice fields, gardens and forests. The use of residues and by-products from crops is very common and the collection of animal feed depends on a heavy input of unpaid family labor. Animals, particularly sheep, compliment the crop production enterprises very well by utilizing materials which might otherwise go unused and making use of the surplus labor which most families posses.

Intensive crop production practices and very small farm size had created an animal management system which relied heavily on family labor inputs. Eighty-five percent of the sheep in Garut were raised intensively, that is they were kept confined with forage cut and carried to them. Goats were managed in the same system in Cirebon (Table 3). All farmers used native grass to feed their animals. Concentrates and medicine were seldom used, even though the government provided the health service, especially in the areas where people raise the prestigious fighting sheep.

Common pastures were not found in Garut villages. Thoretically, there was a communal pasture which could be used to graze animals; but in fact, the pasture was used as farm land. Although the average number of sheep owned was quite low (4.5 head per family), their function as a consumer by-products and supplementary income source was important.

In the Cirebon villages, both sheep and goats were kept. However, these animals did not occupy the same status they did in Garut. Certainly, there were nothing comparable to the fighting sheep phenomenon found in Garut. Therefore, sheep were not found as much as

in the other areas in West Java, while goats were kept because they were adaptable to the dry and hot climate. The use of crop by-products as animal feed was a common practice, even though a communal pasture was available. In the Cirebon situation, sheep were normally grazed while goats were confined (Table 3). The difference was due to the difficulty of herding goats.

There were several patterns of animal ownership in the Garut and Cirebon sites. Most villagers raised their own livestock. Other "shared" animals. Under these circumstances one villager raised another villager's animals and they shared the offsprings. Seventy-nine percent of the 547 sheep raised by Garut farmers were owned by the raisers themselves, while 21 percent were shared animals. In Cirebon, the ownership pattern was somewhat different. Fifty-seven percent of 201 heads of sheep were owned by the raisers, 11 percent were owned by another person either in the same or another village and the rest were raised as shared animals. Sharing animals usually occurred between farmers in the same village, virtually none of the animals belonged to people outside the village. Among 165 goats raised in Cirebon site, more than a half were owned by the raiser (56 percent). The rest were reared as shared animals or owned by another person. Virtually all of the animal were located on the raiser's farm (96 percent in Garut and 98 percent in Cirebon).

There was a general assumption that a positive relationship would exist between farm size and number of animals owned. Yet, this assumption was not supported by the study villages in Garut. No significant correlation occurred between farm size and the number of sheep owned ($r = .04$). Sheep were obviously kept regardless of the

size of farm. The availability of family labor was probably the single greatest limiting factor determining how many animals one could keep. In addition, since many farmers viewed sheep as a prestigious farm animal, nearly everyone, including landless farmers, raised sheep in order to enhance their social position. Garut farmers are known as the best sheep raisers in West Java and this influenced their attitudes and motivations, which, in turn, affected the pattern of sheep ownership in their villages.

By contrast, the existence of communal pasture in the lowland site, coupled with the pattern of land ownership and the presence of both sheep and goats, formed particular pattern of animal raising activity. Interestingly, as in Garut, there was no significant relationship between farm size and the number of small ruminants owned. In the Cirebon situation, landless farmers kept and raised animals to sell when the price was good. In contrast to Garut, the decision to raise sheep or goats in these villages was based more on economics than on status considerations.

THE HUMAN COMPONENT IN THE FARMING SYSTEMS

DIVISION OF LABOR

By comparing the level of participation between male and female member in a family, it is evident that in both study sites females and males contributed roughly equal amount of activity to crop farming. The females' contribution to the males' activity in crop production was considerable for both sites. In a nuclear family in which the availability of unpaid labor was very limited but the demand for labor was quite high, a wife had to engage in farming activities for the family to survive. Husbands and wives frequently cooperated in the same tasks or undertook those of the opposite sex. However, the differences in participation in crop production between the two village were marked. Crop activities were much more important in Garut than in Cirebon. They reflected the diverse nature of the Cirebon activity (e.g. fishing).

In terms of farm activities, the difference in participation between villages and sexes were relatively small. In Garut, 43 percent of the female family members were involved in off-farm work activities and in Cirebon 34 percent were engaged (Table 4). Females provided a seasonal labor force to help meet peak labor demands in the family production cycle, particularly during planting and harvesting. Between these periods, many had time to engage in off-farm work such as working as maid and petty trading.

As in farming activities, role differentiation based on sex was also found in animal care. Since sheep and goats were an important source of cash, care had to be taken in managing them. Males were

engaged in such activities more frequently than females. Compared to those in crop activities, the sexual differentiation was more pronounced in animal raising activities. The most important activities, particularly with sheep, are herding, cutting grass, feeding and watering, bathing and shearing. These were assumed to be male's work and were often distributed not only based on sex specification, but also by age and position in the family. As in crop activities, the contribution of females in sheep raising was complimentary. Women assumed males' work if the latter could not perform such activities.

The contributions of family members by age to household crop activities is shown in Table 5. Again, the levels of participation for all age groups were higher in Garut than in Cirebon. In Garut nearly all adult household member helped with crop activities. Those aged 30-39 were the most actively involved. In Cirebon, by contrast, the highest level of participation was among villagers aged 20-29 and over 59 years of age.

As with in crop activities, twenty years of age was seemed to be a "standard age" when one could start to help with animal raising activities in the family. While more than half of the villager aged 10-19 in Garut were engaged in animal raising activities, virtually all of the older villagers helped raise livestock. The high rate of participation among all age groups over 20 years of age reflected the nature of the production method. The proximity of animal housing and the diminished importance of time and/or effort needed for most tasks made it possible for all family member to contribute. Feeding and watering animals (sheep or goats) were the easiest tasks and could be

performed by nearly every age group, while cutting grass, shearing and bathing were more demanding.

The higher level of participation (compared to crop activities) of children under 10 years and aged 10-19 was related to the nature of the tasks involved. Sheep and poultry raising were not seasonal activities; most tasks did not require special skills or strength. Herding and watering could be performed by children under 10 years of age; they could even herd the animals while playing.

Among upland farmers, 12 percent of those under 20 years worked off-farm while 27 percent of the lowland farmers did so. Thirties and forties were the age when people divided their time and responsibility by working off-farm. The majority of adult household members over 20 in both study sites engaged, to some extent, in off-farm work (Table 5). Thirties contributed more than the forties age group in Garut, but the opposite in Cirebon. In Garut, 85 percent of those in the age group 30-39 years were engaged in off-farm work compared to 80 percent in the age group 40-49 years. The comparable figure for Cirebon was 78 and 82 percent. Although the need for money often forced some villagers to push their children to work, virtually none of the children under 10 engaged in off-farm work activities.

As was noted in Tables 4 and 5 showing sex and age differentiation, level of participation in crop production among all family member was low in the Cirebon site. Even though a son's level of participation was lower than the parent's, he helped more than did a daughter. Parents in such communities expect their sons to be leaders in the family and therefore giving them responsibility is a way to introduce them to a situation they will assume later in life.

The "delegation of authority" in crop production activities could be assumed as a way to prepare the sons for the responsibilities they would assume in the future. Yet, hierarchy was still important among the villagers. As long as the wife still showed her capability in performing farm activities, she was assumed more responsibility than her sons, or the second responsible person in her family.

Both husband and wife were engaged in off-farm works. Among upland communities, the wives' level of participation was somewhat higher than the husbands' (Table 6). This was probably a result of the introduction of new method such as the use of sickles in rice harvesting which displaced a considerable amount female labor. In contrast, among the Cirebon villagers, household heads were more engaged in off-farm work activities. Eighty-one percent of them worked off-farm while 62 percent of the wives did so.

In terms of the distribution of animal management tasks among household member, level of participation between husbands and wives differed significantly. Among upland farmers, the role of household head in each activity was more prominent than were the other members, particularly in sheep management. Herding the animals, cutting grass, bathing and shearing sheep were the tasks the household head was primarily responsible for (Table 7). In contrast, among the Cirebon peasants, the responsibility in doing those activities was delegated to a son while the household head fell as the second responsible person in such activities. Fifty-three percent of the households which herded their animals had the son as the primary responsible person.

The sharp difference in the position of the household head in sheep management between Garut and Cirebon sites can be partially

explained by the different status of sheep in each area. The high regard of sheep in Garut and their economic role as a "bank" prompted farmers to pay close attention to their animals. By contrast, in Cirebon sheep did not have the same important social role. Furthermore, because the animals were inferior in quality they were not as valuable as they did in Garut. In addition, the better economic opportunities in the lowland site encouraged household heads to seek off-farm work in order to increase their income. Whereas all the sheep in Garut were confined in pens and fed cut grass, in Cirebon 74 percent of the sheep grazed. Because of this method of feeding the animals, responsibility for their care was delegated to sons.

DECISION MAKING AND HOME MANAGEMENT

In Garut, husbands tended to dominate the decision making in terms of whether to sell farm commodity and in what to do with the money if something was sold. This was also largely true in Cirebon as well (Table 8). The one exception to this general conclusion concerned the sale of poultry in which a wife played more significant role. This is not surprising since women were primarily responsible for the care of chickens in both study sites.

The dominance of husband as the household head in regard to the use of money gained by selling farm product was again seen (Table 8). Neither sons nor daughters were involved in the decision making process regarding the use of money from selling commodities. Differences also occurred among farm size regarding the use of money from the sale of agricultural products (Table 9). The larger the farm, the greater the percentage of farmers who spent their money for

particular needs other than consumption or saved it.

Table 10 shows the relationship between land ownership and sale of farm products. In both sites, the larger the land owned, the higher the percentage of farms selling surplus farm products. Among the farmers who owned more than .30 hectares, 55 percent sold staple foods, 62 percent sold vegetables and 82 percent sold fruits. The higher percentage of large farms selling vegetables and fruits is not surprising, since these products were grown mainly as sources of cash.

Tables 8 and 10 indicate that the farmers who owned little or no land at all, seldom sold farm products. Those few who did sell such items did so incidentally and in very limited amounts. In contrast with the small farms, in the large farms husbands decided how to use the money received by selling farm products. For them, cash received was used both to fulfill basic needs and also to maintain their farm businesses.

In contrast to selling crops in which farmers sold their product because of a surplus, selling animals was mainly prompted by an emergency or a need for "big money" such as capital during planting season, a wedding or other occasions. As in selling activities of staple crops among upland farmers, farm size was related to the selling activities of sheep and poultry. The larger the size of the farm, the higher the percentage of farmers who sold either sheep or poultry. The sale of animals occurred mainly during particular seasons or religious days. Farm size seemed to be somewhat related to the use of the income. The larger the farm, the greater the likelihood that some money would be saved rather than being spent on the day of transaction.

Table 8 indicates that household heads nearly always made the decision to sell farm products, including animals. Table 9 shows that the use of the income from such sales was related to land ownership. Most landless farmers spent their cash immediately on daily needs.

Selling activities were related to farm size, although not strongly (Table 10). The larger the farm size, the higher the percentage of farmers who sold farm products, either poultry, fruits, vegetables or staple food produced by their own land. This finding is true in both sites, the only difference being in the type of farm product sold by each stratum of farmers.

MARKET AND CREDIT ISSUES

The proximity of local markets, availability of transportation and facilities and flow of information shaped the marketing system (Table 11). In the lowland site, with its better infrastructure and communication, markets were closer to the villages and the vast majority of people could walk to sell their products. This was not the case in Garut. In both sites nearly all farmers expressed satisfaction with the price they received for their products. Whereas nearly all the lowland farmers indicated that they had price information prior to the market, less than half of the farmers in Garut had such information. This was also reflected in perceptions of who determined market prices. Farmers in Cirebon were much more likely to view themselves as one of the primary determinants of price, whereas Garut farmers were likely to feel that "outsiders" controlled the situation. This condition was partly accounted for by the absence of a market in the villages. Farmers had to go to other villages to sell their

products and as "outsiders" they felt they had less influence on price. Their expressed satisfaction with price may exemplify the "self-defeating mechanism" in which "someone was expected to remain silent in facing the reality, however biter it was" (Soewardi, 1978). There was also the difficulties of bringing the product back home after they spent a great deal of time traveling to the market. In Cirebon, because of the farmers' greater bargaining position in dealing with price, market distance and transportation methods were not considered a problem. The attraction of the market as a site for financial gain and the villagers' position influenced them to ignore the distance and the methods transportation to market.

CREDIT ACCESS

The most common source of credit in both study sites was other individuals who were willing to offer credit to farmers who did not have land to mortgage. Two-thirds of the farmers in both study sites had tried at sometime to obtain credit or borrow money from either formal or informal sources (Table 12). However, surprisingly few those who had tried to obtain credit to increase farm production. Only a small percentage in both study sites had sought credit to construct pens, to improve irrigation systems or to buy animals or machinery. Most simply borrowed funds to meet daily needs. Some farmers were aware of the government's agricultural credit program. Fifty-six percent of the upland farmers indicated they preferred to get funds from this source, as did 32 percent of the lowland farmers (Table 12). There was a relationship between farm size and credit system preferred in both sites. Farmers with above-average landholdings in Garut

preferred the government credit system, while those with little or no land indicated that they preferred not to borrow money. In Cirebon, the same was generally true but to a slighty lesser degree, except for the very wealthy farmers.

EXTENSION AND MASS-MEDIA

Neighbors were the most widely used source of agricultural information in both sites (Table 13). Most farmers sought information from neighbors (81 percent in the upland site and 78 percent in the lowland site). In contrast, few considered extension workers as an important source of information. In both sites there was a similar pattern in the proportion of villagers relying on various sources of information about agricultural matters. In both areas there was some relationships between farm size and the villagers key sources of agricultural information. While those with above-average landholdings were more likely to seek advices from extension officer and other government personnels responsible for agricultural development, the majority of the well-to-do respondents indicated that they relied on friends and neighbors for such information. Although most farmers in the communities surveyed indicated that neighbors were the most widely used source of information, 58 percent of the respondents in Garut said that they had "met" with an extension agent as did 45 percent of the farmers surveyed in the Cirebon villages. When asked what they had discussed with the extension personnel, virtually none of the respondents indicated that they had sought specific advice on agricultural matters.

While almost none of the families actively contacted extension agents in an effort to get agricultural information, members of nearly half the households in both study sites had attended government courses and demonstrations. The proportion of upland farmers who had gone to agricultural extension courses was higher than that in the lowland communities (Table 14). Attendance at such events was probably influenced by the social and economic environment. In the upland site, where the villagers were closely tied to their farm land, courses or demonstrations related to crop and livestock production usually were considered very important. Since farming dominated village life, practical knowledge and experience applicable to local conditions were needed and everything related to crop and livestock production was highly valued by the villagers. Furthermore, because of the isolated location of the villages and transportation and communication problems, there was not much extra-village competition for the farmers' time. In contrast, the influence of urban life styles among the lowland villagers and the better communication with the outside world may have caused the lower interest in courses related to rural development.

When asked about the value of information given by the extension workers, most farmers stated that it was valuable (Table 15). However, given the low percentage of farmers who actually had contact with extension agents, this finding should be interpreted cautiously.

There were some interesting differences between the villages in terms of exposure to the mass media. Whereas two-thirds of the upland farmers owned radios, less than half of the village households in the lowland communities did. Contrary to what one would expect, the

percentage of lowland respondents listening to the radio *per se* was higher than among the respondents in the upland villages. But when asked specifically about agricultural programs the survey revealed that a higher proportion of the Garut farmers listened to these programs than did those in the lowland communities. This finfings supports the observation that the more isolated farmers in the upland areas were more concerned about getting agricultural information than those in the lowland area more exposed to urban life styles.

FARMERS' ATTITUDES TOWARD ANIMAL PRODUCTION

(THE CASE OF THE UPLAND SITE)

This study's analysis of the farmers' attitudes toward animal production is limited to villagers in the two upland communities in the Garut area. It was impossible to get government permission to continue the attitudinal portion of the survey among the respondents in the Cirebon area. This unforeseen development was not as unfortunate as one might expect because of the great interest in sheep rearing in the upland area. As noted earlier the villages near Garut are located in the center of a region known for its fighting sheep and the local Sundanese were known as "sheep fanatics". Neither the Javanese nor the coastal Sundanese in the Cirebon area were known for this trait. The Javanese were descended from a sedentary society in which the role of sheep or other small ruminants was not as important as large ruminants, particularly in relation to soil preparation. Furthermore, the greater number of sheep per square kilometer in the Garut area, as compared to the Cirebon region, heightened the importance of examining the upland farmers attitudes about sheep production.

GENERAL ATTITUDES TOWARD AGRICULTURE

Attitudes and values are important in predicting farmers' innovative behavior and willingness to consider changes in their current practices. Small and subsistence farmers face greater risk in venturing into new endeavors than do their wealthier neighbors. Values, beliefs and traditions are basic materials in the decision

making process. While the Garut farmers were relatively homogenous in terms of language, religion, rituals and the role and use of sheep, individual differences in other areas of life appear to have effected their behavior in sheep production.

In this study the attitude responses were scaled to represent a traditional-modern continuum in which the highest scores indicated modernity on the part of the respondent and the lowest scores were indicators of a traditional orientation (Table 17). The vast majority of respondents felt that new varieties of rice and other crop species (items 1 and 8) were better than the old ones. Three-fourths of the respondents indicated that farming methods were changing rapidly in their region. Virtually all of them agreed that a villager had to take chance to get ahead in farming.

The responses to these items represented an interesting intersection of modern and traditional beliefs. On the one hand, the vast majority of respondents felt that traditional crop varieties were not necessarily better, to get ahead one must take chance and that they should change the way they farmed. One the other hand, they felt that success were more dependent on God's will than man's effort and that the sons of businessmen had a better chance for success than did farmers' sons.

The above responses clearly show that most farmers in the Garut villages were aware and seemingly understood the rapid process of agricultural modernization occuring around them. This would lead one to conclude that positive change efforts will be undertaken by farmers if they possibly can do so. The upland farmers' values and beliefs conflicted with their trust of government agents and their belief in

the superiority of new varieties of crops and animals. As food producers, the government hoped that they would adopt new technology. Their responses to questions about agricultural revealed a reasonable understanding of modernization of farming and livestock production. Eighty-two percent of the farmers disagreed with the statement that government extension agents could not be trusted. Another seeming contradiction was exposed in their beliefs about the possibility of becoming rich. Eighty-four percent thought that a farmer's son had a good chance of becoming wealthy, while 97 percent agreed that a businessman's son could become successful more easily because of his father's connections. But living in a traditional society in which religion was usually placed above everything else, they tended to put God's will above human efforts. Eighty-five percent agreed with the statement that success in farming depended more on God than on the efforts of men (Table 17). This finding may represent an interesting point in developing a program to modernize agriculture in this society. The efforts should not emphasize only technical issues, but should also be phrased in spiritual terms since success or failure in farming will be accepted more as God's will than as human's responsibility.

CORRELATES OF SHEEP AND POULTRY PRODUCTION

Although sheep were prestigious animals in Garut, the most common reason given by peasants for raising them was economic rather than social. Among farms of all sizes saving money was the main reason given for rearing sheep (Table 18). In contrast, raising sheep for family consumption was seldom mentioned. Thus, the animals served as a

form of "bank" because of their ease of liquidity. The same trends also were observed for poultry although they were not as pronounced as for sheep. More people consumed poultry and their importance as a form of savings decreased as the size of farms increased. Other reasons given for poultry raising included "hobby" and "use of free time". this may be merely indirect ways of indicating that poultry were raised in order to accumulate weatlh.

The same pattern prevailed when the farmers were asked when they consumed sheep or poultry (Table 19). It should be noted that Garut is dominated by Islamic traditions which mandate the killing of a four legged animal for the religious holiday of Idul Qurban, (this commemorates Abraham's obedience to God's command that he sacrifice his son). Although there was a direct relationship between farm size and use of sheep for religious holidays, the dominant response for all farm sizes was that meat from one's own animal was rarely consumed. Overall, sixty-one percent of the farmers stated they never ate their own sheep. This does not mean they never ate lamb or mutton, as they might occasionally consume meat from someone else's animal. Slaughtering of sheep is usually correlated with an important event and was almost never part of daily consumption. The meat of one sheep was too much for a family to consume before it spoiled. Thus, sharing animals for religious holidays was common. In these villages sheep were simply too important and too valuable for most families to sacrifice. However, the richer the farmer the greater the likelihood that he would sacrifice sheep for ceremonial purposes.

The use of poultry meat was quite different. Poultry was a less expensive source of protein and because of its size there was no

problem with spoilage. Farmers who never ate chicken, ducks and other fowls usually indicated that they did not like them. Most families consumed poultry at some point during the year, and it was the "food of choice" for ceremonial days - weddings, circumcisions, and so forth. Interestingly, the vast majority of the families viewed serving meat in the household as important. This was particularly true for all but the smallest farmers.

ORIENTATION TOWARD ANIMAL RAISING

Sheep were the highest status animals in Garut villages and high quality sheep were greatly priced. In communities where reraring sheep gave status to villagers, 77 percent of the farmers stated that sheep received special attention, while 23 percent indicated that poultry was the most preferred animal. This occurred in spite of the fact that sheep were not the easiest animal to manage since they required more physical effort than chickens or other poultry raised in the traditional way. Labor and other basic inputs were factors that could not be ignored in rearing and caring for sheep, whereas poultry needed relatively little care. Most farmers (77 percent) stated that raising high quality sheep was more important than owning a large number of animals regardless of quality. This finding not only showed the importance of sheep, but also illustrated the farmers' awareness that recognition as the owner of quality sheep conveyed status in their villages.

There was a pre disposition on the part of farmers to improve management techniques for both sheep and poultry (Table 20). This was particularly true for larger farmers, but held true for all farm size

categories. However, when asked about specific changes they had made during the past two years in their animal management techniques or if they had borrowed money to buy animals, only a handful of respondents indicated they had done anything. One can not be sure if this represents their true feeling (i.e. deeds speak louder than words) or if they simply did not have access to new and reliable information about improved animal husbandry.

ROLE OF EXTENSION WORKER

The role of neighbors as a source of information about animal production seemed to be more important than that of extension workers (Table 21). For many villagers, asking a neighbor was far easier than waiting for the extension worker who rarely visited their hamlet because of its relative isolation. The role of neighbors as sources of information, though important, was limited by their knowledge. Their role dropped dramatically when farmers needed to discuss a technical problem about animal production before they made a decision. But to some extent, a neighbor was often involved in discussing the problem before a farmer made a decision, but they did not play a crucial role as a source of information. Farmers considered extension workers were the second most important source of agricultural information. When they were present, villagers used the chance to discuss technical problems of animal production. The villagers' appreciated the extension workers' advices, the only problem was the infrequency of their visits to the isolated villages.

Farm size does not appear to be related to the sources farmers turned to in their quest for information on raising animals. This was

true for farmers who sought information on feeding sheep and poultry, new breeds of sheep and poultry, or poultry management. However, there did seem to be a relationship between farm size and the sources relied on for advice on sheep management. The larger the farm, the more formal information sources were used. Caring for these prestigious animals required not only physical strength and traditional knowledge and experiences, but also new ideas and methods. Usually these were introduced from the "outside world" by well informed people who understood not only the importance and implementation of such ideas, but also the rural peasants' traditional and pragmatic way of thinking. An extension worker, therefore, held an important position as a bridge between modern technology and the traditional, superstitious world of rural farmers.

CONCLUSION AND POLICY IMPLICATIONS

SUMMARY

A baseline survey was undertaken to characterize the social, economic and biological aspects of small ruminant productioin in Java. An upland and a lowland area in West Java were chosen as study sites which further allowed for comparison two different conditions, ecologically, socially and economically in which farming systems and animal raising methods were assumed to be different. The objective of this study was to document the pattern of crop and animal farming and its role in rural social life, the process of decision making within rural family and the role of family members play in both farming and animal raising activities.

One hundred and forty-five sheep farmers were chosen as a sample from the upland site which was representative of the Regency of Garut, while a lowland sample of 100 represented the Regency of Cirebon. The samples were divided into 5 groups based on the size of the farm. The main sociology data collected in the baseline survey activity were institutional contacts, migration data, attitudes and family nutrition and consumption patterns. The most relevant data to the objectives of this study appeared to be the farmers' contact with institutions, labor allocation, decision making and attitudes and values of farmers.

Administratively, both study sites are similar since they were exist under the West Java Provincial Government system. Socially, the lowland farmers' daily lives were strongly influenced by Javanese customs and habits because the study site was located close to the border of Central Java. The upland site was located in the center of

the prestigious fighting sheep area in West Java. While there were striking differences in their social background, both communities were patrilineal.

The research found some similarities and differences between the two study sites. Both were characterized by intensive farming and animal production activities. Multicropping predominated in the upland communities, while wet rice monoculture prevailed in the lowland villages. Furthermore, the animal production activities in the upland site was dominated by sheep production while villagers in the lowland site raised both goats and sheep. Sheep were were raised confined in pens in the upland site as were goats in the lowland villages. Members of the households cut grass and carried it to the animals. Concentrates and medicine were seldom used. Among the patterns of animal ownership, individual ownership was the most common in the upland area, while sharing animals was the most widespread practice among lowland farmers. In both sites there was no significant relationship between farm size and the number of animals owned.

Among farmers raising both crops and animals task allocation was divided along gender line, age and position in the household. The study findings show that the older the age the higher the rate of participation. For both study sites, females and males shared the activities in crop farming relatively equally. The sexual differentiation was more pronounced for animal raising in which the male household members participated more than the females. The females' contribution in such activities was complimentary. In contrast, in the upland site wives participated more in off-farm activities than did their husbands. The gender of the household member

responsible for animal production activities differed between small ruminants and poultry. The male household head had the greatest role in sheep and/or goat raising. In contrast, wives were responsible for most of the decision in poultry raising. In both sites husbands played the key role in deciding what farm product would be sold, when this would be marketed, and how the money would be used. The larger the farm the greater the frequency in which villagers sold farm products.

The farmers preferred to get credit from formal governmental institutions and they were responsive to advice from extension agents. In actual practice, however, most found that they could not get funds from government institutions and they relied instead on other individuals. Similarly, since extension personnel seldom visited the study sites, villagers were forced to rely on neighbors for advice.

As noted earlier in a previous chapter, among the upland farmers the main reason for raising sheep was to get an asset which could be easily turned into cash. They rarely ate their own animals even though they felt it was important to serve meat. The upland villagers' positive attitude toward agricultural modernizations was reflected in their attitudes toward crop and animal production.

CONCLUSIONS

On the surface, livestock, particularly small ruminants, seem to play an insignificant role in the small farms in the study areas. Indeed, small ruminant production appears to be little more than a hobby if one looks at factors such as marginal labor allocation, capital investment, amount of product consumed and number of animals.

However, that is not the case. in the study areas livestock

played important roles in the peasants' economic life. Sheep and goats consumed forage products that might otherwise be wasted and furnished a source of high grade fertilizer. They also served other important socioeconomic functions as well. They provided a from of highly liquid capital in an area where banks were non-existent. Furthermore, since sheep, goats and poultry could be raised in nearly landless conditions they were especially attractive commodities for landless peasants. Most small ruminant farmers in both study sites were landless or near landless peasants.

Whereas many people believe that small ruminants compete with crops in the villages, in both study sites sheep and goats complimented crop production in the local farming systems. Their role as waste product scavenger were quite obvious, particularly in the villages where communal grazing pasture was not available. They also served as symbol of status, particularly for the owners of fighting sheep in Garut villages, but even for the more pedestrian breeds sheep were an important symbol of wealth and were held in high esteem by their owners.

The importance of sheep and goats among all categories of farmers in both study sites was clearly exemplified by the fact that nearly all of the major management decisions in small ruminant production were made by the head of household while the management of poultry was carried out almost exclusively by women. Quite surprisingly, the role of government agents as sources of information was not as important as one had expected. Neighbors were the most important sources. Nevertheless, government agents were still important in encouraging farmers to adopt new ideas and methods but not in the actual process

of making farm management decisions.

The upland farmers exhibited contradictory attitudes about agricultural modernization. While the vast majority were aware that new technology was superior to their old technology, they remained closely tied to their traditional values.

POLICY IMPLICATIONS

The present high dependence of crop and animal raising practices on family labor has developed in response to the social, economic and ecological characteristics of the study sites. A small ruminant development program ought to be able to reach nearly every stratum in such communities. However, the latent problem of uneven land distribution will continue to influence efforts to increase farm productivity. Its effects on the income and family life of the landless farmers is striking.

Raising the farmers' standard of living in such a situation is only possible if the production system is upgraded. This will require improvement of rural and agricultural institutions, extension programs, and marketing facilities. Increasing the productivity of land and expanding small ruminant and poultry raising as nonland-based enterprises will help villagers to increase their output, which in turn, may enable them to enjoy better living conditions.

In addition, mobilizing family labor seems to offer a means of strengthening agricultural-based economic activity in rural areas. The seasonal nature of family labor must be recognized, as it will influence the allocation of family labor. While most farmers lack sufficient land or capital to use advanced technology effectively,

more efficient use of family labor should enable them to increase production. Furthermore, in the effort of the introduction of new technology in small ruminant production in order to increase the peasants' living standard, emphasis should be taken in the policy applied in the different situation. Different ecological, social and economic setting requires different pattern ofn changing technology needed. As example, the improvement method of small ruminant quality in the lowland site may not be applicable for the upland area since those areas showed a distinct difference in many aspects.

FUTURE RESEARCH NEEDED

This study describes the social and agricultural environment of sheep and goat farmers and identifies the economic, social and institutional factors impeding agricultural and rural development. Because the study was based on small samples in both upland and lowland areas, the findings of this research should be applied to other areas with caution. For example, the same conditions might not be found in other lowland areas with different ethnic and cultural backgrounds. However, this study clearly shows the important role of livestock porduction among landless peasants in the study areas.

As with most efforts of this kind, this study has raised many questions as it has answered. Among those issues which deserve further examination are :

1. A more detailed assessment of the role of women in small ruminant production. One weakness of the design of this study was that all data were collected by men from men.

2. The role of the village trader in the marketing system in which their role can be viewed as an accelerator in small ruminant production.

3. An examination of the non-producer of small ruminant to answer the question why they did not raise them. This may lead us to a new way in promoting small ruminant production practices based on the reason given by them.

4. Animal sharing arrangements and the potential for sharing improved breeding rams.

5. Evaluation on the role and effect of the presence of improved rams in the "non fighting sheep" villages.

Table 1. Descriptive Data on Sample Villages (1980).

Description	GARUT Vil. 1	GARUT Vil. 2	CIREBON Vil. 3	CIREBON Vil. 4
1. Altitude, m	600	600	10	10
2. Area, ha	736	1,438	415	665
3. Population	7,550	5,485	4,130	6,288
4. No. of household	1,930	1,556	726	1,392
5. Density/sqkm	1,026	381	995	945
6. Cultivated area, ha :				
- wet rice field	154	105	366	389
- dry field	495	741	-	54
7. Non-cultivated area	87	592	42	-
8. No of sheep/goats	1,900	2,028	166	443

Vil. 1 : Sindangratu.
Vil. 2 : Tenjonegara.
Vil. 3 : Kertasura.
Vil. 4 : Purwawinangun.

Table 2. Hierarchy in Fetching Water for Daily Needs.

Relationship in HH	GARUT	CIREBON
	---------- percentage	---------
1. Male Head	3	9
2. W i f e	77	48
3. S o n	2	5
4. Daughter	9	9
5. Others	1	29
SAMPLE SIZE	145	100

Table 3. Sheep and Goat Management.

Raising Methods	GARUT (Sheep)	CIREBON (Sheep)	CIREBON (Goats)
	---------- percentage ----------		
1. Grazed	6	74	57
2. Confinement	85	26	100
3. Combination 1 & 2	9	0	0
SAMPLE SIZE	145	43	57

Table 4. Division of Labor : Relationship of Sex to Tasks Performed.

Description	GARUT Male	GARUT Female	CIREBON Male	CIREBON Female
	---------- percentage ----------			
1. Help with crops	65	62	33	29
2. Help with livestock	70	58	70	34
3. Off-farm work	39	43	42	34
SAMPLE SIZE	279	281	266	221

Table 5. Division of Labor : Relationship of Age to Tasks Performed.

Tasks Performed	Age Category lt.10	10-19	20-29	30-39	40-49	50-59	over 59
	---------- percentage ----------						
GARUT :							
1. Help with crops	2	59	96	98	97	93	83
2. Help with livestock	4	63	92	84	100	95	84
3. Off-farm work	0	12	69	85	75	50	50
SAMPLE SIZE	122	152	78	80	59	40	24
CIREBON :							
1. Help with crops	1	32	56	48	48	51	57
2. Help with livestock	19	56	67	75	86	81	75
3. Off-farm work	1	27	65	78	82	59	57
SAMPLE SIZE	155	114	48	64	44	37	28

Table 6. Division of Labor : Relationship in Household to Tasks Performed.

Description	Relationship in Household			
	HH Head*	Wife	Son	Daughter
	---------- percentage ----------			
GARUT :				
1. Help with crops	92	96	43	32
2. Help with livestock	94	91	52	27
3. Off-farm work	65	77	17	11
SAMPLE SIZE	139	119	141	133
CIREBON :				
1. Help with crops	54	53	23	9
2. Help with livestock	91	67	56	6
3. Off-farm work	81	62	18	12
SAMPLE SIZE	99	95	162	110

* : Garut : Includes 6 female heads.
Cireton : Includes 4 female heads.

Table 7. Division of Labor in Small Ruminant Management.

Relationship in Household	Herding grass	Cutting grass	Feeding	Watering	Bathing	Shearing
	percentage					
GARUT :						
1. HH Head	65	66	74	81	79	78
2. W i f e	3	6	7	3	0	0
3. S o n	29	20	13	13	16	14
4. Daughter	3	2	1	0	0	0
5. Others	0	6	5	3	5	8
SAMPLE SIZE	31	133	133	31	123	131
CIREBON (SHEEP) :						
1. HH Head	9	52	41	29	24	44
2. W i f e	3	5	9	8	0	1
3. S o n	53	26	32	47	50	2
4. Others	35	16	18	16	26	2
SAMPLE SIZE	34	19	22	38	38	9
CIREBON (GOAT) :						
1. HH Head	1	57	57	56	53	0
2. W i f e	0	10	12	14	8	0
3. S o n	0	22	22	21	29	0
4. Others	0	11	9	9	10	0
SAMPLE SIZE	1	58	58	57	38	57

Table 8. Decision Making : Relationship of Farm Size to the Sale of Farm Products and Use of Money.

Relationship in Household	Staple	Vegets.	Farm Products Fruits	Sheep	Poultry	Using Money
	percentage					
GARUT :						
1. HH Head	94	96	100	98	60	69
2. W i f e	6	4	0	1	39	31
3. S o n	0	0	0	1	1	0
SAMPLE SIZE	51	98	37	119	72	142
CIREBON :						
1. HH Head	82	50	76	98	42	77
2. W i f e	18	50	24	2	57	23
3. Daughter	0	0	0	0	2	0
SAMPLE SIZE	22	2	34	52	60	86

Table 9. Decision Making : Relationship of Farm Size to the Sale of Farm Products.

Category Label	Farm Size (hectares)+				
	lt .02	.02-.15	.15-.30	.30-1.0	over 1.0
	percentage				
GARUT :					
1. Take home for later use	0	10	11	9	0
2. Buy something that day	50	19	8	7	0
3. Buy something that week	12	14	22	7	0
4. Spend some, save some	0	0	2	4	0
SAMPLE SIZE	8	21	37	77	0
CIREBON :					
1. Take home for later use	7	3	0	3	7
2. Buy something that day	57	48	0	30	29
3. Buy something that week	0	3	0	3	7
4. Spend some, save some	36	46	0	33	14
SAMPLE SIZE	14	29	0	33	14

+ : In Garut only 3 farms were larger than 1 hectare and they were combined with the next smaller category (.30-1.0 ha). In Cireton, only 2 farms fell in the .15-.30 hectare category. These were combined with the next smaller category. This account for the lack of case in the respective cells.

Table 10. Marketing : Relationship of Farm Size to the Sale of Farm Products.

Category Label	Farm Products sold				
	Staple	Vegets.	Fruits	Sheep	Poultry
	percentage				
GARUT :					
1. less than .02	0	1	0	6	5
2. .02 - .15	24	8	10	14	10
3. .15 - .30	21	29	18	27	31
4. .30 - 1.0	55	62	82	53	53
SAMPLE SIZE	51	98	38	122	73
CIREBON :					
1. less than .02	0	0	9	15	15
2. .02 - .15	14	0	47	35	40
3. .30 - 1.0	54	0	29	38	35
4. More than 1.0	32	0	15	12	10
SAMPLE SIZE	22	0	34	52	60

Table 11. Market and Credit Issues.

Category Label	GARUT	CIREBON
	---------- percentage ---------	
1. Market Distance (km) :		
less than 1	0	16
1 - 5	56	64
6 - 10	44	19
more than 10	0	1
2. Transportation to Market :		
- walk	32	79
- pick-up ("colt")	24	0
- others	43	21
3. Satisfaction about price :		
- satisfied	94	96
- not satisfied	1	1
- don°t know	5	3
4. Information about price	46	97
5. Who influence price :		
- people in such hamlet	34	88
- people in such village	7	11
- "outsiders"	59	1
6. Credit system used previously ++):		
- government bank	14	-
- local money lender	35	-
- individual	1	-
- never borrow	50	-
SAMPLE SIZE	145	100

++) : Data not available for Cirebon.

Table 12. Credit Issues : Credit System Preferred by Size of Farm.

Category Label	Farm Size (hectares)+				
	lt .02	.02-.15	.15-.30	.30-1.0	over 1.0
	percentage				
GARUT :					
1. Government bank	10	43	54	67	0
2. Money lender	0	0	8	3	0
3. Individual	0	0	0	2	0
4. Won°t borrow	90	57	38	28	0
SAMPLE SIZE	10	21	37	76	0
CIREBON :					
1. Government bank	16	20	0	37	72
2. Money lender	16	3	0	9	0
3. Individual	0	0	0	0	7
4. Won°t borrow	68	77	0	54	21
SAMPLE SIZE	19	32	0	35	14

+ : In Garut only 3 farms were larger than 1 hectare and they were combined with the next smaller category (.30-1.0 ha). In Cirebon, only 2 farms fell in the .15-.30 hectare category. These were combined with the next smaller category. This account for the lack of case in the respective cells.

Table 13. Extension : Usual Source of Information by Farm Size.

Category Label	Farm Size (hectares)+				
	lt .02	.02-.15	.15-.30	.30-1.0	over 1.0
	percentage				
GARUT :					
1. Neighbor	86	90	82	81	0
2. Other friends	0	0	6	2	0
3. Village leader	0	0	6	10	0
4. P.T.D. ++)	14	6	6	1	0
5. Extension worker	0	0	0	6	0
SAMPLE SIZE	7	21	34	77	0
CIREBON :					
1. Neighbor	84	93	0	59	57
2. Other friends	16	0	0	7	7
3. Village leader	0	0	0	0	7
4. P.T.D. ++)	0	3	0	25	7
5. Extension worker	0	0	0	9	22
SAMPLE SIZE	19	32	0	34	14

+ : In Garut only 3 farms were larger than 1 hectare and they were combined with the next smaller category (.30-1.0 ha). In Cirebon, only 2 farms fell in the .15-.30 hectare category. These were combined with the next smaller category. This account for the lack of case in the respective cells.

++ : Village staff in charge for agriculture.

Table 14. Extension : Attendance at Village Level Courses.

Category Responses	GARUT	CIREBON
	---------- percentage	---------
1. Attended any course	58	45
2. Attended agricultural courses	12	6
3. Attended crop demonstration	8	2
4. Attended animal demonstration	4	1
5. Attended family life training	4	5
6. Attended family welfare courses	1	6
7. Attended youth course	1	8
8. Never attended any course	42	55
SAMPLE SIZE	145	100

Table 15. Extension : Farmer's Perception on the Suggestion and Information given by the Information Source.

Category Responses	GARUT	CIREBON
	---------- percentage	---------
1. Very valuable	1	17
2. Valuable	94	79
3. Less valuable	5	4
SAMPLE SIZE	84	29

Table 16. Extension : The Role of Mass Media.

Category Label	GARUT	CIREBON
	---------- percentage	---------
1. Own a radio	68	40
2. Listen to the radio	70	92
3. Listen to agricultural programs	78	42
4. Find the program useful	96	96
SAMPLE SIZE	145	100

Table 17. Farmers° Attitude toward Agriculture, GARUT.

Variables	Strongly agree	Agree	Disagree	Strongly disagree
	---------- percentage ----------			
1. It is better to grow traditional varieties of crops rather than take a chance of an unknown new variety even though the new variety yield more	2	19	68	11
2. If a person has to get ahead in farming, he must take chances	27	71	1	1
3. The way my father did in farming practices is better than any government agent can tell me	1	21	60	18
4. I don°t trust government agent	0	18	67	15
5. New farming ideas are okay for big farmers, but not for small farmers	1	43	40	16
6. Success in farming is more dependent on God than on the efforts of man	23	62	15	0
7. Methods of farming are changing rapidly around here	6	69	25	0
8. New varieties are generally better than old ones	18	74	8	0
9. Farming is changing in this area and I should change the way I farm	4	59	37	0
10. The son of a farmer does not have very good chance of becoming wealthy	0	16	81	3
11. Businessmen have good connections that make it easy for their sons to become successful	21	76	3	0

Table 18. Reason for Raising Sheep and Poultry, CARUT.

Category Label	Farm Size (hectares) lt .02	.02-.15	.15-.30	over .30	Total
	percentage				
1. Sheep :					
- cash	10	10	16	9	10
- consumption	0	0	0	1	1
- saving money	80	76	57	71	69
- other reason	10	14	27	19	20
2. Poultry :					
- cash	20	10	14	3	8
- consumption	10	0	21	5	7
- saving money	60	48	27	55	11
- inheritance	0	14	8	8	70
- other reason	10	28	30	29	4
SAMPLE SIZE	10	21	37	76	144

Table 19. The Use of Meat Produced by own Animal, GARUT.

Category Label	Farm Size (hectares) lt .02	.02-.15	.15-.30	over .30	Total
	---------- percentage ----------				
1. Sheep meat :					
- never use	90	67	72	52	62
- to be given	0	0	0	1	1
- consumed in ceremonies	10	33	28	47	37
2. Poultry :					
- never use	10	11	0	1	3
- consumed on market days	0	6	6	6	5
- consumed several times/week	0	11	19	9	11
- consumed in ceremonies	90	72	75	84	81
3. The importance of serving meat :					
- very important	0	6	0	1	1
- important	60	89	84	84	83
- somewhat important	40	5	16	15	16
SAMPLE SIZE	10	18	32	70	130

Table 20. Farmers' Attitude toward Animal Production, GARUT.

Category Label	Sheep	Poultry
	---------- percentage	---------
1. Intend to improve :		
- feeding method	82	75
- raising method	92	85
2. Management change within the last 2 years :		
- feeding method	1	1
- feed given to the animal	1	2
- breed of the animal	1	1
3. Ever borrowed money to buy animal	6	3
SAMPLE SIZE	143	103

Table 21. Source of Information in Animal Raising, GARUT.

Category Label	Sheep	Poultry
	---------- percentage	---------
1. Family	2	0
2. Neighbors	75	75
3. Village leader	2	3
4. Government agent	12	12
5. Other	8	10
SAMPLE SIZE	132	94