



**Agricultural Marketing and Processing
in Upland Java
A Perspective From A Sunda Village**

**Yujiro Hayami
Toshihiko Kawagoe
Yoshinori Morooka
and Masdjidin Siregar**



The CGPRT Centre

The CGPRT Centre

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In co-operation with ESCAP member countries, the Centre will initiate and promote research, training and dissemination of information on socio-economic and related aspects of CGPRT crops in Asia and the Pacific. In its activities, the Centre aims to serve the needs of institutions concerned with planning, research, extension and development in relation to CGPRT crop production, marketing and use.

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Foreword

The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber (CGPRT) Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) was established by the United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP) in April 1981. It aims to promote regional co-operation for research and development on CGPRT crops in the region.

Within the framework of the work programme approved by its Governing Board, the CGPRT Centre has formulated a study project, entitled Soybean Processing Industry and Marketing Systems in Developing Countries of Asia. In 1986, the project activities have centred on the survey and the analysis of soybean and other related commodities in a selected upland area in West Java.

This study investigates how peasants in developing economies are linked to markets in the sale of their products. How are the numerous petty traders organized? How efficient are they as an economic bridge between village and town? Where are the greedy middlemen exploiting peasants by monopoly/monopsony pricing and usury?

The study provides useful insights into these questions and the efficiency of the marketing systems.

The study was conducted in 1986 by Dr. Yujiro Hayami (Team Leader), Professor of Aoyama Gakuin University, Japan; Dr. Toshihiko Kawagoe, National Research Institute of Agricultural Economics, Japan and presently CGPRT Centre, Bogor; Mr. Masdjidin Siregar, Centre for Agro-Economic Research, Indonesia; and Mr. Yoshinori Morooka, CGPRT Centre and presently Tropical Agriculture Research Centre, Tsukuba, Japan.

The conclusions of the study provide a challenge for further study in other parts of Java and abroad. We hope that this study will contribute to further research and policy formulation in the sector of secondary crops in Indonesia and Asia.

Shiro Okabe
Director
CGPRT Centre

Dr. Yujiro Hayami

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This study would have not been feasible without an ongoing project of the CGPRT Centre on the integrated analysis of farm production and household economy in the study village that was conducted by Yoshinori Morooka from January 1985 until December 1986. The deepest appreciation is extended to assistance from the staff of that project as well as the village collaborators, especially Mr. Encum Maksum, the former head of the study village.

Bogor, Indonesia
July 1987

Yujiro Hayami

Summary

This study, conducted as a case study in 1986 in the district of Garut, West Java, attempted to make an in depth investigation into the local marketing and processing of other upland crops in Indonesia as an example of informal sector activities in developing economies. One of the major objectives is to shed light on the structure of the local market with a focus to identify whether a major imperfection or inefficiency is involved so that the present marketing system represents a bottleneck against agricultural and rural development. Another objective is to measure how much of a contribution the marketing and processing activities are making to the generation of income and employment in local economies.

One of the underlying issues is the common misconception of the greedy middlemen who exploits peasants and workers. This perception has induced many governments to formulate policies with the aim of curtailing the role of the middlemen, which may reduce the efficiency of the system.

In the district of Garut, the marketing system can be approximated by perfect competition and is highly efficient in economizing on the use of scarce capital, while utilizing the low opportunity cost of local labour.

The members of the well-integrated rural community in the Garut district each perform roles as producers, transporters, processors, middlemen, and pedlars. Together they make up a flexible economic network which reaches from the producers through local processing to local consumers and wholesale traders. Although credit tying is common among middlemen, it is rare between middlemen and producers. This is partly because the financial position of village-based middlemen is no better than the producers and partly because the producers' need for credit is relatively small in this area since various upland crops planted in an intercropping system are harvested one by one continuously over a year.

There are no signs of monopolistic pricing, while price differences at various points in the marketing chains are explained by transportation costs. Hoarding and speculation of soybean is rare because the seasonal price variations are flattened out by extensive soybean trade among regions with different cropping seasons.

It is hypothesized that policy interventions based on the more intensive use of capital would impair the existing systems resulting in serious losses of economic and social efficiency.

There are reasons to assume that the findings of this study can be confirmed in communities with similar conditions: a well-developed infrastructure, an existing local and external demand, and a well-integrated community structure. Additional research is required to investigate these matters in similar communities as well as other communities such as new settlements or communities in remote areas.

Introduction

Since the publication in 1926 of Chayanov's classic study, *The Theory of Peasant Economy*, it has been common among economists to assume that peasants are isolated from markets and that they allocate resources mainly for subsistence, without regard to price signals (Nakajima 1986; Wharton 1969). In reality, however, these non-market creatures are exceptions to the rule in the world today, if they exist at all. In Asia, peasants, even in villages very remote from urban centres, are integrated with the market economy to the extent that market prices determine their resource allocations, just as they determine the decisions of urban business entrepreneurs (Hayami and Kikuchi 1981; Scott 1976).

Since the publication in 1964 of T.W. Schultz's *Transforming Traditional Agriculture*, there has developed a consensus of belief that peasants respond rationally to price incentives (Hopper 1965; Krishna 1967; Massel 1967; Yotopoulos 1968). Recent studies indicate that apparent anomalies in peasants' organizations and behaviors can be explained by the economic and technological environments without resort to their special preference pattern (Binswanger and Rosenweig 1986; Roumasset 1976). Yet, little is known about how efficiently the price incentives are transmitted to peasants through the complex marketing system comprised of numerous middlemen, processors and transport agents.

Local marketing and processing of agricultural products in developing countries are carried out within the informal sector (Sinclair 1978; Breman 1980). Virtually no official statistics are available on the informal sector. The highly elusive nature of agricultural marketing organizations typical of the informal sector in developing economies, together with the general hostility of middlemen toward investigation by outsiders, has defied the formal studies by economists.

In the absence of information to the contrary, a traditional image prevails that middlemen exploit peasants through the practice of monopsonistic pricing and usury. This stereotype has been waning with evidence gathered in bits and pieces from recent studies (Ruttan 1969; Mears et al. 1974; Siamwalla 1978; Unnevehr, Chapter 6 in Falcon et al. 1984). Yet, the evidence is far from sufficient to clarify the controversial role of middlemen. It is common to assume that middlemen are a major block to agricultural and rural development and to rationalize government intervention in the market economy on that score. Therefore, investigations of the structure of agricultural product markets at the local level are critical to the design of government policy.

The informal sector is known to have a high labour-absorptive capacity and its potential contribution to the alleviation of poverty and unemployment/underemployment in developing countries has been emphasized (ILO 1972; 1974). Previous studies on the informal sector have largely concentrated on the metropolis (Moir 1978; Sethuraman 1981; Shaefer 1978). Yet, a wide scope seems to exist to increase

employment and income in local communities through the development of informal economic activities such as cottage industries and petty trades, that form a bridge between villages and towns in developing economies (Oshima 1984).

This study is a pilot investigation of local marketing and processing of non-rice food crops grown mainly in upland conditions, such as corn, pulses, roots and tubers (CGPRT crops), in Indonesia. The role of informal sector activities is especially large in the marketing and processing of those subsidiary crops grown by peasants in marginal areas - crops other than rice, wheat and some plantation crops.

CGPRT crops have a dual role to play in developing economies in Asia and the Pacific. First, CGPRT crops are the major source of employment, income and nutrition for a large number of neglected people in marginal areas - marginal in the sense that the areas are remote from major development currents, and have received little public assistance for the development of infrastructure such as irrigation systems and roads.

The second important role of CGPRT crops is their potential contribution to commercial agricultural development in order to meet the needs arising from national economic growth. As per capita income has been rising, developing countries of Asia have been experiencing sharp increases in the consumption of livestock products and other forms of protein-rich foods. Domestic production of feed grains and soybeans has not kept up with increasing domestic demand, and imports have been increasing sharply, resulting in a serious drain on foreign exchange. In Indonesia, soybean imports in particular have increased over the past decade, from self-sufficiency in 1974 to the current import of almost half of the domestic consumption. Thus, the increased production of hitherto neglected CGPRT crops is of vital importance to meet the national economic development needs.

These two potential roles of CGPRT crops are not at all separate. The generation of income and employment in marginal areas can be most effective if subsistence or semi-subsistence producers are transformed into small-scale, efficient, commercial producers responsive to rising demands from food processing industries and feed mills. Furthermore, if these agricultural product processing industries are located close to the farm production base, the contribution of CGPRT crops to employment and income in marginal areas can be maximized.

To achieve this goal, it is vital to improve farming technology so that output and marketable surplus can be increased. It is also critically important for the local marketing system to develop a proper linkage between farm producers and processing industries and give them price signals that correctly reflect national and international market conditions.

This study attempts an in depth investigation of local marketing and processing of CGPRT crops in Indonesia, focusing on soybean. Soybean in Indonesia provides a highly interesting case study in the context of the problem concerned. Soybean demand has steadily increased over the last decade. In Indonesia, soybean is processed into a variety of food products, such as *tofu*, *tempe*, *tauco* and *kecap*. Much of the processing activity is carried out in rural areas, contributing significantly to rural employment and income. For these reasons, it is expected that the case study of soybean production and marketing in Indonesia will produce highly relevant information for local marketing and processing of agricultural products in general, for Indonesia as well as other developing countries.

However, this study is not limited to the investigation of soybean. It covers other upland crops produced jointly with soybean in intercropping systems, such as corn, tobacco and cassava. Differences and similarities in the marketing/processing systems of these jointly-produced farm products provide a key to understanding the nature of local marketing.

Objectives of the study

This study attempts to clarify the working mechanism of local marketing and processing of agricultural products grown in the upland areas of West Java as an example of the informal sector in a developing economy. Investigations focus on how middlemen and processors at various levels are organized to make up a network for agricultural marketing at the local level. The term local refers to villages and towns in a district (*kabupaten*). Some aspects of inter-regional and international trade are discussed to the extent that they influence local marketing and processing activities, but they are beyond the scope of our main investigation.

Two major questions addressed in this study are: How efficiently is the system working as a channel between farmers and end-users of CGPRT crops, especially soybean? and: How much employment and income are generated from local marketing and processing in addition to employment and income from farm production itself?

Our specific objectives in this study are:

1. to identify the complete network for soybean marketing and processing at the local level and its connection with the marketing and processing of other commodities produced jointly on farms;
2. to identify the trade practices and contracts used to organize relationships among middlemen and between middlemen and producers and processors, and to examine elements that promote market imperfections;
3. to gauge prices, marketing margins and transportation costs at various stages of soybean marketing in order to test whether the market is competitive and efficient;
4. to estimate income and employment generated from local soybean marketing and processing in order to assess their potential role in rural development.

Methodology and scope

Local marketing and processing of agricultural products in Indonesia are carried out mainly within the informal sector. By nature, informal sector organizations and activities are highly elusive and characterized by infinite variations. Moreover, middlemen are suspicious of and resistant to investigations by outsiders. These conditions defy an approach based on an extensive survey over a wide area with standardized questionnaires. The investigations must rely heavily on careful personal observations and intensive contact with the marketing agents to be investigated as well as with a large number of people in the same community.

For this reason we have limited our investigation to one location, sacrificing the national and regional representativeness of our results. Our strategy was to conduct a

sample survey of farmers in one village in order to identify how much of their products were sold, and to whom, in the last crop season. We then traced the marketing chain through the middlemen to end-users, noting prices, transportation costs, trade practices and contracts. The village of Cibuyutan in the Garut District in West Java was chosen as the study site for the initial farmer survey. This village was chosen because one member in our study team has been conducting an integrated analysis of farm production and household economy for January 1985 through December 1986 (Socio-Economic Studies on Soybean-based Farming System at Village Level in Indonesia: SFSI), a research project of the CGPRT Centre. Valuable information accumulated on this village community and mutual trust with villagers nurtured through the SFSI project were indispensable to this marketing study.

There is another reason for the choice of Cibuyutan as a study site. Soybean is produced in this village and its vicinity in an intricate intercropping system combining soybean with corn, tobacco and cassava. This intercropping system is typical of tropical upland areas in which CGPRT crops are grown. The marketing of soybean must be analysed as a part of the whole complex of joint production and marketing of these commodities. For that purpose, this village presents a highly relevant example.

Our field work was conducted during 1986 in three steps:

1. A benchmark survey covering all households in a major hamlet of this village was conducted in May 1986, with a Benchmark Survey Questionnaire Form, to obtain background information on socio-economic conditions of this study site.
2. A sample of 25 farmers in the study village was selected from this hamlet. A survey was conducted in August 1986 with the Farmer Survey Questionnaire Form (Appendix A), identifying outputs and sales of soybean and related crops.
3. Middlemen to whom sample farmers sold their products were interviewed with the Middlemen Survey Questionnaire Form (Appendix B). Their sales to other middlemen or processors were traced and the successive buyers were interviewed. The interviews with processors were based on the Processor Survey Questionnaire Form (Appendix C). In addition, several transport agents, such as truck and pony wagon operators, were interviewed using a Transportation Survey Questionnaire in order to assess transportation costs involved in marketing. The middlemen and the processors whom we were able to trace included those operating in the study village, those operating in nearby towns, especially in the bazaar of Garut, and those operating in other districts, such as Bandung and Tasikmalaya. Surveys of middlemen and processors were conducted in August and September 1986.

It must be pointed out that most middlemen, except those residing in the study village, were not receptive to a formal interview. In many cases, therefore, we had to listen without taking notes and to fill in the questionnaires later from memory. Also, in some cases the information they gave us was considered false and was therefore discarded. The middlemen and processors whose survey results were considered usable are listed in Table I.1. There are many inconsistencies in these results, however.

Therefore, we based our analysis on the data selected for their consistency among those who traded with each other.

This study is exploratory by nature. Its major objective is to identify problems significant for policy design, which may be subjected to a large-scale investigation in the future.

Plan of the volume

The characteristics of the study site are summarized in Chapter 2, including socio-economic aspects, farming systems practiced and its position within a nation-wide soybean production and trade network. Chapter 3 classifies various agents who participate in local marketing of agricultural products, and identifies a trade network that links them together. Chapter 4 investigates the structure of market relations between farmers and middlemen as well as among various types of middlemen and discusses why certain trade practices and contracts are being used. Chapter 5 gauges marketing margins and transportation costs at various levels of marketing in order to test whether the market is competitive and efficient. Chapter 6 analyses the economic status of agricultural processing industries in terms of estimated production costs and returns. Chapter 7 combines the results of Chapters 5 and 6 to estimate employment and income generated from local soybean marketing and processing. Chapter 8 summarizes major findings and policy implications, and suggests an agenda for future research.

Table 1.1 Number of respondents to survey interview by professional category; Garut, August to September 1986.

Category ^a	No. of respondents	Category ^a	No. of respondents
Farmer	25	Processor	
		Home processing	
Middleman		Tobacco	4
Hamlet collector	4	<i>Opak</i>	3
Village collector	13	<i>Gaplek</i>	2
Inter-village collector	6		
Bazaar trader	6	Factory processing	
Pedlar	6	<i>Tempe</i>	5
Grocery store	2	<i>Tofu</i>	4
		Tobacco	2
Total	37	Other ^c	2
		Total	22
Transporter ^b	3	Grand total	87

^a Definition of the category is presented in chapters 3 and 6.

^b Owner/driver of pony wagon, mini truck and large truck.

^c Tapioca and poultry feed.

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Environment of Local Marketing

This chapter gives readers background information on the general characteristics of the study site. Explanations are focused on farming conditions and systems in which CGPRT crops are produced in the study village and its vicinity as well as on the geographical relation of the study village to markets in towns in the Garut district and in other districts. The position of soybean production and trade in this district relative to other districts and regions in Indonesia is discussed, as well as the possible influence of imported soybean and its distribution system on the local soybean market.

Characteristics of the study village

The village (*desa*) in which our Farmer Survey was conducted is called Cibuyutan, and is located in the district (*kabupaten*) of Garut. The location of the Garut district is shown in Figure 2.1. This district is on a hilly plateau, 700 to 1,000 m above sea level, surrounded by mountains. Cibuyutan is typical of villages in the Sunda region of Java. Almost all inhabitants are Sundanese and pious Moslems. The village statistics (*monografi desa*) show that the total population in 1985 was 4,600 persons in 960 households. As much as 95 percent of the 420 ha of arable land is used for upland agriculture under rain-fed conditions.

Since the beginning of this century, villagers have settled in this area and raised various kinds of upland crops (*palawija*) such as soybean, groundnuts, corn and cassava together with tobacco, upland rice, vegetables and fruits in small plots of upland terrace. With rapid population growth, land has been gradually opened for crop cultivation from the lower to the upper part of the village. Today, few land frontiers are open for further expanding cultivation. Farmers have traditionally intercropped several commodities to use their limited land more efficiently and economically. Crops are grown mostly in terraced upland fields of the andosol or regosol soil types.

Cibuyutan is connected by about 1 km of unpaved road to a national highway that runs from the town of Garut to Bandung, the capital of West Java (Figure 2.2). The population of Garut is about 108,000 persons. Garut is about eight km from Cibuyutan and is easy to reach by pony wagon (*delman*) and minibus (*angkutan kota*). Garut is a major market for the sale of village products, as well as for the purchase of consumer goods. It is not uncommon, however, that the products of the village are taken directly to Bandung and other cities outside the district of Garut.

Our Farmer Survey included 25 of the 121 farmers in one hamlet (*kampung*) in Cibuyutan. Preceding the Farmer Survey, a benchmark survey had included all households in this hamlet. The socio-economic characteristics of the village, summarized in Table 2.1, refer to this hamlet.

Farming is the main occupation of the majority of household heads (Table 2.1). More than 80 percent of household heads are engaged in farming. Out of all 149

households, 16 householders make a non-farm living as pedlars, drivers, construction workers, etc. Farming full-time occupies 64 percent of farmers, while others are part-time farmers. In addition to the 121 farm households, there are 8 households in which the head is an agricultural labourer who has no farmland to cultivate but earns a living from farm work.

Table 2.1 Occupation of 149 household heads in the village of Cibuyutan, Garut, in 1986.

Farm household	
Owner cultivator	68
Owner cultivator/tenant	34
Tenant	19
Total farm	121
Agricultural labourer	8
Non-farm household	
Trader	2
Driver ^a	2
Porter	1
Car repairman	1
Others	10
Total non-farm	16
Unidentified ^b	4
Total	149

^aTricycle (*becak*) or pony wagon (*delman*) driver.

^bThose who did not reply to survey interview.

As shown in Table 2.2, about one-quarter of householders have no farmland and another one-quarter own less than 0.2 ha. The average area of farmland owned per household is less than 0.4 ha, and the average area of farmland per farm household is only about 0.5 ha. Operational farm sizes are very small, with an average size of 0.5 ha. Only 8 percent of farmers cultivate more than 1 ha.

Table 2.2 Size distribution of land ownership and operational holdings by villagers in the study hamlet, May 1986.

Area (ha)	Ownership holding		Operational holding	
	(No.)	(%)	(No.)	(%)
0	35	24	24	17
0.01 - 0.2	36	25	31	21
0.21 - 0.6	40	28	56	39
0.61 - 1.0	24	17	22	15
1.01 - 2.0	9	6	11	8
2.01 -	1	-	1	-
Total	145	100	145	100
Total area (ha)	54.2		61.5	
Average of all households (ha) ^a	0.37		0.42	
Average of farm households (ha)	0.45		0.51	

^aExclude 4 householders who did not reply to our interview.

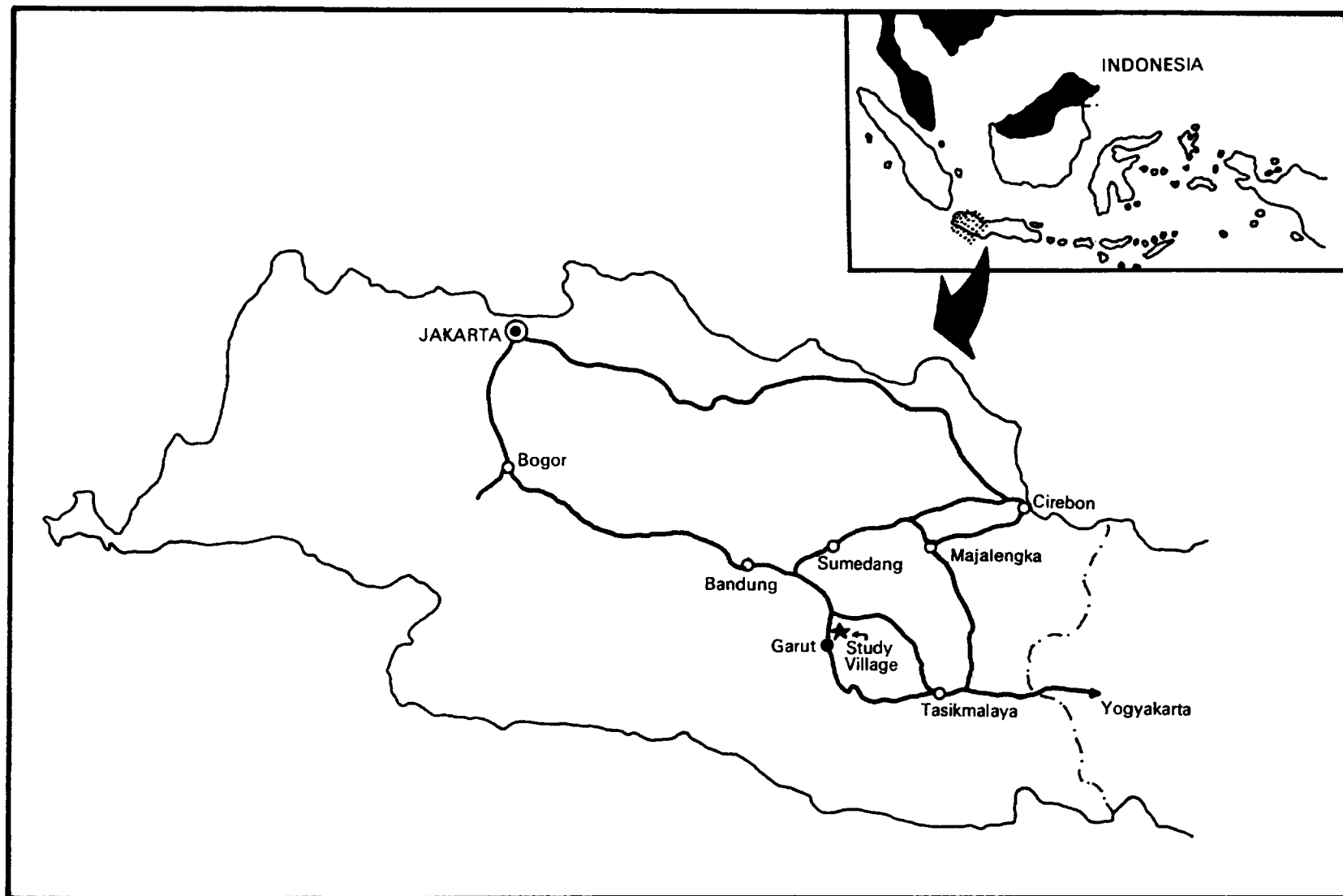


Figure 2.1 Location of Cibuyutan, the study village, in the Garut district in West Java.

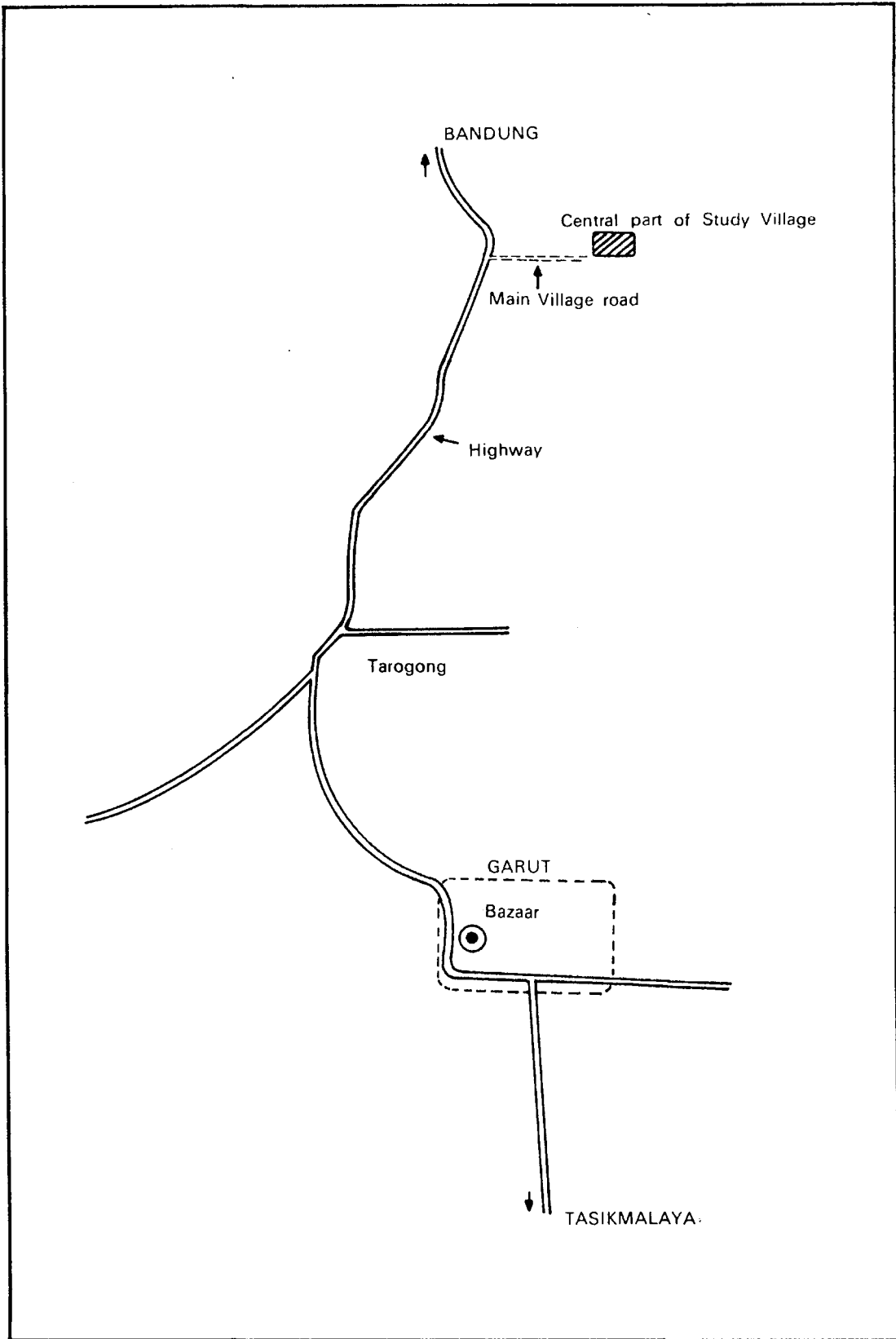


Figure 2.2 Location of the study village in relation to the town of Garut, West Java.

Soybean-based farming system

In Indonesia, soybean is commonly intercropped with other commodities in upland areas. In the intercropping system, called *tumpangsari* in Indonesian, one main crop is planted with other crops in particular sequences and configurations.

Tumpangsari has several agro-ecological advantages. As is widely known, the main advantage is the maintenance and/or revitalization of soil capability under upland conditions. In addition, this system restrains the growth of weeds since *tumpangsari* crops cover land relatively faster than do monocrops. Experimental results show that *tumpangsari* can increase biological stability for pest management. For example, intercropping corn and groundnuts reduces the number of corn stemborers.

In Cibuyutan, eight main crops are cultivated - soybean, corn, cassava, tobacco, upland rice, peanuts, fruits (mainly oranges) and vegetables - in various combinations. Soybean covers more than 80 percent of the total upland area. Because of the dominant role of soybean in *tumpangsari* in this area, we call it the soybean-based farming system.

There are many variations in the soybean-based farming system. A typical crop cycle is shown in Figure 2.3, in relation to the monthly distribution of rainfall. In a normal year, the wet season starts from September and continues into May. Most farmers plant soybean with corn from September to January, followed by soybean and tobacco from February to June. Cassava is usually grown at the edges of the fields. One crop cycle extends from 1 to 1.5 years, and includes 2 or 3 crops of soybean.

There are many variations in crop density. Figure 2.4 shows planting conditions when corn and tobacco are intercropped with soybean during different cropping seasons. In the soybean/corn system, corn is usually planted linearly. The distance between rows varies from 3 m to 5 m in most cases. About 200 hills of soybean can thus be planted with 4 to 8 hills of corn per *bata* ($3.75 \times 3.75 \text{ m} = 0.14 \text{ ha}$). On the other hand, tobacco is usually planted in a grid. The distance between tobacco plants varies from 80 cm to 1 m. Fewer soybean hills can be planted with tobacco than with corn.

Utilization and processing

How are the products of the soybean-based farming system utilized? Table 2.3 shows how farmers in the study village disposed of commodities produced during a six-month period prior to our survey. Only small percentages of the crops produced from the soybean-based farming system are consumed by producer households. More than 70 percent of farm output was sold for all crops but tobacco.

In the Garut area, tobacco leaf is processed in farmer households by slicing and drying. Because the dried tobacco material is highly storable, farmers tend to hold it for a long time until attractive marketing opportunities arise. The allocation of the stock of tobacco material for home consumption is very small, certainly not more than 5 percent of the total output. In the case of soybean, a relatively large stock is held back by farmers for their own use as seeds for production as well as to sell at higher prices in the planting season.

In general, soybean is consumed in processed forms. There is a large variety of processed soybean food (CGPRT Centre, 1985, Chapter 6). Only the two most popular soybean foods, *tempe* and *tofu*, are dealt with in this study, because these are the products into which soybean in the study village is processed.

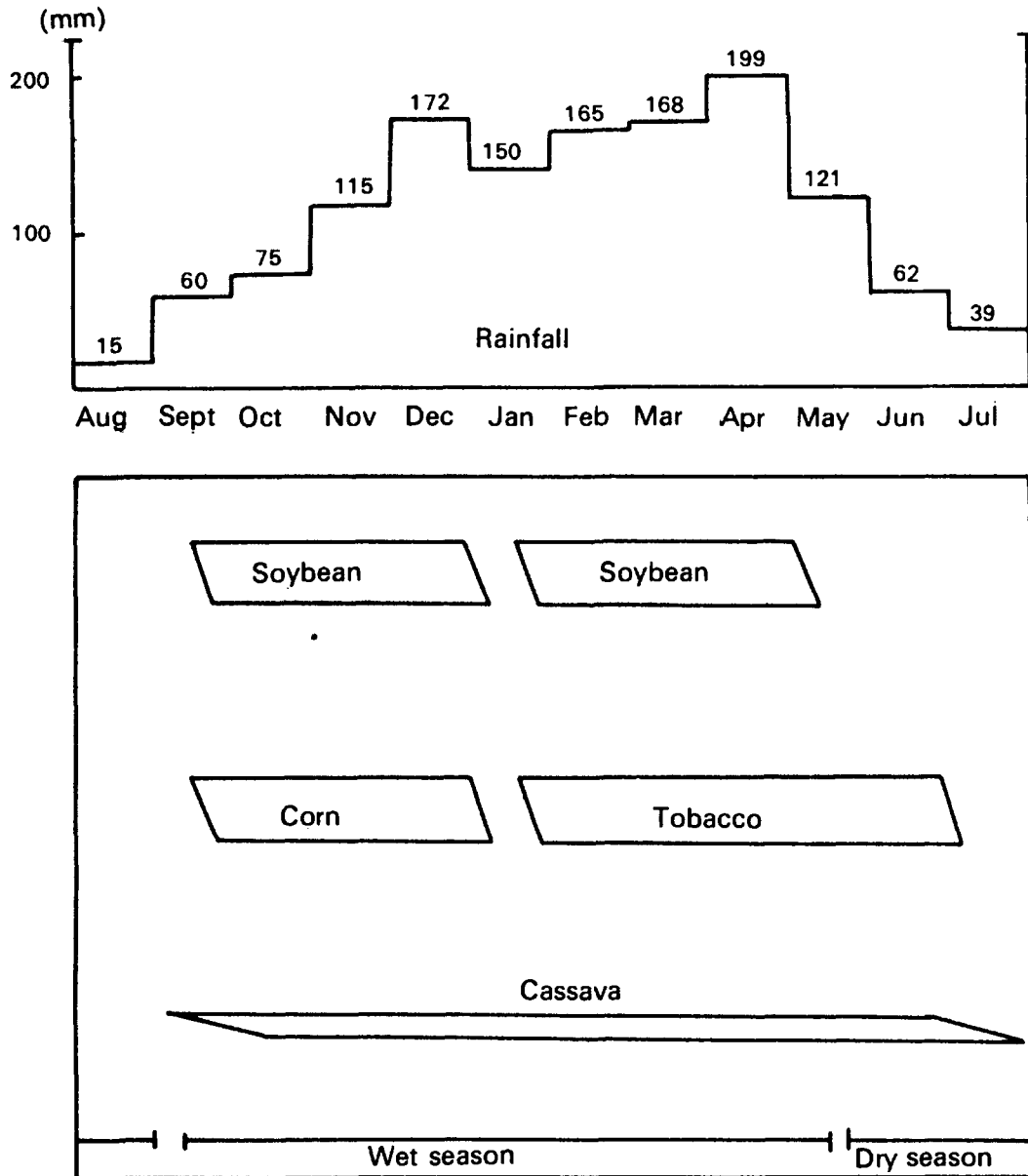


Figure 2.3 Average monthly rainfall in Cibuyutan for 1976 to 1985, and seasonal sequence of soybean-based cropping system.

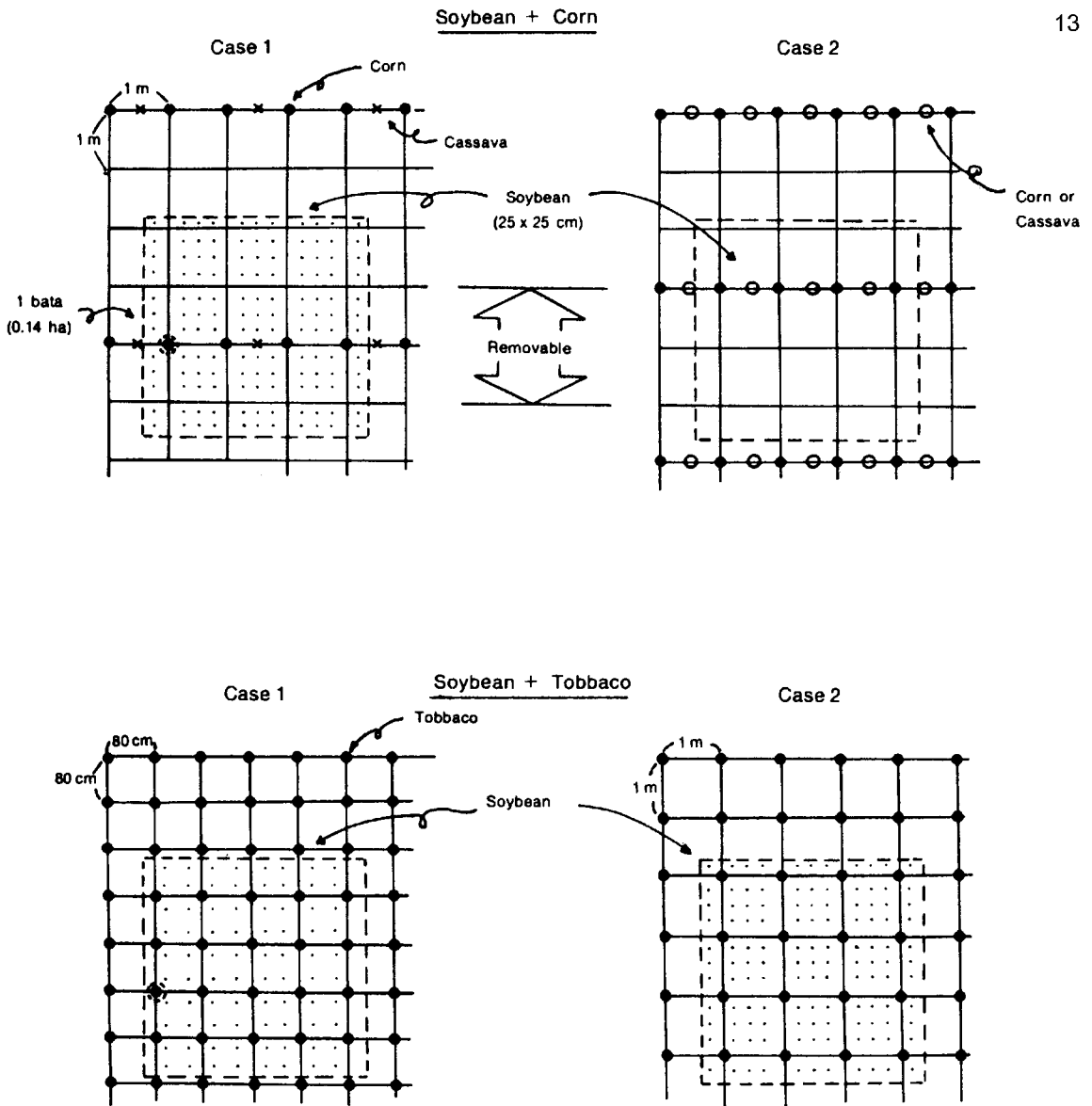


Figure 2.4 Soybean-based planting conditions under the intercropping system at upland areas in the district of Garut, West Java.

Table 2.3 Production and disposition of crops produced from the soybean-based farming system in the study village, average of sample farmers, February to July 1986.

	Soybean ^a		Corn (grain equivalent)		Tobacco (sliced and dried)		Cassava (fresh root equivalent)	
	(kg)	(%)	(kg)	(%)	(kg)	(%)	(kg)	(%)
Output	142	100	146	100	132	100	160	100
Sale	104	73	117	79	80	61	122	76
Home consumption	5	4	11	8	2	1	17	11
Stock at home ^b	33	23	18	13	50	38	21	13

^aSoybean refers to the produce of the second crop harvested mainly in May and June.

^bStock standing at the time of the survey.

Tempe is a food made by fermentation of soybean with *Rhizopus* bacteria. The beans are soaked in water for 12 hours, then hulled and boiled for 2 hours. The cooked beans are spread out to dry and are drained and cooled. They are then inoculated with *Rhizopus*, wrapped in plastic or banana leaves, and allowed to ferment at room temperature for two days. During the fermentation process, the beans become covered and bound together by a white mycelium.

Tofu is a protein curd obtained from the water extracted from ground soybean. It is usually made from yellow or green soybeans. The process begins with soaking the beans, followed by grinding while adding small quantities of water. The resulting slurry is heated to near the boiling point and is then filtered to produce a milk. Calcium sulphate is added to this milk to coagulate it into curd. The curd is then cut into small pieces, which are wrapped individually.

Both *tempe* and *tofu* are cooked in a variety of ways: fried, boiled, or added to soup. There is a wide range of production methods for *tempe* (Winarno et al. 1985). In general, *tempe* processing is simpler and requires less capital than does the production of *tofu*. A large number of small *tempe* manufacturers of the cottage-industry type are located in both rural and urban areas, while most *tofu* producers are located in urban areas or in densely populated rural areas.

Corn is consumed either in fresh ears or in shelled. Some of the corn produced in Cibuyutan is marketed in ears but most of it is sold shelled to poultry raisers and feed mills in nearby districts, such as Bandung and Cirebon (Table 2.4).

Cassava is used in three different forms: fresh root, *gaplek* and *opak*. Fresh root may be eaten directly as an additive to rice or may be processed into cakes. However, a major part of the cassava crop is used as material for tapioca (starch). Crude tapioca is obtained by extracting water from ground cassava. Crude tapioca production is commonly carried out in rural small-scale industries. Refining and further processing of crude tapioca for urban use are usually carried out by larger modern factories (Falcon, et al. 1984, Chapter 4).

Gaplek is chopped and dried cassava processed in farmer households. It can be used as a food additive, feed for ducks and chickens, and as material for tapioca production. *Gaplek* is exported as feed (Falcon, et al., 1984, Chapter 5).

Cassava root is also processed into *opak* in farmer households. *Opak* is cassava tip fried to be eaten as a snack. It is a popular food in the study area but is not necessarily common in other parts of Indonesia. Processing *opak* from cassava root involves peeling, grinding and steaming, and then mixing the mash with oil, salt and spices, shaping it into a flat oblong form, and finally drying it. As shown in Table 2.4, about 60 percent of the cassava grown in Cibuyutan is processed into *opak* and sold.

Tobacco leaf harvested by farmers is sliced thinly and dried material may be smoked in a hand-made cigarette rolled in thin paper or palm leaf (*daun enau*). Most of it is sold for further processing. A part of the crop goes to modern cigarette factories in large cities and another part goes to small factories in town for simple processing, which includes smoking it in special woods and adding spices and sugar. The processed sliced tobacco is sold in small plastic pouches for local consumption.

Production seasonality and inter-regional trade

Soybean harvests in the study area are concentrated in the months, of December to January and May to June, although some crops are harvested a few weeks before or after these periods. It is natural to expect that soybean prices are characterized by large seasonal fluctuations.

Table 2.4 Allocation of corn and cassava for different uses, average of sample farmers, January to July 1986.

	Sale ^a		Home consumption		Total	
	(kg)	(%)	(kg)	(%)	(kg)	(%)
Corn (grain equivalent)						
Shelled	116	99	7	65	123	96
Ear	1	1	4	35	5	4
Total	117	100	11	100	128	100
Cassava (fresh root equivalent)						
Fresh root	44	36	10	60	54	39
<i>Gaplek</i>	3	2	0	0	3	2
<i>Opak</i>	76	62	7	40	83	59
Total	123	100	17	100	140	100

^aIncludes stock for future sale.

Indeed, price data collected at the bazaar and in the village twice in each month from 1 August 1985 through 15 July 1986 show that both the bazaar and the village prices hit troughs in the midst of the harvest months and rise to peaks between harvest months (Figure 2.5). However, seasonal price fluctuations are not quite so large and do not correspond so regularly to harvest fluctuations. The bazaar price, in particular, does not rise as much in the lean season from August to October.

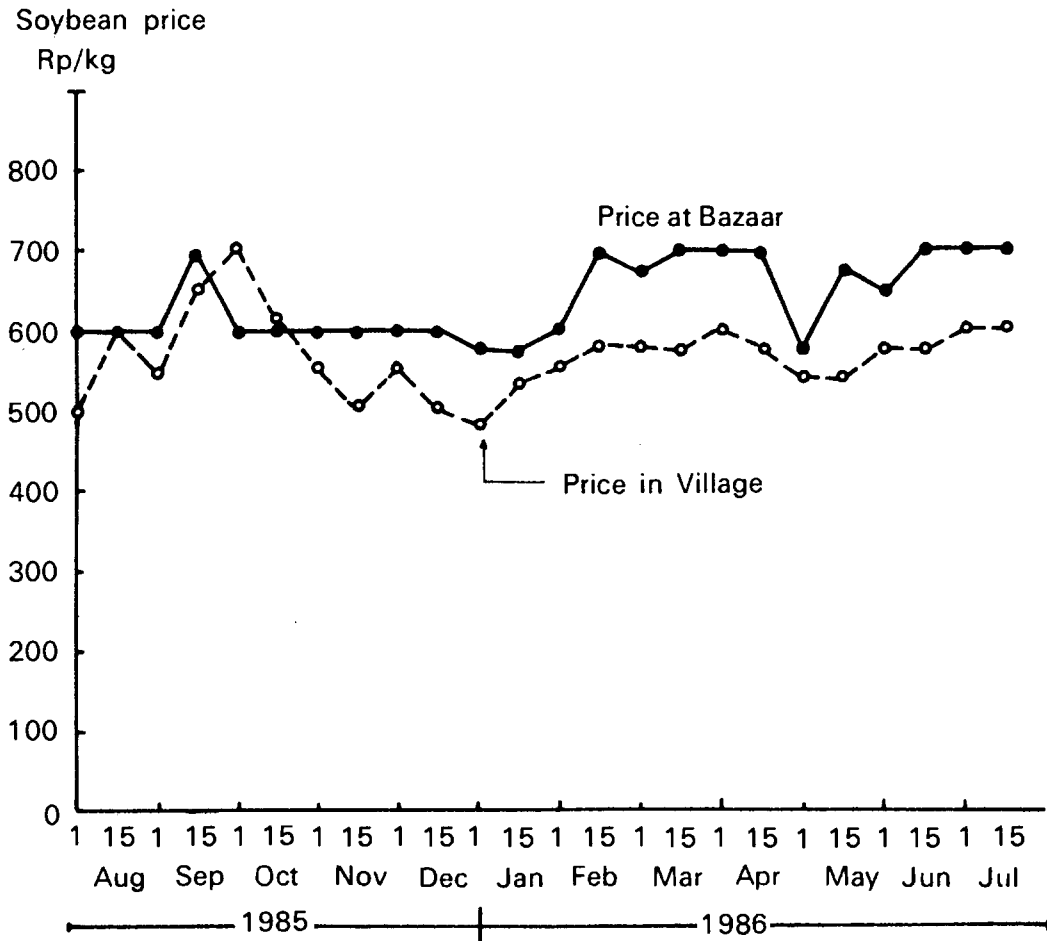


Figure 2.5 Seasonal fluctuations in soybean prices at Garut bazaar and in the study village, 1 August 1985 to 15 July 1986.

The relative price stability over seasons, especially at the bazaar, is explained by extensive trading of soybean among regions with different harvest seasons. As indicated in Figure 2.6, soybean is harvested somewhere in Indonesia at almost any time during the year. It is a major function of traders in town to import soybean from other regions during the lean seasons for local production. For example, in August and September, when our survey was conducted, shops in the Garut bazaar were flooded with soybean from East Java and Lampung (Sumatra). As shown in Figure 2.6, during October when the local soybean supply is exhausted, the village price rose above the bazaar price because the villagers' demand for soybean had to be met by the supply of soybean from other regions via the bazaar. On the other hand, during the local harvest season for soybean, traders export it to other districts and regions.

Given the relative price stability of soybean, there seems to be little room for traders to profit from storage operations. The cost of storage is high because of the high rate of capital interest (discussed in Chapter 4). Given that storage loss is about

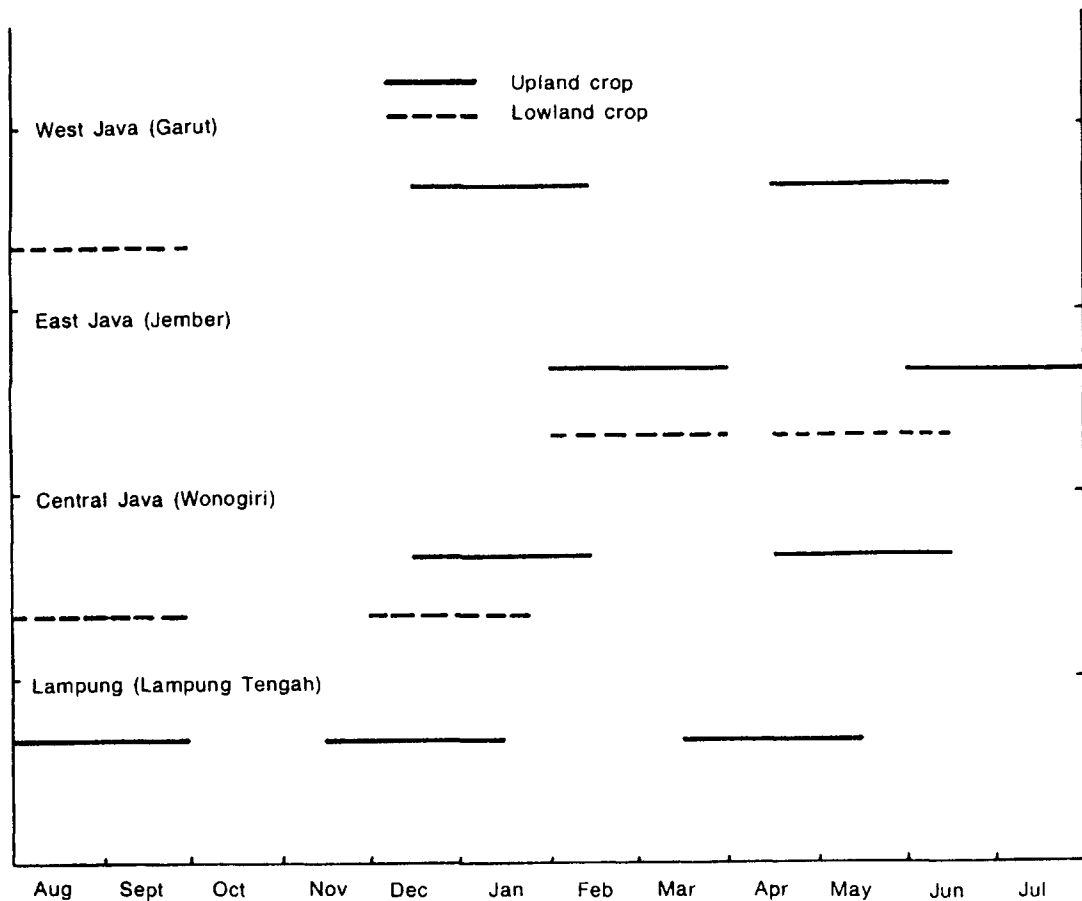


Figure 2.6 Harvest seasons of soybean in different regions of Indonesia.

3 to 5 percent per month and the interest rate of a private non-collateral loan is probably higher than 5 percent per month, the storage of soybean would not be profitable unless its price were to rise more than 10 percent per month. Such a price increase occurred only during February and September in the bazaar, and during August and September in the village.

Distribution of imported soybean

Government intervention in the soybean market is not very visible. BULOG (*Badan Urusan Logistik* - Food Logistic Board) guarantees the floor price of domestic soybean. However, the floor price is much lower than the market price, making direct price support ineffective.

A major influence of government policy on the soybean market is exercised by control of imports. Soybean imports to Indonesia have increased dramatically from 18,000 tons in 1975 to 401,000 tons in grain plus 206,000 tons in cake in 1984. Altogether, the imports are roughly equivalent to domestic production. Imported soybeans, especially those from China, are preferred for *tempe* production for their large grain size.

The import of soybean has been handled exclusively by BULOG. There are two channels for distribution of imported soybean to local users. One channel is KOPTI (*Koperasi Produsen Tempe dan Tahu Indonesia* – Co-operative of *Tempe* and *Tofu* Producers in Indonesia). Officially, KOPTI engages in activities to improve the economic viability of the small soybean processors in general, such as providing technical guidance and mutual credit, and setting sanitation standards. However, the fact that KOPTI was established in 1979 when soybean imports became significant suggests that it was designed mainly to channel imported soybean to local users.

One KOPTI unit established in each district is allocated a certain quota of imported soybean from BULOG. KOPTI Garut, for example, receives 250 tons per month and distributes to about 300 members. It is estimated that the cif import price of U.S. soybean is about Rp 250/kg. KOPTI Garut buys it at Rp 390/kg, and sells it to members at Rp 565/kg, when the market price is about Rp 600/kg. (These were the prices at the time of our survey in August 1986.) KOPTI's quota from BULOG is not sufficient to meet the needs of members. The gap has to be filled mainly by the purchase of soybean from private traders by members themselves, although KOPTI also supplies a small amount of local soybean purchased from the market.

KOPTI Garut estimates that about 150 processors have not yet joined KOPTI. However, it is our impression that the proportion of members would be much smaller if small *tempe* producers in villages were enumerated.

Besides KOPTI, there is a private channel for soybean distribution. About a half of the imported soybean supply is sold at a price of Rp 430/kg to a private firm called P.T. Watraco, from which it is channelled through wholesalers in large cities such as Jakarta and Bandung, to bazaar traders in smaller towns such as Garut. In Garut bazaar only a few large traders handle imported soybean. It is not clear to us whether the handling of imported soybean is limited to large traders because it requires large working capital or because it requires a special connection with the exclusive source of supply.

Organization of Marketing

This chapter gives a perspective on local marketing agents and channels through which soybean moves from producers to processors and on to consumers. In general, local marketing and processing of foods in developing countries are carried out mainly by unincorporated informal agents who do business on a small-scale with few permanent employees. These agents are linked to each other through informal contracts and tacit understandings to form an intricate marketing network. As is typical of the informal sector, there exists a nearly infinite variety of agents and channels of marketing soybean and soybean products. In this study, in order to facilitate an understanding of how the system works, we tried to classify these agents and marketing channels into a few distinct categories. In reality, however, these categories are not mutually exclusive.

Agents of marketing

First, we shall try to enumerate and classify various agents who participate in soybean marketing. As a classification device, it is useful to separate the agents whose activities are village-based from those whose activities are town-based, while recognizing substantial overlap between them. Village here refers to rural areas in which farming is the dominant economic activity. This designation does not exactly coincide with the administrative concept of village (*desa*). Town refers to urban areas, typically the capital of a district (*kabupaten*) or subdistrict (*kecamatan*). An important qualification in our definition of town is that it has a bazaar (*pasar*) that functions as an auction arena to set local market prices. In this study, Cibuyutan and its surroundings represent village and the city of Garut represents town.

The village-based marketing agents are farmers (*petani*) themselves and middlemen. The village-based middlemen are pedlars (*pedagang keliling*) and collectors (*penampung*). Pedlars at the village level, who are mostly women, collect a basketful of products from farmers for sale directly to consumers at the bazaar, door-to-door to non-producer households in nearby towns and villages, or to stall vendors in the bazaar. Pedlars handle mainly ready-to-eat or ready-to-cook perishable commodities, such as fruits, vegetables and cakes. They seldom engage in the trade of soybean itself, but handle some of the commodities produced from the soybean-based farming system, such as *opak* (cassava chip). Pedlars not only bring farm products from village to town but also carry urban-made commodities back to the village for sale to households.

While pedlars are essentially retailers, collectors are wholesalers. They collect farm products for delivery to processors and traders in town. There is a hierarchy of collectors, ranging from the hamlet collector at the bottom, to the village collector and on to the inter-village collector at the top. Hamlet collectors collect small amounts of produce from neighbouring farmers in the same hamlet (*kampung*).

Typically, a hamlet collector is tied to a village or an inter-village collector, from whom he receives an advance payment to finance the purchase of produce from farmers, and to whom he then delivers his collection.

Village collectors also collect directly from farmers over a somewhat wider territory encompassing several hamlets or villages. They only occasionally buy from hamlet collectors. A major difference between hamlet and village collectors is that the latter have much greater autonomy in disposing of their collected commodities. Village collectors may choose to sell their collections to inter-village collectors, processors, or town traders in their own district or in other districts. While hamlet collectors are essentially casual employees working on commission, village collectors are independent small-scale traders.

Inter-village collectors are similar to village collectors but their activities encompass much wider territories, covering several villages, and they handle a much larger volume of commodities. They collect goods mainly from hamlet and village collectors and seldom buy directly from farmers. These collectors are living in a village and doing business part-time besides farm work.

The hierarchy of collectors parallels the hierarchy of land holders. Most hamlet collectors are landless farm labourers (*buruh tani*) and marginal farmers, while their wives and daughters are pedlars. Small returns from petty trades are important supplements to the income of people in the poorest class in the village community. Most village collectors are middle class farmers whose farm operations are based mainly on family labour. Most inter-village collectors are large land holders who rely heavily on hired labour for the cultivation of their land and often rent out a part of it. The parallel between the amount of land owned and the scale of collecting and trading seems to reflect the direct correlation between the amount of land owned and the ability to accumulate working capital for trade.

Farm producers themselves play an important role in marketing their products. It is not uncommon for farmers' wives and daughters to peddle home produce outside the village. It is also not uncommon for farmers themselves to carry their products to town for sale to traders in the bazaar or for direct supply to processors. The distinction between farmers and village-based middlemen is therefore not complete.

Trading activities in towns in Indonesia are centred around the bazaar. This has been described in a classic study by Dewey (1962). Although not all town-based middlemen are located in the bazaar, we limit our analysis to those based in the bazaar for the sake of expository simplification. Given this simplification, town-based middlemen may be classified into bazaar traders and vendors. Bazaar traders purchase farm products brought to them by village-based middlemen and farmers, and sort, grade and pack the products for trans-shipment to traders in other districts. They also engage in retail trades with local customers. Most larger scale traders operate at shops (*toko*) inside permanent buildings along streets surrounding the bazaar, while smaller scale traders operate in roofed stalls (*kios*) inside the bazaar. Many of the *toko* traders are Chinese; the bulk of their business is inter-regional wholesale trades.

Besides the *toko* and the *kios* traders, there are many petty traders who sell commodities that meet daily needs in open stalls or on the streets in the bazaar. We call them bazaar vendors (*pedagang kaki lima*). Their customers are consumers and petty retailers such as pedlars and small grocery store (*warung*) keepers in the town and village.

Bazaar vendors do not usually deal with storable farm commodities, such as soybean, which can be handled relatively easily in large quantities, but they provide an important marketing channel for perishable commodities, both fresh (e.g., fruits) and processed (e.g., *tempe* and *tofu*).

In order to have a good understanding of local marketing of farm products, it is necessary to have a clear picture of the nature and the location of farm product processing industries. Some farm products are processed in modern factories for urban use or export, such as tapioca refineries and cigarette factories. Many farm products produced in this study area are processed by village-based industries for local needs. For example, crude tapioca and sliced tobacco for local consumption are produced in small cottage industry factories located in villages. Most operators of such industries belong to the same class as inter-village collectors in the village community and own relatively large farms.

The scale and location of soybean processing industries are different for different products. The production of *tempe* involves a very simple process and requires little capital. Its production is mainly based on family labour supplemented by a few hired labourers. A large number of such mini-sized *tempe* factories are dispersed widely in villages and towns, each supplying the demand of a small neighbouring population. Most of village-based *tempe* producers belong to the same social class as village collectors and some belong to the same social class as hamlet collectors.

The production of *tofu* requires a much larger amount of capital, and therefore is usually carried out on a much larger scale than the production of *tempe*. Unlike the mini-sized *tempe* factories, relatively large-scale *tofu* factories tend to be located in towns and supply a larger population of consumers.

Marketing channels of soybean and soybean products

Figure 3.1 illustrates how the various marketing agents described in the previous section are linked to form the network of marketing channels for soybean and soybean products. The directions of flow indicated by arrows apply only to the local harvest seasons for soybean; the direction is reversed in some cases between harvest seasons. Village collectors purchase at the bazaar soybean imported from other regions, such as East Java and Sumatra, for delivery to *tempe* producers in the village.

Marketing channels for local soybean begin with farmers. A major portion of the local product is marketed through collectors but a part is brought to bazaar traders by farmers themselves or supplied directly to *tempe* producers within the village. Two hamlet collectors and three village collectors handle soybean in the hamlet where our farm survey was conducted. Four village collectors living in other hamlets trade with farmers in this hamlet. Farmers may bring their produce to three inter-village collectors residing in a neighbouring village, which can be reached by pony wagon over about 1 km of unpaved road. There are three *tempe* producers in this hamlet and 30 altogether in Cibuyutan. These producers are potential buyers of soybean from farmers in this hamlet.

If the market for soybean within the village does not seem attractive, farmers may take their produce to the Garut bazaar, about 8 km away by minibus or pony wagon. This is not a difficult option for farmers because they and their wives frequently visit the bazaar for shopping. Some farmers report that they bring soybean to the bazaar if

the price offered by collectors is more than Rp 10/kg less than the price offered at the bazaar. Such direct access by farmers to town markets is fairly typical in Java because of the high population density, but may not be so common in the more thinly populated outer islands of Indonesia.

Although there are many marketing alternatives for soybean, it appears that farmers sell their product mainly to village collectors. According to our survey, almost 80 percent of the soybean sold by farmers surveyed was purchased by village collectors and about 90 percent by village-based middlemen, including hamlet, village and inter-village collectors (Table 3.1). The amount of soybean sold by farmers directly to bazaar traders was less than 10 percent, even though this option is open to them.

Table 3.1 Percentage distribution of soybean sales from farm producers to different marketing outlets, average of 25 sample farmers, the second crop, 1986.

Sold to	kg	Percent
Neighbour consumer	1	1
<i>Tempe</i> producer	2	2
Collector		
Hamlet collector	6	6
Village collector	81	78
Inter-village collector	5	5
Bazaar trader	9	8
Total	104	100

Soybean collected by hamlet collectors is delivered to village collectors tied by advance payments. Marketing outlets for village collectors are varied. Some of them are bound through advance payments to deliver their collection to inter-village collectors. Others specialize in providing a continuous supply to fixed-customer processors. In the latter case, payment is occasionally deferred for one day or more until *tempe* or *tofu* is produced from the soybean and sold out. Cash sale at the bazaar is always an available option.

The inter-village collectors we interviewed engage mainly in the shipment of collected soybean to traders in other districts such as Bandung and Tasikmalaya. They seldom sell to processors or market traders in Garut because they have no advantage over village collectors in local trade. Their advantage lies in bulk, long-distance trade by exploiting scale economies in transportation and communication.

It is difficult to estimate the percentage of soybean collected by village collectors that is supplied to local *tempe* and *tofu* producers and the percentage that is shipped out through inter-village collectors. However, based on our discussions with village and inter-village collectors, it appears that about half of the volume of soybean collected by village collectors is delivered to inter-village collectors and half is supplied directly to local processors. If this estimate is correct and the sample survey data in

Table 3.1 fairly represents the situation in this area, we conclude that about 40 percent of locally produced soybean is consumed locally after it is processed into *tempe* and *tofu*, and 60 percent is shipped out to other districts mainly through inter-village collectors.

As shippers of local soybean, bazaar traders have the same function as inter-village collectors, even though their territories are somewhat wider, extending as far as Cirebon and Jakarta in some cases. The role of the bazaar trader as a retailer of local soybean seems rather small. In harvest seasons, much of the demand for soybean by processors in the Garut area, in both town and village, is met by village collectors. However, the role of bazaar traders in soybean retailing is very large between harvest seasons in the Garut area, because they import soybean from other regions where it is in season. Indeed, some of the bazaar traders reported in interviews that their retail sales decline in the harvest seasons. As mentioned previously, between local harvest seasons, village collectors buy soybeans from bazaar traders to supply *tempe* producers in the village.

Marketing of soybean imported from abroad (China and the United States) is also an important part of the bazaar traders' business. Imported soybean, especially from China, is preferred for *tempe* because of its large grain size. Therefore, it is in great demand even during the local harvest seasons, when local soybean is relatively cheap. As explained in the previous chapter, about half of the volume of foreign soybean imported by BULOG is distributed through KOPTI, and the other half is distributed through a private firm (P.T. Watraco). Only a few large *toko* traders in the bazaar who have good connections with the exclusive source of wholesale supply are able to handle imported soybean.

KOPTI Garut is allocated a quota of 250 tons of imported soybean per month by BULOG, which it sells to members at a price about 5 percent lower than the market price. The lower price naturally creates an excess demand for the supply of soybean from KOPTI, which appears to be one reason for the limitation of membership. When this study was conducted, KOPTI Garut members numbered 300, about two-thirds of all *tempe* and *tofu* producers in its territory. Few small *tempe* producers in the villages are members. For example, only 4 of 30 *tempe* producers in Cibuyutan are KOPTI members.

For both *tempe* and *tofu*, small grocery stores (*warung*) provide the major retail channel. *Tempe* produced by village-based manufacturers is sold to neighbouring store keepers and consumers. Town-based *tempe* and *tofu* manufacturers sell their products mainly at the bazaar, either directly from their own stalls or through bazaar vendors. Only a small part of the volume produced is retailed at the factory. Bazaar customers are grocery store keepers as well as housewives. Early every morning, keepers (who are mostly women) of small grocery stores in town and villages come to the bazaar to look around the vending stalls, and to bargain for and buy a bundle of goods for sale in their stores that day. They usually bring back in their baskets a few pieces of *tofu*, which is not produced in the village. Soybean sold from the village through various marketing channels thus returns to the village in a processed form.

Marketing of joint farm products

In the study village and its vicinity, soybean is normally produced from a farming

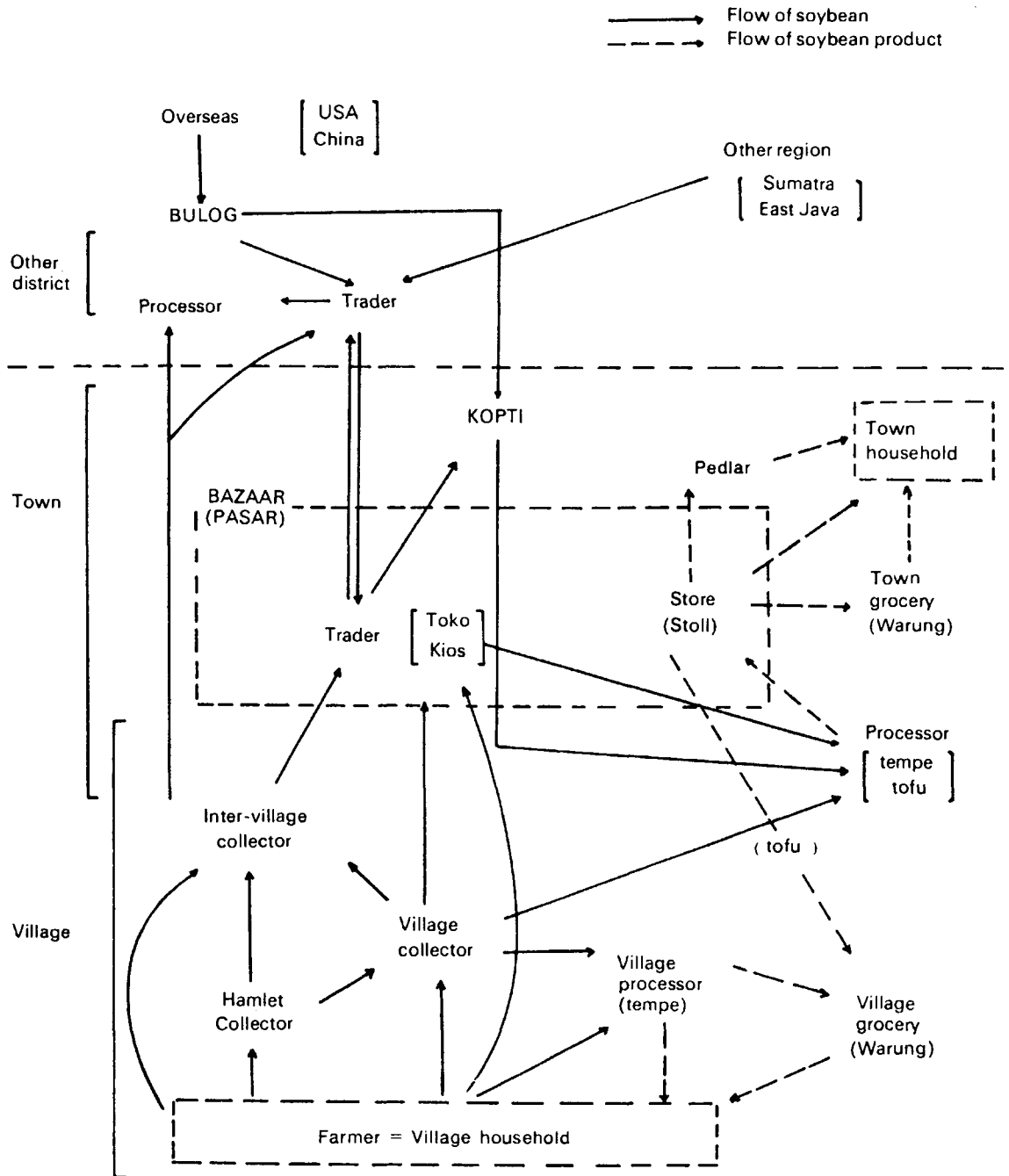


Figure 3.1 Marketing channels of soybean and soybean products.

system that combines soybean, corn, tobacco and cassava. How are these jointly produced farm products related in marketing channels?

The marketing channels for corn are illustrated in Figure 3.2. This diagram illustrates marketing channels for shelled corn only. Some corn is sold in ears at road-side stands to travellers or brought to town by pedlars. Farmers sometimes sell a standing crop to collectors, who have the crop harvested by hired labourers. This system, called *tebasan*, is practiced extensively for fruits and vegetables for which marketing requires special knowledge and skill.

A comparison of Figure 3.1 with Figure 3.2 shows that marketing channels are largely the same for shelled corn and soybean. In fact, all but two of the collectors who market soybean in Cibuyutan also market corn. The two exceptions are village collectors who specialize in the continuous supply of soybean to fixed-customer processors. Bazaar traders in Garut and other cities also handle corn and soybean together with other commodities such as mungbean, peanut and spices.

The handling by one marketing agent of joint products with different harvest seasons maximizes the use of capital and entrepreneurial ability of the middlemen. However, this advantage is not as important at the village level, where little capital is required for small transactions and middlemen conduct their business part-time and engage in farm work too. The two village collectors who specialize in soybean trade report that less than half of their time is spent on marketing activities.

Economies of scale can be a large advantage in the marketing of commodities that require similar trading skills and similar methods of handling. The quality of both corn and soybean is relatively easy to check and similar methods of transportation can be used. Tobacco and cassava are somewhat different from soybean and corn in these respects.

Marketing channels for tobacco are illustrated in Figure 3.3. Harvested tobacco leaf is sliced thinly and dried in farm households. The processed tobacco can be smoked after it is rolled by hand in thin paper or palm leaf to make a cigarette, but most of it is sold to factories for further processing. The dried material is highly storable and weighs little. Therefore, its transportation cost is low. Its quality varies greatly, however, as is reflected in prices that range from Rp 750/kg for the lowest grade to Rp 6,500/kg for the top grade at the factory gate. Because the quality is difficult to assess, few village-based middlemen who handle soybean also handle tobacco. In Cibuyutan, only one of three inter-village collectors and five of eight village collectors who handle soybean also engage in the tobacco trade. These collectors handle only low quality tobacco.

There are three village collectors who specialize in the tobacco trade and have connections with tobacco processors in other districts. They usually handle medium to high quality tobacco that command prices higher than Rp 3,000/kg. Besides these village collectors, a large number of tobacco collectors from other districts, some from as far away as East Java, come to Cibuyutan to buy sliced, dried tobacco. Because a special skill is required to assess the quality of tobacco, collectors who specialize in this commodity have an advantage. They can realize economies of scale by enlarging their territories since transportation costs are low.

The marketing channels for cassava are shown in Figure 3.4. Cassava is marketed either as fresh root or processed. Some cassava roots are marketed by pedlars for

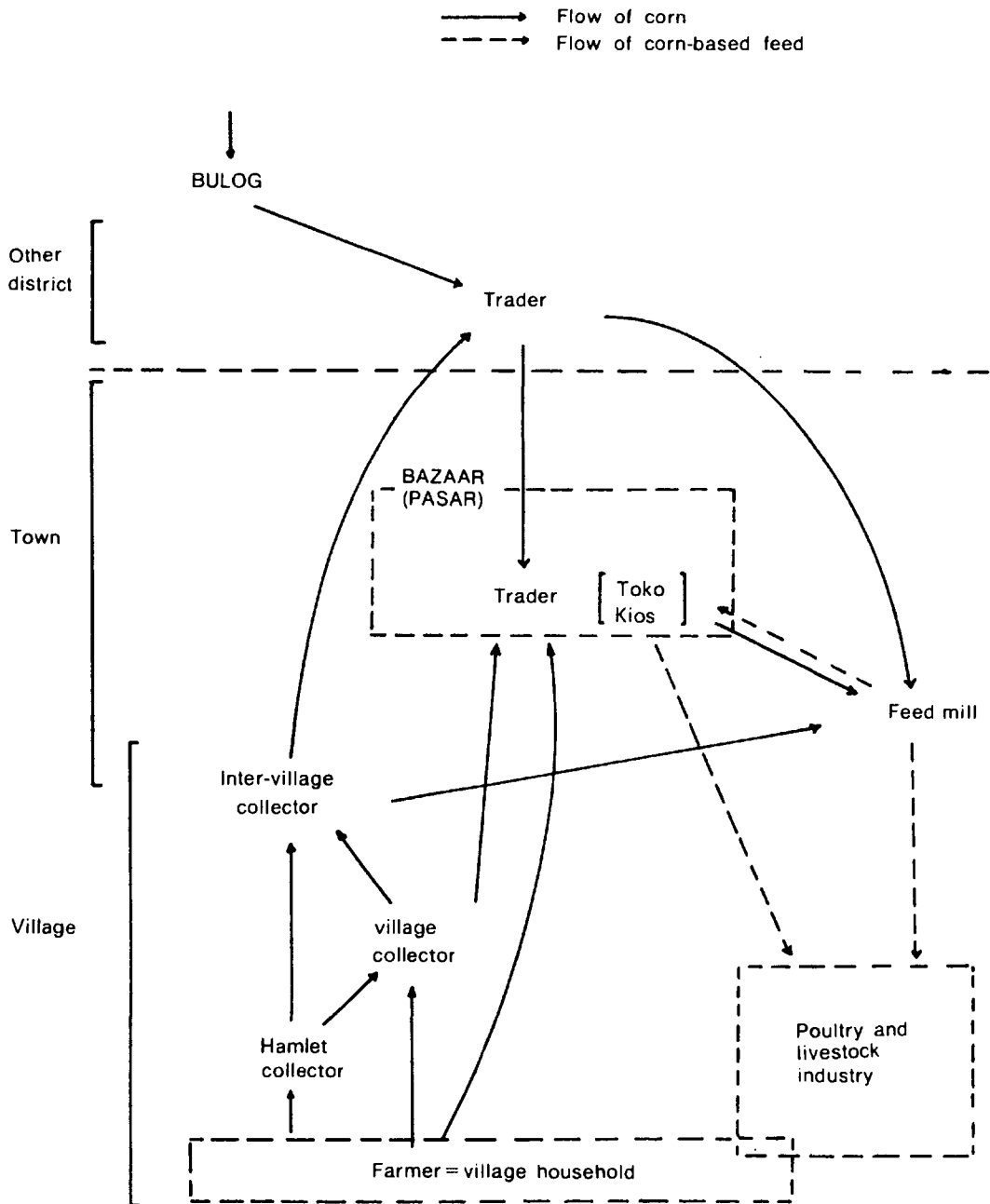


Figure 3.2 Marketing channels for corn.

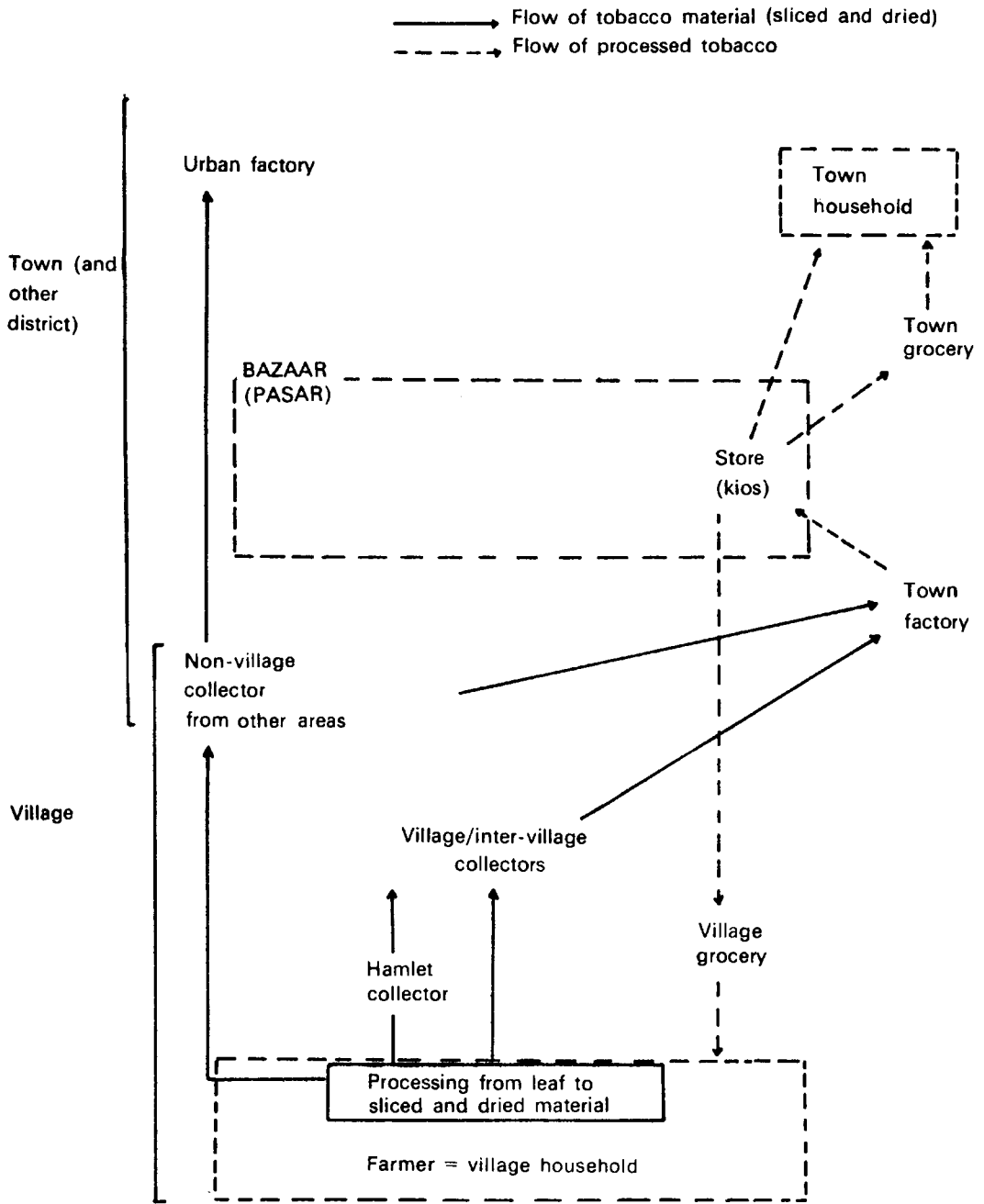


Figure 3.3 Marketing channels for tobacco.

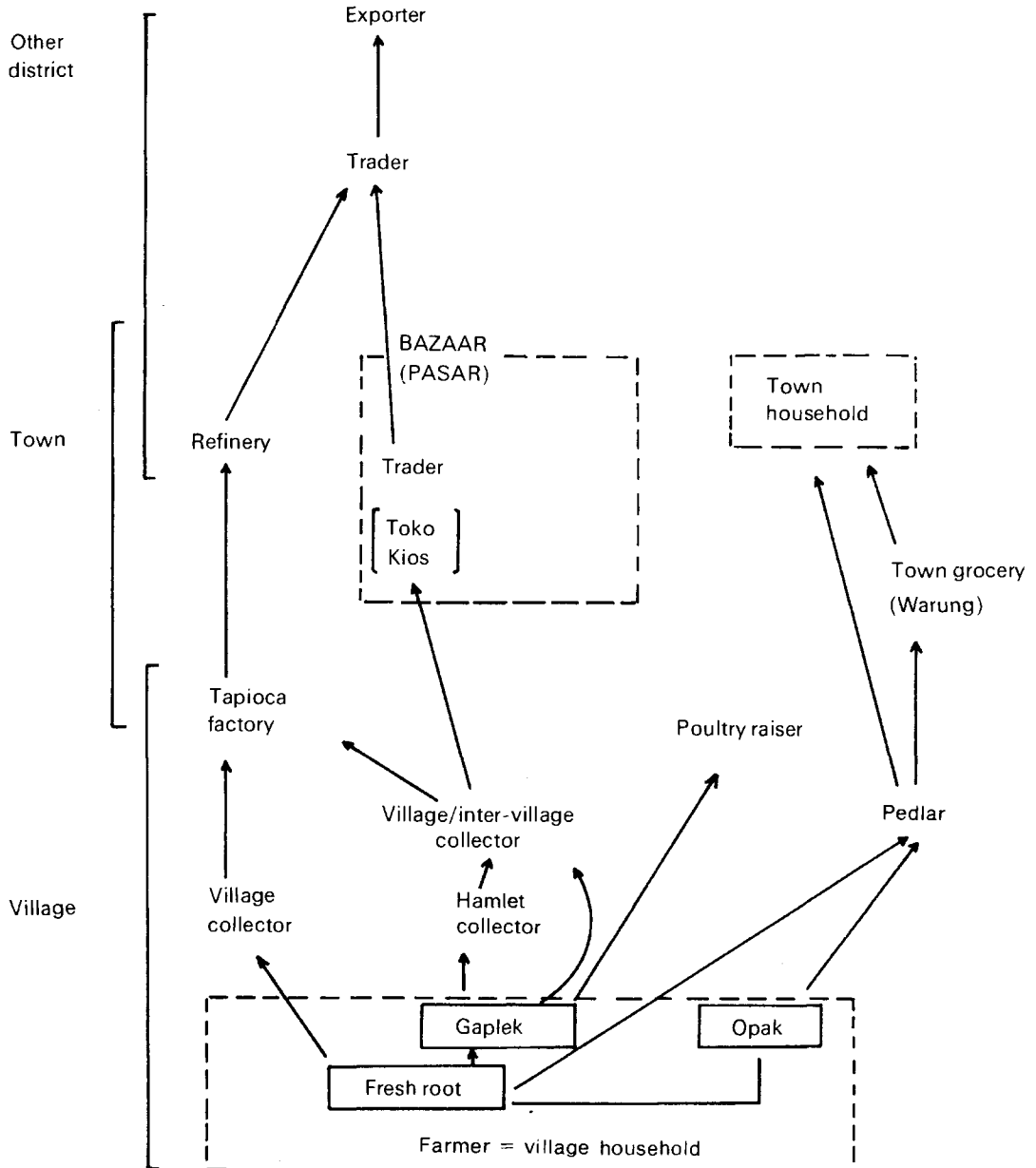


Figure 3.4 Marketing channels for cassava products.

human consumption but most are delivered to local tapioca factories. The village collectors who handle cassava root are not the same collectors who deal with soybean. We presume that this is because different skills are required. While soybean is purchased in grain form by village collectors at farmers' houses, cassava roots are purchased in the field either by the kilogram of dug root or by the plot of standing crop (*tebasan*). However, purchase by the kilogram is not very different from the *tebasan* purchase. In both cases, labourers hired by the collectors harvest the roots and peel them for marketing, and payments to farmers are made on the day of harvest or deferred for a day or so until the collectors sell the crop to tapioca factories and receive payment. The *tebasan* purchase requires an ability to estimate the quality of the crop under ground. This skill, together with the ability to organize harvesting labour, appears to underlie specialization in cassava collection at the village level. The relatively long harvest season for cassava may also encourage specialization.

Cassava is processed in farm households into *gaplek* and *opak*. *Opak* (cassava chip), which is ready to fry and is eaten as a snack, is marketed mainly by pedlars. *Gaplek* (chopped and dried cassava) is sometimes sold to duck and chicken raisers but is more often collected by village collectors for export overseas via bazaar traders and traders at ports. *Gaplek* is often handled by the same village collectors who handle fresh cassava roots. Bazaar traders who handle *gaplek* almost invariably also handle soybean and corn, but those who handle soybean and corn do not always handle *gaplek*.

It may be of interest here to consider the role of the *tebasan* system. Collier and others consider *tebasan* a new system intended to reduce labour costs in rice harvesting (Collier et al. 1973; Utami and Ihalauw 1973). They suggest that *tebasan* is a response to pressures of modernization, such as commercialization and new technologies, and that its effect has been to destroy the traditional village systems of income and work sharing. Although the Collier thesis has made *tebasan* the subject of recent debate (Hayami and Kikuchi 1981), there is no doubt that *tebasan* itself is not a new but an old system practiced in Sundanese communities for a long time to harvest perishable commodities such as fruits and vegetables. Unnevehr has recently advanced the hypothesis, with respect to the application of *tebasan* to cassava harvesting, that *tebasan* provides an economy of scale in organizing labour and transportation (Falcon et al. 1984, Chapter 6). However, since cassava is harvested by labourers organized by middlemen, whether it is purchased as *tebasan* or by the kilogram of dug root, neither of these two arrangements appears to have an economic advantage over the other. *Tebasan* is apparently preferred by farmers because it saves the cost of monitoring the harvest. In particular, it avoids the problems with middlemen who are cream skimming by selecting only the better products, or cheating on the weight of harvested crops.

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Market Structure and Trade Practice

This chapter examines the structure of the local soybean market in terms of relations between farmers and middlemen as well as among various types of middlemen. Major questions addressed are why specific trade practices and contracts are used and whether they reflect any major imperfection or inefficiency in the market.

Conditions of local marketing

First, we will try to specify the economic and technical conditions that characterize the market organization for local farm products, mainly with respect to soybean. One important market condition typical of crops grown by peasants is that producers sell the product in small amounts, which tends to increase the transaction cost per unit of product collected by middlemen. This condition is especially severe for soybean in the study area because soybean is intercropped with other crops and the per hectare yield of soybean is very low. As shown in Table 3.1, the average amount of soybean sold by one farmer for the second crop season in 1986 was only 104 kg.

On the other hand, soybean is easy to handle in bulk and therefore economies of scale can reduce the cost of transportation. For example, if 100 kg of soybean is carried from Cibuyutan to Garut bazaar by pony wagon, its transportation cost amounts to about Rp 10/kg, whereas the cost declines to Rp 5/kg if one ton is carried by a mini truck, and declines further to Rp 2.5/kg if the truck load is two tons. A major consideration in organizing soybean marketing is how to economize on the transaction costs involved in the accumulation of a large number of small lots into a large load that will enable the collector to exploit economies of scale in transportation.

A second important market condition is the scarcity of capital. It is very difficult to estimate the market rate of interest because charging interest for money lent is prohibited in an Islamic society. However, available evidence suggests that the interest rate is very high. For example, in some villages in the Subang and the Bandung districts, where interest is explicitly charged, the interest rate for one rice crop season amounted to 50 percent, implying that the annual rate is higher than 100 percent (Hayami and Kikuchi 1981, p. 200; Fujimoto 1986, p. 91). A credit arrangement called KOPIA (*Koperasi Simpan Pinjam*) is practiced commonly in this area as well as throughout Indonesia. In this arrangement, a person who borrows Rp 1,000, for example, has to pay back to the lender Rp 40 every day for one month, implying that the interest rate is higher than 20 percent per month. It does not seem unreasonable to assume that the market rate of interest for a non-collateral loan can be as high as 100 percent per year (6 percent per month) or higher, reflecting the severe scarcity of capital.

The interest rate for a collateral loan should be much lower. This rate can be estimated from rents under two different land-tenure arrangements, *sewa* and *gadai*. *Sewa* is a fixed cash rent for a year to be paid in advance at the beginning of the

contract. *Gadai* is a pawning arrangement in which a tenant deposits a lump sum of money with a landlord to establish a right to continue cultivating a certain area until the landlord pays back the deposit money. The typical *sewa* rent is Rp 500 per *bata* (0.0014 ha) per year and the *gadai* deposit is Rp 2,000 per *bata*. The land rent implicit in the *gadai* arrangement is Rp 2,000 x r where r is the interest rate for collateral loans. This rent should be in equilibrium with the *sewa* rent. Since the *sewa* rent is paid in advance of the contract period, the *sewa* rent comparable with the *gadai* rent would be Rp 500 x (1 + r). By solving the equilibrium condition:

$$2,000 r = 500 (1 + r)$$

the interest rate of a collateral loan is estimated to be 33 percent per year paid at a rate of 2.5 percent per month. The 50:50 sharecropping tenancy arrangement (*maro*) is also in common practice besides *sewa* and *gadai*.

With the high interest rates, the profit derived from any trade is lost if a large amount of capital is tied up for long time. Therefore, it is vitally important for traders to shorten the period required to recover working capital by selling commodities out as soon as possible. This consideration is important for the trade of almost all agricultural commodities because a large amount of working capital is required for their purchase during a short harvesting season. It is especially important for soybean because its price does not rise much with the passage of time after harvest, due to the import of soybeans from other regions with different harvest seasons. A rapid turnover of working capital is especially important for petty traders without collateral, such as hamlet and village collectors.

Credit tying and hierarchy among middlemen

The hierarchy of village-based middlemen, from the hamlet collectors to the inter-village collectors, may be understood as an organization geared for saving both transaction costs and working capital. For a middleman who engages in shipment of soybean from a village to distant markets, the transaction capital needed to collect an optimum amount for bulk shipment will be too high if he himself must collect the product from a large number of small farmers. It is more economical for him to consign the business to other agents whose cost of transaction with farmers is lower. Hamlet and village collectors live closer to producers than do inter-village collectors and they expend less time and effort contacting farmers and searching for available supply. Moreover, the hamlet and the village collectors have smaller assets and less education so that the opportunity cost of their labour is lower than that of the inter-village collectors.

A major constraint on the operation of village/hamlet collectors is the shortage of working capital. They say that a minimum working capital requirement for a village collector is about Rp 500,000. This is not an easy sum of money for ordinary villagers to mobilize because it is roughly equivalent to the annual income of a middle class farmer. Institutional credit from government banks such as BRI (*Bank Rakyat Indonesia*) and BPD (*Bank Pembangunan Daerah*) is difficult for collectors to obtain because it requires collateral and complicated paper work.

A device to mitigate this capital constraint is informal credit from inter-village

collectors in the form of advance payment. The period of advance payment is usually very short, rarely exceeding one week. It is typical for a hamlet collector to receive a cash advance from an inter-village collector, with which he purchases soybean from farmers and delivers it to the inter-village collector within only a day or two. No interest is charged explicitly on this short-term cash advance, nor is it observed that implicit interest is charged in the form of a discount purchase price for the inter-village collector.

It appears that the interest that is not paid by the hamlet/village collectors is a premium, absorbed by the inter-village collectors, for an assured delivery of commodities. The inter-village collectors can save transportation and transaction costs by carefully scheduling the shipment of commodities to be collected.

In general, capital costs are significantly lower for the inter-village collectors who have relatively large land assets for use as collateral. They can take advantage of their high credit worthiness by using the hamlet/village collectors to collect commodities from a large number of small farmers at modest transaction costs. This function of larger traders supplying working capital to smaller traders whose credit risk is higher is not a rare practice in the world. For example, it is commonly used by large Japanese trading companies (*Sogo Shosha*) at home and abroad. However, such an arrangement is rarely practiced between village-based middlemen and bazaar traders in Garut or in other districts, although one inter-village collector was observed to receive payment from a trader in Bandung a month or so in advance of every harvesting season, from which he financed advance payments to hamlet collectors.

Usually, a village or an inter-village collector sells his collected goods for cash to the town-based trader who offers him the highest bid. The general absence of credit tying between village-based and town-based traders may be due to the high risk of default. Inter-village collectors and hamlet/village collectors living in the same community are bound by various community ties such as mutual friends and relatives (Ben-Porath 1980). It is relatively easy for the former to force the latter to keep the terms of a contract. In contrast, it is difficult for traders in town, and especially if the town is in another district, to prevent collectors in villages from disappearing altogether with advanced money.

The hierarchy among the village-based middlemen is not so tightly structured, however, as to give monopsony power to the inter-village collectors. Although it is common for hamlet/village collectors to deliver their collections to the same inter-village collectors year after year, the possibility is always open for them to change customers. They do not often do so because terms of trade with other inter-village collectors are more or less the same while a continuous relationship with one customer has the advantage of saving transaction costs.

Although the different levels in the hierarchy of middlemen correspond to different social classes and their land assets, mobility among these levels is possible. For example, one village collector who is a tenant farmer cultivating 0.5 ha of land, sold his collection of soybean and corn to a trader in Bandung. He was able to finance working capital for collecting from the sale of his own tobacco crop, which commanded a very high price because of its high quality.

Village-based middlemen may also become bazaar traders. A *kios* trader in the Garut bazaar, who bases his business on capital amounting to about six million rupiahs, equally divided between fixed and working capital, reported that he began his

career as a village collector. It is an unanimous view among traders interviewed that capital is not a real constraint to trade success and that a trader can always find a way to finance needed capital if he is trusted by others for his honesty as well as his ability to grasp market situations.

This does not mean, of course, that there is a chance that landless hamlet collectors will be able to become inter-village collectors or that village collectors will become bazaar traders. However, it is clear that the credit tying of middlemen to inter-village traders is not a reflection of monopsony by those in the top levels of the hierarchy. The chance is even smaller for inter-village traders and bazaar traders to exercise a monopoly over supply. As explained in the previous chapter, the demand for local soybean by *tempe* and *tofu* producers is supplied mainly by village collectors. Also, there seems to be little possibility that village collectors may earn large profits from speculation and hoarding, because the capital cost of storage is very high and price variations are relatively small for soybean due to inter-regional trade and import. The source of their income is the thin margin over bulk trade with other districts or regions. A trader's income can be large if he is able to trade in volume and to take advantage of inter-regional price differences. A slight miscalculation on the price differential relative to the transportation costs may result in a large loss. A critical consideration is how to speed the turnover of working capital.

Farmers and middlemen

It is interesting to observe that, while credit tying is common among middlemen, this arrangement is not practiced between middlemen and farmers. According to our farm survey, farmers do not receive advance payments for the sale of soybean, corn and cassava, and only one of 62 transactions recorded for tobacco involved an advance payment. On the contrary, deferred payments are fairly common, especially for the sale of tobacco and cassava (*opak*), implying that farmers are lenders rather than borrowers vis a vis middlemen.

This contrast suggests that the seasonal requirement for working capital for the collection of farm products by middlemen is much larger than for farm production itself, because the income and asset position of hamlet/village collectors is no better than it is for farm producers. Farmers' credit needs are relatively small in Cibuyutan because the different crops produced from the soybean-based farming system are harvested at different times throughout the year. Short-term credit for daily needs is supplied in the form of purchase on credit or deferred payment at grocery stores, or borrowing from neighbours. On some occasions farmers mobilize working capital for the purchase of fertilizer and chemicals through the liquidation of fixed assets, for example, the sale of a goat.

Farmers are entirely free to choose to whom they sell their products. There are many alternatives, including direct sale to town traders. However, each farmer tends to sell all his crops to a single middlemen. According to our farmer survey, 77 percent of farmers sell their soybean crops to the one middleman to whom they sell their products more or less continuously. This percentage was even higher for other commodities: 91 percent for corn, 81 percent for tobacco and 100 percent for cassava, including *gaplek* and *opak*. This stability in trade relations does not seem to reflect monopsony on the part of middlemen. The terms and conditions offered by buyers are always very similar so that it is advantageous for farmers to save transaction costs by

trading with one buyer continuously.

In fact, as many as 90 percent of the farmers interviewed said that they know the bazaar prices for soybean well and felt that it is easy for them to sell their product there if they so wish. Neighbours and friends were named as the most important sources of market price information by 42 percent of farmers; 37 percent identified cross-checking with a number of middlemen; and 21 percent identified direct visits to the bazaar. This data suggests that most farmers are able to obtain fairly accurate information on market prices by relatively inexpensive means.

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Prices and Marketing Margins

This chapter assesses the competitiveness and efficiency of the local farm product market, based on prices and marketing margins. However, there are large variations in price over time and space, even within a single village. Our price observations were too few to estimate average price relations accurately, but the data presented in this chapter does illustrate price relations in a rough order of magnitude. For that purpose, figures are rounded off for the analysis.

Transportation costs

Transportation cost is a major determinant not only of marketing margin but also of marketing organization and trade practice. Therefore, before we proceed to the analysis of prices and marketing margins, we shall attempt first to estimate the costs of transportation pertaining to the marketing activities dealt with in this study.

Table 5.1 summarizes the estimates of transportation costs per kilogram of ordinary farm commodities. These estimates do not apply to some items that are

Table 5.1 Estimates of transportation costs.

Location	Assumption			Transportation cost (Rp/kg)
	Distance (km)	Transportation means	Lot size (kg)	
Within village	1	Man with pole	Up to 50	5
Village centre to highway	1	Man with pole	Up to 50	5
		Pony wagon	100 to 200	2
		Mini truck	1,000	2
Village to Garut Bazaar	8	Pony wagon	100 to 200	10
			1,000	5
			1,500	3
			2,000	2.5
Village to Bandung City	60	Mini truck	1,000	15
			1,500	10
			2,000	7.5
			2,000	10
		Large truck	4,000	5
			5,000	4

particularly troublesome to transport, such as live animals. Hauling farm products within a village (except along the main village road if it can be reached by pony wagon), is usually done by a porter with a carrying pole. The portering cost is Rp 5/kg regardless of the size of the load.

In Cibuyutan, the residence-cum-shops of inter-village collectors are located at the junction of the main village road and the national highway. Goods can be carried from the central part of the village to this junction by a porter, a pony wagon or mini

truck. One chartered trip in a pony wagon costs Rp 250, and can carry a load of up to 200 kg along with the owner of the load. The charter fee is reduced if the load is smaller. It is common for several people to ride together in a pony wagon and share the cost. On the average, the cost of chartering a pony wagon to carry goods is about Rp 2/kg.

The cost of chartering a mini truck with a gasoline engine (*colt bak*) for the same trip is about Rp 2,000. The cost of transportation is less than Rp 2/kg if the load exceeds one ton. However, loads transported from the village to the highway are usually small, and seldom exceed one ton. The unit cost of transportation on the village road by means of mini truck is not larger than that by pony wagon. On the whole, scale economies are not large for short distance transportation within the village.

The large economies of scale emerge for longer distance transportation. It costs Rp 1,000 to 2,000 to charter a pony wagon for a trip to Garut bazaar, carrying a load of 100 to 200 kg. It costs Rp 5,000 to charter a mini truck for the same trip for any load, up to the vehicle's maximum capacity of two tons. Therefore, the cost of transportation ranges from Rp 10/kg for a pony wagon carrying a load that weighs less than 200 kg, to Rp 5/kg for a mini truck carrying a one-ton load, to Rp 2.5/kg for a mini truck carrying a two-ton load. We may assume that the average transportation cost by mini truck from Cibuyutan to Garut bazaar is about Rp 3/kg.

Economies of scale are also evident for transportation to Bandung City, 60 km away from Cibuyutan. The cost of chartering a mini truck for the trip is Rp 15,000, while chartering a large truck with diesel engine (*truk besar*) costs Rp 20,000. Therefore, the unit transportation cost ranges from Rp 15/kg for a one-ton load carried by mini truck, to Rp 7.5/kg for a two-ton load carried by mini truck, and further down to Rp 4/kg for a five-ton load carried by a large truck.

If a load is transported by mini or large truck, an additional cost of Rp 1/kg in addition to the truck charter fee is usually required for loading and unloading.

Prices and marketing margins of soybean

Table 5.2 summarizes typical prices of local soybean at various points in the marketing chain.

Farmers receive Rp 570/kg if they sell their produce to hamlet or village collectors at the farm gate. They can receive Rp 10/kg more if they take their produce to the shops of inter-village collectors. However, it costs them nearly Rp 10/kg to haul soybean from their residence to the village centre and to the shops of inter-village collectors along the national highway. It is therefore clear why farmers who do not live near inter-village collectors usually sell their products to hamlet or village collectors.

Farmers who bring soybean to the bazaar traders in Garut can sell it at a price Rp 15/kg higher than the price at the farm gate. To do so, they incur an additional cost of nearly Rp 15/kg for transportation by porter to the village centre and by pony wagon to Garut. Therefore, farmers usually do not bother to take their produce to the bazaar for sale, even though this opportunity is always open to them. It is clear that the high percentage of farmers' who sell their soybean to village/hamlet collectors is not a reflection of a collectors' monopsony but rather is a natural outcome of market competition. The fact that the price difference between village and bazaar is about

equal to the transportation cost indicates that the local soybean market covering both village and town approximates perfect competition.

Marketing margins for various types of middlemen implied in the data given in Table 5.2 are calculated in Table 5.3. The marketing margins for hamlet and village collectors for the marketing channel from farmers to customers (*tempe* manufacturers or inter-village collectors) within the village are, without exception, Rp 10/kg. For this trade, Rp 5/kg is usually required for hauling soybean from the farm to the customer. The cost of hauling is covered by collectors themselves, especially in the case of hamlet collectors. Therefore, the rate of profit or net return for these middleman activities is Rp 5/kg.

Table 5.2 Typical prices of local soybean for sale by various marketing agents in the Garut district in the harvesting season, May to June 1986.

Seller	Buyer	Point of Sale	Price received by selling (Rp/kg)
Farmer	Hamlet/village collector	Farmer	570
	Inter-village collector	Inter-village collector	580
	Bazaar trader	Garut bazaar trader	585
Hamlet collector	Village/inter-village collector	Hamlet collector	580
Village collector	Village processor	Village collector	590 ^a
	Inter-village collector	Village collector	580
	Bazaar trader	Garut bazaar trader	585
Inter-village collector	Bazaar trader	Garut bazaar trader	585
	Trader in other district	Bandung bazaar trader	600
Bazaar trader	Town processor	Garut bazaar trader	590
	Trader in other district	Bandung bazaar trader	600

^aHigh-quality soybean for *tempe*, which is about Rp 10/kg higher than ordinary soybean.

If a village collector takes his collection to bazaar traders in Garut, his marketing margin increases by Rp 5/kg before deducting the additional cost of transportation. If he carries one ton to Garut by mini truck, Rp 5/kg is required. In that case, the rate of profit from his sale to bazaar traders is in equilibrium with trade with village customers. Therefore, whether he prefers to sell his collection to inter-village collectors or bazaar traders depends on whether he is able to collect more than one ton of soybean at one time under the constraint of working capital. Of course, the price spread between village and town changes day by day and there should be moments at which shipment to the bazaar is more attractive than sale within the village, even in a smaller lot.

The marketing margin for an inter-village collector is very thin if he buys from hamlet/village collectors and sells to bazaar traders in Garut. The marketing margin of Rp 5/kg is not sufficient to cover the transportation costs, including the cost of hauling the soybean collected from hamlet/village collectors to his shop in small lots and shipping it in a larger lot to Garut by mini truck. Therefore, inter-village

collectors do not usually engage in such trade. As explained in Chapter 3, the main activity of inter-village collectors is the shipping of collected goods to other districts, such as Bandung. Their profit is derived from the exploitation of scale economies associated with the long-distance trade.

Table 5.3 Marketing margins for various channels of local soybean marketing in the Garut district in the harvest season May to June 1986.

Marketing agent	Marketing channel ^a	Marketing margin (Rp) (1)	Transportation cost (Rp/kg) ^b (2)	Middlemen profit (Rp) (1) — (2)
Hamlet collector	F to IC	10	5 (man)	5
Village collector	F to VP	10	5 (man)	5
	F to IC	10	5 (man)	5
	F to BT/TP	15	8 to 10 (man & mini truck)	5 to 7
Inter-village collector	HC/VC to BT	5	5 to 7 (pony & mini truck)	-2 to 1
	HC/VC to OT	20	10 to 17 (pony & mini truck)	3 to 10
Bazaar trader	F/VC/IC to TP	5	0	5
	F/VC/IC to OT	15	10 (1.5 t/mini truck) 5 (4 t/mini truck)	5 10

^aF: Farmer; HC: Hamlet Collector; VC: Village Collector;

IC: Inter-village Collector; VP: Village processor;

^bTP: Town Processor; BT: Bazaar Trader; OT: Trader in other district.

^cEstimates of transportation cost from Table 5-1, corresponding to assumptions on transportation mean and lot size shown in parentheses.

A similar situation applies to the business of bazaar traders. If a bazaar trader ships a load of 1.5 tons of soybean by mini truck to Bandung, for example, Rp 5/kg of profit can be earned, which is the same as the profit from his local retail sale. However, if a load of four tons is carried by a large truck, the profit doubles to Rp 10/kg.

From these observations, it should be clear that petty traders such as hamlet and village collectors base their business on low transaction costs with small farmers, while larger traders, such as inter-village collectors and bazaar traders, base their business on scale economies associated with long-distance transportation.

The retail price of local soybean in the shops of bazaar traders is usually higher than the supply price from village collectors to town processors. The village collectors usually sell to processors in bulk and their supply does not always meet the processors' demand. The higher retail price at the bazaar traders' shop may be considered a premium paid to assure a continuous, small supply. Thus, the bazaar traders are only residual suppliers to town processors during the harvest season of the local crop. They become the major suppliers between harvests when imported soybean dominates the market.

Prices and marketing margins of soybean products

Table 5.4 summarizes the prices of *tempe* and *tofu* that prevailed at various points

of marketing in the study area at the time of our survey. Unlike the price of soybean itself, the prices of processed soybean products are characterized by stability over time and space.

For some reason that is difficult for us to identify, *tempe* is produced and sold in town in large pieces weighing about 900 g, whereas in the village *tempe* is sold in pieces one-tenth that size. The size difference is exactly proportional to the price difference. The price per unit of town-made *tempe* is the same as the price per unit of village-made *tempe*. The uniform price suggests that the local *tempe* market is competitive and not obstructed between village and town even though there is usually no trade of *tempe* between village and town.

Tofu produced in a factory in town is usually sold in the bazaar from a stall owned by the producer to town consumers as well as to grocery store keepers from both town and village. The retail price of *tofu* in village grocery stores is not different from that in town stores, presumably because the town groceries that sell *tofu* are located far from the bazaar, and therefore the cost of transportation is not so different from the cost of transportation to the village. In any case, it is clear that a single competitive market encompasses both village and town with respect to *tofu*.

Table 5.4 Typical prices of soybean products at various points of marketing in the Garut district, August 1986.

Product	Seller	Buyer	Sale at	Price (Rp/piece)
<i>Tempe</i>	Village processor	Village grocery	Factory	40 ^a
	Village grocery	Village consumer	Store	50 ^a
	Town processor	Town grocery	Bazaar stall	40 ^b
	Town grocery	Town consumer	Store	50 ^b
<i>Tofu</i>	Town processor	Grocery/consumer	Bazaar stall	25 ^c
	Village grocery	Village consumer	Store	30 ^c
	Town grocery	Town consumer	Store	30 ^c

^aPrice per piece of 85 to 90 g.

^bPrice per piece of 900 g divided by 10 so as to be comparable with village-made *tempe*.

^cPrice per piece of 50 g.

Comparison of marketing margins and profits among crops

Table 5.5 compares marketing margins and profits for crops produced from the soybean-based farming system in the study area. The comparison is made for the entire local marketing chain, from farm producers to end-users, without breaking down margins and profits among the various middlemen participating in the trade of each commodity.

A major characteristic of soybean marketing revealed in Table 5.5 is its low marketing margin and middleman profit relative to those of other crops. The middleman's profit rewards entrepreneurship and management ability and provides the capital needed for the middleman's activities. Absolute margins and profits are the same between soybean and corn, reflecting their physical similarities in handling, storing, and quality assessment.

Gaplek is similar to soybean and corn in this respect. However, the rates of margin and profit relative to the price paid by end-users are lowest for soybean. The

low rate of middleman profit (as low as 1 percent) seems to reflect the highly competitive nature of the local soybean market as well as the relative ease of quality assessment and handling.

Table 5.5 Comparison of marketing margins and profits among crops produced from the soybean-based farming system.

	Price (Rp/kg)		Marketing margin		Transportation cost	Middleman profit	
	Farm gate	Retail/factory ^a	(Rp/kg)	Percent	(Rp/kg)	(Rp/kg)	Percent
	(1)	(2)	(3) = (2) - (1)	(4) = (3) / (2)	(5)	(6) = (3) - (5)	(7) = (6) / (2)
Soybean	570	585	15	3	10	5	1
Corn	100	115	15	13	10	5	4
Tobacco ^b	3,000	3,500	500	17	15	485	14
Cassava							
Fresh	30	55	25	45	22 ^c	3	5
<i>Gaplek</i>	80	100	20	20	15	5	5
<i>Opak</i>	250	400	150	38	35	115	29
						(75) ^d	(19) ^d

^aRetail price at Garut bazaar for soybean and corn; local factory/feed mill-gate price for tobacco, fresh cassava root and *gaplek*; and pedlars' retail price at urban household gate.

^bMedium quality tobacco material (sliced and dried).

^cIncludes harvesting cost.

^dProfit after deducting the implicit wage of pedlar's labour imputed by a standard wage rate of female farm work (Rp 600/day).

In contrast, marketing margins are very high for perishable commodities such as fresh cassava root and *opak*. We observed that perishable commodities such as fruits and vegetables are characterized by a high marketing margin in general.

The high marketing margin of fresh cassava root is, to a large extent, explained by the inclusion of the harvesting cost paid by middlemen in the purchase of fresh root in the fields, as explained in Chapter 3. Indeed, the rate of profit, after deducting the harvest and transportation costs, is not so different from those for corn and *gaplek*.

The marketing margin of *opak* is very high, reflecting high labour intensity and high transaction costs involved in peddling this product door-to-door. The unit cost of transportation is also high for *opak* because a pedlar has to pay a minibus fare not only for her load but also for herself (Rp 500 for a round trip to town with a basket load of about 15 kg). However, the middleman's profit, after deducting the imputed cost of the pedlar's labour and transportation, remains much higher for *opak* than for other commodities, except tobacco. The large middleman profit for *opak* seems to reflect the high transaction costs for a pedlar to establish and maintain the patronage of regular customers while minimizing the risk of default on payment advanced to them through day-by-day sale on credit.

Both the marketing margin and the profit margin are high for tobacco, too. The high rate of middleman profit reflects the special skill required for assessing the quality of dried tobacco material.

Altogether, it appears that the differences in the absolute level of middleman profit among these crops can be explained largely by differences in risk and transaction costs involved in their marketing, without resort to market imperfections.

Production Structure of Processing Industries

This chapter analyses the production structure of local industries that engage in the processing of crops produced from the soybean-based farming system in the study area. The production structure is analysed mainly in terms of relations among input, output, income and profit.

Stages of farm product processing

Activities for processing farm products at the local level may be classified into three stages. First, some crops are processed by farm producers themselves at home. These activities by farmers and their family members to process their own farm products are referred to here as home processing. Home processing activities in the study village include the manufacture of sliced and dried tobacco material from leaf, and of *gaplek* and *opak* from fresh cassava root.

The activities of processing purchased materials at home or in a small workshop attached to the home, based mainly on family labour, are referred to here as cottage industries. A typical example of the cottage industry in this study area is the manufacture of *tempe*.

The local processing of farm products is also carried out by small to medium-scale manufacturing firms. These are referred to here as local factories. Local factories usually use hired labour, with the number of workers typically less than a dozen, but family labour is also used extensively. Some local factories consume raw agricultural materials, such as soybean, which is processed into *tofu*. Others consume home-processed materials, such as sliced-dried tobacco material. As explained in Chapter 3, many local factories are located in villages and their operators often own and operate farms as well as factories.

Home processing

Production structures of the home processing of tobacco and cassava are summarized in Table 6.1. The upper section presents the data on output, input and prices. The lower section estimates income and profit from the processing activities expressed per kilogram of raw material processed.

The data for tobacco in the first column of the table refer to the case of a husband and a wife working together to slice and dry 70 kg of tobacco leaf into 10 kg of dried material in 10 days. For the sake of comparison with the production of other crops, the output and input per day are given. Cutting tobacco leaf into thin slices with a large blade is an arduous task that is usually done by males. Sorting and arranging sliced tobacco for drying in the sun is a task usually done by females. To estimate the cost of family labour, we have used an average wage rate of Rp 150 per hour for the husband and wife together, based on typical wage rates for hired farm work (Rp 1,200 per day for males and Rp 600 per day for females, assuming six hours of work per day).

Table 6.1 Production structure of home processing of tobacco and cassava at producers' households.

	Tobacco (leaf to dried material)	Cassava root to	
		<i>Gaplek</i>	<i>Opak</i>
Output, input and price			
(1) Output (kg/day)	1	20	5
(2) Raw material input (kg/day)	7	40	16
(3) Labour input (hr/day)	8	4	6
(4) Conversion factor (1) / (2)	0.14	0.5	0.31
(5) Labour coefficient (3) / (4)	1.1	0.1	0.38
(6) Product price (Rp/kg)	3,000	80	250
(7) Wage rate (Rp/hr)	150 ^a	100 ^b	100 ^b
Rp/kg of raw material			
Income and profit			
(8) Raw material input	240	30	30
(9) Other current input	10	0	5
(10) Product (4) x (6)	420	40	78
(11) Value-added (10)-(8)-(9) (Value-added ratio %)	170	10	43
(11) / (10)	(40)	(25)	(55)
(12) Labour income (5) x (7) (Labour's share %) (12) / (11)	165 (97)	10 (100)	38 (88)
(13) Processor profit (11)-(12) (Profit rate %) (13) / (10)	5 (1)	0 (0)	5 (6)

^a Average of male and female wage rates.

^b Female wage rate.

Given the conversion factor of 7 kg of leaf to 1 kg of dried material, the value of the dried material produced from 1 kg of leaf is estimated as Rp 420 (row 10, Table 6.1). Gross value-added from the home processing of tobacco leaf is obtained by subtracting the costs of raw material and other current inputs from the product value. This gross value amounts to Rp 170/kg and the value-added ratio is 40 percent (row 11), implying that 40 percent of the market value of dried tobacco material is farmers' income from home processing. Labour's share of this income (measured by comparing the estimated cost of family labour to the total income from the processing activity) is as high as 97 percent (row 12), reflecting the highly labour-intensive nature of home processing. On the other hand, the processor profit, which measures the return for entrepreneurial and managerial ability as well as for capital used for the home processing, is negligibly small both in absolute terms and relative to the product value (row 13). Furthermore, a significant portion of the processor profit must be discounted for the high rate of capital depreciation of cutting blades.

The second and third columns in Table 6.1 refer to the cases in which a farmer's wife alone engages in processing fresh cassava root for *gaplek* and *opak*. The process to make *gaplek* is simple – peeling, chopping and sun drying – and requires little capital or special skill. These characteristics of the *gaplek* production process are reflected in a relatively low value-added ratio and a labour share as high as 100 percent.

Making *opak* involves a more complicated process than making *gaplek*. It requires four times more labour per unit of cassava root processed (row 5). Moreover, special

skills are needed to mix ground and steamed cassava with several ingredients such as oil, salt and spices. These production characteristics are reflected in a value-added ratio and profit rate that are higher for *opak* than for *gapek*.

Cottage industry

The production structure of tempe manufacturing, a typical example of cottage industries, is described by the data presented in the first column of Table 6.2. These data pertain to a case in which a farmer's wife engages in the business alone, with only occasional aid from other family members.

Table 6.2 Production structure of soybean processing industries.

	<i>Tempe</i>	<i>Tofu</i>
Output, input and price		
(1) Output (kg/day)	17	150
(2) Raw material input (kg/day)	10	100
(3) Labour input (hr/day)	8	40
(4) Conversion factor (1) / (2)	1.7	1.5
(5) Labour coefficient (3) / (2)	0.8	0.4
(6) Product price (Rp/kg)	440	500
(7) Wage rate (Rp/hr)	100 ^a	150 ^b
Rp/kg of raw material		
Income and profit		
(8) Raw Material input	590	585
(9) Other current input	60	60
(10) Product (4) x (6)	748	750
(11) Value-added (10)-(8)-(9)	98	105
(Value-added ratio %) (11) / (10)	(13)	(14)
(12) Labour income (5) x (7)	80	60
(Labour's share %) (12) / (11)	(82)	(57)
(13) Processor profit (11)-(12)	16	45
(Profit rate %) (13)/(10)	(2)	(6)

^aFemale wage rate.

^bAverage of male and female wage rates.

Compared with the home processing of tobacco and cassava, *tempe* manufacturing has very low value-added ratio. This low ratio may not be characteristic of cottage industries but rather of soybean processing, because the value-added ratio for *tempe* is about the same as for *tofu*.

While the value-added ratio is lower, labour's share of income produced from the *tempe* manufacturing does not differ greatly from that of home-processed tobacco and cassava. This seems to reflect the fact that cottage industries and home processing are both highly labour-intensive. It appears that both the home processing and the cottage industries supplement farm household income by increasing the rate of utilization of family labour. Family members engaged in these activities receive incomes about equal to those engaged in farm work.

Local factory

The data pertaining to the production structure of *tofu* manufacture as an example of local factories are presented in the second column of Table 6.2. These data refer to

the case in which four hired workers (two males and two females) are employed. Its scale of operation as measured by the daily volume of soybean processed, is ten times that of *tempe* (row 2).

Compared with cottage industries and home processing, local factories have production structures that are characterized by higher capital intensity and a lower labour intensity. This difference is illustrated by the example in Table 6.2 in which the labour coefficient for *tofu* is only half that of *tempe* (row 5) and labour's share for *tofu* is significantly lower than that for *tempe*.

Tobacco and tapioca factories have characteristics that are similar to local factories. In Table 6.3 the data for tobacco pertains to a factory with six male hired workers that engages in reprocessing the home-processed dried tobacco material. The data for tapioca pertains to a factory with 11 employees that processes fresh cassava root into crude tapioca.

Table 6.3 Production structure of local tobacco and tapioca industries.

	Tobacco	Tapioca
Output, input and price		
(1) Output (kg/day)	50	2,500
(2) Raw material input (kg/day)	50	10,000
(3) Labour input (hr/day)	55	100
(4) Conversion factor (1) / (2)	1	0.25
(5) Labour coefficient (3) / (2)	1.1	0.01
(6) Product price (Rp/kg)	4000	240
(7) Wage rate (Rp/hr)	200 ^a	150 ^b
Rp/kg of raw material		
Income and profit		
(8) Raw material input	3,500	55
(9) Other current input	130	2
(10) Product (4) x (6)	4,000	60
(11) Value-added (10)-(8)-(9)	370	3
(Value-added ratio %) (11) / (10)	(9)	(5)
(12) Labour income (5) x (7)	220	1.5
(Labour's share %) (12) / (11)	(59)	(50)
(13) Processor profit (11)-(12)	150	1.5
(Profit rate %) (13) / (10)	(4)	(3)

^aMale wage rate.

^bAverage of male and female wage rates.

In both cases the value-added ratio is even lower than that for *tofu*, and labour's share is about the same (within a range of 10 percent). Even though the profit rate itself is not very high, total profit or income accruing to the owners/operators of these factories is fairly large. The average profits per day, calculated by multiplying unit processor profits by the quantities of raw material input (row 2 x row 13), are: Rp 4,500 for *tofu*, Rp 7,500 for tobacco and Rp 15,000 for tapioca.

The large profit per day for tapioca production does not necessarily mean that the operator of the tapioca factory is wealthier than owners of other local factories, because the tapioca processing is limited to the cassava harvesting season (July to September) and the factory stands idle in other months. In contrast, the *tofu* factory can operate throughout the year, because it can use soybean imported from other regions or abroad between local harvest seasons for soybean.

The tobacco factory is also not limited to the harvest season because the dried tobacco material can be stored for a long time. However, tobacco production involves a high cost of working capital to maintain a stock sufficient for the year-round operation.

Although fair estimates of income are difficult to obtain, it appears that net incomes rewarding the entrepreneurial and managerial abilities of factory owners/operators may not vary much among the local factories producing different commodities. For example, if we tentatively assume that both the *tofu* and the tobacco factories operate 300 days per year while the tapioca factory operates only 80 days per year, and that the cost of working capital is 20 percent of total gross profit in the case of *tofu* and tapioca and 50 percent in the case of tobacco, the net profit (after deducting the cost of working capital) amounts to about one million rupiah per year in all three cases.

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Income and Employment Generation

This chapter addresses itself to the question of how much income and employment are generated from the marketing and processing of agricultural products, in addition to income and employment from farm production itself. The calculation is limited to the case of soybean, for which necessary data is available.

Method and assumptions

First we estimate the income and the employment generated from farm production of soybean per hectare, and then estimate how much income and employment are added in processing the farm-produced soybean and in marketing the soybean from farms to factories and the soybean products from factories to consumers. In this calculation, transportation is included in marketing. Income is measured in terms of value-added (gross output value minus current input cost). In addition to the total value-added, an estimation is made of labour income or the part of value-added that accrues to labour.

As we noted in Chapter 3, there are various channels for soybean marketing and processing. For the purpose of illustration, calculations in this study are made for the following two cases:

- Case 1 : assumes that soybean produced on the farm are delivered to *tempe* producers within the same village through village collectors, and that the *tempe* produced there is sold to consumers through village grocery stores.
- Case 2 : assumes that soybean produced on the farm are delivered to *tofu* producers in town through village collectors, and that the *tofu* produced there is sold to consumers through grocery stores either in the town or the village.

Calculations are made based on the first crop (September to January) and the second crop (February to June) of soybean in 1985/1986. The income and the employment to be generated from marketing in cases 1 and 2 above are lower than for soybean that are collected by village collectors, shipped by inter-village collectors or bazaar traders to other districts (e.g., Bandung) and processed there. Therefore, the calculations in this study estimate the lower values for contributions of soybean marketing to income and employment generation.

Farm production data will be explained in the next section. Most of the data necessary for the analysis of marketing and processing are presented in chapters 5 and 6. Total value-added, labour income and employment generated from processing soybean produced per hectare into *tempe* and *tofu* can be estimated simply by multiplying the quantity produced on a farm by value-added and labour income per kg of soybean processed (rows 11 and 12) and by the labour coefficient (row 5) in Table 6.2.

Similarly, total value-added per hectare from the marketing of soybean can be estimated by using the marketing margins of village collectors in Table 5.3, after deducting the cost of fuel and oil for truck transportation, which is assumed to be Rp 1/kg of soybean delivered to *tofu* processors in the town of Garut. A major problem is the lack of data on labour inputs in marketing activities. Because the number of hours middlemen work is difficult to measure directly, it is estimated indirectly by dividing the middleman's income by the standard wage rates for hired farm work; the male wage rate of Rp 1200 per day is applied to the income of village collectors and the female wage rate of Rp 600 per day is applied to the income of grocery store keepers. This calculation may slightly underestimate the number of days of labour because not all the village collectors are male while virtually all the store keepers are female.

This method of estimating the labour inputs assumes that the village collectors and the grocery store keepers are earning an average income per hour of marketing activities at a rate equivalent to that of farm work; this is not an unrealistic assumption because petty traders are themselves farmers or farm labourers (or their family members are) and they engage part-time in middleman activities.

Table 7.1 Output and inputs in the farm production of soybean, per hectare of harvested area, average of sample farms for first and the second crops, 1984/1985.

	1st season		2nd season		Total
	Quantity (kg/ha)	Value (Rp 1000/ha)	Quantity (kg/ha)	Value (Rp 1000/ha)	Value (Rp 1000/ha)
Output	536	306	357	203	509
Current input					
Seed	42	26	36	22	47
Fertilizer					
Urea	70	7	104	10	17
TSP	12	1	20	2	3
Labour input	(hr/ha)		(hr/ha)		
Hired					
male	219	44	70	14	58
female	183	18	127	13	31
Family					
male	192	38	363	73	111
female	151	15	162	16	31
Total	745	115	722	116	231

Farm production costs and returns

Input and output data for the farm production of soybean are presented in Table 7.1. This data was obtained from farm records kept for another research project (SFSI). In the original farm records, labour inputs for soybean were not separated from those for corn as they were planted together in the soybean-based farming system. For this study, they are separated in proportion to their shares in output

value. A problem is that soybean yields per hectare in 1985/1986 were abnormally low due to drought and pests. The use of this yield data results in a serious underestimation of income from farm production relative to those from marketing and processing. For this study, therefore, the yields in a previous year that are considered fairly normal are used in order to illustrate relationships under normal conditions.

Farm production costs and returns for soybean calculated from the input-output data in Table 7.1 are presented in Table 7.2. It is estimated that total value-added from soybean production per hectare per year was Rp 441,000, of which about a half is the return to labour. This is a reasonable result considering that share cropping — 50:50 sharing of output and current input costs (*maro*) — is commonly practiced in this area. It should be noted that the income from soybean production as estimated in Table 7.2 is only a part of the total income from the land in 1984/1985 because other crops were intercropped with soybean.

Table 7.2 Farm production costs and returns for soybean, per hectare of harvested area, average of sample farms for the first and second crops, 1984/85.

	1st season	2nd season	Total (Rp 1,000/ha)
Output (1)	306	203	509
Current input (Rp 1,000/ha)			
Seed	26	22	48
Fertilizer	8	12	20
Total (2)	34	34	68
Value-added (3) = (2)-(1)			441
(Value-added ratio %) (3)/(1)			(87)
Labour income (4)			231
(Labour income share %) (4) / (3)			(52)
Labour employment (days/ha)			245 ^a

^a Assume 6-hour work day.

Note: Total labour employment, including both family and hired labour, is estimated as 245 days per hectare per year, assuming an average 6-hour work day.

Total income and employment from soybean-related activities

The method and data explained in previous sections are put together to estimate total income and employment generated from all economic activities associated with soybean, including farm production, processing and marketing. The results are shown in Table 7.3.

The estimates are made for the cases of *tempe* manufacturing in the village (Case 1) and *tofu* manufacturing in town (Case 2). In addition, simple averages are calculated without precise information on the allocation of locally produced soybean between the uses for *tempe* and *tofu*.

For both *tempe* and *tofu*, total value-added per hectare per year was about Rp 700,000, of which about two-thirds was produced on the farm and the rest was added in processing and marketing. The results imply that income from soybean of people in

villages and towns in the Garut district would have been smaller by about one-third if marketing and processing activities had not been developed. It is remarkable to see that the contribution of marketing to local income was more than twice as large as that of processing, despite the fact that the method of calculation used has a bias which underestimates the contribution of marketing.

Table 7.3 Income and employment generation from soybean production, processing and marketing, per hectare of harvested area, for the first and second crops, 1985/1986.

	Case 1 <i>Tempe</i>		Case 2 <i>Tofu</i>		Case 3 Average	
	Rp 1000/ha (%)					
Value-added						
Farm production	441	(62)	441	(65)	441	(64)
Processing	89	(13)	94	(14)	92	(13)
Marketing ^a	178	(25)	146	(21)	162	(23)
Total	708	(100)	681	(100)	695	(100)
Labour income						
Farm production	231	(48)	231	(54)	231	(51)
Processing	71	(15)	54	(13)	63	(14)
Marketing	178	(37)	143	(33)	160	(35)
Total	480	(100)	428	(100)	454	(100)
(Labour's share %) ^b		(68)		(63)		(65)
	days/ha (%)					
Labour employment ^c						
Farm production	245	(38)	245	(46)	245	(41)
Processing	119	(18)	60	(11)	90	(15)
Marketing ^a	289	(44)	227	(43)	258	(44)
Total	653	(100)	532	(100)	593	(100)

^aIncludes transportation.

^bTotal labour income divided by total value-added.

^cAssumes a 6-hour work day.

The relative contributions of marketing and processing to labour income and employment were even greater than those to total value-added. Their contributions to labour income were higher than 50 percent and higher than 60 percent to employment in the case of *tempe* manufacturing. These results reflect the highly labour-intensive nature of marketing and processing activities at the village level. The contributions of processing were somewhat smaller in the case of *tofu* manufacturing, reflecting a higher capital intensity in *tofu* than in *tempe* production. The fact that the contribution of marketing and processing to employment was higher than their contribution to labour income reflects the more intensive use of female labour in these activities than in farm production.

These findings with respect to soybean suggest a critically important role for farm product processing and marketing activities in generating income in local communities as well as their important role in equalizing income distribution by increasing employment and the share of income accruing to labour, especially to females whose opportunity cost is lower. The possibility is demonstrated that the development of processing and marketing activities may be used as a means to alleviate poverty and inequality in the local sector of developing economies.

Conclusions

This study attempted an in depth investigation into local marketing and processing of soybean and other upland crops in Indonesia as an example of informal-sector activities in developing economies. One of the major objectives was to examine the structure of local markets to identify whether major imperfections or inefficiencies exist, and to determine whether the present marketing system is a bottleneck to agricultural and rural development. Another objective was to measure the contribution of marketing and processing activities to the generation of income and employment in local economies.

This study was limited to a small area in West Java. A sample survey of farmers was conducted in one upland village in the study region to identify the marketing outlets for their products. Middlemen whose activities form links in the marketing chain from farmers to processors and from processors to consumers were interviewed, and data was collected on prices, transportation costs, trade practices and contracts. Finally, a survey of processors was conducted in order to estimate how much income and employment are contributed by the processing activities.

Summary of findings

Major findings of this study are the following:

A division of labour in the local marketing of agricultural products is observed between small middlemen who live in villages and collect farm products little-by-little from neighbouring farmers, and larger traders who engage in the shipment of the commodities collected by the village-level middlemen to other districts. It is common that the latter advances credit to the former to assure delivery of the collected commodities for shipment.

The hierarchical division of labour stems from 1) scale economies in transportation, 2) differences in labour opportunity costs and 3) differences in financial positions. Large traders need to collect commodities into a lot sufficiently large to exploit the scale economies for long-distance transportation of bulk commodities like soybean. It is economical for them to let small middlemen with lower labour opportunity costs collect from small farmers in small amounts. Indeed, small collectors are themselves small farmers or agricultural labourers trading these commodities in their spare time. On the other hand, large traders own real assets such as land and buildings that can be used as collateral. Therefore, their credit cost is substantially lower than for small collectors with no collateral. Usually, interest is not explicitly charged on the trade credit, according to regulations in the Islamic society. The interest foregone is considered a premium for the assured delivery of collected goods that enables large traders to schedule shipment in large lots.

While credit tying is common among middlemen, it is seldom practiced between middlemen and farmers. This is partly because the financial position of village-based

middlemen is no better than that of farmers and partly because the farmers' need for credit is relatively small in this area because upland crops planted in an intercropping system are harvested one by one fairly continuously over a year.

Despite the hierarchical organization among middlemen tied by trade credit, there is no sign of monopolistic pricing. Price differences among various points in marketing chains can be explained by transportation costs. These observations are consistent with the hypothesis that the local soybean market approximates perfect competition.

There are many options open for farmers to sell their products, including direct delivery to processors and direct sale at town bazaars. However, there is a strong tendency for each farmer to continue to sell his product to the same middleman. This fixity in trade relations does not reflect any monopsony power exercised by middlemen. Instead, the terms and conditions offered by alternative buyers are very similar so that it is advantageous for farmers to save transaction costs by trading with one buyer continuously. In general, farmers have good knowledge of prices and other conditions prevailing in the market.

Small middlemen and large traders of soybean are not much involved in hoarding and speculation because seasonal price variations are flattened out by extensive soybean trade among regions with different cropping seasons within Indonesia as well as year-round availability of imported soybean. Moreover the cost of storage is high because of the high capital cost. Traders try to increase profit by enlarging their trade volume within the thin margin resulting from scale economies in transportation and inter-regional price differences.

The two most popular soybean foods in Indonesia, *tempe* and *tofu*, are produced in different ways. Typically, *tempe* manufacturing is a cottage industry based mainly on family labour and geared for the demand of a small neighbouring population. Many *tempe* manufactures are located in villages and operate as a side business for small and middle-sized farmers. They use a highly labour-intensive technology, and therefore the share of labour income in the total value-added from *tempe* production is as high as 80 percent. In contrast, the manufacture of *tofu* is usually located in town and operated as a small factory with several hired workers. Its labour income share amounts to about 60 percent.

Tempe and *tofu* are retailed mainly through small grocery stores that are usually operated by housewives in their own residences. Village groceries run by farmers' wives are supplied with *tempe* from the producers located in the village. These women purchase *tofu* at the bazaar in town and carry it back to the village in baskets. The fact that *tempe* and *tofu* prices are uniform at the wholesale level as well as at the retail level indicates a highly competitive market.

Agricultural product processing activities at the local level can be classified into three categories. In the first category is home processing by farmers and their families (for example, the processing of cassava into *opak* and *gaplek*). The second category contains cottage industries, for which agricultural materials are purchased but are processed mainly by family labour, (for example, the processing of *tempe* from soybean). The third category contains small factories in which a few hired labourers engage in agricultural processing (for example, the manufacture of *tofu* and crude tapioca). These three categories of local processing industries are all characterized by intensive use of labour relative to capital. In the first two categories, income shares for labour were found to range from 80 percent to 100 percent.

The estimation of total income generated from all the economic activities associated with local soybean production shows that about two-thirds of the total income is produced on the farm and the remaining one-third is generated from marketing and processing activities. The contributions of marketing and processing to labour income and employment are even greater 50 percent and 60 percent respectively reflecting the highly labour-intensive nature of these activities.

Policy implications

The local market for agricultural products in Indonesia, exemplified by soybean and soybean products in a small region of West Java, was found to approximate perfect competition. The marketing and processing system seems to work efficiently by making intensive use of local inputs, especially of labour having a low opportunity cost, and by minimizing the cost of capital needed for transportation and storage. Middlemen were not found to be exploiting peasants through the practice of monopsonistic pricing and usury.

These findings imply that government intervention in this market through controls on prices and profits, if attempted, will likely result in serious losses in social and economic efficiency. If a policy attempts to substitute the present system with a modern system that requires a more intensive use of capital, it not only would reduce efficiency but may significantly impair equity as it would reduce labour income and employment. Policy efforts in this direction should be delayed until overall economic development reaches a stage in which the real wage rate begins to rise sharply and devices that save labour becomes socially beneficial.

This conclusion does not mean, however, that government can do nothing to improve the existing system of marketing and processing. A wide scope exists to reduce transportation costs through government investment in roads and highways. Moreover, given that scale economies are associated with the activities of middlemen in searching for supplies, negotiating contracts and arranging transportation, the unit marketing cost would be reduced significantly if the marketable surplus per farm were increased. Therefore, government investments in agricultural research and extension geared for increasing crop yield and marketable surplus will reduce marketing costs. Inefficiency in agricultural marketing has often been blamed as an obstacle to increasing agricultural productivity. However, low agricultural productivity is probably the major impediment to improving market efficiency. Similarly, a wide range of government assistance for industrial research and extension would reduce the cost of processing farm products.

It has been argued that government intervention in the market is necessary to prevent volatile price fluctuations. However, private trades among regions with different crop seasons in Indonesia have proved to be highly effective in reducing seasonal price variations. Price stability from year to year can also be achieved easily at a modest cost by controlling the import of soybean, without resorting to intervention in domestic marketing channels. This is particularly true for soybean in Indonesia because a significant share of the soybean consumed domestically is imported. The present distribution system for imported soybean that is channeled from BULOG through either KOPTI or an exclusive private trader may need to be re-examined in this light.

Future research agenda

Conclusions from the results of this study are drawn with reservation for several reasons. First, the study covered only one small region in West Java. For example, the highly competitive structure of the market in this area might be due to the relatively direct access of farmers to customers in town. The situation might be different in more remote areas such as new settlements in the outer islands of Indonesia. In such areas, middlemen might have a monopsonistic power if farmers cannot sell their products directly to urban customers. As well, where the farming system is a monoculture, farmers' credit demand for subsistence during a lean season may give middlemen monopoly/monopsony power. Therefore, small studies of this type must be conducted in other areas with different agronomic and socio-economic conditions before policy relevant to Indonesia or developing economies in Asia in general can be established.

Second, although efforts were made to investigate the relationships among various commodities produced from the soybean-based farming system, information collected on the products other than soybean was not sufficiently thorough to enable an integrated analysis of CGPRT-based economies. Further efforts to collect data on these other products are needed as a basis for a comprehensive policy for rural development in upland areas.

Third, information collected on processing was less satisfactory than that collected on marketing. For example, the sample of processors was too small to estimate whether the processing activities are characterized by scale economies. The study did not investigate the relationship between the local industries covered in this study such as crude tapioca manufacturers, and the large scale urban factories, such as tapioca refineries, not covered in this study. Investigations into these problems remain on the research agenda in the future.

Finally, this investigation into local markets must be complemented by an analysis of inter-regional trade within the national economy as well as of international trade linkages.

Appendix A

CGPRT Marketing and Processing Survey (August to September 1986).

Farmer Survey Form

Date:

Name:

Address:

I. Production and disposition

Soybean Tobacco Corn Cassava Papaya

Total output

Payment in kind:

Rent

Wage

Other

Total

Receipt in kind:

Rent

Wage

Other

Total

Reserve home use

future sale

Sold:

At village (for millage consumption)

At outside village (for outside supply)

II. Sale at village (by transaction)

Crop	Buyer ^a	How many days after harvest ^b	Quantity (unit:kg)	Price (Rp/kg) ^c	Payment condition ^d	Credit tying		Buyer characteristics	
						Period	Interest rate	Personal tie ^e	Frequency of trade ^f
1.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
5.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
6.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____
7.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____

^aHM = hamlet middleman; VM = village middleman; IV = inter-village middleman; P = pedlar; V = villagers for consumption; outside middleman

^bIn case of *tebasan*, how many days before harvest.

^cIf unit is different, specify.

^dC = cash; A = advance payment (how many days ago); D = deferred payment (how many days later); add T if *tebasan* is used.

^eRelatives, close friends, neighbours, others

^fAlways, often, sometimes, new-comer

III. Sale at outside village (by transaction)

Crop	Buyer ^a	Location	How many days after harvest*	Quantity	Price	Payment condition ^b	Credit tying		Buyer characteristics	
							Period	Interest rate	Personal tie ^c	Frequency of trade ^d
1.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
5.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
6.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____
7.	_____ = _____	_____	_____	_____	_____	_____	_____	_____	_____	_____

	Transportation cost		Other cost (if any)
	man-hour	cost	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

^a IV = inter-village middleman; W = wholesaler; R = retailer; DC = direct consumer

^b C = cash; A = advance payment (how many days ago); D = deferred payment (how many days later);

add T if *tebasan* is used.

^c Relatives, close friends, neighbours

^d Always, often, new-comer

*In case of *tebasan*, how many days before harvest.

IV. Information collection and availability

Crop	How many middlemen do you contact before deciding to whom to sell? ^a	How hard do you negotiate with middleman? ^b	How many middlemen in the village to whom the farmers can sell their product?	Is it easy to sell directly at market when the offer of middlemen are not satisfactory? ^c	How well do you know about prices prevailing in market? ^d	How do you collect information on market prices? ^e
Soybean	_____	_____	_____	_____	_____	_____
Tobacco	_____	_____	_____	_____	_____	_____
Corn	_____	_____	_____	_____	_____	_____
Cassava	_____	_____	_____	_____	_____	_____
Papaya	_____	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____	_____

^a 0, 1, 2,

^b Very hard, fairly hard, not so hard, no negotiation (in the last two cases, specify reason i.e., middleman is trustworthy, no other middleman, etc.)

^c Yes or no

^d Very well, fairly well, not very well, no idea except middleman's offer

^e D=Direct visit to market, NF=hear from neighbours and friends, M=cross check with many middlemen, E=extension service including radio & TV broadcasting (multiple entry: Rank according to importance)

Appendix B

CGPRT Marketing And Processing Survey (August to September 1986)

Middleman Survey Form

#. _____

Interviewed:

Date: _____ / _____ /86

Place: _____

I. General

Type of job: _____ collector (_____ hamlet _____ village _____ inter-village)
_____ bazaar trader _____ bazaar vendor _____ pedlar
_____ grocery (_____ village _____ town)

Job status of the operator: _____ full-time _____ part-time

type of occupation

share of working time (%)

1. _____

2. _____

(age) sex

Name: _____ Address: _____

Handling items: _____

Major working area: _____

II. Commercial custom

1) Occupational career of the operator

entering date: _____ former occupation: _____

school years: _____ father's occupation: _____

2) Entry barriers

a) training: required training period to be
independent: _____ years

How did you get trained? _____

b) initial capital requirement: amount at least (Rp)

Working capital: _____ fixed capital: _____

How did you get capital?^a _____

c) other major conditions^b

1. _____
2. _____
3. _____

III. Total handling quantity in one harvest season

crop: _____

quantity: _____

^a own funds, friends and relatives, bank, money lender, trading partners.

^b (possible condition)

- (1) intimate personal relationship with customers for long time,
- (2) ability to expect the future price variation,
- (3) ability to identify the grade/quality of crop, etc.

IV. Commodity flow in the last harvest season

1) Buying

	crop	no. of seller	type ^c	frequency of trade	where (distance; km)	total quantity
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____

	average price/unit	payment ^d condition	load/unload cost	transportation cost type ^e	quantity/one trip
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____

^c F = farmer; HC = 7 hamlet collector; VC = village collector; IC = inter-village collector; BT = bazaar trader; BV = bazaar vendor; TG = town grocery; VG = village grocery; P = pedlar.

^d A = advance (period, amount); C = cash; D = deferred (period).

^e man, delman, minibus, bemo, truck (gasoline), truck (diesel).

2) Selling

	crop	no. of buyer	type ^f	frequency of trade	where (distance; km)	total quantity
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____

	average price/unit	payment ^g condition	storage period loss (%)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

	load/unload costs	transportation cost	type ^h	quantity/ one trip
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____

^f F = farmer; HC = hamlet collector; VC = village collector; IC = inter-village collector; BT = bazaar trader; BV = bazaar vendor; TG = town grocery; VG = village grocery; P = pedlar.

^g A = advance (period, amount); C = cash; D = deferred (period).

^h man, delman, minibus, bemo, truck (gasoline), truck (diesel).

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Appendix C

CGPRT Marketing And Processing Survey (August to September 1986)

Processor Survey Form

#. _____

Interviewed:

Date: _____ / _____ /86

Place: _____

I. General

(age sex)

Name: _____ Address: _____

Processing items: _____

Job Status of the operator _____ full-time _____ part-time

type of occupation

share of working time (%)

1. _____
2. _____

II. Commercial custom

1) Occupational career of the operator

entering date: _____ former occupation: _____

school years: _____ father's occupation: _____

2) Entry barriers

a) training: required training period to be independent:

___ years

How did you get trained? _____

b) initial capital requirement: amount at least (Rp)

Working capital: _____ fixed capital: _____

How did you get capital?^a _____

c) other major conditions^b :

1. _____
2. _____
3. _____

^a own funds, friends and relatives, bank, money lender, trading partners.

^b (possible condition)

(1) high skill; (2) intimate relationship with customers for long time; (3) ability to foresee the market condition; (4) ability to get or identify good soybean, etc.

III. Product

product: _____ daily production: _____

1) direct retail

	selling quantity	price/unit	working man-hour	payment ^c condition
a) at the factory:	_____	_____	_____	_____
b) at the market:	_____	_____	_____	_____
(location of the market: _____)				

2) wholesale
to whom

	No. of buyer	type ^d	frequency of trade	where	selling quantity	price/unit	transportation cost	payment ^c condition
1.	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____	_____	_____

IV. Processed crop

a) crop: _____

b) total processing quantity (daily): _____

c) buying of the crop

from whom

	No. of seller	type ^e	frequency of trade	where	buying quantity	price/unit	transportation cost	payment ³ condition
1.	_____	_____	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____	_____	_____

^c A = advance (period, amount; C = cash; D = deferred (period).^d BT = bazar trader; BV = bazar vendor; TG = town grocery; VG = village grocery; P = pedlar.^e F = farmer; V = village collector; IC = inter-village collector; Bt = bazaar trader; BV = bazaar vendor; TG = town grocery; VG = village grocery; P = pedlar.

3) Current input (except processed crop)^g

	Item	daily cost	payment condition
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

^g fuel, power, package, raw materials other than processed crop.

4) Credit: for borrowing (during the past months)

_____ none _____ yes

	lender name(address)	type ^h	borrowed date	amount	returned date	amount	=	interest rate (%/month)
1.	_____	_____	_____	_____	_____	_____	=	_____
2.	_____	_____	_____	_____	_____	_____	=	_____

^h Kopti, middleman, wholesaler, village money lender, bank.

5) Instrument plan for capital purchase

Item	Cash price	Initial payment	Instrument (Rp/month)	Period (No. of month)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Glossary

Acronym

BPD	Bank Pembangunan Daerah (Regional Development Bank)
BRI	Bank Rakyat Indonesia (Indonesian Peoples Bank)
BULOG	Badan Urusan Logistik (Food Logistic Board)
CARE	Center for Agro-Economic Research
CGPRT	Coarse Grains, Pulses, Roots and Tuber Crops
ESCAP	Economic and Social Commission for Asia and the Pacific, United Nations
KOPIA	Koperasi Simpan Pinjam (Co-operative of Saving and Loan)
KOPTI	Koperasi Produsen Tempe dan Tahu Indonesia (Co-operative of Tempe and Tofu Producers in Indonesia)
SFSI	Socio-Economic Studies on Soybean-based Farming System in Indonesia Farm household Record-keeping Project of the CGPRT Centre)

Abbreviation

Rp	Rupiah (Indonesian currency)
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Local word

Angkutan kota	Minibus, major public transportation
Bata	Measure of land (100 bata = 0.14 ha)
Becak	Tricycle plying for hire
Buruh tani	Farm labourer
Colt bak	Small truck with gasoline engine
Daun enau	Palm leaf

Delman	Pony wagon
Desa	Village
Gadai	A pawning arrangement between landlord and tenant
Gaplek	Chopped and dried cassava
Kabupaten	District
Kampung	Hamlet
Kecamatan	Subdistrict
Kecap	Fermented soybean sauce (soy sauce)
Kios	Roofed stall inside bazaar
Kota	Town
Maro	A 50 : 50 sharecropping arrangement
Monografi desa	Village statistics
Opak	Chip made of cassava for snack
Palawija	Upland crops such as soybean, corn and cassava
Pasar	Bazaar/Market
Pedagang kali lima	Bazaar vendor
Pedagang keliling	Pedlar
Penampung	Collector
Petani	Farmer
Sewa	A fixed cash rent
Sunda	An ethnic region of West Java
Tauco	Salted fermented soybeans
Tempe	Fermented soybean cake

Tahu	Soybean protein curd
Toko	Shop inside permanent building
Truk besar	Large truck with diesel engine
Tumpangsari	Intercropping sistem
Warung	Small shop

Exchange rate

Rp 1,126 per one US dollar during the study period, May to September 1986.

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