The Developing Economies, XXXIII-4 (December 1995)

AGRICULTURAL DIVERSIFICATION AND INSTITUTIONAL CHANGE: A CASE STUDY OF TENANCY CONTRACT IN INDONESIA

SHIGEKI YOKOYAMA

I. INTRODUCTION

THE purpose of this paper is to examine how "agricultural development," which is expressed here as diversification and commercialization, caused a change in the "institution" of tenant farming, and what logic is behind the choice of tenancy contract. A case study was conducted in a rain-fed village in West Java, Indonesia, which virtually has no status system or legal restrictions to land tenure (Hayami and Otsuka [5, p. 108]). The area is therefore suitable for an analysis of farmer economic activities under conditions where commercial transactions and tenant farming contracts can in principle be selected freely.[1]

II. CHARACTERISTICS OF THE STUDY VILLAGE

A. *Employment and Landholdings*

The village surveyed is located in the district (*kabupaten*) of Majalengka in West Java Province, Indonesia. It is about 250 kilometers from the national capital of Jakarta and about 80 kilometers from the provincial capital of Bandung. It is situated on a gently undulating slope, 70 to 100 meters above sea level. Agriculture is the only industry of the village. In neighboring villages, however, bricks and roof tiles are manufactured as a small-scale cottage industry in response to the construction boom in urban areas. Some of the residents of the village surveyed are em-

This paper is part of the results of a research project, "Rural Employment and Income Generation from the Production, Marketing and Processing of CGPRT Crops" (1989–91), commissioned by the UN/ESCAP CGPRT Centre. The CGPRT Centre is not responsible for the opinions expressed in this paper.

[1] A previous study analyzing the relationship between commercialization and tenant farming in Java reports that in the outlying areas of the district of Malang in East Java Province, the system of renting at a fixed amount is dominant in villages where there are many part-time jobs and agriculture is more commercialized, whereas the profit-sharing system is dominant in villages where agriculture is not so commercialized (Wijaya and Sturgess [15]). Datta and others, who built transaction costs into a landlord–tenant farmer model, have drawn the hypothesis that as labor grows more intensive, production more uncertain, and the scope of entrepreneurship wider, the seriousness and opportunities of tenant farmer sabotage increase along with monitoring costs, resulting in more frequent adoption of the system of fixed rent. They have verified their hypothesis using data for India [1].

TABLE I

OCCUPATIONS OF HOUSEHOLD HEADS IN THE STUDY VILLAGE, 1989

	Total		Hamlet A		Hamlet B	
	No.	%	No.	%	No.	%
Farm households:						
Full-time farmers	101	34	40	25	61	44
Part-time farmers	126	42	74	47	52	37
Self-employed / officials	68		46		22	
Day laborers / seasonal workers	58		28		30	
Subtotal	227	76	114	72	113	81
Of which: vegetable growers	129		37		92	
Landless farm laborers	10	3	6	4	4	3
Nonfarm households	60	20	37	24	23	16
Total	297	100	157	100	140	100
Number of family members	3.9		4.1		3.7	
Age of household head	43.6		45.0		42.0	

ployed in the industry. In addition, in the dry season many farmers go to Jakarta and Bandung to work as construction workers, peddlers, and the like. Table I classifies the households by occupation of household head. Seventy-six per cent are farm households and 56 per cent of farm households have other occupations as well. Many of the nonfarm households are small merchants dealing primarily in agricultural produce and farming materials. Provincial and village officials, factory workers, minibus drivers, carpenters, and tailors are also in this category. Of the occupations that farmers are concurrently engaged in, "self-employed" in Table I refers to peddlers who sell clothing, tableware, and other daily necessities outside the village, the above-mentioned small merchants who deal in farming materials in the village, and small shop (*warung*) keepers. "Officials" refer to governmental officials, officials of agricultural cooperatives, and school teachers. Since these jobs are stable and bring large incomes, the farmers who are concurrently engaged in these occupations generally do not depend on farming to a great degree. "Day laborers" refer to those who are engaged in miscellaneous jobs, such as assisting in the construction and repair of houses and loading or unloading bricks onto or from trucks. "Seasonal workers" refer to those who go to Jakarta or Bandung to work on construction sites in the dry season. Since both of these occupations are unstable, those who are engaged concurrently in these jobs depend on farming to a great degree. Although there are a few households that own no land, many of these household heads are widows. Comparing the two hamlets, in hamlet A there are a large percentage of nonagricultural households and part-time farm households with stable concurrent jobs, whereas in hamlet B there are a high percentage of full-time farm households and part-time farm households with unstable nonfarm jobs.

Table II classifies the households by the size of farmland owned and operated.

TABLE II

THE SIZE OF LAND OWNED AND FARMED BY HOUSEHOLDS IN THE STUDY VILLAGE, 1990

Area (ha)	Hamlet A				Hamlet B			
	Ownership		Farmed		Ownership		Farmed	
	No.	%	No.	%	No.	%	No.	%
0	45	29	43	27	38	27	27	19
0.01–0.20	56	36	36	23	60	43	39	28
0.21–0.50	32	20	52	33	30	21	48	34
0.51–1.00	11	7	23	15	9	6	22	16
1.01–	13	8	3	2	3	2	4	3
Total	157	100	157	100	140	100	140	100
Gini coefficient	0.67		0.53		0.57		0.48	
Total area (ha)	49.0		43.3		27.7		42.6	
Average of all households (ha)	0.31		n.a.		0.20		n.a.	
Average of farm households (ha)	0.43		0.38		0.22		0.38	

The structure of landholdings is generally flat. In both hamlets, the Gini coefficient, or the index of concentration, is lower for land farmed than for ownership. This indicates that land leasing functions to equalize the size of farm operation. The average size of landownership and farm operation is 0.43 hectare and 0.38 hectare respectively in hamlet A, and 0.22 hectare and 0.38 hectare in hamlet B. This shows that hamlet A is a net lessor of farming land while hamlet B is a net lessee. It seems that this situation is related to the fact that the village officials are concentrated in hamlet A. Village officials are granted the right to use certain areas of the rain-fed lowlands (five hectares in the case of the village head) during their term of office, and most of this land is customarily leased to villagers. This is also verified by the fact that there are twenty-nine cases where land is leased from hamlet A to hamlet B whereas there are only four of the opposite cases.[2]

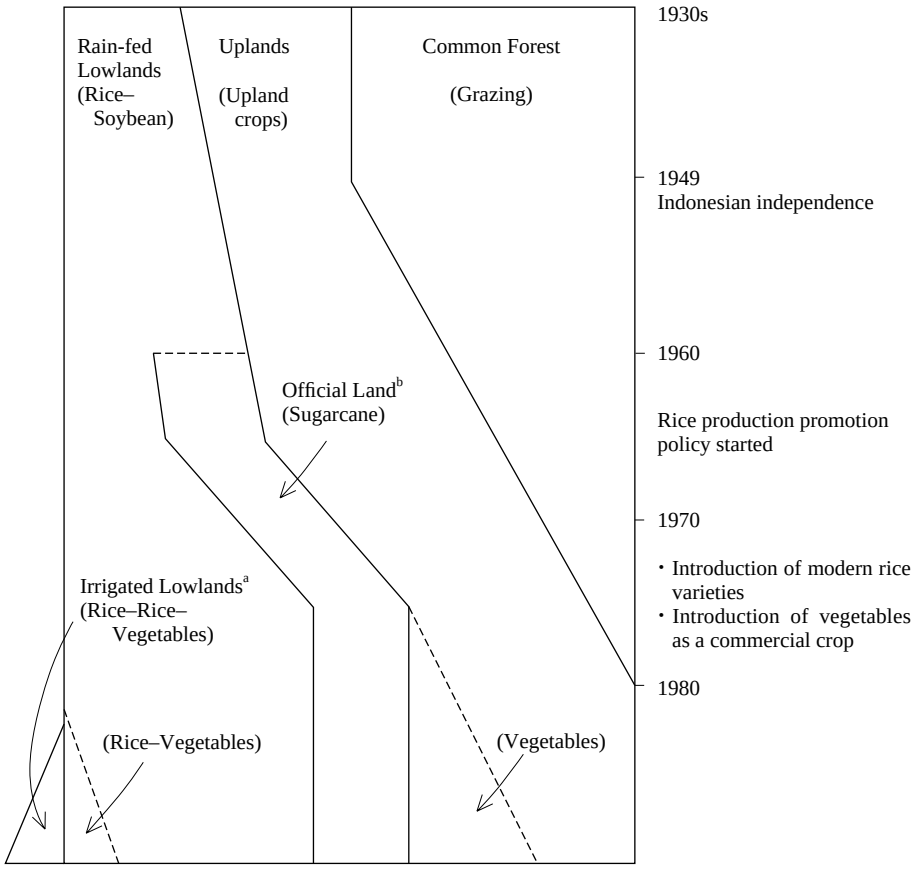
B. *Changes in Land Use and Cropping System*

Figure 1 shows changes in land use and in the cropping system. The village already existed as an administrative unit in the mid-1930s. In those days about 10 per cent of the farm land was categorized as rain-fed lowlands, about 40 per cent was upland fields privately owned and used, and the remaining 50 per cent was nationally owned forests. Rice was grown in the rain-fed lowlands while a part of this land was used for growing soybeans or corn as secondary crops. In the uplands both rice and cassavas were grown together. The villagers were permitted to use the nationally owned forests to collect fodder and grazing their cattle.

After the independence of Indonesia in 1949, the government sold the forest to the village which then rented forest land to villagers on request, allocating ten ares

[2] For more details about the agricultural and employment structure of the study village, see Kawagoe et al. [8].

Fig. 1. Historical Change in Land Use and Cropping System in the Study Village



[a] Leased from other villages for the third crop season (June–September).
[b] Lowlands provided to village officials as part of their salary during their term in office.

per household (five ares in the case of households headed by widows). This forest land was gradually brought under cultivation. By reclaiming the forest, the villagers were granted the right to use it.

The ownership of these reclaimed lands formally belongs to the village which collects rents of Rp. 1,000 to 1,250 per ten ares (as of 1989). The right to use the land can be inherited and transferred. In fact, there are observed cases in which such land is transferred or leased (for the effective rent of Rp. 10,000 to 16,000 per ten ares). Most of the villagers misinterpret their rent payments to the village as a land tax and their right to use as ownership. It would be safe, therefore, to regard

the right to use as virtual ownership. As grazing land decreased, water buffalo decreased gradually and disappeared from the village in the early 1970s. By the 1980s virtually no forests were left unreclaimed.

The upland fields privately owned from the beginning were gradually turned into paddy fields. This conversion had already been under way in the 1930s and accelerated in the late 1960s. Factor behind this development were population increase, the allocation of land for sugarcane,[3] and the policy of boosting rice production.

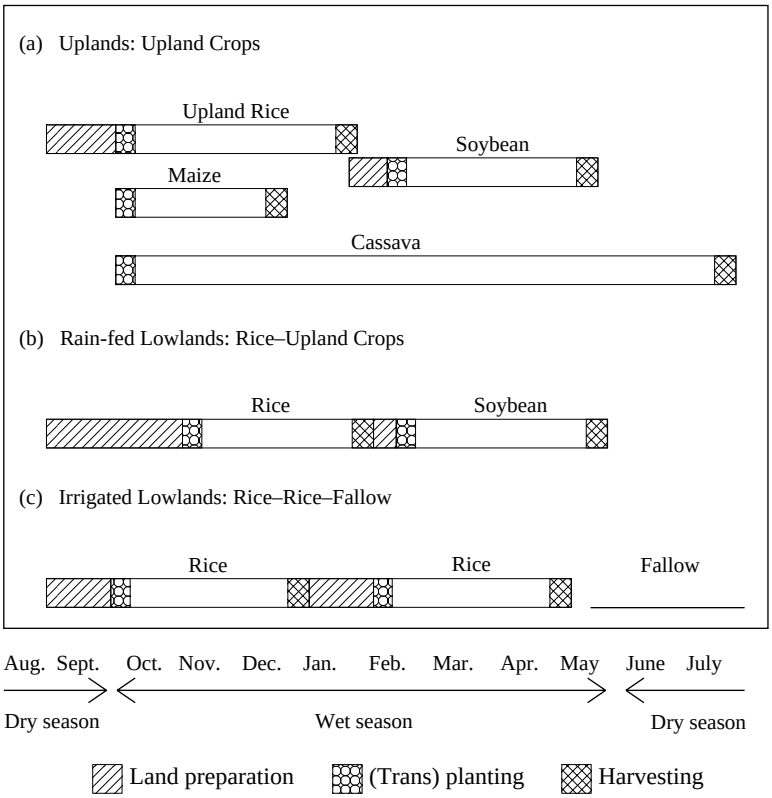
Because the village has no irrigation facilities, the cropping system is determined by the distribution of rainfall. Annual rainfall and its distribution vary substantially from year to year. On average, however, the wet season lasts from October to May (with rainfall peaking in December to February) and the dry season from June to September. Planting is basically limited to the wet season. Figure 2 shows the traditional cropping system. In uplands, miscellaneous cereals, legumes, and tuber crops are generally grown together. Although there are various combinations of crops, it is common to plant upland rice and maize in the first half of the wet season and soybeans in the second half. Planted on the edges of fields are cassavas which are harvested during the dry season in July or August after being grown for ten months. In rain-fed lowlands, rice is grown followed by soybeans. In irrigated lowlands, which are located outside the study village and provided with improved irrigation facilities, rice double cropping is practiced. In the study village, all operations are conducted manually; no draft animal or power machines are used.

The traditional cropping system is undergoing drastic changes in the wake of the introduction of vegetables. It seems that vegetables for home consumption have long been grown, but the cultivation of commercial vegetables owes much to a young peddler born in hamlet B. In the mid-1970s, the peddler then in his late teens was dealing in tableware. While peddling his wares, he discovered that a village several kilometers from the study village was growing vegetables for large profits. He learned how to grow vegetables and brought back seeds to his village. He started growing vegetables himself and also taught neighbor farmers the cultivation techniques.

As a middleman, he sold the vegetables collected in the village to wholesalers. The wholesalers ship several four-ton truckloads of vegetables every day at harvest time primarily to Jakarta. Because of the perishableness of vegetables, the greatest concern for the wholesalers is securing sufficient supplies every day. One of the means they use for this is the extension of credit. On condition that all the produce be sold to them, middlemen lend the money provided by wholesalers to farmers in the form of production materials such as fertilizers and chemicals. The cost of

[3] The planting of sugarcane, an estate crop, has been allocated on a village basis through the General Bureau of Estates of the Ministry of Agriculture. Since early in the 1960s, more than ten hectares have been allocated to the study village. However, villagers dislike cultivating sugarcane because profitability is low. All sugarcane is grown in paddy fields of village officials, and these are leased to farmers outside the village; no farmer in the study village is engaged in sugarcane cultivation.

Fig. 2. Traditional Cropping System



these production materials is offset by the produce at harvest time.[4] The techniques for vegetable cultivation have not yet been well established, and therefore production is quite unstable. It is not rare for vegetables to be totally damaged by insects and other pests. In such cases, the repayments to be made by farmers are postponed to the next season. The wholesalers who provide funds to middlemen have abundant funds and carry on business over a wide area where growing periods differ. Therefore their funds circulate quite smoothly throughout the year, and they can afford to allow specific middleman to postpone repayments. The situation is much the same for the middlemen. Since they deal with a large number of farmers, their risk is diversified. Unless they are forced by the wholesalers to make repayments, they need not demand that the farmers make repayments as scheduled. Rather, it is more important for them to maintain their contracts with the farmers by continuing to provide credit and thus secure supplies of vegetables over the long term. At the same time, since the cultivation of vegetables is highly profitable, it is unlikely that the farmers will become insolvent unless poor yields continue for

[4] For more details about credit tied to contract vegetable farming and the marketing system, see Hayami et al. [3].

years. The credit contracts between the middlemen and the farmers are made orally. No written contract is prepared, though the middlemen record their transactions in their notebooks and give the farmers memos bearing the amounts of credit.

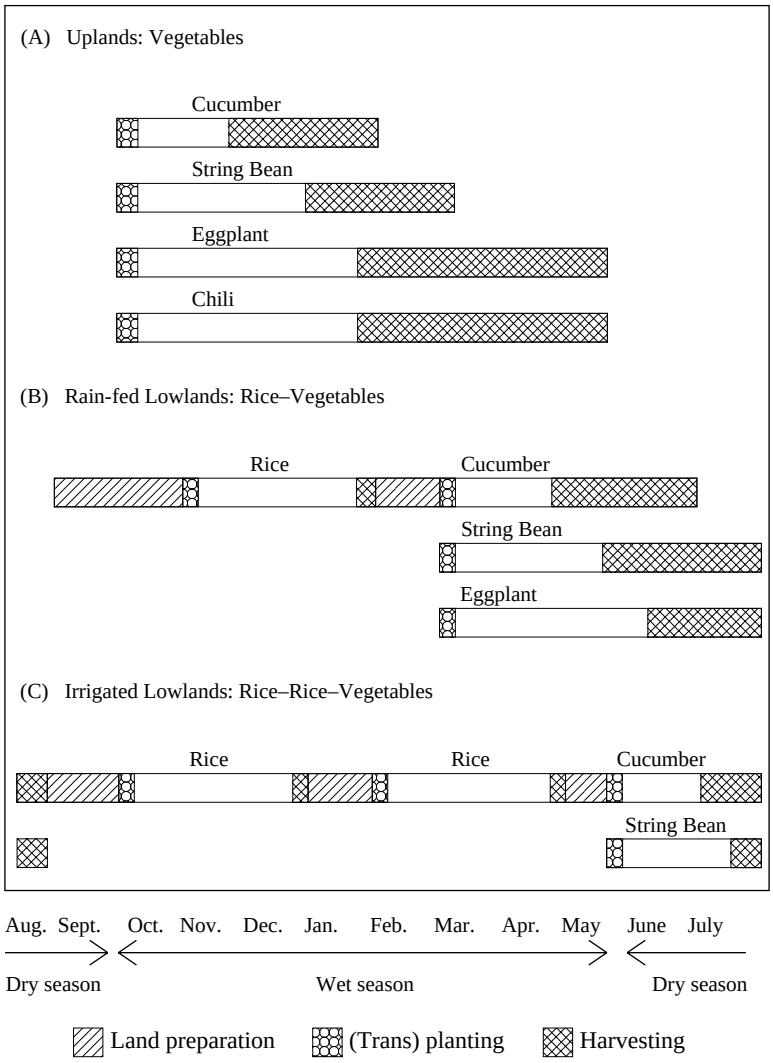
Thus the middlemen in the village provide the farmers with the cultivation techniques, capital, and marketing channels through contract farming tied to credit. By so doing, they have contributed greatly to the establishment of the commercial production of vegetables in the study village. It also should be noted that the heavy risk involved in vegetable production has been borne by the wholesalers who have abundant funds, a factor which has played an important role in the diffusion of commercial vegetable farming.

Figure 3 shows the new cropping system. In uplands, the intercropping of upland crops has been replaced by that of vegetables. The vegetables include cucumbers, eggplants, string beans, chilies, ridge gourds, bitter gourds, and *luenca* (botanical name is *Solanum nigrum*, a plant of the eggplant family bearing round edible fruits two to three centimeters in diameter). There are cases in which such traditional crops as soybeans, maize, and cassavas are combined with the new vegetables. No systematic efforts have been made by any organization, such as extension offices, to provide technical guidance. Farmers have therefore been trying to improve their techniques by trial and error. Consequently, there are far greater technical differences among the farmers than in the cultivation of rice and other traditional crops. The typical cultivation method is as follows. In early October when the wet season starts, fields are hoed and ridged, then seeds mixed with barnyard manure are sowed in straight rows at intervals of several centimeters. No furrows are made in the fields where the drainage is good. Bamboo supports 1.5- to 1.8-meter long are provided for climbing plants such as cucumbers and string beans. Harvest periods differ widely from one vegetable to another. In the case of cucumbers, which grow quickly, harvesting starts toward the end of November, about six weeks after seeds have been sowed. Harvesting continues until early February. When the harvesting of cucumbers ends, the harvesting of eggplants and chilies starts and continues until May when the wet season ends.

In rain-fed lowlands, soybeans have been replaced by vegetables. But this cropping system has not become common yet for the following technical reasons. First, when vegetables are grown in lowland areas, it is vital to make furrows for drainage purposes. Land preparation for vegetables overlaps with the harvesting of rice, and this causes a labor shortage. Second, the sowing of vegetable seeds and the early part of the growing season are at the peak of the wet season (December to March), and a great deal of damage tends to be caused by rain. Third, harvest time is in the dry season, and the harvesting period tends to be short, thus the yield is generally low. In some neighboring villages with advanced vegetable cultivation techniques, vegetable growers use seasonal migrant workers coming in from other areas to deal with the first problems, and they use mulch with rice straw (this technique is said to extend the harvest time for about one month) to cope with the third problem.

It should be noted that the introduction of vegetables in the study village has given rise to changes in the cropping system of neighboring irrigated paddy fields.

Fig. 3. New Cropping System



Some farmers rent irrigated paddy fields for the idle third-crop season (June to September) and cultivate cucumbers and string beans which grow quickly. This leasing idea has also been taken up by the middleman in hamlet B mentioned above. Paying rent in advance, he and several other middlemen rent land, about two to four hectares per lease, from the holders of irrigated paddy fields (many of them being village officials who have the right to use one to five hectares of paddy fields during their terms) and sublease the land in smaller units (usually 0.1 to 0.18 of a hectare each) to farmers on condition that they sell all the vegetables grown to the lessors. This tenant farming is also accompanied by the extension of credit, and

TABLE III

AREA OF FARMLAND UNDER DIFFERENT CROPPING SYSTEM CULTIVATED BY FARMERS IN THE STUDY VILLAGE, 1989

	Total		Hamlet A		Hamlet B	
	No.	%	No.	%	No.	%
Uplands:						
(a) Upland crops	13.4	16	10.3	24	3.1	7
(A) Vegetables	18.5	22	3.8	9	14.7	35
Rain-fed lowlands:						
(b) Rice-upland crops	40.6	47	26.9	62	13.7	32
(B) Rice-vegetables	6.3	7	2.3	5	4.0	9
Irrigated lowlands:						
(C) Rice-rice-vegetables	7.1	8	—	—	7.1	17
Total traditional system (a + b)	54.0	63	37.2	86	16.8	39
Total new system (A + B + C)	31.9	37	6.1	14	25.8	61
Total	85.9	100	43.3	100	42.6	100

the farmers repay rent in kind. This system is beneficial to all of the three parties involved in the following ways. The landlords can gain income from their otherwise idle land and need not worry about arrears because the rent is paid in advance. They only have to negotiate with one or two representatives; as a result they can save substantially on transaction cost when compared with the conventional system of concluding contracts with a large number of small farmers. The benefit to the middlemen is that they can gather vegetables during the dry season which is essentially an off-season in rain-fed areas such as the study village. The benefit to the farmers is that it is possible for them, without negotiating with the landlords and without capital, to pay rent in advance and to lease irrigated paddy fields outside their village which they would not be able to lease through individual negotiations.

Table III shows the respective areas farmed under the traditional and new cropping systems. The diffusion of vegetable cultivation differs widely between hamlets A and B. This difference corresponds to the employment structures of the two hamlets. In hamlet A, where there are a large number of stable part-time farmers and only 32 per cent of all the farmers grow vegetables, the traditional cropping system accounts for 86 per cent of the total cultivated area. In contrast, in hamlet B, where there are a large number of full-time farmers and 81 per cent of the farmers grow vegetables, the new cropping system is dominant, while additional cultivation is undertaken on leased irrigated paddy fields which account for as much as 17 per cent of the total cultivated area. This fact shows that the farmers in hamlet B, who have less access to favorable part-time jobs, are increasing their incomes by introducing vegetables and expanding their farm size through leasing. Moreover, the fact that the cultivation of vegetables was introduced by the middleman from hamlet B has something to do with the concentration of vegetable cultivation in the hamlet. The fixed-term lease for irrigated paddy fields, which enables cultivation

TABLE IV

CONDITIONS OF TENANCY CONTRACTS IN THE STUDY VILLAGE, 1989

	Maro	*Kontrak*	*Sewa*
Cost sharing by landowner	Half of current input	None	None
Form of land rent	Half of produce in kind after deducting the share of harvest labor	Fixed paddy	Fixed cash
Timing of payment	After harvest	After harvest	Beginning of crop season
Applicability to cropping system:			
Rain-fed lowlands:			
Rice-soybeans	○	○	○
Rice-vegetables	×	○	○
Uplands:			
Upland crops	×	○	○
Vegetables	×	○	○
Irrigated lowlands:			
Rice-rice-vegetables	×	×	○

Note: ○ = applied. × = not applied.

in the dry season, is observed in hamlet B only. The middleman himself, however, does not conclude cultivation contracts only with farmers in hamlet B or provide technical guidance only to them or give them any preferential treatment because it benefits him to promote the cultivation of vegetables in the whole village.

III. RELATIONSHIP BETWEEN THE TENANCY FORM AND THE CROPPING SYSTEM

Three tenancy forms are observed in the study village: *maro*, *kontrak*, and *sewa*. Table IV summarizes the respective characteristics and the cropping systems to which they apply. *Maro* refers to tenant farming under a profit-sharing scheme, under which the material costs and harvest are shared equally between the landlord and the tenant after deduction of payments for harvest labor. This is applied only to the traditional rice-soybean cropping system in the rain-fed lowlands.

Under the *kontrak* form, rent is paid in kind in the form of a fixed quantity of the harvest. The landlord bears no expenses. The rent is paid at rice harvest time in the form of a fixed quantity of paddy (unhulled rice). This payment in paddy is applied even to fields where no rice is cultivated. It is not applied, however, to the cultivation of vegetables in irrigated paddy fields outside the study village.

With the *sewa* form, rent is paid in cash at a fixed amount ahead of the crop season. This is adopted for all land and all crops.

Table V summarizes the relationship between the cropping systems and land tenure. The land owned and cultivated by farmers themselves accounts for an over-

TABLE V

DISTRIBUTION OF LAND CULTIVATED BY FARMERS IN THE STUDY VILLAGE BASED ON CROPPING SYSTEM AND TENURE STATUS, 1989

	Total		Owned Land		Rented Land					
					Maro		*Kontrak*		*Sewa*	
	No. of Plots	%	No. of Plots	%	No. of Plots	%	No. of Plots	%	No. of Plots	%
Uplands:										
(a) Upland crops	101	100	91	90	—	—	4	4	6	6
(A) Vegetables	155	100	127	82	—	—	13	8	15	10
Rain-fed lowlands:										
(b) Rice-upland crops	164	100	105	64	24	15	11	7	24	15
(B) Rice-vegetables	30	100	15	50	—	—	10	33	5	17
Irrigated lowlands:										
(C) Rice-rice-vegetables	38	100	—	—	—	—	—	—	38	100
Total traditional cropping system (a + b)	265	100	196	74	24	9	15	6	30	11
Total new cropping system (A + B + C)	223	100	142	64	—	—	23	10	58	26
Total	488	100	338	69	24	5	38	8	88	18

whelming 70 per cent of the total number of plots. By the form of tenant farming, *sewa* accounts for 59 per cent, *kontrak* 25 per cent, and *maro* 16 per cent of the rented land. The percentage and the form of tenancy differ according to the type of land and the cropping system. The ratio of ownership in upland areas is as high as 85 per cent, far higher than the corresponding figure of 62 per cent for the rain-fed lowlands. Since upland fields are "marginal land," by Ricardo's definition, and yield almost no rent when traditional crops are grown, there is no economic basis for them to be leased (Hayami et al. [3, p. 48]).

The reasons why the ratio of owned land is high in the uplands even after highly profitable vegetables were introduced include: (1) Upland fields are equally distributed among the farmers because in the past national forest land was sold to the village which then rented plots to the farmers on their request. (2) There is a limit to the expansion of scale because of the extremely labor intensive nature of vegetable cultivation.

Looking at the relationship between the cropping system and the frequency of tenancy in the whole village, the ratio of tenancy is higher when vegetables are planted. This is indicated by the fact that 74 per cent of the land is farmer-owned under the traditional cropping system while 64 per cent is farmer-owned under the new cropping system. By form of tenancy, *sewa* accounts for 43 per cent, *maro* 35 per cent, and *kontrak* 22 per cent of rented land under the traditional cropping system while the corresponding figures are 72 per cent, 0 per cent, and 28 per cent, respectively, under the new cropping system. The percentage of *sewa* is particularly high under the latter system.

It is assumed that the expanding cultivation of vegetables has promoted tenant farming, even in the uplands, which in turn has given rise to the diffusion of forms of cash rent tenancy. This assumption is verified by village officials and old villagers. There was no leasing of upland areas before vegetables were introduced. A majority of the rain-fed lowlands were owned by the farmers themselves; only under the *maro* form was there tenant farming. In the mid-1970s, when commercial vegetables were introduced, upland fields began to be leased. This was not under *maro* however, but under the *kontrak* form where rent is paid in the form of a fixed quantity of unhulled rice at harvest time. *Sewa* was introduced soon thereafter. Leases increased with the diffusion of vegetable cultivation. At the same time, *kontrak* and *sewa* began to be applied to the rice-soybean cropping system in the rain-fed lowlands as well. The commercialization of agriculture triggered by vegetable cultivation has changed and diversified the form of tenant farming from *maro* to *kontrak* and *sewa*.

When looking for the logic behind this change in tenant farming from a profit-sharing system to a fixed rent system, we must first try to answer why a profit-sharing system has not been adopted for vegetable cultivation. In a profit-sharing system, it is desirable that the standard volume of input and the standard harvest be known to ensure that tenant farmers are working hard enough. In the cultivation of vegetables, however, no standard cultivation practice has been established yet, and the volume and the quality of the harvests are greatly affected by the kind, quality, and quantity of inputs as well as by cultivation techniques and other factors that are hard to observe and monitor by the landlords (Rao [12]). In addition, vegetables pose a problem in rent payment. Several kinds of vegetables are grown together and harvested in small quantities every day over a long period of time. It is inconvenient for tenant farmers to deliver to their landlords a fixed percentage of the vegetables harvested in small quantities every day. It is also very difficult for the landlords to make sure that the tenants are not cheating on the volume of the harvest. In addition, the fact that no standard cultivation practice has yet been established and that there are large price differentials due to differences in quality means that there is a wide scope for tenants to display their managerial ability. Therefore, when tenant farmers wish to fully enjoy the results of their own entrepreneurship, they are tempted to choose the fixed rent system (Hayami and Otsuka [5, p. 109]). Thus the fixed rent system in the cultivation of vegetables is desirable both for the landlords and the tenants.

It should be noted, however, that while the cultivation of vegetables can be highly profitable, the risks are also high because large cash payments have to be advanced to buy large volumes of fertilizers, chemicals, and hired labor.[5] In this sense, the profit-sharing system may appear to be preferable to the tenant farmers because credit is granted and risk is also shared by the landlords. Nonetheless, the

[5] In the traditional cropping system, the expenses for current inputs (fertilizers, chemicals, and seeds) are Rp. 139,000 per hectare in upland fields and Rp. 181,000 per hectare in the rain-fed lowlands. In the new cropping system, they are Rp. 462,000 and Rp. 420,000, respectively (Hayami et al. [3, p. 49]).

role of middlemen in the cultivation of vegetables must be recalled in this context. As described above, vegetable growers can borrow such materials as fertilizers and chemicals in kind from middlemen and, if the crop is extremely poor, their repayments can be postponed until the next crop. Therefore, there is no reason for tenant farmers to choose the profit-sharing system as a means of obtaining credit and avoiding risk.

In the traditional cropping system for rice-soybeans, profit sharing has been dominant. The system of a fixed cash rent was adopted with the coming of vegetable cultivation in upland fields, and the system has expanded with the diffusion of vegetable growing. As of the time of the survey, both the profit-sharing system and the fixed cash rent system can be observed in rice-soybean farming. Although there is no change in the kind of crops they cultivate, the tenant farming system has undergone some changes. To understand the reason for this, we need to keep in mind that the profit-sharing system includes the extension of credit from landlords to tenants. If a farmer who is facing financial constraints chooses the profit-sharing system primarily to obtain credit, the choice will become meaningless as soon as his financial constraints are resolved. These constraints have been eased through the diffusion of the cultivation of vegetables which are a highly profitable commercial crop, and the expansion of opportunities for nonfarm jobs, which in turn has brought about a shift from profit-sharing to the fixed cash rent system.

The profit-sharing system is also not applied to traditional crops such as soybeans and maize in upland fields. The difficulty in confirming the volume of harvests is the same as that for vegetables. In traditional upland cultivation where the inputs of fertilizers and chemicals are comparatively low, the system of cash rent at a fixed amount is chosen partly because the credit needs of tenant farmers are small.

In the remainder of this section we will examine the relationship between the form of tenancy and the economic status of households. As mentioned earlier, there is no concentration of landownership in the study village. There is no class of absentee landlords nor a class of landless. However, there are frequent leases of farm land, and the percentage of land under tenancy can reach as high as 30 per cent of the number of plots. Table VI shows the economic characteristics of the villagers by land tenure status. The average age of a farmer–land lessor (owning more land than they actually cultivate) is fifty-two while that of a pure tenant (owning no land) is thirty-one. This age gap is nearly equal to one generation. The average age of an owner farmer and an owner-cum-tenant is in the mid-forties. Farm size is somewhat smaller for owner farmers while it is nearly equal for farmer–land lessors and pure tenants, and larger for owners-cum-tenants. Farm size basically corresponds to the quantity and quality of household labor.

These facts indicate that young households that become independent from their parents start with tenant farming, then acquire more land through inheritance and purchases to be owner farmers or owners-cum-tenants, and then become farmer–land lessors at advanced age, reducing their farmed area by renting out as the capacity of family labor decreased. This would indicate that the agricultural ladder

TABLE VI

ECONOMIC CHARACTERISTICS OF HOUSEHOLDS IN THE STUDY VILLAGE BASED ON LAND TENURE STATUS, 1989

	Nonfarmer Land Lessor	Farmer–Land Lessor[a]	Owner Farmer[b]	Owner-cum-Tenant[c]	Pure Tenant
Number of households	10	21	106	77	23
Age of household head	56	52	46	43	31
Ratio of female household heads (%)	30	10	10	3	—
Number of family members	3.1	4.1	3.9	4.4	3.6
Owned area (ha)	0.40	1.25	0.30	0.19	—
Farmed area (ha)	—	0.39	0.30	0.49	0.35
Annual income per capita (Rp. 1,000):					
Farm	—	70	76	206	47
Nonfarm	266	369	154	111	73
Total	266	439	230	317	120
(Number of samples for income data)	(9)	(17)	(82)	(69)	(19)
Ratio of vegetable growers (%)	—	43	43	77	65
Number of farms by tenancy form:					
Maro	—	—	—	17 (22)[d]	4 (17)[e]
Kontrak	—	—	—	19 (25)[d]	12 (52)[e]
Sewa	—	—	—	53 (69)[d]	16 (70)[e]

[a] Owned area > farmed area.
[b] Owned area = farmed area.
[c] Owned area < farmed area.
[d] Numbers in parentheses are the ratio to total owners-cum-tenants. Total is more than 100, since some farmers have contracts under more than two tenancy forms.
[e] Numbers in parentheses are the ratio to total pure tenants. Total is more than 100, since some farmers have contracts under more than two tenancy forms.

theory based on the life cycle is applicable.[6] Yet it should be noted that since the farmer–land lessors far exceed owner farmers and owners-cum-tenants in the amount of land owned and in income level (especially, nonagricultural income), most of them are assumed to be village officials and other governmental officials who form a clearly different class from the average farmers. However, there are no significant difference between nonfarmer land lessor and owner farmers in the amount of land owned and in income level. The characteristics of the nonfarmer land lessors include advanced age, a high percentage of women, and a small family. Judging from these characteristics, these lessors seem to consist largely of retired farmers and widows. Regarding the relationship between the absence or presence of rented land, the degree of dependence on agriculture, and the cultivation of

[6] Some researchers studying the relationship between the agricultural ladder theory and forms of tenant farming contend that for young farmers who have neither much experience nor much money, the profit-sharing system helps them receive credit and technical advice from their landlords, and in this respect the system has the function of raising farm management ability (Reid [13], Rosenzweig and Wolpin [14]). This argument does not apply to the study village, however, because *maro* is not more widely adopted by young tenant farmers.

vegetables, the farmer–land lessors and the owner farmers have nonfarm incomes far larger than farm incomes and ratio of vegetable producers is less than half. On the other hand, owners-cum-tenants and pure tenants depend very much on farming and 77 and 65 per cent of them produce vegetables respectively.

IV. THE LOGIC OF TENANCY CHOICE

A. *Comparison of Production by Tenency Form*

It is traditionally assumed that under the profit-sharing system, the marginal remuneration for tenant farmer labor is only a part of the total marginal production of labor, and thus the tenant farmers are discouraged from inputting labor, causing an excessively small input of labor. This is the so-called Marshallian inefficiency (Kawagoe and Otsuka [9, p. 163]). But many of the empirical studies made so far do not support the presence of this inefficiency in the profit-sharing system in respect to yield level or the volume of input of materials and labor if it is possible to choose between the profit-sharing system and the fixed rent system (Hayami and Otsuka [5, pp. 86–106]). Moreover, theoretical study on the profit-sharing system shows that if no costs are required for enforcing the contents of contracts, no inefficiency occurs in the profit-sharing system (Morooka and Hayami [11, pp. 28–42]).

It follows from these studies that if both the profit-sharing and fixed rent systems are present and there are no difference between them in the input and output structure, the latter system is chosen when large expenses are required to monitor the tenant farmers' management efforts while the former system is chosen when the tenant farmers prefer it for some reasons and the monitoring cost is small enough to ignore. Here, the underdevelopment of the credit market is considered to be the factor that prompts the tenant farmers to choose the profit-sharing system. Since this system is accompanied by the extension of credit, the farmers facing financial constraints and high interest rates will be encouraged to choose profit sharing.

This discussion can be summarized as follows. It is assumed that the system of fixed cash rent is chosen when landlords have to bear large monitoring costs and tenants are not faced with financial constraints, whereas the profit-sharing system is chosen when the monitoring costs are small and tenants are faced with financial constraints.

This hypothesis can be verified for the rice-soybean system in the rain-fed lowlands where both the profit-sharing and fixed rent systems have been adopted. First, we will see if there is Marshallian inefficiency. Then, the levels of rent will be compared. Lastly, we will examine the relationship between landlord risk and monitoring cost and the forms of tenancy.

Table VII shows the yields of rice and soybeans in the rain-fed lowlands by land tenure status in hamlet A where the profit-sharing system has been adopted widely. The *t*-test was conducted to compare owned land and fixed rent (*sewa* and *kontrak*), to compare owned land and *maro*, and to compare fixed rent and *maro*. No significant difference could be seen in the yield of rice or soybeans for all cases.

TABLE VII
COMPARISON OF YIELD BASED ON LAND TENURE: RICE-SOYBEANS IN RAIN-FED LOWLANDS IN HAMLET A, 1989

	Rice[a] (t/ha)	Soybeans[a] (t/ha)	Total (Rp. 1,000)
Owned land [56, 47, 45]	3.8	0.7	1,373
	(1.3)	(0.4)	(440)
Tenancy with fixed rent[b] [16, 11, 11]	3.5	0.6	1,230
	(1.1)	(0.4)	(300)
Maro [17, 13, 12]	3.4	0.6	1,177
	(1.1)	(0.4)	(290)
Student-*t*:[c]			
Owned vs fixed rent	1.070	0.928	1.011
Owned vs *maro*	1.367	0.784	1.453
Fixed vs *maro*	0.253	0.428	0.436

Notes: 1. Numbers in brackets are sample sizes for rice, soybeans, and total, respectively.
2. Numbers in parentheses are standard deviations.

[a] Yield per harvested area.

[b] *Sewa* and *kontrak*.

[c] All the differences are not significantly different from zero at the 10 per cent level.

Looking at the cost structure by tenure status shown in Table VIII, there is no indication that current input and labor input are lower in *maro* or in the profit-sharing system than with owned land and *sewa* or the fixed cash rent system. From these facts, it is clear that the Marshallian inefficiency is not found in the village and that the input-output structure is not affected by the form of land tenure. As will be described later, kinship relationships are widely observed in the profit-sharing system, indicating low monitoring costs. Therefore, this observation is consistent with the above hypothesis.

B. *Comparison of Rent by Tenancy Form*

In this section we will compare the different levels of rent for *maro, kontrak,* and *sewa* and examine the factors that bring about the differences. Table IX shows the rent rates for the different forms of tenancy and cropping systems. It can be seen that the nominal value of rent for all cropping systems is cheapest under *sewa*, then *kontrak*, with *maro* the highest. But *maro* and *kontrak* include the extension of credit from landlords to tenants, and thus the interest rate on that credit must be considered when comparing rents in real terms. Moreover, landlords bear the monitoring cost and part of the risk under *maro,* so this factor must also be considered.

Assuming that effective rents under *kontrak* and *sewa* balance each other, i.e., the nominal difference in rent between the two systems is accounted for by the cost of credit only, this cost or interest rates can be estimated. Then the effective rent under *maro* can be calculated using this interest rate.

First, the discount rate between *kontrak* and *sewa* will be estimated. As mentioned before, rent under *sewa* is paid in cash before the crop season while rent

TABLE VIII

PRODUCTION COSTS AND RETURNS BASED ON LAND TENURE STATUS: RICE-SOYBEANS IN RAIN-FED LOWLANDS IN THE STUDY VILLAGE, 1989

(Rp. 1,000/ha)

	Owned Land			*Maro*			*Sewa*		
	Rice	Soybeans	Total	Rice	Soybeans	Total	Rice	Soybeans	Total
Sample size	11	7	11	4	4	4	3	3	3
Average harvested area (ha)	0.29	0.31	0.29	0.27	0.27	0.27	0.57	0.57	0.57
Average yield (t/ha)	4.5	0.7	n.a.	4.4	0.7	n.a.	4.0	0.6	n.a.
Output[a] (1)	1,039	458	1,497	1,025	452	1,477	934	419	1,353
Current inputs:									
Seed	15	26	41	12	32	44	12	34	46
Fertilizer	92	12	104	88	14	102	88	10	98
Others[b]	24	34	58	24	25	49	23	27	50
Subtotal (2)	131	72	203	124	71	195	123	71	194
Labor costs:									
Hired[c]	359	210	569	309	95	404	279	80	359
Family[d]	105	58	163	177	168	345	150	140	290
Subtotal (3)	464	268	732	486	263	749	429	220	649
Land rent (4)	—	—	—	365[e]	181[e]	546	n.a.[f]	n.a.[f]	182[f]
Total costs (5) = (2) + (3) + (4)	595	340	935	975	515	1,490	n.a.	n.a.	1,025
Operator's surplus (6) = (1) – (5)	444	118	562	50	–63	–13	n.a.	n.a.	328

[a] Assuming that farm gate prices for rice (paddy) and soybeans are Rp. 232/kg, Rp. 651/kg, respectively.

[b] Rental cost of sprayer.

[c] Rice: cost of transplanting and harvest labor is calculated as: 1/6 of harvest to harvesters as their share plus cost of meals (Rp. 300/meal) served at transplanting. This follows the harvest labor practice in the village (*ceblokan*). Soybeans: cost of harvest labor is calculated according to *ceblokan* as 4 per cent of harvest to harvesters as their share.

[d] Cost of family labor is imputed at the farm wage rate in the village (Rp. 360/hour for males, Rp. 170 for females).

[e] Rent under *maro* is expressed as follows: $R = \alpha(1 - \theta)\, Y - \beta V$, where R = rent, Y = output, V = current input, α = rate of rent (landlord's share after deduction of the share for harvest labor), β = landlord's share of current input, and θ = rate of the share for harvest labor. From the conditions for *maro* contracts, $\alpha = \beta = 1/2$. From *ceblokan*, $\theta = 1/6$ for rice, $\theta = 4/100$ for soybeans.

[f] Rent under *sewa* cannot be divided by crop since it is paid in a lump sum at the beginning of the crop season.

TABLE IX

COMPARISON OF RENTS BASED ON CROPPING SYSTEM AND TENANCY FORM IN THE STUDY VILLAGE, 1989

(Rp. 1,000/ha)

	Nominal Rent			*Kontrak-Sewa* Discount Rate (%/Month)[a]	*Maro* Rent after Deductions (vs *Sewa*)
	Sewa	*Kontrak*	*Maro*		
Uplands:					
Upland crops	100 (6, 0.29)[b]	158 (4, 0.38)	n.a.	10.70	n.a.
Vegetables	160 (11, 1.10)	188 (12, 0.35)	n.a.	3.65	n.a.
Rain-fed lowlands:					
Rice-soybeans	228[c] (21, 0.18)	334 (11, 0.23)	546[d]	8.85	315[e]
Rice-vegetables	283 (5, 0.31)	402 (10, 0.08)	n.a.	8.11	n.a.

[a] Assuming that the period of paddy rice cultivation is 4.5 months from the time of land preparation to harvest; from this the discount rate i can be estimated based on the expression: $sewa = kontrak/(1 + i)^{4.5}$.

[b] Numbers in parentheses are sample size, coefficient of variation respectively.

[c] The figure is different from that in Table VIII because of the difference in sample size.

[d] From Table VIII.

[e] The rent under *maro* discounted on the basis of the time of payment under *sewa* (beginning of crop season) is expressed as follows: $R_M^* = \{\alpha (1 - \theta_R) Y_R / (1 + i)^p - \beta V_R\} + \{\alpha (1 - \theta_S) Y_S / (1 + i)^{p+q} - \beta V_S / (1 + i)^p\}$, where R_M^* = rent discounted, Y_R = output of rice, Y_S = output of soybeans, V_R = current input for rice, V_S = current input for soybeans, α = rate of rent (landlord's share after deduction of the share for harvest labor), β = landlord's share of current input, θ_R = rate of the share for harvest labor (rice), θ_S = rate of the share for harvest labor (soybeans), i = discount rate, p = rice cultivation period, and q = soybean cultivation period. From Table VIII $Y_R = 1{,}039$, $Y_S = 458$, $V_R = 131$, $V_S = 72$. From the conditions for *maro* contracts, $\alpha = \beta = 1/2$. From the harvesting labor practice in the village (*ceblokan*), $\theta_R = 1/6$, $\theta_S = 4/100$. When $i = 8.85$, $p = 4.5$, and $q = 3.5$ are substituted into the above expression, then $R_M^* = 315$.

under *kontrak* is paid in a fixed amount of unhulled rice, irrespective of the crops planted on the tenant's land, at rice harvest time during the wet season. Since the period for cultivating paddy rice is 4.5 months from land preparation to harvest, the following formula can be expressed: $sewa = kontrak / (1 + i)^{4.5}$, where i represents the monthly interest rate.

The interest rates per month thus calculated are 10.70 per cent for upland crops and 3.65 per cent for vegetables in upland fields, and 8.85 per cent for rice-soybeans and 8.11 per cent for rice-vegetables both in rain-fed lowlands (Table IX). Except for vegetables grown in upland fields,[7] the interest rates are within a range

[7] *Sewa* rent on the use of land for the cultivation of vegetables ranges from Rp. 80,000 to Rp.

of 8 to 11 per cent, irrespective of the kind of land and the crops planted.

Using the interest rates thus obtained, *maro* rent can be discounted to the present value at the beginning of the crop season or the time of payment under *sewa*. Under *maro*, half of the expenses for current input are borne by landlord and the rent is paid in kind at harvest time both for rice and soybeans. As a result, the effective rent differs with the time and the way the landlord give the tenant farmer such input materials as fertilizers and chemicals or the funds to buy them. It is assumed here that the input materials are purchased in bulk and given to the tenants at the beginning of each crop season.

As shown in Table IX, the discounted *maro* rent is Rp. 315,000 per hectare, about 38 per cent higher than the Rp. 228,000 under *sewa*. This difference is attributable to the transaction costs to have the *maro* contract carried out (i.e., the monitoring costs), the risk premium, and other factors.

C. *The Logic for Choosing Profit Sharing*

In the study village, there are three forms of easy access finance through which farmers can get credit without security. There is a women's club (PKK), a semipublic organization chaired by the wife of the village head, which extends credit to women members to support their peddling and other economic activities. There is also an agricultural cooperative (KUD) and credit cooperative (KOSIPA), the most popular financial institution in the village. If Rp. 10,000 is borrowed from the PKK for 2.5 months (ten weeks), the effective interest rate per month is 13.2 per cent. If the same amount is borrowed from the KUD for forty days, the interest rate is 24.4 per cent. If the same amount is borrowed from the KOSIPA for three months, the effective interest rate is 21.4 per cent (Hayami and Kawagoe [2, pp. 139–42]). It follows from these figures that interest rates for tenant farmers who can provide no security is more than 10 per cent per month. On the other hand, Rp.

TABLE X

NUMBER OF TENANT FARMS BASED ON CROPPING SYSTEM IN RAIN-FED LOWLANDS IN THE STUDY VILLAGE, 1989

Cropping System	Total	*Maro*	*Kontrak*	*Sewa*	M. + S.	K. + S.	M. + K. + S.
Rice-upland crops	57	18	12	22	2	2	1
Rice-vegetables	45	0	16	29[a]	0	0	0
Total	102	18	28	51	2	2	1

[a] Of the total, sixteen farms are engaged only in the cultivation of a third crop (vegetables) on leased irrigated land in the lowlands.

700,000 per hectare, the highest being nearly nine times larger than the lowest. The coefficient of variation is 1.10, also extremely large when compared with other contract forms. Therefore, *sewa* rents on vegetables are not considered here. No such large differences are seen in the cultivation of vegetables as a secondary crop in rain-fed lowland areas or under *kontrak* for upland fields. These extremely large rent differentials among individual cases under *sewa* for the cultivation of vegetables in upland fields pose a question for further consideration.

65,000 is borrowed from a bank for two months on the security of land, the effective interest rate is 3.79 per cent per month (Hayami and Kawagoe [2, pp. 176–79]).

In effect the interest rate of 8 to 11 per cent on credit extended by landlords to tenant farmers under *kontrak* is higher than the interest rate for institutional finance, and equal to or slightly lower than the interest rate on easy access finance which requires no security. In other words, this interest rate is not high to the tenant farmers who have credit needs but do not have any land to provide as security or any land certificate to prove it,[8] but it is unfavorable to those who can provide security and have access to institutional finance. Assuming that credit needs are the factor for the choice of *kontrak* or *maro* as discussed earlier, farmers who have strong credit needs would be expected to choose one of these two contract forms while other farmers would choose *sewa*.

We will now examine the economic characteristics of tenant farmers to check if there are any differentials in financial status depending on the forms of tenancy. It should be noted in this connection that some farmers cultivate a number of plots of rented land under various contracts. Table X shows the numbers of farming households classified by cropping system on rented rain-fed lowlands and by tenancy forms. In the study village, there are 102 tenant farmers, of whom 57 grow only traditional crops and 45 grow vegetables. Only five households have multiform of

[8] According to Mizuno, less than 10 per cent of the land in Indonesia is measured and registered clarifying ownership and rights to land. In rural areas of the country, there are a large number of different documents certifying rights to land including notarial deeds on land sales, certificates based on the regional development contribution tax, receipts of land prices, as well as the land certificate which certifies registration under the Fundamental Law on Agriculture of 1960, which lays down the basic principles of current land-related laws. The reliability of these documents and land prices are not equal. The land certificate, which has the greatest legal standing in most cases, is required to obtain low-interest loans from the People's Bank of Indonesia (Bank Rakyat Indonesia). Based on a study of farming villages in West Java, Mizuno has determined that only a few people, most of them belonging to the upper class, have land certificates as shown in table below (Mizuno [10]).

Relationship between Farmland Ownership and Land Certificate Possession: Cikacun of Bandung District, 1986

Size of Owned Farmland (ha)	No. of Households Surveyed (a)	No. of Households with Certificate for Housing Lot (b)	b/a (%)
0	44	2	5
–0.5	22	6	27
0.5–	5	4	80
Total	71	12	17
Average area	0.19 ha	n.a.	n.a.
Average area excl. landless	0.50 ha	n.a.	n.a.

Source: Compiled from Mizuno [10, pp. 288 and 290].

TABLE XI

ECONOMIC INDICATORS FOR TENANT FARMER HOUSEHOLDS BASED ON TENANCY CONTRACTS IN THE STUDY VILLAGE, 1989

	Sewa	*Kontrak* + *Maro*			Total
		Subtotal	*Kontrak*	*Maro*	
Number of households[a]	27[b]	30	12	18	57
Number of family members	4.1	4.8	4.1	5.3	4.7
Age of household head	44.0	40.8	33.9	45.4**	42.3
Farmed land area (ha)	0.52	0.44	0.41	0.45	0.48
Owned land area (ha)	0.23	0.12	0.11	0.13	0.17
Annual income per capita (Rp. 1,000)	263	168*	163	172	213
Kinship relation with landlord[c]	0.43	0.56	0.35	0.75**	0.50

[a] Households growing rice–upland crops on at least one rented plot in the rain-fed lowlands.
[b] Of the total: *sewa* + *maro* = two households, *sewa* + *kontrak* = two households, *sewa* + *kontrak* + *maro* = one household (see Table X).
[c] Of the total number of tenant contracts, the ratio of those contracts where the parties have kinship.
* $p < 0.1$ (*t*-test).
** $p < 0.05$ (*t*-test).

TABLE XII

RELATIONSHIP BETWEEN TENANCY FORM AND RESIDENCE OF LANDLORDS AND TENANTS IN THE STUDY VILLAGE, 1989

(%)

	Same Hamlet	Other Hamlet in the Village	Other Village	
			Kinship Relation	No Kinship Relation
Maro	58	4	25	13
Sewa	24	28	2	46
Kontrak	47	40	5	8
Total	35	27	7	31

tenant farming for traditional crops: two households have selected *maro* and *sewa*, another two *sewa* and *kontrak*, while one household has all three forms of tenancy.

Table XI summarizes the economic characteristics of the tenant farmers who follow the traditional cropping system of renting land (these are the farmers shown in the first row of Table X). It is clear from the table that those farmers who select *kontrak* or *maro* have significantly lower income per capita and have strong credit needs compared with the farmers who select *sewa*. In short, the underdeveloped state of the credit market accounts for the presence of the tenant farming systems where credit is extended from landlords to tenant farmers.

As already mentioned, *maro* requires landlords to bear risks and monitor their tenant farmers. Thus if all conditions are equal, landlords would prefer to conclude *maro* contracts with parties who pose less risk and require less monitoring cost. As shown in Table XI, which compares *kontrak* and *maro* tenant farmers, it is clear

that the latter are older and often have a kinship relationship with their landlords.[9] Older farmers have greater experience, thus their production is generally more stable and less risky than younger farmers. Moreover, monitoring cost tends to be smaller if there are kinship ties or a tight territorial bond between landlord and tenant. The closer the personal relationship, the greater the damage in the long run to a tenant farmer's reputation in closely knit Javanese society if he follows an opportunistic course (Hayami and Kikuchi [4]). The presence of strong territorial and blood bonds between landlords and tenant farmers under *maro* contracts is verified in Table XII, which shows the relationship between the form of tenancy and the residence of landlords and tenants. In about 60 per cent of the *maro* contracts (compared with the average of 35 per cent for all tenant farming contracts), landlords and their tenant farmers live in the same hamlet; even when they live in different villages, they usually have kinship ties.

The fact that landlords cannot ignore monitoring costs can be assumed from the fact that landlords who have both *sewa* and *maro* contracts with multi-tenant farmers say that they conclude *maro* contracts for fields close enough to their homes to monitor the tenant farmers' work and *sewa* contracts for fields too distant from their homes to do so easily.

V. SUMMARY AND CONCLUSIONS

In the study village, the tenant farming system has been shifting from a profit-sharing to a fixed cash rent system in line with the commercialization of agriculture following the introduction of vegetable cultivation. In the traditional cropping system, however, there still are three kinds of tenant farming: the profit-sharing system, the system of payment in kind at a fixed amount, and the system of cash rent at a fixed amount.

Inefficiency in resource allocation is not found to be associated with the profit-sharing system compared with owner cultivation and the fixed rent system since landlords conclude contracts with tenants who pose less risk and less enforcement costs. The nominal difference between rents in the fixed in-kind and fixed cash systems is explained by the interest rate for easy access credit requiring no security which is available in the village. Farmers who face financial constraints and have strong credit needs conclude fixed in-kind or profit-sharing tenancy contracts which are interlinked with the extension of credit from landlords. It is shown that the fixed cash system is chosen in more cases if such financial constraints are resolved as a result of increased cash income from vegetable production or from nonfarm jobs. The real difference between rents in the profit-sharing and fixed in-kind systems can be accounted for by landlord risk-sharing and monitoring costs.

We can generalize the following conclusions from the study. First, the peasants in developing countries behave economically rationally under conditions of no re-

[9] Kano has observed that share contracts are common between relatives and fixed tenancy is common between nonrelatives in a village in the suburbs of Jogyakarta in Central Java Province (Kano [6][7]).

strictions on contract choice, resulting in socially efficient resource allocation. Second, agricultural development has caused an institutional change which has moved agriculture in the direction of a cash economy. As the rural economy becomes more commercialized, there has been a shift from in-kind to cash-based tenancy contracts. Third, in economic development and institutional arrangement, the function of indigenous profit-sharing tenancy systems can be interpreted as a means of capital mobilization under conditions where the credit market is less developed.

REFERENCES

1. DATTA, S. K.; O'HARA, D. J.; and NUGENT, J. B. "Choice of Agricultural Tenancy in the Presence of Transaction Costs," *Land Economics*, Vol. 62, No. 2 (May 1986).
2. HAYAMI, Y., and KAWAGOE, T. *The Agrarian Origins of Commerce and Industry* (New York: St. Martin's Press, 1993).
3. HAYAMI, Y.; KAWAGOE, T.; YOKOYAMA, S.; AL SRI BAGYO; and AMAR KADAR ZAKARIA. *Marketing Innovation for Vegetables: Condition of Diversification in Upland Farming*, CGPRT No. 25 (Bogor: ESCAP CGPRT Centre, 1991).
4. HAYAMI, Y., and KIKUCHI, M. *Asian Village Economy at the Crossroads* (Tokyo: University of Tokyo Press, 1981).
5. HAYAMI, Y., and OTSUKA, K. *The Economics of Contract Choice: An Agrarian Perspective* (Oxford: Clarendon Press, 1993).
6. KANO, H. *Sawahan: kaihatsu taisei ka no chūbu Jawa nōson* [A rural village of Central Java under the Sawahan Development Scheme] (Tokyo: Institute of Developing Economies, 1981).
7. ————. *Dagen: Isuramu Karuyawan no mura no shakai keizai* [Dagen: socioeconomic structure of villages in Islam-Karyawan], *Tōkyō daigaku keizaigaku ronshū*, Vol. 47, No. 3 (October 1981).
8. KAWAGOE, T.; FUJITA, K.; YOKOYAMA, S; WAYAN SUDANA; and AMAR KADAR ZAKARIA. *Role of Secondary Crops in Employment Generation: A Study in a Rain-fed Lowland Village in Java*, CGPRT No. 23 (Bogor: ESCAP CGPRT Centre, 1990).
9. KAWAGOE, T., and OTSUKA, K. "Bun'eki kosaku seido riron no saikentō" [A review of theories on the sharecropping system], *Nōgyō sōgō kenkyū*, Vol. 36, No. 3 (July 1982).
10. MIZUNO, K. "Nishi Jawa nōson ni okeru tochishoyūken no kakunin shorui hoyū jōkyō" [Right of landownership in rural West Java and documents to certify this right], in *Tōnan Ajia no tochiseido to nōgyō henka*, ed. H. Umehara (Tokyo: Institute of Developing Economies, 1991).
11. MOROOKA, Y., and HAYAMI, Y. "Contract Choice and Enforcement in an Agrarian Community: Agricultural Tenancy in Upland Java," *Journal of Development Studies*, Vol. 26, No. 1 (October 1989).
12. RAO, C. H. H. "Uncertainty, Entrepreneurship, and Sharecropping in India," *Journal of Political Economy*, Vol. 79, No. 3 (May/June 1971).
13. REID, J. D., Jr. "Sharecropping and Agricultural Uncertainty," *Economic Development and Cultural Change*, Vol. 24, No. 3 (April 1976).
14. ROSENZWEIG, M. R., and WOLPIN, K. J. "Specific Experience, Household Structure, and Intergenerational Transfers: Farm Family Land and Labor Arrangements in Developing Countries," *Quarterly Journal of Economics*, Vol. 100, Supplement (1985).
15. WIJAYA, H., and STURGESS, N. H. "Land Leasing in East Java," *Bulletin of Indonesian Economic Studies*, Vol. 15, No. 2 (July 1979).