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Yujiro Hayami, Masao Kikuchi,  
Luisa M. Bambo, and Esther B. Marciano

The International Rice Research Institute  
P.O. Box 933, 1099 Manila, Philippines

# TRANSFORMATION OF A LAGUNA VILLAGE IN THE TWO DECADES OF GREEN REVOLUTION

Yujiro Hayami, Masao Kikuchi, Luisa M. Bambo, and Esther B. Marciano<sup>1</sup>

## ABSTRACT

The rice belt of Laguna Province, Philippines (popularly known as the heartland of the Green Revolution for its early adoption of modern rice varieties) has experienced dramatic economic and social changes during the last two decades. Four major forces have promoted change: increasing population pressure on limited land, advances in rice production technology, implementation of land reform programs, and penetration of urban economic activities. Data from five surveys in 1966-87 in a typical village illustrate a pattern of socioeconomic change shared by many irrigated rice areas in the country.

Rapid population growth, resulting from both natural reproduction and immigration, has resulted in sharp reductions in farmland area per villager. The increased labor demand deriving from the adoption of modern rice technology has induced immigration from surrounding upland areas. At the same time, land reform programs have transformed traditional sharecroppers into leasehold tenants. Rents fixed at lower-than-market rates have resulted in an inactive land-rental market and have closed opportunities for landless agricultural laborers to become tenant farmers. As a result, the number of landless worker households has increased dramatically both in absolute terms and relative to the number of farm households. The average income of large leaseholders increased significantly in real terms in 1974-87, despite major decreases in the real price of rice. This was mainly because an increasingly larger share of land rent accrued to them under land reform regulations. Meanwhile, landless laborers were able to keep their relative household income, although income per family member tended to decline. Real income per capita did not decline because nonfarm employment opportunities within and outside the village increased.

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<sup>1</sup>Visiting scientist, former associate economist, and research assistants, respectively, Social Sciences Division, International Rice Research Institute, P.O. Box 933, Manila, Philippines.

# TRANSFORMATION OF A LAGUNA VILLAGE IN THE TWO DECADES OF GREEN REVOLUTION

Laguna Province lies along the southern coast of Laguna de Bay (the largest lake in the Philippines), south of Manila (Fig. 1). The strip of irrigated lowland along the lake is one of the most productive rice areas in the country. Relatively well-developed irrigation systems enable rice production in both wet and dry seasons in most ricefields. Because of the favorable environment, as well as Laguna's proximity to major agricultural research centers in Los Baños, including the International Rice Research Institute (IRRI), farmers in the area were the earliest to adopt modern rice varieties and technologies, not only in the Philippines but also among tropical rice-producing areas of the world. Rice yields per cropping season doubled, from 2-3 t/ha to 4-6 t/ha within 20 yr.

The impacts of this technological change on agrarian organization and rural life are important. Of course, in Laguna many other factors had significant socioeconomic influences. Land reform programs executed primarily for lowland rice areas during 1972-81 converted traditional sharecropping tenancies to leasehold tenancies at a low fixed, controlled rent. Rural villages in Laguna have been rapidly exposed to urban economic activities facilitated by the completion of highways (notably the South Super Highway in 1977 and the Masapang Highway in 1978) and the increasing location of urban industries along those highways, especially on the western coast of Laguna de Bay. Population has continued to grow rapidly and the land/population ratio to decline.

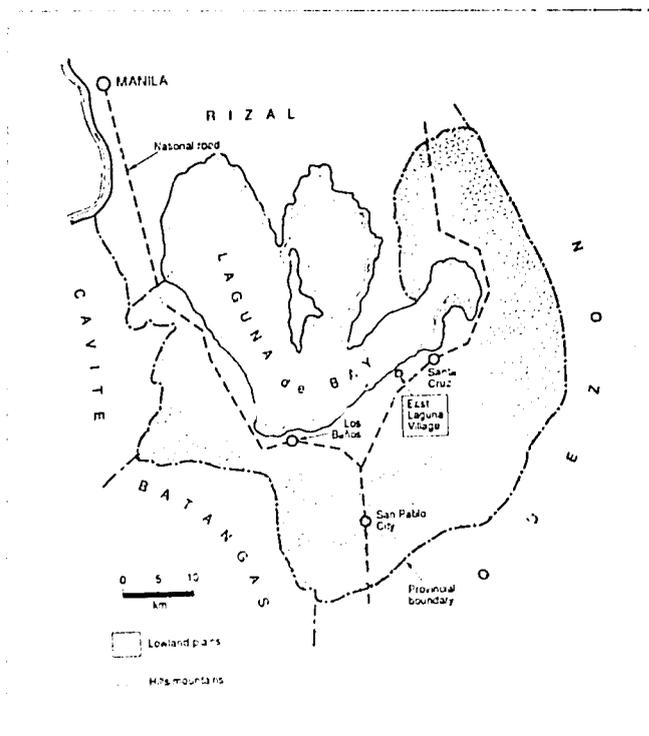
These factors have interacted with the adoption of new rice technology to cause major socioeconomic changes in Laguna, exemplified by the detailed historical accounts of a typical village found in this paper. Not only is the village fairly typical, in both environmental and socioeconomic conditions, of the rice area in the province, but several surveys covering all the households in the village were conducted there between 1966 and 1987. The first survey, done in 1966 by Umehara (1967), provides invaluable information about the pre-modern variety (MV) situation. The second survey (1974), the third (1976), and the fourth (1980) were organized by the IRRI Agricultural Economics Department; the results are reported in Hayami and associates (1978, Chapter 1), Hayami and Kikuchi (1981, Chapter 5), and Kikuchi et al (1980), respectively. The most recent survey, conducted in October-December 1987, was a part of the Differential Impact Study (DIS) of IRRI's agricultural economics program. While we try to make maximum use of the 1966 data, most comparisons made in this paper are for the period between 1974 and 1987 because of data limitation in the first survey. Although the second to the

fifth surveys were similar, not all the data are comparable among 1974, 1976, 1980, and 1987.

This paper documents historical changes in the village. No major effort is made to measure separately the influences of various causal factors, as attempted in Hayami and Kikuchi (1981). Rather, we provide a factual basis for postulating hypotheses for more analytical research in the future. As historical documentation, this study has a limitation because the 1987 DIS survey did not collect detailed data on labor use in rice production. Therefore, we are not able to cover this important subject, as was done by Hayami and associates (1978) and Hayami and Kikuchi (1981). Analysis of this aspect is an important item for the research agenda.

## VILLAGE PROFILE

The village (*barangay* or *barrio*) is one of 13 in the Municipality of Pila. Henceforth, we call it East Laguna Village, because it faces the east coast of Laguna de Bay (Fig. 1). The houses are hidden in a coconut grove that looks like an island in a sea of surrounding ricefields—a landscape typical of the Laguna rice belt.



1. Laguna Province, Philippines.

There is little difference in elevation between the fields and Laguna de Bay, so the fields are often flooded during the rainy season. The coconut grove is slightly higher. Most villagers reside under the coconut trees with the consent of the landowners, most of whom live outside the village. By custom, they are allowed to use the land under the trees for growing fruits and vegetables or for raising livestock and poultry. In return, the villagers clear the underbrush.

In both 1974 and 1987, the coconut grove covered 19.7 ha, of which only 6.1 ha were owned by villagers and the rest by absentee landlords (Table 1). It is difficult to measure unambiguously the surrounding rice area belonging to this village, because the village border is not clearly defined. If we measure it in terms of area cultivated by the villagers, it was 111.5 ha in 1974, which decreased to 91.6 ha in 1987, reflecting a net transfer of 19.9 ha from villagers' to nonvillagers' cultivation, since no new land was opened for cultivation or conversion of ricefields to other land categories.

As in other rice-producing areas in the Philippines, absentee landlordism is pervasive in the village, with more than 80% of the ricefields owned by nonvillagers. However, unlike the inner part of Central Luzon, where large rice haciendas prevailed before land reform programs, the long-settled areas along the sea and lake coasts around Manila have been characterized by small, scattered holdings of small to medium landlords (Hayami and Kikuchi 1981). The 1976 survey recorded that all landlords except 1 owned less than 7 ha in this village, and a majority of them lived in the *poblacion* (urban section) of Pila; this pattern remained essentially unchanged in 1987 (Table 2). Traditionally, most villagers had been the tenants of these landlords under sharecropping contracts. Later they were given leasehold titles through land reform programs (see section on Land tenure relations).

Rice farming is by far the most dominant enterprise in the village. Coconut is a minor income source for villagers, because few of them own and grow coconut trees; even the harvesting labor is usually brought in from outside the village by the absentee landlords. Fishing and duck raising are common sideline enterprises of the villagers.

Villagers buy small daily needs from family grocery stores in the village. They frequently go to a market and shops in the poblacion of Pila, passing a country road of about 2 km on foot or by tricycle. For larger purchases, people go to Santa Cruz, the capital of Laguna Province, by jeepney—about 8 km along the highway. The village has a Catholic church and an elementary school up to the fourth grade. Older children commute to the school in Pila.

At casual glance, the profile of this village does not appear to have significantly changed during the two decades. Under the surface, however, its economy and social organization have experienced dramatic changes. Major forces that caused economic and social changes were continued population pressure on limited land resources, technological progress in rice production represented by MV adoption and increased fertilizer and chemical application, implementation

**Table 1. Land area and use, East Laguna Village, 1974 and 1987.**

Year	Land use	Area (ha)				Percentage of area owned by villagers
		Owned by		Total		
		Villagers	Absentees	Area	%	
1974	Ricefield <sup>a</sup>	1.9	109.6	111.5	85	2
	Coconut land <sup>b</sup>	6.1	13.6	19.7	15	31
	Total	8.0	123.2	131.2	100	6
1987	Ricefield <sup>a</sup>	3.2	88.4	91.6	82	4
	Coconut land <sup>b</sup>	6.1	13.6	19.7	18	31
	Total	9.3	102.0	111.3	100	8

<sup>a</sup>Area cultivated by villagers. <sup>b</sup>Residences located under coconut trees.

**Table 2. Distribution of landlords owning riceland in East Laguna Village, 1976 and 1987.**

Distribution	1976		1987	
	Landlords (no.)	Area owned (ha)	Landlords (no.)	Area owned (ha)
<b>By residence</b>				
East Laguna Village	4	2.4	8	5.0
Poblacion or another village in the same municipality	34	56.6	17	50.9
Other municipalities in Laguna	7	11.7	7	9.9
Neighboring provinces <sup>a</sup>	19	33.3	9	21.4
Manila	2 <sup>b</sup>	4.2	4	4.4
Total	66	108.2	45	91.6
<b>By ownership size</b>				
< 1 ha	20	10.2	13	5.1
1-2.9 ha	34	46.2	24	37.4
3-6.9 ha	11	38.2	6	28.5
> 6.9 ha	1	13.6	2	20.6
Total	66	108.2	45	91.6

<sup>a</sup>Including Batangas, Cavite, and Rizal. <sup>b</sup>Including 1 landlord living in Baguio.

of land reform programs, and increasing urban influences accelerated by improvements in highway systems that reduced travel time from Pila to Manila from more than 3 h to less than 2 h. In the following sections, we will try to identify the influences of these forces based mainly on our recurrent survey data.

## POPULATION PRESSURE

The poblacion of Pila was developed in the early Spanish period. Within the municipality, East Laguna Village represents a newly developed area, inhabited since the late 19th century. During the process of settlement, landlords, mainly living in the poblacion, gave settlers land parcels and advanced them credit for subsistence, with the understanding that they would enter into a sharecropping arrangement after a gratis period. According to national census data, the ricefield area in the village increased from 52 ha in 1903 to 104 ha in 1960; no significant increase has been recorded since then

**Table 3. Changes in riceland, population, and labor force in East Laguna Village, 1903-1987.<sup>a</sup>**

Year(s)	Riceland <sup>b</sup> (ha) (1)	Population (no.)		Labor force ratio (%) (3)/(2)	Person-land ratio (persons/ha) (2)/(1) (3)/(1)	
		Total (2)	Economically active <sup>c</sup> (3)		(2)/(1)	(3)/(1)
1903	52	94	na	na	1.8	na
1960	104	349	na	na	3.4	na
1966 (Dec)	104	393	180	45.8	3.8	1.7
1974 (Nov)	111	549	312	56.8	5.0	2.8
1976 (Dec)	108	644	345	53.6	6.0	3.2
1980 (Apr)	90	698	373	53.4	7.7	4.1
1987 (Nov)	92	816	523	64.1	8.9	5.6
<i>Growth rate (%/yr)</i>						
1903-60	1.2	2.3	na	na	1.1	na
1960-66	0	2.0	na	na	2.0	na
1966-74	0.8	4.3	7.2	2.7	3.5	6.4
1974-80	-3.4	4.1	3.1	-1.0	7.5	6.5
1980-87	0.3	2.2	4.9	2.6	1.9	4.6

<sup>a</sup>na = not available. <sup>b</sup>Area cultivated by villagers. <sup>c</sup>13-16 yr old for 1974, 1980, and 1987; 14-64 yr old for 1966 and 1976.

(Table 3). Subsequent changes in rice area cultivated by villagers have occurred through the transfer of land cultivation rights between villagers and nonvillagers.

Although the land frontier closed, population continued to increase. For 1903-60, the reported population growth rate in the village based on national census data (2.3% per yr) exactly matched the rate in the Philippines as a whole. Therefore, it seems that the village population increased more or less at its natural growth rate, with in- and out-migrations largely balanced, during this period. For 1960-66, the village population growth rate (2.0%) was lower than the national rate (3.1%), reflecting a net out-migration, presumably due to the worsening person-land ratio.

The population growth rate jumped to 4.3% for 1965-74 and 4.1% for 1974-80, exceeding the national rates of 2.9 and 2.7%, respectively. These unusually high rates resulted from both high natural population growth and high net in-migration. As shown in Figure 2, the base of the population pyramid continued to widen, reflecting increases in the birth rate. However, the labor force ratio as measured by the ratio of economically active population (13-65 yr) to total population did not decline because of a large inflow of labor into the village. This labor inflow resulted, in part, from the increased labor demand that was common in irrigated rice areas in the Philippines due to the development and diffusion of new rice technology (Barker and Cordova 1978). Also, it resulted from the push of population from the coconut areas in the hills surrounding the rice belt of Laguna. Unlike in irrigated rice, no major technological breakthrough occurred in upland farming, so that increased population in the hills sought employment in irrigated rice areas (Kikuchi 1983).

For 1980-87, the population growth rate in the village declined to 2.2%, below the national rate of 2.4%. As clearly indicated in Figure 2, the base of the population pyramid had begun to shrink in 1987, reflecting a decline in the birth rate,

for the first time since 1966, for which the population cohorts are constructed. The declining birth rate resulted in an increase in the labor force ratio from 53.4% in 1980 to 64.1% in 1987. The deceleration in population growth seems to be explained partly by increasing out-migration of villagers, especially the better educated, to urban jobs. This process was already under way in the 1970s but became more pronounced after improvements in the highway system in 1977-78 (Kikuchi et al 1983).

Continued population growth, although its rate fluctuated over time, pressed hard on limited land resources. Average population per hectare of rice area in the village increased from 1.8 persons in 1903 to 3.8 persons in 1966, and further to 8.9 persons in 1987; this was paralleled by increases in economically active population per hectare from 1.7 persons in 1966 to 5.6 persons in 1987.

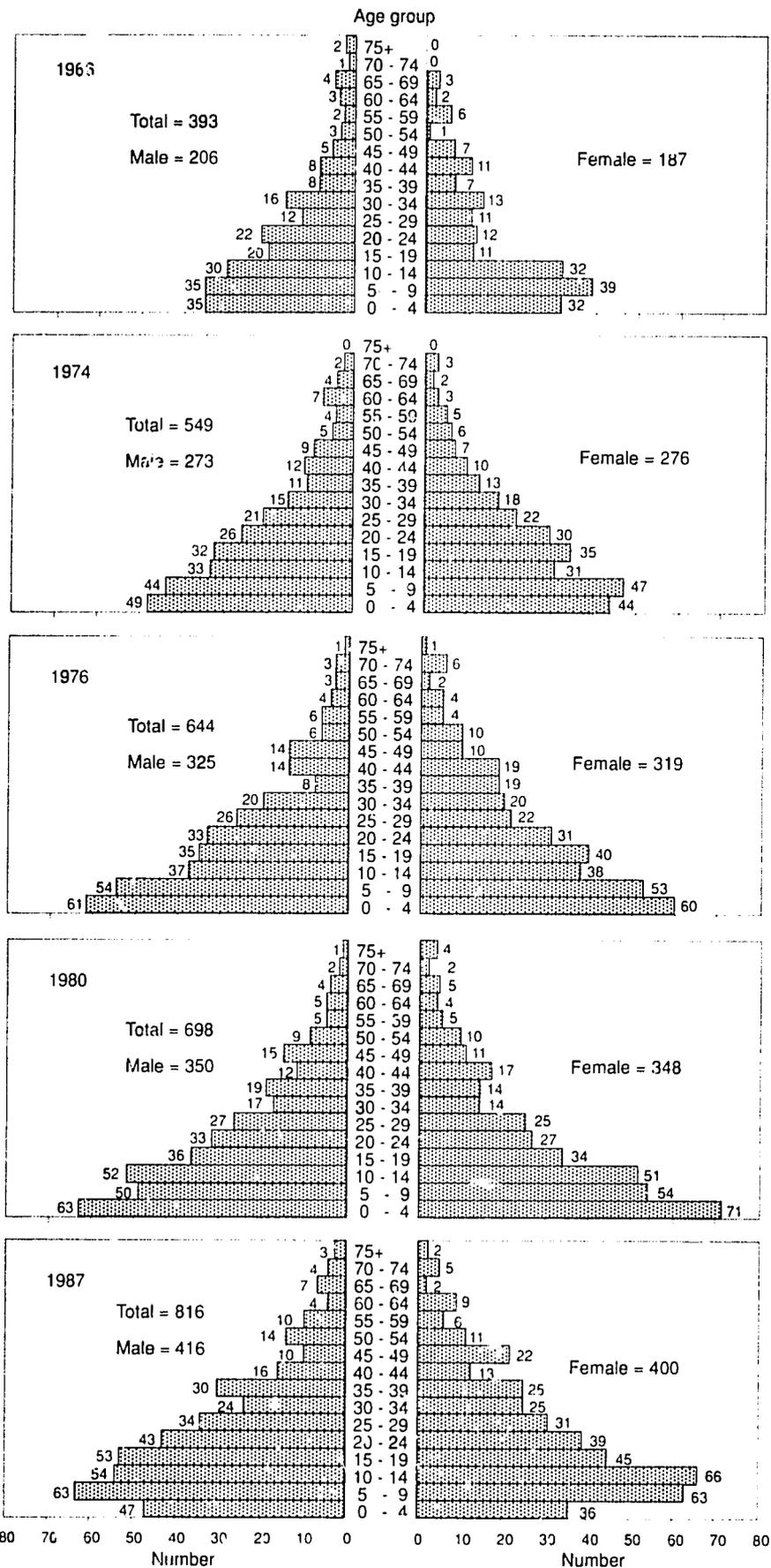
One consequence of the strong population pressure on land was an increase in the number of landless laborers with no farm to operate, either owned or rented. The increase in the total number of households from 1966 to 1987 largely paralleled the growth in population (Table 4); it increased from 66 in 1966 to 95 in 1974 and further to 156 in 1987. The number of landless worker households increased dramatically faster than the number of farmer households. As a result, the share of landless households in the total number of households increased from 30% in 1966 to 50% in 1976 and further to 66% in 1987. The sharp increase in the number of landless worker households, however, was due not only to population pressure but also to land reform regulations on land tenancy contracts, to be discussed in the section on Land tenure relations.

The growing relative scarcity of land due to population pressure is also reflected in changes in farm-size distribution (Table 5). Average farm size declined progressively from 2.3 ha in 1966 to 1.7 ha in 1987. Meanwhile, the share of farms smaller than 2 ha increased from 43 to 71%, and their share of riceland increased from 20 to 43%. The size distribution of operational holdings in this village was relatively equal and unimodal. Even the largest operational holding was only 8.5 ha in 1987.

## FAMILY STRUCTURE

Strong population pressure affected family structure, too. As is common in rural villages in the Philippines, families in East Laguna Village have traditionally been dominated by those of the nuclear type consisting of only one married couple (or widow) and their(her) children. When the children marry, they usually move to a hut near their parents' houses; they make their living as casual workers, laboring on their parents' and other neighbors' farms, until they inherit the parents' farms. As a step toward inheritance, it is common for children to have a sharecropping arrangement with their parents. When retiring from farming, parents sometimes keep one child (often the youngest) after marriage in their house.

A change in the life-cycle pattern seems to be reflected in the distributions of households by family type and in the



2. Age distribution of population in East Laguna Village, 1966-87.

**Table 4. Number of households, East Laguna Village, 1966-87.\***

Year(s)	Farmers	Landless workers	Total
1966	46 (70)	20 (30)	66 (100)
1974	54 (57)	41 (43)	95 (100)
1976	55 (50)	54 (50)	109 (100)
1980	49 (40)	72 (60)	121 (100)
1987	53 (34)	103 (66)	156 (100)
	<i>Growth rate (%/yr)</i>		
1966-74	2.0	9.4	4.7
1974-80	-1.6	9.6	4.1
1980-87	1.1	5.2	3.7

\*Numbers in parentheses are percentages.

average farm sizes of three major household categories (large farmers with operational farm sizes of 2 ha and above, small farmers with operational farm sizes below 2 ha, and landless workers with no operational holding), shown in Tables 6 and 7. In 1974, as many as 85% of households were the nuclear type, while the share of extended families was higher among farmers, especially large farmers, than among landless workers; correspondingly, average family size was significantly larger for large farmers than for landless workers. However, in 1980, while nuclear families were still predominant, the differences in the distributions by family type as well as in average family size largely disappeared between farmers and landless workers. In 1987, while this difference emerged again between farmers and landless workers, small farmers

had a higher percentage of extended families and a larger average family size than large farmers.

This change seems to reflect the closure of the so-called "agricultural ladder" (Spillman 1919). In old days when land was relatively abundant and its rental market was not regulated by land reform laws, a young boy who began as an agricultural laborer could move up to a sharecropper and sometimes to a leasehold tenant as he accumulated farming experience and savings to buy farm equipment and carabao (water buffalo); as his family size increased and children grew to working age, he was able to expand his cultivated area by renting more land. As population pressure mounted and land reform regulations rendered the land rental market inactive, the chances for a landless laborer to ascend this agricultural ladder to become a tenant farmer, and for a small farmer to expand his operational farm size in response to growth in his family size, became progressively smaller. People had to remain casual agricultural laborers; this was especially the case for the landless laborers who migrated from outside the

**Table 6. Distribution of households by type of family, East Laguna Village, 1974, 1980, and 1987.**

Year	Parameter	Large farmers	Small farmers	Landless workers	Total or weighted average
1974	Households (no.)	24	30	41	95
	% of nuclear families	66.7	86.7	95.1	88.0
1980	Households (no.)	18	31	72	121
	% of nuclear families	83.3	87.1	83.3	84.3
1987	Households (no.)	15	38	103	156
	% of nuclear families	86.7	76.3	93.2	88.5

**Table 5. Size distribution of operational holdings of ricefields in East Laguna Village, 1966-87.**

Year	Parameter	Farm size <sup>a</sup>					Total	Average area/farm (ha)
		<1 ha	1-1.9 ha	2-2.9 ha	3-4.9 ha	>4.9 ha		
1966	Farms (no.)	6 (13) (3)	14 (30) (17)	10 (22) (20)	13 (28) (44)	3 (7) (16)	46 (100)	2.3
	Rice area (ha)	3 (3)	18 (17)	21 (20)	45 (44)	17 (16)	104 (100)	
1974	Farms (no.)	8 (15)	22 (41)	11 (20)	11 (20)	2 (4)	54 (100)	2.1
	Rice area (ha)	4 (4)	29 (26)	24 (22)	40 (36)	14 (12)	111 (100)	
1976	Farms (no.)	13 (24)	20 (36)	9 (16)	11 (20)	2 (4)	55 (100)	2.0
	Rice area (ha)	6 (6)	28 (26)	18 (17)	41 (38)	14 (13)	107 (100)	
1980	Farms (no.)	12 (24)	19 (39)	9 (18)	7 (14)	2 (5)	49 (100)	1.8
	Rice area (ha)	6 (7)	25 (28)	20 (22)	25 (28)	14 (15)	90 (100)	
1987	Farms (no.)	14 (26)	24 (45)	7 (13)	5 (10)	3 (6)	53 (100)	1.7
	Rice area (ha)	7 (8)	32 (35)	17 (18)	16 (17)	20 (22)	92 (100)	

\*Numbers in parentheses are percentages.

**Table 7. Average family size (no. of persons), East Laguna Village, 1974, 1980, and 1987.**

Year	Category	Large farmers	Small farmers	Landless workers	Total or weighted average
1974	Male	3.4	2.9	2.3	2.8
	(13 and above)	(2.1)	(1.7)	(1.2)	(1.6)
	Female	3.9	2.3	2.4	2.9
	(13 and above)	(2.7)	(1.3)	(1.3)	(1.7)
	Total	7.3	5.2	4.7	5.7
1980	(13 and above)	(4.8)	(3.0)	(2.5)	(3.3)
	Male	3.2	2.9	2.8	2.9
	(13 and above)	(2.4)	(1.6)	(1.5)	(1.7)
	Female	3.2	2.9	2.8	2.9
	(13 and above)	(2.2)	(1.5)	(1.4)	(1.5)
1987	Total	6.4	5.8	5.6	5.8
	(13 and above)	(4.6)	(3.1)	(2.9)	(3.2)
	Male	3.2	2.7	2.5	2.6
	(13 and above)	(2.7)	(1.8)	(1.6)	(1.7)
	Female	2.5	3.4	2.3	2.6
1987	(13 and above)	(2.0)	(2.3)	(1.4)	(1.7)
	Total	5.7	5.1	4.8	5.2
	(13 and above)	(4.7)	(4.1)	(3.0)	(3.4)

village. This immobility also seems to have underlain the disappearance of the positive association of farm size with family size.

#### AGRICULTURAL PRODUCTION

One of the major counteractive forces against population pressure on land is the development of agricultural technology toward a land-saving and labor-using direction (Hayami and Ruttan 1985). Indeed, such development occurred in East Laguna Village. The conditions for major advancement in rice technology were created by the extension of a national irrigation system to the village in 1958. Irrigation made double cropping of rice possible in almost all the ricefields in the village, thereby doubling the rice yield.

Another major change was the introduction of MVs. Because of the good irrigation conditions in this village as well as its proximity to Los Baños, where the International Rice Research Institute is located, the diffusion of MVs was very fast. According to the Umehara (1967) survey, no one in the village had tried MVs in 1966. In 1974, all farmers had planted MVs. MV diffusion was accompanied by the increased application of fertilizers and chemicals and by the adoption of improved cultural practices such as intensive weeding and straight-row planting.

As a result, the average rice yield increased significantly (Table 8). Recognizing the hazards of yield comparisons among single years subject to weather disturbances, the major yield gain from 1966 to 1974 on the order of 20% seems to be explained mainly by the diffusion of initial MVs such as C4 and IR8. Another major yield boost from 1976 to 1979 was associated with the diffusion of second-generation MVs with stronger pest resistance, such as IR36. The relatively slow increase in yield from 1979 to 1987 corresponded to a shift to IR64, which is superior to IR36 in grain quality but not so

**Table 8. Average rice yields (t/ha) of harvested area, East Laguna Village, 1956-87.\***

Year	Wet season	Dry season	Total
1956	2.2 (73)	-	2.2 (32)
1966	2.4 (80)	3.1 (81)	5.5 (81)
1974	3.1 (100)	3.8 (100)	6.9 (100)
1976	3.2 (107)	3.6 (95)	6.8 (99)
1979	3.8 (127)	4.6 (121)	8.4 (122)
1987	4.2 (135)	4.6 (121)	8.8 (128)

\*Numbers in parentheses are weighted percentages based on 1974 = 100%.

much in yield. Such yield movements show clearly that the so-called "green revolution" is not a one-shot phenomenon but an evolutionary process involving successive replacements of earlier MVs by new ones, accompanied by increased application of modern inputs and adoption of better cultural practices.

No significant difference in average yield between large and small farmers and between owner/leaseholders and share-tenants was observed except for the tenure comparison for the 1974 dry season (Table 9). This observation supports the generalization concerning MV technology that "neither farm size nor tenure has been an important source of differential growth in productivity" (Ruttan 1977).

Another aspect of technological innovation in agriculture is reflected in changes in the holdings of productive assets (Table 10). For a decade since the mid-1960s, hand tractors had replaced carabao in land preparation. Mechanization thus began much earlier than the introduction of MVs. According to the Umehara (1967) survey, 14 tractors were already in use; the number increased to 21 in 1974. Meanwhile, the number of carabao decreased from 21 to 4. However, high fuel prices in the decade following the 1973 oil crisis revived land preparation by carabao. The carabao population increased to 13 in 1980 and further to 23 in 1987. More recently, the number of carabao is said to be declining again, corresponding to relative declines in fuel prices.

Corresponding to the development of MV technology, the number of chemical sprayers and rotary weeders increased dramatically. Rotary weeders were owned not only by farmers but also commonly by landless workers for the purpose of their being employable under a special contract called *gama* by which a laborer weeds, harvests, and threshes a certain plot for a share of its output (Hayami and Kikuchi 1981). A more recent development in farm mechanization was the rapid diffusion of portable threshers; the number increased from only 1 in 1976 to 7 in 1987. These machines were not only used on the owners' farms but were also contracted out to thresh other farmers' crops, resulting in almost complete replacement of hand threshing by mechanical threshing in the village. This rapid adoption of portable threshers was a common phenomenon in major rice areas in the Philippines (Duff 1986, Hayami et al 1988).

Duck and pig raising used to be a common sideline enterprise for villagers. However, the duck population decreased by about one-half from 1974 to 1980 due to decreased

**Table 9. Average rice yield of harvested area by farm size and land tenure class, East Laguna Village, 1974 and 1987.**

Season	Tenure status	Farm size <sup>a</sup>			Student t-value <sup>b</sup>
		Large (2 ha & above)	Small (below 2 ha)	Average	
1974 wet	Owner/leasehold	3.3	3.5	3.3 (50)	1.18
	Share	3.1	2.7	2.9 (14)	
	Total	3.2 (32)	3.2 (32)	3.2 (64)	
	t-value <sup>c</sup>	0			
1974 dry	Owner/leasehold	3.9	3.9	3.9 (50)	2.05*
	Share	3.3	3.3	3.3 (14)	
	Total	3.7 (32)	3.8 (32)	3.8 <sup>a</sup> (64)	
	t-value <sup>c</sup>	0.26			
1987 wet	Owner/leasehold	4.8	4.4	4.6 (48)	0.16
	Share	4.9	4.2	4.5 (22)	
	Total	4.9 (27)	4.3 (43)	4.5 <sup>a</sup> (70)	
	t-value <sup>c</sup>	1.17			
1987 dry	Owner/leasehold	5.0	5.1	5.1 (47)	0.81
	Share	5.6	5.3	5.4 (21)	
	Total	5.2 (27)	5.2 (41)	5.2 <sup>a</sup> (68)	
	t-value <sup>c</sup>	0			

<sup>a</sup>Numbers in parentheses are numbers of plots observed. <sup>b</sup>Test difference between owner/leasehold and share plots. \* = significant at the 5% level. <sup>c</sup>Test difference between large and small farms. <sup>d</sup>Simple averages of the yields by plot; these are not exactly the same as the weighted averages in Table 8 calculated from the division of total output by total area harvested.

**Table 10. Holdings of productive farm assets (no.), East Laguna Village, 1966-87.<sup>a</sup>**

Item	Farmer					Landless					Total				
	1966	1974	1976	1980	1987	1966	1974	1976	1980	1987	1966	1974	1976	1980	1987
<b>Machines and implements</b>															
Hand tractors	14	21	24	20	21	0	0	0	2	0	14	21	24	22	21
Threshers	0	na	1	na	7	0	na	0	na	0	0	na	1	na	7
Chemical sprayers	0	23	26	19	21	0	0	0	0	0	0	23	26	19	21
Rotary weeders	45	80	84	65	55	0	23	43	45	71	45	103	127	110	126
<b>Animals</b>															
Carabao	21	4	8	10	17	0	0	0	3	6	21	4	8	13	23
Cattle	na	5	na	13	22	na	1	na	6	8	na	6	na	19	30
Pigs	na	62	47	34	54	na	20	25	21	12	na	82	72	55	66
Chickens	na	199	na	349	232	na	111	na	182	322	na	310	na	531	554
Ducks	na	2989	1426	1386	2047	na	2847	1275	984	558	na	5836	2701	2370	2605
Goats	na	0	na	0	4	na	0	na	3	2	na	0	na	3	6

<sup>a</sup>na = not available.

supply of shellfish from the lake as a major source of feed. On the other hand, cattle and goat raising based on pasture under coconut became common. Landless workers and poor farmers often raise cattle under a contract called *iwi* by which they take care of the animals rented at the calf stage, with the agreement that they will receive one-half of the revenue from sale of the adult.

#### LAND TENURE RELATIONS

Traditionally, the common form of land tenure contract in the village was the crop-sharing tenancy, with output shared equally by landlord and tenants. Cost sharing approximated 50:50. The most common arrangement was 100% of the cost for land preparation borne by the tenants; 100% of the irriga-

tion fee borne by the landlord; and other paid-out costs, including seed, fertilizers, chemicals, planting, weeding, harvesting, and threshing, shared equally. In one variation, the whole cost of fertilizers and chemicals in addition to the irrigation fee is shouldered by the landlord. Fixed-rent leasehold tenancy was limited to a small number of large farmers before land reform.

Land tenure relations in the village changed dramatically from 1966 to 1974 as a result of land reform. Philippine land reform consisted of two programs: the shift from share to leasehold tenancy with a government-controlled fixed rent (Operation Leasehold), and the redistribution of tenanted rice (and maize) land above a landlord's retention limit to tenants cultivating the land (Operation Land Transfer). These pro-

grams were implemented based on the 1963 Agricultural Land Reform Code but, until 1972, its impact had been limited mainly to pilot projects in Central Luzon (de Los Reyes 1972). The code was amended in 1971 to extend land reform to the whole nation, with automatic conversion of all share-tenants to leaseholders. The 1971 Code was strengthened by the Marcos Administration through Presidential Decrees No. 2 and No. 27, declared immediately after Martial Law was proclaimed in 1972. The landlord's retention limit was successively reduced from 75 to 7 ha (Hayami et al 1989).

Operation Land Transfer had little impact on East Laguna Village, because few landlords owned more than the retention limit. As of 1987, only four farmers had received the Certificate of Land Transfer (CLT). On the other hand, Operation Leasehold resulted in a major replacement of share tenancy by leasehold tenancy from 1966 to 1974 (Table 11, 12). However, share tenancy did not totally disappear; despite the law denouncing it (Republic Act 3844, Section 2), it continued to be practiced among relatives and close friends.

By the reform programs, leasehold rent was fixed at 25% of average rice yield for 3 normal years preceding the year of program implementation. Land rent in the traditional sharecropping arrangements is considered to be about one-third of total rice output after subtracting production costs shared by landlords from the 50% share of gross output. Therefore,

**Table 11. Distribution of farms by tenure status, East Laguna Village, 1966-87.**

Year	Tenure status	Farms		Area	
		No.	Percent	Ha	Percent
1966	Owner/leasehold	2	4	10.3	10
	Leasehold	7	15	18.0	17
	Share	35	76	65.9	63
	Leasehold/share	2	4	10.0	10
	Total	46	100	104.2	100
1974	Owner/leasehold	4	7	11.4	10
	Leasehold	34	63	54.4	49
	Share	6	11	20.6	18
	Leasehold/share	10	19	25.1	23
	Total	54	100	111.5	100
1976	Owner/leasehold	3	6	11.2	10
	Leasehold	29	54	48.5	45
	Share	14	26	24.7	23
	Leasehold/share	8	14	23.9	22
	Total	54	100	108.3	100
1980	Owner/leasehold	4	8	12.6	14
	Leasehold	28	58	39.0	44
	Share	9	18	9.4	10
	Leasehold/share	8	16	29.0	32
	Total	49	100	90.0	100
1987	Owner/leasehold <sup>a</sup>	7	13	13.9	15
	Leasehold	31	58	48.2	53
	Share	11	21	18.5	20
	Leasehold/share <sup>c</sup>	4	8	11.4	12
	Total	53	100	92.0	100

<sup>a</sup>Includes 1 pure owner. <sup>b</sup>Includes 4 CLT holders. <sup>c</sup>Includes 2 mortgage arrangements.

significant increases in rice yield widened the income gap between sharecroppers and leaseholders, whose rent was fixed by land reform laws. Already in 1974, rent paid by leaseholders was only 19% of their output. The share of leasehold rent went down further to 17% in 1979 (Table 13). These data suggest that the economic rent accruing to the service of land, equal to its marginal value product and the actual rent paid from leaseholders to landlords, widened under the institutional rigidity of the land rental market. Naturally, the income position of the leasehold tenants, whose income increased by the amount of the gap between the economic rent and the actual rent, improved relative to that of the share-tenants, whose rent payments increased proportionally with yield increases. This gap between the economic rent and the actual rent provided an economic basis for the emergence of a subtenancy arrangement in which the tenant subrented a part (or the whole) of his operational holding to landless laborers and extracted from his sublessees a surplus of the rent revenue over the payment to his landlord.

Indeed, as shown in Table 12, the number of plots subrented by leasehold tenants increased from 5 in 1966 to 16 in 1976, although subtenancy was illegal (Republic Act 3844, Section 27). Subtenancy arrangements could be classified into three types. The first is the land pawning arrangement, in which the sublessor put his land in pawn to the sublessee; in other words, the sublessee advanced a credit to the sublessor to establish a right to cultivate the land until the loan was repaid. The second was the leasehold arrangement, in which the sublessor received a fixed rent from the sublessee; this was

**Table 12. Distribution of plots by tenure status, East Laguna Village, 1966-87.**

Year	Tenure status	Plots	
		No.	Percent
1966	Owner	2	3
	Leasehold	12	19
	Sharecrop	44	70
	Subrented	5	8
	Total	63	100
1976	Owner	3	3
	Leasehold	44	48
	Sharecrop	30	32
	Subrented	16	17
	Pawning arrangement	5	5
Leasehold arrangement	6	7	
Sharecrop arrangement	5	5	
Total	93	100	
1987	Owner	7	9
	CLT	5	6
	Leasehold	41	50
	Sharecrop	20	24
	Subrented	9	11
Pawning arrangement	5	6	
Leasehold arrangement	4	5	
Total	82	100	

**Table 13. Average rent and yield of land under leasehold tenancy, East Laguna Village, 1976-87.**

Year	Season	Leasehold rent (kg/ha) (1)	Yield (kg/ha) (2)	Ratio (1)/(2)
1976	Wet	567	3213	0.18
	Dry	788	3852	0.20
	Total	1355	7065	0.19
1979	Wet	590	3753	0.16
	Dry	887	4896	0.18
	Total	1477	8649	0.17
1987	Wet	627	3505	0.18
	Dry	706	4296	0.16
	Total	1333	7801	0.17

limited mainly to an arrangement between father and son as a step in the inheritance of land cultivation rights. The third was the sharecropping arrangement, in which the sublessor and the sublessee shared output and costs on a 50-50 basis.

The incidence of subtenancy in this village, which increased from only 5 cases in 1966 to 16 in 1976, decreased rather sharply to 9 in 1987 despite the wide gap between actual and economic rents. In 1980, one sublessor dared to appeal to the District Office of Agrarian Reform to the effect that he was the actual tiller of the land, to obtain a formal title of leasehold tenancy by forfeiting his lessors' title. Naturally, this incidence strongly discouraged leaseholders from using subtenancy contracts thereafter.

#### TRANSFER OF LAND CULTIVATION RIGHTS

The subtenancy arrangements were developed as a device to bypass land reform regulations for adjusting operational farm size to family labor size. In addition, the land pawning arrangement was used as a means of easing the credit constraint under the condition that neither the CLT nor the leasehold title was allowed to be used as collateral for institutional loans. However, transaction costs for sublessors were high because of possible penalties upon discovery by officials.

An alternative to the land pawning arrangement for land reform beneficiaries to mobilize finance from the usufruct rights on land is to sell their cultivation rights. Unlike the pawning arrangement, the sale of leasehold titles can be made legally (although sale of the CLT is illegal) if a seller is able to obtain the signature of his landlord to the effect that the landlord accepts voluntary surrender of the land from the selling tenant and agrees to designate the buyer as a new tenant.

Both subtenancy and sale of leasehold titles increased from the late 1960s to the mid-1970s, corresponding to the implementation of Operation Leasehold (Table 14). During this period, the deflated price of a tenancy title tended to increase, while that of a land ownership title tended to decrease. This anomaly arose from the fact that the values of land

ownership titles recorded in Table 14 were for those with tenants on the land. The buyer of the land had to pay the tenants to move in order to recover his right to the use of "top of the soil."

After the mid-1970s, while the incidence of subtenancy declined, as observed in Table 12, the sale of leasehold titles continued at a high level. Sales to nonvillagers increased. Leasehold land area sold by farmers in the village exceeded the area bought by farmers in the village over a wide margin (Table 15); this implies a large net outflow of land cultivation rights from villagers. Buyers of the leasehold titles were either original landlords or other relatively wealthy people in local towns engaging in urban business, employed in government offices, or using money from overseas employment. They operated the farms with hired labor either under their direct management or under the supervision of overseers.

The increased sales of leasehold titles do not necessarily reflect impoverishment of small leaseholders and CLT holders. Of course, there are cases in which sellers lose their titles and slip down to the rank of landless laborers as a result of excess consumption or misfortunes such as crop damage and sickness. But, there are also cases in which they try to mobilize funds for starting nonfarm businesses, going abroad to work, or imparting higher education to children; these represent a process in which land reform beneficiaries transform themselves from tillers of land to the nonfarm middle class. Indeed, it is a common dream of villagers to escape from the drudgery of ricefields to "clean-nailed" jobs. This dream seems to have strengthened as urban influences increased.

#### OCCUPATIONAL STRUCTURE

So far we have observed the process by which the population of landless laborers increased relative to that of farmers in East Laguna Village. To recapitulate, the development and diffusion of MV technology based on well-developed irrigation infrastructure increased labor demand for rice farming. This increase was met by both natural population growth within the village and immigration to the rice belt from the surrounding upland areas. Partly because of increasing scarcity of land and partly because of land reform regulations on tenancy contracts, the possibility for new entrants to the village labor market to become farm operators by renting land decreased.

These developments are reflected in changes in the distribution of the economically active population (13-65 yr) from 1974 to 1987. During that period, the share of economically active males whose major occupation was self-employment on their own farms decreased from 47 to 21%, while the share of those engaged mainly in hired rice farming increased from 19 to 48% (Table 16). As many as 16% of active members in the farmer households engaged in hired rice farming as their major occupation in 1987, but none of them did so in 1974. That seems to reflect the growing difficulty of adjusting farm size in response to the increase in family size as discussed in the section on Population pressure. The concentration of landless household members in hired rice farming increased

**Table 14. Sale of land ownership and tenancy titles, East Laguna Village, 1959-87.\***

Year	Sale of land ownership title				Sale of tenancy title <sup>b</sup>			
	No.	Area (ha)	Value (P/ha)		No.	Area (ha)	Value (P/ha)	
			Current	Deflated by price index <sup>c</sup>			Current	Deflated by price index <sup>c</sup>
1959	0	0	-	-	1	1.0	150	792
1960	0	0	-	-	1	2.4	125	594
1961	0	0	-	-	0	0	-	-
1962	1	3.0	6,333	26,159	0	0	-	-
1963	1	1.3	7,692	25,203	1	2.0	1,500	4,915
1964	1	3.5	5,429	15,173	0	0	-	-
1965	0	0	-	-	1	3.0	433	1,286
1966	1	1.0	11,000	31,673	0	0	-	-
1967	0	0	-	-	1	1.5	467	1,345
1968	1	1.5	18,000	47,506	3	3.9	611	1,612
1969	1	0.8	14,667	35,730	3	2.5	980	2,387
1970	1	2.0	9,500	23,142	4	6.4	2,100	5,116
1971	1	2.5	10,000	20,653	0	0	-	-
1972	2	1.4	12,143	19,229	4	5.0	1,300	2,059
1973	1	1.0	15,000	19,521	2	3.5	3,086	4,016
1974	0	0	-	-	2	3.1	4,113	4,294
1975	1	0.4	15,600	15,600	4	5.1	4,068	4,068
1976	0	0	-	-	1	1.2	6,667	6,530
1977	-	-	-	-	2	(2)	10,000	9,406
1978	-	-	-	-	2	(2)	10,500	10,179
1979	-	-	-	-	1	(1)	10,000	9,406
1980	-	-	-	-	2	(2)	10,000	8,797
1981	-	-	-	-	1	(1)	9,333	7,268
1982	-	-	-	-	2	(2)	12,886	10,034
1983	0	0	-	-	3	(2)	14,000	9,172
1984	0	0	-	-	1	0.50	10,000 <sup>d</sup>	4,222
	0	0	-	-	1	1.0	15,000	6,333
1985	0	0	-	-	4	(3)	15,000	4,782
	0	0	-	-	1	1.0	11,000	3,507
1986	1	1.75	85,000	30,244	2	(1)	17,500	6,227
1987	1	0.5	80,000	28,865	-	-	-	-

\*From 1959 to 1961, 1 US\$ = P2.02; from 1962 to 1969, 1 US\$ averaged P3.91; from 1970 to 1975 the value increased from P5.91 to P7.25, increasing an average of P.47 per year; from 1976 to 1979 1 US\$ averaged P7.40. Values thereafter were: 1980, P7.90; 1981, P7.90; 1982, P8.54; 1983, P11.11; 1984, P16.70; 1985, P18.61; 1986, P20.39; 1987, P20.57. <sup>b</sup>Sales to nonvillagers are shown in parentheses. <sup>c</sup>The rough rice price index for the Southern Tagalog area (1975 = 100). <sup>d</sup>Relatively lower because it was purchased from father.

**Table 15. Matrix of land transfers (no. of transfers)\* through sale/purchase of leasehold titles, East Laguna Village, 1977-87 totals.**

Farm size class (ha)	Bought by							Total
	Villager of farm size class					Nonvillager		
	<0.9 ha	1-1.9 ha	2-2.9 ha	3-4.9 ha	>4.9 ha	Landlord	Other	
<i>Sold by villager</i>								
<0.9 ha	1 (0.25)	1 (1.5)			1 (1.0)	5 (6.2)	7 (10.5)	15 (19.45)
1 - 1.9 ha	1 (1.0)	1 (0.5)				2 (4.5)	1 (1.0)	5 (7.0)
2 - 2.9 ha								
3 - 4.9 ha								
>4.9 ha							1 (2.0)	1 (2.0)
<i>Sold by nonvillager</i>								
Total	2 (1.25)	2 (2.0)	1 (3.0)		1 (1.0)	7 (10.7)	9 (13.5)	22 (31.45)

\*Hectares transferred are shown in parentheses.

**Table 16. Percentage of persons in economically active male population (13-65 yr) by occupation, East Laguna Village, 1974, 1980, and 1987.**

Occupation	1974			1980			1987		
	Farmer N = 99	Landless N = 52	Total N = 151	Farmer N = 87	Landless N = 110	Total N = 197	Farmer N = 114	Landless N = 158	Total N = 272
<i>Major occupation</i>									
Rice farming									
Self-employed	71.7	0	47.0	58.6	0	26.0	50.0	0	20.9
Hired	0	53.8	18.6	9.1	74.6	45.7	15.8	70.9	47.8
Duck raising	6.1	32.7	15.2	1.2	3.6	2.5	1.8	0.6	1.1
Fishing	0	0	0	0	1.8	1.0	0	3.8	2.2
Tricycle driver	0	0	0	1.2	0	0.5	0.9	1.9	1.5
Vendor	0	1.9	0.7	1.2	0	0.5	0	0.6	0.4
Buy and sell	0	0	0	0	0	0	0	0.3	0.7
Native doctor	0	1.9	0.7	0	0	0	0	0	0
Carpentry	0	3.9	1.3	1.2	3.6	2.5	0	1.9	1.1
Salaried worker	4.0	1.9	3.3	8.0	4.6	6.1	6.1	6.3	6.2
Schooling	16.2	3.9	11.9	19.5	8.2	13.2	21.9	10.8	15.5
None	2.0	0	1.3	1.2	3.6	2.5	3.5	1.9	2.6
Total*	100.0	100.0	100.0	101.2	100.0	100.5	100.0	99.0	100.0
<i>Minor occupation</i>									
Rice farming									
Self-employed	6.1	0	4.0	8.0	0	3.6			
Hired	14.1	21.2	16.6	10.3	4.5	7.1			
Duck raising	17.2	11.5	15.2	9.2	10.9	10.2			
Cattle raising	0	0	0	1.1	0	0.5			
Fishing	0	1.9	0.7	14.9	16.4	15.7			
Tricycle driver	2.0	0	1.3	6.9	1.8	4.1			
Vendor	0	0	0	0	0.9	0.5			
Native doctor	0	0	0	1.1	0	0.5			
Carpentry	0	0	0	13.8	8.2	10.7			

\*Totals may not be exactly 100.0 due to rounding.

from 54% in 1974 to 71% in 1987, partly because of the increased labor demand for rice work and partly because of a shrinkage in duck raising due to the feed shortage. The growing concentration in rice work applied to the female population as well (Table 17).

Concurrently, the village experienced significant increases in nonfarm economic activities, especially after the highway improvements in 1977-79. Casual employment in construction (carpentry) in nearby towns and even in Manila became an important source of income for many villagers, if not the major source. The number of villagers permanently employed as salaried workers in local firms and government offices also increased significantly, corresponding to the increased educational level of villagers (Table 18).

Parallel to the increases in nonvillage employment opportunities, nonfarm economic activities within the village increased. From 1974 to 1987, the number of *sari-sari* stores increased from 3 to 12, and the number of tricycles owned by villagers increased from 3 to 9. In addition to these service activities, manufacturing activities such as dressmaking and handicrafts production increased through a subcontract arrangement by which corporations in Manila supplied materials to women in village households for processing, and paid them at a piece rate for finished products. The manufacturing

activities were still rare in 1987 because the inroad of this subcontract arrangement to the village lagged significantly behind the villages along the highways, but there are clear signs that it has been increasing rapidly.

#### INCOME LEVELS AND DISTRIBUTION

Finally, we examine changes in the levels and the distribution of income among households in the village as a result of economic, social, and technological changes observed so far.

##### Wage rates

To understand changes in income levels and distribution, it is useful first to examine trends in wage rates. Comparable time-series data on farm wage rates for land preparation and rice transplanting in the village are available for 5 yr from 1966 to 1987 (Table 19). The nominal wage rates increased rapidly, due mainly to inflation. The increase in the wage rate for land preparation was slower than that for transplanting, reflecting mechanization in the former process.

Contrasting pictures emerge in the trends in real wage rate, depending on the choice of deflator. Application of the rice price index results in increases in real wage rates by 19% for land preparation and 42% for transplanting from 1974 to 1987. However, if the consumer-price index (CPI) outside

**Table 17. Percentage of persons in economically active female population (13-65 yr) by occupation, East Laguna Village, 1974, 1980, and 1987.**

Occupation	1974			1980			1987		
	Farmer N = 106	Landless N = 55	Total N = 161	Farmer N = 80	Landless N = 95	Total N = 176	Farmer N = 107	Landless N = 144	Total N = 251
<i>Major occupation</i>									
Rice farming									
Self-employed	18.0	0.0	11.8	7.5	0	3.4	2.8	0	1.2
Hired	0	21.8	7.5	5.0	25.0	15.9	2.8	20.8	13.2
Duck raising	0.9	1.8	1.2	13.8	8.3	10.8	6.6	0.7	3.2
Sari-sari store	4.7	1.8	3.7	8.7	3.1	5.7	7.5	4.2	5.6
Vendor	0	1.8	0.6	0	0	0	3.7	3.5	3.6
Dressmaking	0.9	0.0	0.6	5.0	2.1	3.4	3.7	2.8	3.2
Handicrafts	0	0	0	0	1.0	0.6	0	0	0
Rice milling	0	0	0	0	0	0	0	0.7	0.4
Native doctor	0	0	0	0	0	0	0	0.7	0.4
Maid	0	0	0	0	4.2	2.3	2.8	4.2	3.5
Salaried worker	4.7	0	3.1	3.7	2.1	2.8	8.4	2.0	4.8
Overseas worker	0	0	0	0	0	0	1.9	1.4	1.6
Schooling	13.2	7.3	11.2	23.8	12.5	17.6	16.8	8.3	11.9
None (household)	57.6	65.5	60.3	32.5	41.7	37.5	45.0	50.7	47.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Minor occupation</i>									
Rice farming									
Self-employed	20.8	0	13.7	3.8	0	1.7			
Hired	15.1	25.4	18.6	3.8	13.5	9.1			
Duck raising	10.4	3.6	8.1	10.0	8.3	9.1			
Sari-sari store	0	0	0	2.5	1.0	1.7			
Vendor	0	0	0	1.2	2.1	1.7			

**Table 18. Percentage of adult population (21 yr and above), by educational level, East Laguna Village, 1974 and 1987.**

Educational attainment	Male		Female		Total	
	1974 N = 112	1987 N = 180	1974 N = 103	1987 N = 182	1974 N = 215	1987 N = 362
No schooling	14	3	9	5	12	4
Primary						
Grades 1 - 4	42	32	39	30	41	31
Grades 5 - 6	22	30	37	34	29	32
Secondary (Grades 7-10)	14	21	8	16	11	19
College						
Grades 11 - 12	8	7	7	5	7	6
Grades 13 - 14	0	7	0	10	0	8
Total	100	100	100	100	100	100

Manila is used, significant declines in real wage rates are discovered. This difference implies sharp declines in the price of rice relative to the CPI.

A major factor underlying the relative decline in the rice price appears to be the increase in global rice supply due to successful developments in MV technology, not only in the Philippines but also in many other countries in monsoonal Asia. Thus, a major benefit from progress in rice production technology was transferred from producers to consumers in the form of reduced rice prices. The position of landless

agricultural laborers is ambiguous, because they gained to the extent that they were net buyers of rice while they lost to the extent that their wages were paid in kind (especially for harvesting); also, low rice prices reduced the demand for hired labor in rice production.

#### Household incomes

We now estimate changes in the levels of household income from 1974 to 1987. Because it was difficult to collect detailed income data from single-visit surveys, our estimates of house-

**Table 19. Changes in wage rates (P/d)<sup>a</sup>, East Laguna Village, 1966-87.**

Item <sup>b</sup>	1966	1974	1976	1980	1987
Nominal wage					
Land preparation	4.5 (38)	12.0 (100)	13.0 (108)	20.0 (167)	40.0 (333)
Transplanting	3.4 (41)	8.3 (100)	8.4 (101)	13.0 (157)	33.0 (398)
Real wage (deflated by rough rice price)					
Land preparation	11.3 (94)	12.0 (100)	12.7 (106)	16.7 (139)	14.3 (119)
Transplanting	8.5 (102)	8.3 (100)	8.2 (99)	10.8 (130)	11.8 (142)
Real wage (deflated by CPI)					
Land preparation	19.7 (164)	12.0 (100)	11.1 (93)	10.6 (88)	8.0 (67)
Transplanting	14.8 (178)	8.3 (100)	7.2 (87)	6.9 (83)	6.6 (90)
Rough rice price (P/kg)	0.40	1.00	1.02	1.20	2.80
CPI outside Manila (1974 = 100)	22.9	100	117	189	503
Rough rice price/CPI (P/kg)	1.74	1.00	0.87	0.63	0.56

<sup>a</sup>Numbers in parentheses are percentages based on 1974 = 100%. <sup>b</sup>CPI = consumer price index.

hold incomes from self-employed activities are admittedly very crude. Farmers' incomes from rice farming for a crop season (wet season) immediately preceding the survey period were estimated by subtracting from the values of rice output the costs paid to external entities, while the dry season's

incomes were calculated by assuming the same ratios of paid-out costs to output values for respective households as for the wet season. Incomes from other agricultural enterprises were equated simply to the sale values without subtracting paid-out costs; this procedure tends to overestimate nonrice-farming incomes. Estimates of income from nonfarm enterprises relied on survey respondents' own estimates of total revenues minus paid-out costs.

The household income levels thus calculated are compared in terms of average incomes, both per household and per household member, for all households as well as for three household groups separately (Table 20). It may appear anomalous that the rate of increase in average income for all households was lower than those of all the three household groups. This anomaly is explained by sharp increases in the shares of relatively low-income landless workers in the total number of households as well as in total population, which pulled down the averages for all households; this effect is much larger in per-capita comparisons than in per-household comparisons because of decreases in the average family size of large farmers relative to small farmers and landless workers as observed in Table 7.

Similar to comparisons in the wage rates, much higher rates of increase in real income levels are calculated from the use of the rice price index as a deflator than from the CPI (Table 20). However, unlike the wage rates, even when the CPI was applied the average real income of each household group did not decline. The average real income of landless workers increased by 16% on a per-household basis and 19% on a per-capita basis, despite significant decreases in the real

**Table 20. Household incomes, East Laguna Village, 1974 and 1987.<sup>a</sup>**

Item	Income per household			Income per household member		
	1974 (P/yr)	1987 (P/yr)	1987/ 1974	1974 (P/yr)	1987 (P/yr)	1987/ 1974
Nominal income						
Large farmers	10,973 (100)	65,425 (100)	5.96	1,463 (100)	11,478 (100)	7.85
Small farmers	5,082 (46)	27,365 (42)	5.38	924 (63)	4,486 (39)	4.85
Landless workers	2,401 (22)	14,059 (22)	5.86	490 (34)	2,929 (26)	5.98
All households	5,300	22,240	4.20	917	4,277	4.66
Real income (deflated by rough rice price) <sup>b</sup>						
Large farmers	10,973	23,366	2.13	1,463	4,099	2.80
Small farmers	5,082	9,773	1.92	924	1,602	1.73
Landless workers	2,401	5,021	2.09	4,901	1,046	2.13
All households	5,300	7,943	1.50	917	1,528	1.67
Real income (deflated by CPI) <sup>c</sup>						
Large farmers	10,973	13,007	1.19	1,463	2,282	1.56
Small farmers	5,082	5,440	1.07	924	892	0.97
Landless workers	2,401	2,795	1.16	490	582	1.19
All households	5,300	4,421	0.83	917	850	0.93

<sup>a</sup>Percentage incomes, with large farmers' income set equal to 100, are shown in parentheses. In 1974, 1 US\$ = P6.79; in 1987, 1 US\$ = P20.57. <sup>b</sup>Deflators are the same as for Table 19.

wage rate based on the CPI. That indicates that the possible decline in the real wage rate was more than compensated for by increases in employment opportunities.

While the development and diffusion of MV technology undoubtedly increased employment of hired labor from both the increased total labor demand and the reduced family labor supply (Roumasset and Smith 1981, Smith and Gascon 1979), it is doubtful whether it increased at a sufficiently rapid rate to counteract the decline in real wage rates. More important appears to be the increase in nonfarm employment opportunities. Indeed, the share of landless household income from nonfarm sources, including both self-employment and hired employment, increased from 13% in 1974 to 45% in 1987 (Table 21).

The increased dependency on nonfarm income was especially pronounced for landless worker, but it also occurred in farmer households. There is a sharp contrast between large and small farmers in the ways by which the share of nonfarm income increased: while small farmers increased nonfarm incomes mainly from self-employed activities such as *sari-sari* store and tricycle operations, large farmers relied mainly on salaried employment in urban factories and offices. Also, in large farmers' households the share of grants in their income increased sharply; this increase resulted mainly from large remittances from their family members working abroad in such places as the Gulf States. The high dependency of large farmers' incomes on local salaried jobs and remittances from abroad reflects the relatively high educational level of their children.

The rates of change in per-household income from 1974 to 1987 were not so different among the three household groups (Table 20). Meanwhile, the average family size of large farmers decreased relative to those of small farmers and landless workers, resulting in a widened income gap between

**Table 21. Percentage composition of household income by source, East Laguna Village, 1974 and 1987.**

Income source	Farmer							
	2 ha and above		< 2 ha		Landless worker		Average	
	1974	1987	1974	1987	1974	1987	1974	1987
Self-employed								
Rice	84.5	44.3	66.5	38.7	0	0	63.4	25.3
Others	6.9	8.8	18.0	10.2	25.8	4.8	13.6	7.8
Nonfarm enterprise	3.1	5.0	5.9	27.0	8.2	16.0	5.1	30.0
Commerce <sup>a</sup>	2.7	2.9	4.3	20.6	8.2	12.7	4.2	12.3
Transport <sup>b</sup>	0.4	2.1	1.2	5.0	0	2.5	0.6	2.9
Manufacturing <sup>c</sup>	0	0	0.4	1.4	0	0.8	0.3	0.8
Hired wage earning								
Farm work	1.8	8.8	8.0	12.8	58.8	45.9	14.4	24.8
Nonfarm	3.7	19.0	1.6	8.0	1.5	29.0	3.0	20.0
Casual work	0	1.2	1.6	3.7	4.5	14.9	1.2	8.1
Salaried	3.7	17.8	0	4.3	0	14.1	1.8	11.9
Grant <sup>d</sup>	0	14.1	0	3.3	2.7	4.3	0.5	6.1

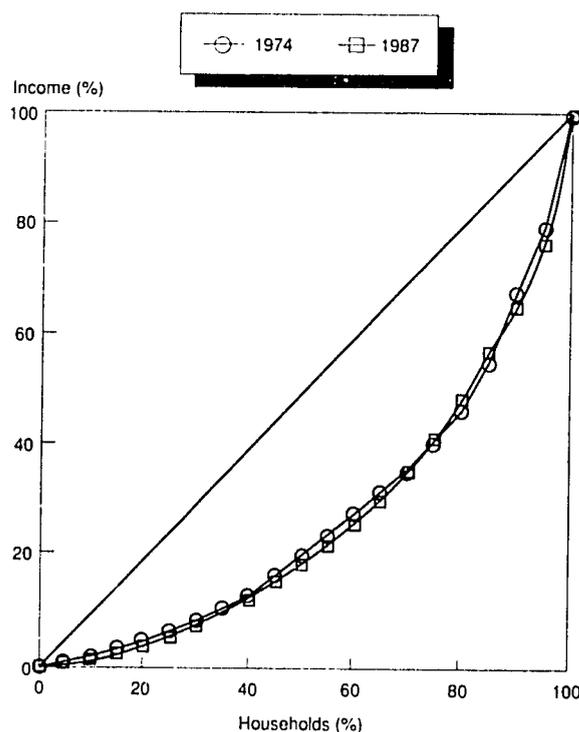
<sup>a</sup>Sari-sari stores and vending/marketing. <sup>b</sup>Tricycles. <sup>c</sup>Rice milling, dressmaking, and handicraft production. <sup>d</sup>Includes remittances.

large farmers and other household categories. The average per-capita incomes of larger farmers increased faster than those of small farmers and landless workers, partly because the average income earning capacity of their family labor increased, as reflected in the increased share of their income from salaried employment. However, a more important factor appears to be the increased land rent accruing to large leasehold tenants, for whom rent payments to landlords were fixed by land reform programs despite major gains in rice yield. Without land reform programs, the income gap between farmers and landless workers would have been significantly smaller, especially in the situation of declining rice prices in real terms, while the gap between tenant farmers and landlords would have undoubtedly been much larger.

Overall, this village experienced no appreciable change in the size distribution of household incomes, with the Gini coefficient remaining almost constant from 1974 to 1987.

**Table 22. Size distribution of household incomes, East Laguna Village, 1974 and 1987.**

Income quintile	Share of income (%)	
	1974	1987
I (top)	53.6	51.5
II	18.8	22.5
III	14.9	13.7
IV	8.1	8.6
V (bottom)	4.6	3.7
Gini coefficient	0.467	0.478



**3. Lorenz curves to compare the size distributions of household incomes in East Laguna Village between 1974 and 1987.**

**Table 23. Percentage distribution of houses by type, East Laguna Village, 1974 and 1978.**

Type of house	Farmers with farms						Total	
	2 ha and above		Below 2 ha		Landless workers		1974 N=95	1987 N=156
	1974 N=24	1987 N=15	1974 N=30	1987 N=38	1974 N=41	1987 N=103		
Permanent <sup>a</sup>	46	53	13	26	2	13	17	20
Semipermanent <sup>b</sup>	42	32	44	34	27	19	36	24
Temporary <sup>c</sup>	13	15	43	40	71	68	47	56

<sup>a</sup>Made of concrete, wood, and galvanized sheet iron. <sup>b</sup>Does not include one of the materials used in permanent houses.

<sup>c</sup>Made of bamboo and leaf materials, using a minimum of lumber.

(Table 22), and as illustrated by no visible shift in the Lorenz curve (Fig. 3). Although comparisons of the size distribution of incomes on a per-household basis tend to underestimate the inequality in incomes per capita due to differential changes in family size, the income inequality within this village does not appear to have increased as much as expected due to the strong population pressure and to land reform programs, which favor large tenant farmers. In the distribution of houses, an indicator of living standard, there is no clear indication that farmers' houses improved disproportionately more than landless workers' houses (Table 23). It seems reasonable to identify increased nonfarm employment opportunities as the major factor that prevented income inequality in this village from worsening under mounting population pressure.

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APPENDIX

Questionnaire for the 1987 East Laguna Village Survey

**VILLAGE SURVEY**

Name of interviewer: \_\_\_\_\_  
 Date of interview: \_\_\_\_\_  
 Name of family head: \_\_\_\_\_  
 Name of person interviewed: \_\_\_\_\_  
 (his or her status in family): \_\_\_\_\_  
 Major occupation: \_\_\_\_\_  
 Major sideline enterprise: \_\_\_\_\_

2. Assets

Item	Unit	Quantity	Brief description
<b>Animals</b>			
Carabao			
Cattle			
Pigs			
Chickens			
Goats			
Ducks			
Others (specify)			
<b>Machinery and implements</b>			
Tractor with accessories			
Animal plow			
harrow			
Sprayer			
Weeder			
Others (specify)			

1. Family status

Name*	Relation to family head	Sex	Age	Major occupation
	Head			
	Wife			
	Son(s):			
	Daughter(s):			
	Others (specify)			

\*Include nonfamily members living in the same household.

3. Income from nonrice sources

Source	In kind	In cash	Remarks
<b>Sales of agricultural production</b>			
Ducks			
Pigs			
Others (specify)			
<b>Nonfarm enterprises (specify)</b>			
<b>Wages (specify earners)</b>			
<b>Others* (specify)</b>			

\*Include grant.

4. Family history with regard to tenure status

Date of settlement in the village: \_\_\_\_\_  
 Relation of the settler to the present family head: \_\_\_\_\_  
 Residence of the settler before the settlement: \_\_\_\_\_  
 Major reason(s) for the migration: \_\_\_\_\_  
 Occupation and tenure status\* before the migration: \_\_\_\_\_  
 Tenure status\* at the time of settlement: \_\_\_\_\_  
 Date of independence of the present head from his parents: \_\_\_\_\_  
 Tenure status\* at the time of independence: \_\_\_\_\_  
 Changes in tenure status since 1977

Date of change	Tenure status*	Remarks
_____	_____	_____
_____	_____	_____

Tenure category\* at present: \_\_\_\_\_

Other remarks:

\*Tenure category: (multiple entries according to area sizes)

- LN : Land owner noncultivating
- O : Owner operator
- AO : Amortizing owner
  
- L : Leaseholder
- S : Sharecropper
  
- SL : Subtenant in leasehold arrangement
- SS : Subtenant in share arrangement
- SM : Subtenant in mortgage arrangement
  
- W : Landless worker

- SBRN : Subrenter noncultivating
- SBR : Subrenter cultivating (Ex. L/SBR)
- SBE : Subrenter (Ex. S/SBE.L; a sharecropper with subrented area under lease)

5. Landholding (for farmers only)

	1987 area (ha)	
	Owned	Rented
Farming area	_____	_____
Irrigated rice	_____	_____
Rainfed rice	_____	_____
Upland	_____	_____
Tree crops (specify)	_____	_____

	1987 subrented area (ha)
Rented but subrented area	_____
Irrigated rice	_____
Rainfed rice	_____
Upland	_____
Tree crops (specify)	_____

	1987 area (ha)
Owned but rented area	_____
Irrigated rice	_____
Rainfed rice	_____
Upland	_____
Tree crops (specify)	_____

6. Tenure status of rice farming area by plots (for 1987) (for farmers only).

Number of landlords concerned (including farmer himself) \_\_\_\_\_

Item	Plots by ownership/tenure status	
	1	2
Area (ha)		
Landowner name address		
Holding status <sup>a</sup>		
Date of acquisition		
From whom? name <sup>b</sup> status <sup>c</sup> address		
How much was paid? (If paid) <sup>d</sup>		
Major reason(s) for the acquisition (specify)		
Duration of the contract (if tenanted) <sup>e</sup>		
Type of the contract <sup>f</sup>		
Rent (for rented areas only): A. Lease (cavans) dry wet total		
Are all production costs shouldered by the farmer? <sup>g</sup>		
In case of bad crop, how is the rent treated? <sup>h</sup>		
B. Sharecropping (%) Crop-sharing ratio for tenants		
Cost-sharing ratios for tenants: seed land preparation transplanting fertilizer and chemicals weeding harvesting and threshing hauling irrigation fee land tax		
C. To whom rent is paid: name status <sup>i</sup> address		

continued

Item	Plots by ownership/tenure status	
	1	2
Changes in tenure status after the acquisition (for tenanted areas, if present):		
1. Date of the change		
2. Tenure status before the change		
3. Major reason(s) for the change (specify)		
4. Differences in rent before and after (in average cavans)		
dry		
wet		
total		
5. Total rice output at the time of change		
dry		
wet		
total		
Other information on land transaction		
Type of transaction <sup>1</sup>		
Time of transaction		
Names of persons concerned		
Area		
Value		
Remarks		
<p><sup>1</sup>O = owned, L = leasehold, Sub.L = subleasehold, S = sharecropping, Sub. S = subsharecropping, Sub.M = subtenant under mortgaging. <sup>2</sup>In case where the landholding was from the farmer's father or relative, specify it. <sup>3</sup>Landlord, Tenant. In case of "Tenant", specify tenure status, and <i>katiwala</i> or <i>namumuwisari</i>. <sup>4</sup>For owned areas, the value of purchased land. For tenanted areas, the value of tenancy right. Both in current prices. <sup>5</sup>If permanent contract, P. If temporary contract, write the number of seasons or years. If the contract is exceptionally special, specify the relations. <sup>6</sup>Paper contract, Oral contract. <sup>7</sup>"Yes" or "no." If "No", specify what production costs are paid by the landlord. If there are special arrangements, specify the relations. <sup>8</sup>Specify the treatments. If there is no special arrangement on this, write "No." Enter "himself" if the one interviewed is the owner. <sup>9</sup>Transaction of: landownership, cultivating right, mortgaging, others (specify).</p>		

7. Rice area and rice production, 1986 wet and 1986/87 dry seasons (For farmers only)

Item	1986 wet	1986/87 dry
Area (planted/harvested) (ha)	___ / ___	___ / ___
Dominant tenure status	_____	_____
Production (cavans)		
Total	_____	_____
Harvester's share	_____	_____
Thresher's share	_____	_____
Seed for next crop	_____	_____
Others	_____	_____
Landlord's rent	_____	_____
Operator's share	_____	_____
Unit price of rice (P/cavan)	_____	_____
Major variety planted	_____	_____

8. Rented/subrented area by plots (for 1987)  
(For those who rent or subrent land to others only)

Number of tenants concerned \_\_\_\_\_

Item	Plots by tenant/tenure status	
	1	2
Area (ha)		
Landowner <sup>1</sup>	name	
	address	
A. Relations with landowner		
Tenure strains		
Date of the acquisition		
From whom?	name	
	status	
	address	
How much was paid? (if paid)		
Duration of the contract		
Type of the contract		
Rent (to the landowner):		
1. Lease (cavans)	dry	
	wet	
	total	
Cost sharing and bad crop rent reduction arrangement (if present, specify)		
2. Sharecropping		
Crop sharing ratio for the (sub-) rentee (%)		
Does the landowner share part of production costs? (if yes, specify the sharing ratios in B)		
B. Relations with tenants		
Tenure status		
Date of the initiation of the contract		
Major reason(s) for (sub-) rented (for the subrentee, specify)		
Duration of the contract		
Type of contract		
To whom? (sub-) rented?	name	
	address	
Rent (from the subrentee):		
1. Lease (cavans)	dry	
	wet	
	total	
Cost share for the (sub-) rentee (if present, specify)		
Bad crop rent reduction arrangement		

continued

Item	Plots by tenant/tenure status	
	1	2
2. Sharecropping <sup>b</sup> (%)		
Crop sharing ratio for the (sub-) rentee		
Cost sharing ratios for the (sub-) rentee:		
seed		
land preparation		
transplanting		
fertilizer and chemicals		
weeding		
harvesting		
hauling		
irrigation fee		
land tax		

Remarks<sup>c</sup>

<sup>a</sup>Enter "himself" if the one interviewed is the owner. <sup>b</sup>If the landowner shares parts of costs or output with subrentee and subrenter, specify the shares among them. <sup>c</sup>Clarify who is the decisionmaker in farming subrented area. If the subrented area is further subrented to another, specify the relation.

9. Subrented area by plots for 1987  
(For those who subrented land to others)

Item	Plots by tenant/tenure status	
	1	2
Area (ha)		
Landowner name		
address		
Tenure status (to landowner)		
Duration of the contract (to landowner)		
Tenure status (to subrentee)		
Duration of the contract (to subrentee)		
To whom? name		
address		
Rent: (cavans or % of output)		
To the landowner		
From the subrentee		

Remarks:

10. Wage rates for rice production activities.

Item	1986 wet		1986/87 dry	
	P/day	Food	P/day	Food
Repairing and clearing dikes				
Seedbed preparation				
Plowing				
Harrowing				
Transplanting				
Fertilizer application				
Spraying chemicals				
Weeding				
Harvesting and threshing				
Rice processing				
Drying				

	1986 wet		1986/87 dry	
	P/day	P/ha	P/day	P/ha

Rental payments for:

Tractor only	_____	_____	_____	_____
Tractor and operator	_____	_____	_____	_____
Tractor operator and fuel	_____	_____	_____	_____
Carabao only	_____	_____	_____	_____
Carabao and operator	_____	_____	_____	_____
Payments for threshing machine	_____	_____	_____	_____

22  
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