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Y. Hayami, E.B. Marciano, and L.M. Bambo

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

RICE HARVESTING SYSTEMS IN CENTRAL LUZON AND LAGUNA REVISITED

Y. Hayami, E.B. Marciano, and L.M. Bambo[1]

ABSTRACT

In Central Luzon and Laguna, which constitute the rice bowl of the Philippines, dramatic changes in rice harvesting systems have occurred during the past two decades in response to modern rice varieties and threshing machine development under conditions of growing population pressure, land reform, and irrigation system improvement.

A previous study (Kikuchi et al 1979) discussed the major changes in harvesting systems that had taken place during the decade 1968-78, which encompassed the land reform programs that had broken up the rice haciendas, and also developments in rice technology and irrigation systems that had made rice double-cropping a common practice in this area. This study follows up the previous study, identifying further changes in the succeeding decade.

Hand threshing, which replaced mechanical threshing by large machines called *tilyadora* during the demise of the hacienda system, has recently been almost completely replaced by portable axial-flow threshers. However, unlike the shift from *tilyadora* to hand threshing, the shift from hand to portable machine threshing has not been accompanied by major changes in labor-employment arrangements for harvesting. This finding suggests that the International Rice Research Institute-designed axial-flow threshers represent a technology relatively less disruptive to the existing organization of rice farming in the Philippines than large-scale labor-saving machines.

[1]Visiting scientist and research assistants, Agricultural Economics Department, International Rice Research Institute, P. O. Box 933, Manila, Philippines. (Principal author's current address: Aoyama-Gakuin University; School of International Politics, Economics and Business; Shibuya, Shibuya-ku, Tokyo, Japan 150.)

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RICE HARVESTING SYSTEMS IN CENTRAL LUZON AND LAGUNA REVISITED

A decade ago, in 1978, we conducted a survey of rice harvesting systems in Central Luzon and Laguna, the areas that make up the rice bowl of the Philippines (Kikuchi et al 1979). At that time, rice harvesting systems in this region were experiencing major changes due to the land reform program, irrigation systems, and new rice technology. The traditional method of rice threshing in the landlocked plain of Central Luzon—called inner Central Luzon—by large threshing machines of the McCormick-Deering design was rapidly being replaced by hand threshing because of the demise of the rice haciendas following land reform. This change was accompanied by changes in labor contractual relations.

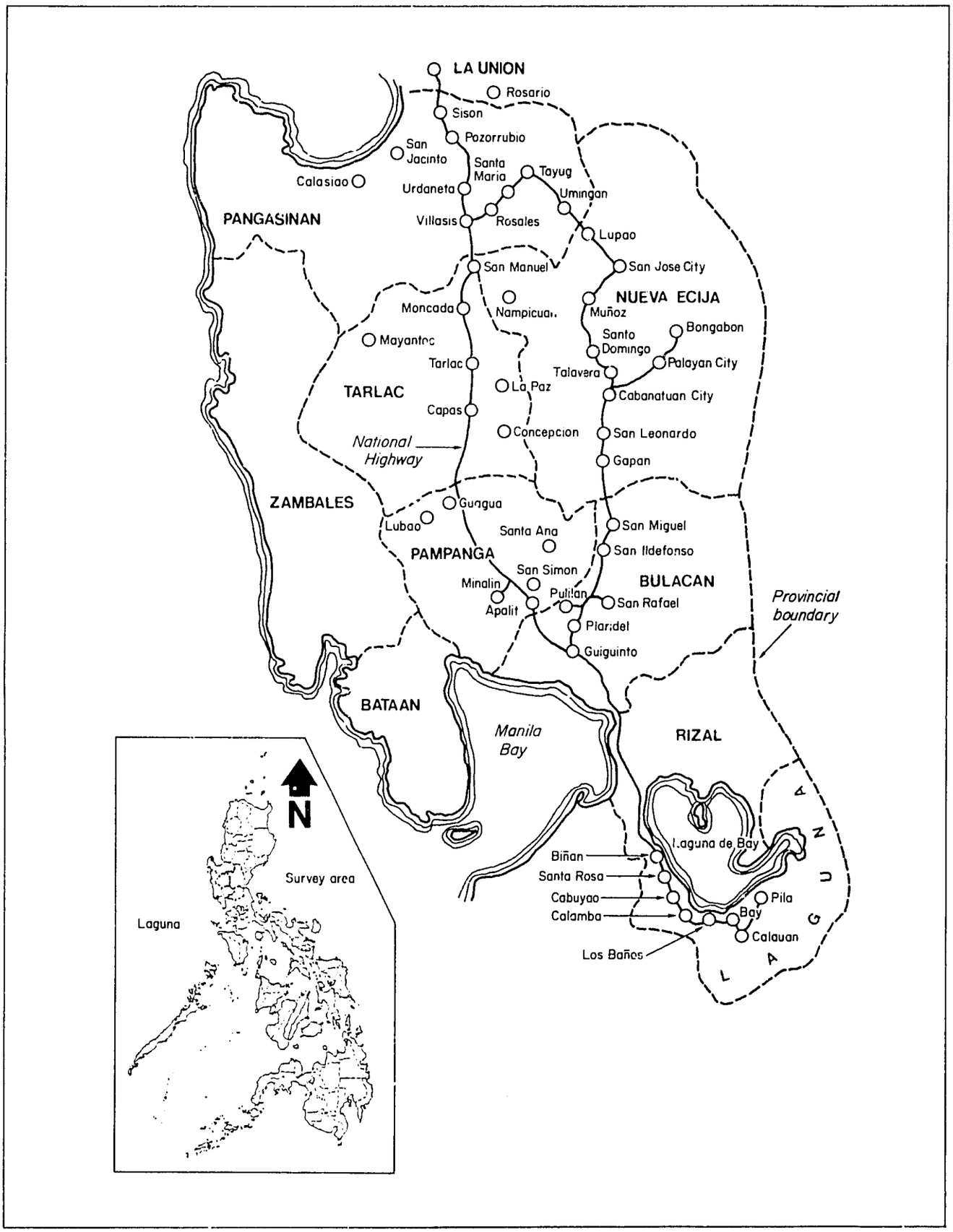
In the decade since 1978, a major technological innovation has occurred in rice threshing in the form of the International Rice Research Institute (IRRI)-designed axial-flow threshers, especially the portable type (Duff 1986). To identify changes in rice harvesting systems during the decade since 1978, we conducted in August 1987 a survey of the sites covered by the 1978 survey, following the routes shown in Figure 1.

This report summarizes the results of this new survey, together with some data generated from the Central Luzon Loop Survey (CLLS) conducted by IRRI's Agricultural Economics Department during September-October 1986 and June-August 1987. Our survey and the CLLS differed in nature. CLLS was designed to obtain information on the specific practices of sample respondents, whereas our survey sought information on common practices in the communities in which respondents lived. To make the CLLS data consistent with ours, we averaged the CLLS data within one village (barangay), or chose an apparently typical observation. The basic observational units for our analysis are thus *barangays*, as summarized in Appendices 1 and 2. The questionnaire used in the survey is given in Appendix 3.

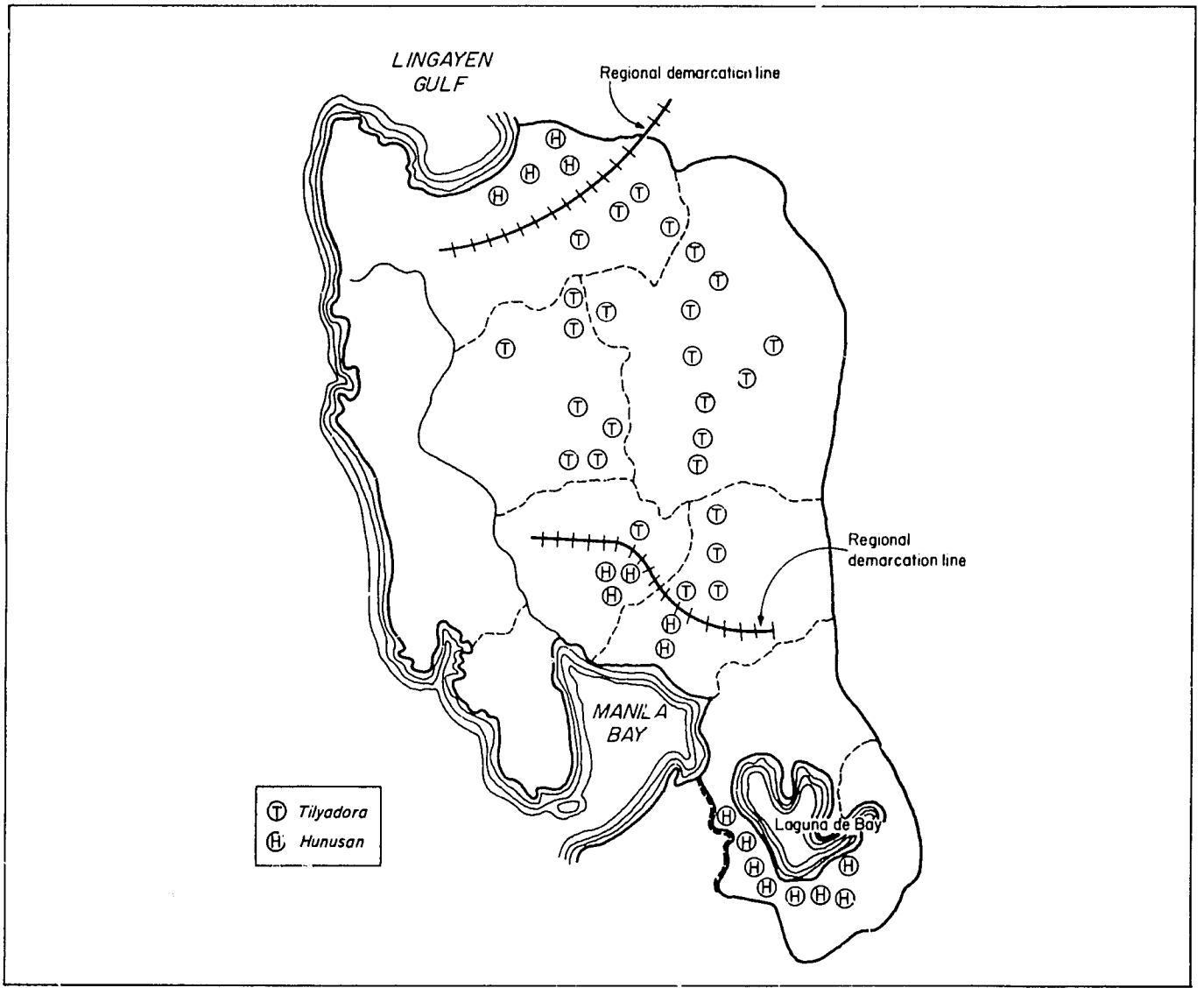
SUMMARY FINDINGS OF THE PREVIOUS SURVEY

To understand the nature of recent changes, major findings of the previous study (Kikuchi et al 1979) may be summarized as follows:

- Two systems of rice harvesting, one called the *tilyadora* system and the other called the *hunusan* system, had traditionally been used in Central Luzon and Laguna before the 1970s. In the *tilyadora* system, rice is cut with sickles and piled in a large stack by workers employed under a daily wage contract (*upahan*), and is then threshed by the large *tilyadora* thresher that is pulled by a 40- to 60-hp tractor. The *hunusan* system is a community-type arrangement in which, when a farmer specifies the time of harvesting, every villager is allowed to participate in harvesting. Harvesters cut the rice and thresh it by hand, beating it on a wooden or bamboo stand; they then receive a certain share of the threshed crop.
- Until the 1970s, the *tilyadora* system had been used mainly in inner Central Luzon, and the *hunusan* system mainly in the rice belts along the lakes and seacoasts called the coastal area (see Fig. 2 for the situation in 1968). In inner Central Luzon, which had been dominated by large haciendas, *tilyadoras* had been used to meter output accurately to collect the right rents from a large number of sharecroppers. Typically, a contractual clause obligated tenants to thresh their crops with the *tilyadora* owned or contracted by the hacienda management, leaving no room for the tenants to underreport their output and, hence, to reduce their rent. In contrast, in the old coastal area, where landholdings were relatively small and scattered, strong community ties and a patron-client relationship between landlords and tenants made the likelihood of the former cheating the latter smaller. Therefore, the landlords felt no need to rely on the *tilyadora*, which was less efficient in their small and scattered holdings.
- Land reform programs based on Presidential Decree No. 27 of 1972 were successful during the mid-1970s in breaking down large rice haciendas and in converting tenants into leaseholders and amortizing owners holding Certificates of Land Transfer (CLT). Prior to or concurrent with land reform, developments in irrigation systems and the diffusion of short-maturing and photoperiod-insensitive modern



1. The survey area and the municipalities covered by the 1987 survey.



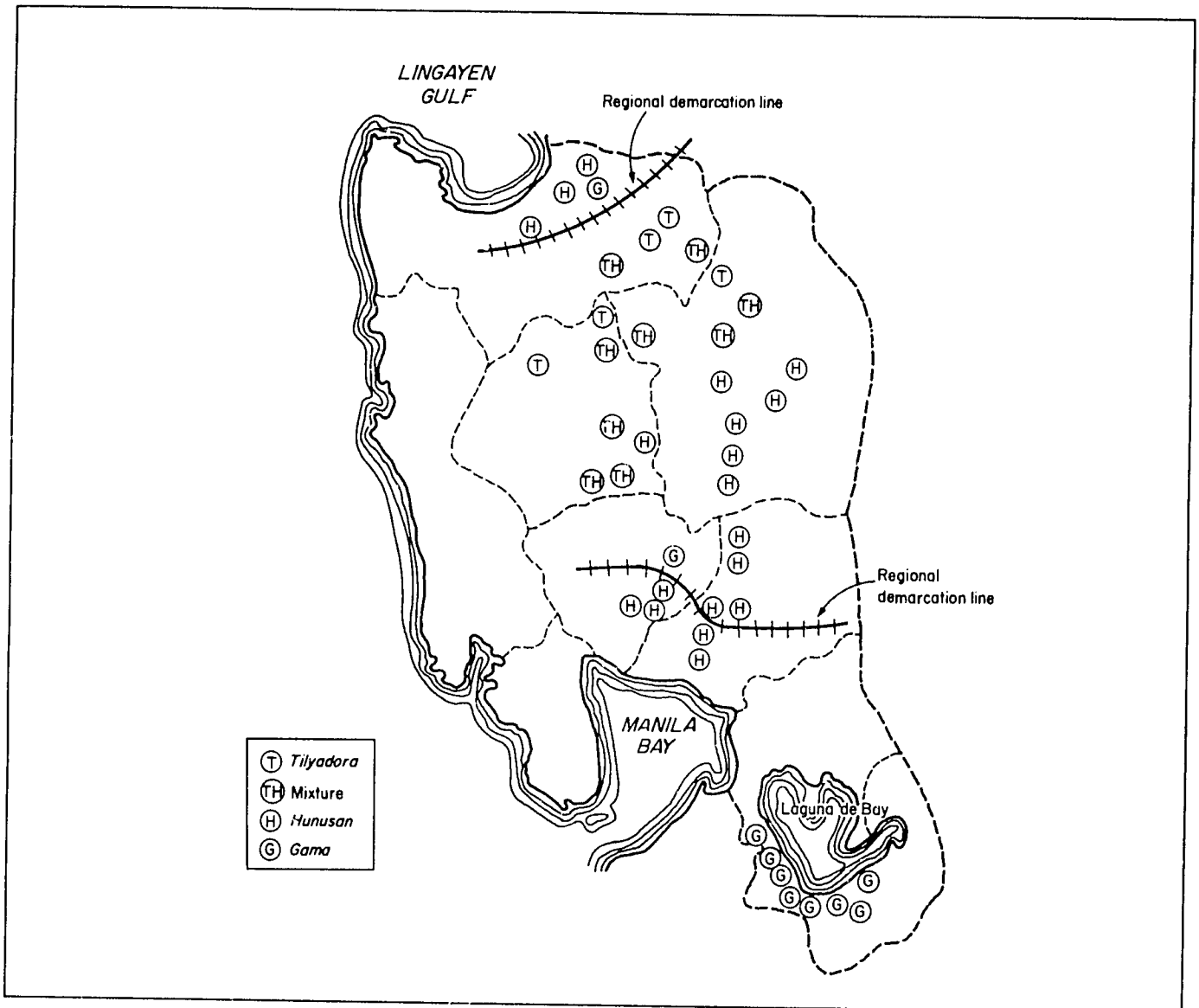
2. Regional distribution of harvesting systems commonly used by municipalities in the survey areas in 1968.

rice varieties enabled rice double-cropping and thus necessitated harvesting the first crop before the rainy season ended—to allow land preparation for the second crop; this made the *tilyadora* more inefficient, because it is difficult to pull this heavy machine into wet fields. With emancipation from hacienda regulations, new leaseholders and amortizing owners abandoned the *tilyadora* system and shifted to the *hunusan* system; this process was faster and more complete in irrigated, double-cropped areas in the western part of inner Central Luzon than in rainfed, single-cropped areas in the northwestern part (see Fig. 3 for the situation in 1978).

- Meanwhile, a new harvesting system called *gama* diffused into the coastal area, especially in Laguna (Fig. 3). Unlike the *hunusan* system, the *gama* system limits participation in harvesting and the right to receive a share of the output of a certain plot to a certain worker or a family in exchange for the service of weeding the plot without pay. This system, traditionally practiced on the hillsides of the Southern Tagalog Region, was brought to the lowlands along Laguna de Bay by seasonal migrant workers. It was used by farmer-employers to reduce wage rates for harvesting work without changing the established crop share of harvesters (Hayami and Kikuchi 1981).

DOMINANCE OF PORTABLE THRESHERS

A major change in rice harvesting systems in Central Luzon and Laguna over the past decade has been the rapid diffusion of axial-flow threshers, especially the portable type. Although the development and extension of IRRI-designed axial-flow threshers began in 1974, our



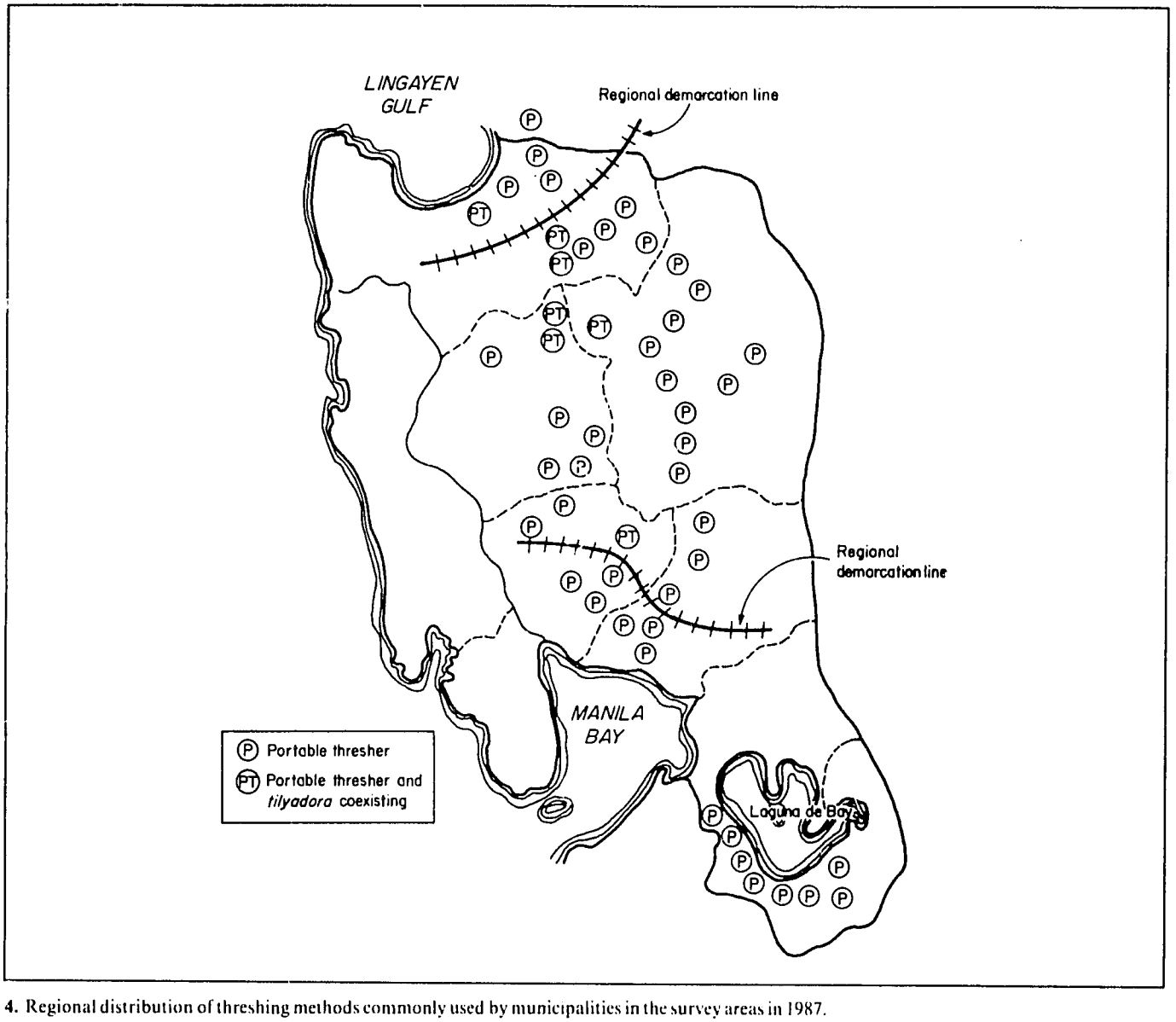
3. Regional distribution of harvesting systems commonly used by municipalities in the survey areas in 1978.

1978 survey revealed that in no municipality was this new machine the dominant means of rice threshing.

Our 1987 survey, however, showed that portable axial-flow threshers almost completely dominated rice threshing in Central Luzon in 1987 (Fig. 4). No case was found of hand beating being used to any significant extent. The *tilyadora* was still operating mainly in a rainfed area at the junction of the Nueva Ecija-Pangasinan-Tarlac borders, where it had been common in 1978. Even in this area, the *tilyadora* had been overtaken by portable threshers.

Tilyadora owners have been trying, in vain, to hold their ground by various efforts such as providing the hauling of threshed rice or contributing a part of the threshing fee to a *barangay* development fund. Many of them told us that they had no intention of replacing their machines when they wore out and would rather buy portable threshers. Thus, in time the *tilyadora* will disappear completely from Central Luzon.

One major factor underlying the wide diffusion of portable threshers relative to the *tilyadora* is their utility in wet ricefields. While the *tilyadora* was used in 1978 mainly in single-cropped rainfed areas in which harvesting could be done after the fields became dry, the portable thresher was found in 1987 in both irrigated and rainfed areas in almost the same proportions as for the total observations in our sample (Table 1). It is most probable that, if portable threshers had been readily available at the time of implementation of land reform programs, new leaseholders and CLT holders, emancipated from the rice haciendas, would have begun using portable threshers directly, rather than passing through the hand beating stage.



4. Regional distribution of threshing methods commonly used by municipalities in the survey areas in 1987.

Table 1. Relations between commonly used threshing methods and irrigation status, 1978 and 1987.

Irrigation status	Number of municipalities[a]						
	1978				1987		
	Tilyadora[b]	Mixture[c]	Hand beating	Total	Portable thresher only	Portable thresher and *tilyadora*	Total
Irrigated	0 (0)	7 (70)	17 (74)	24 (56)	22 (54)	2 (25)	24 (49)
Irrigated/rainfed	5 (50)	2 (20)	2 (9)	9 (21)	8 (19)	1 (12)	9 (18)
Rainfed	5 (50)	1 (10)	4 (17)	10 (23)	11 (27)	5 (63)	16 (33)
Total	10 (100)	10 (100)	23 (100)	43 (100)	41 (100)	8 (100)	49 (100)

[a]Figures in parentheses are percentages. [b]Includes animal treading. [c]Typically *tilyadora* in dry season and hand beating in wet season, although other combinations exist.

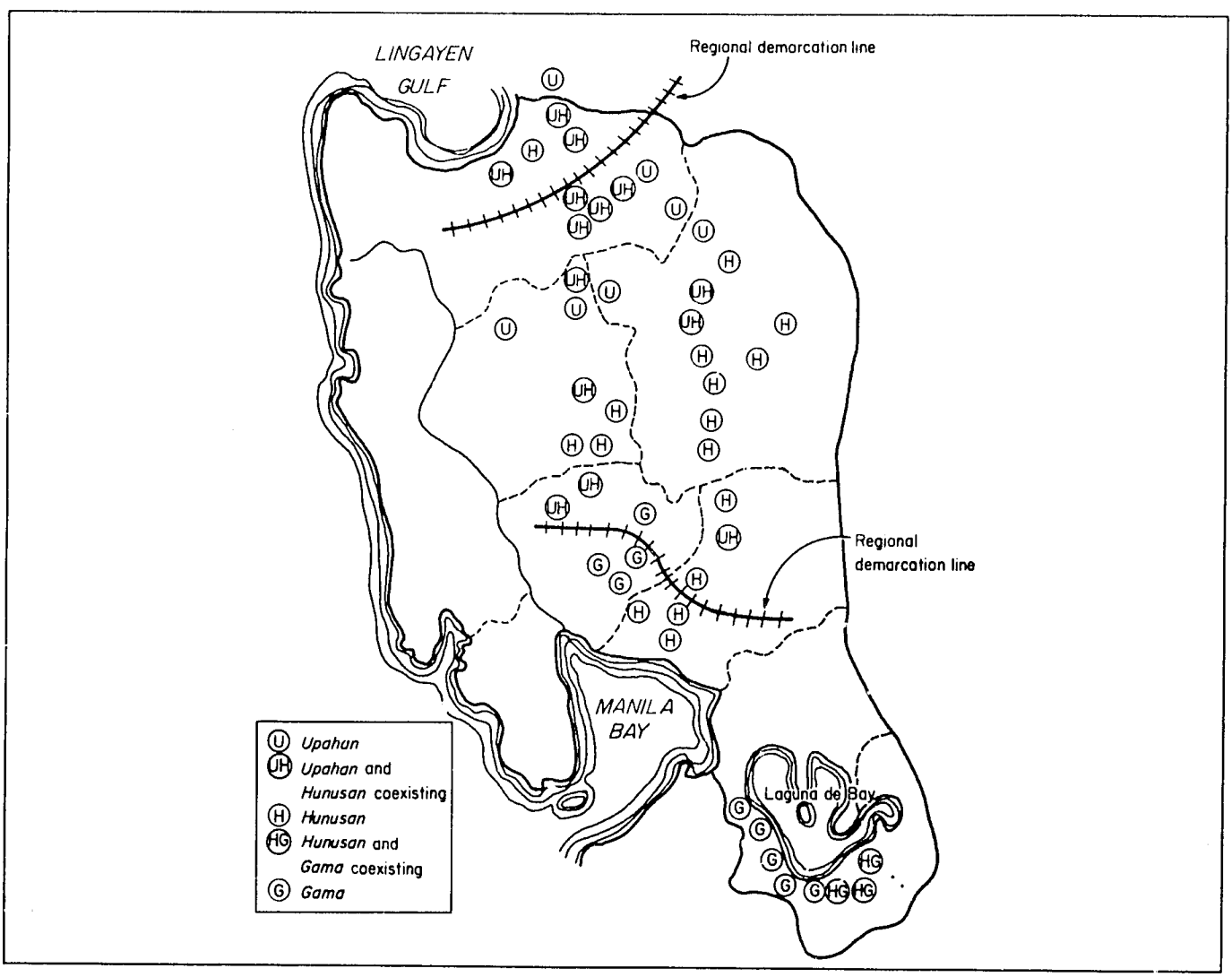
While *tilyadoras* were usually owned by local businessmen such as machine dealers and rice millers, those who owned and provided custom services of portable threshers were mostly relatively large farmers. In our sample, 32 (67%) of 48 respondents in 1987 were provided with the services of farmer-owned threshers. They usually employed 5-6 workers to operate 1 machine and received a share of threshed grain ranging from 5 to 10% (most commonly 6%). The threshing fee was paid by either farmers or harvest workers, or was shared equally (harvesters' share was given after deducting the threshers' share). In our sample, of 92 respondents, 73 (80%) were paid by farmers, 14 (15%) were paid by harvesters, and 5 (5%) were shared.

RELATIONSHIP BETWEEN THRESHING METHOD AND LABOR CONTRACT

Despite the drastic change in threshing method, the regional distribution of labor contracts for rice harvesting experienced little change between 1978 and 1987 (compare Fig. 5 with Fig. 3). Most areas in which crop-share contracts (*hunusan* or *gama*) had been used in 1978 continued to use them in 1987. Similarly, areas in which the fixed daily wage (*upahan*) contract had been practiced in association with the use of the *tilyadora* largely continued to use the same contract in 1987, even after the *tilyadora* had been replaced by portable threshers.

In general, if a *tilyadora* is used for threshing, it is difficult to use *hunusan* labor for harvesting, because the cut crop should be bulked in one location before the *tilyadora* arrives. Therefore, it is difficult to identify the amount of rice harvested by a specific worker as the basis for sharing the harvested crop, this is the reason *upahan* or *pakyaw* (area-rate) labor was used in the *tilyadora* system.

In contrast, the portable thresher is easy to transport. *Hunusan* harvesters can pile their cut crops individually in small stacks to which portable threshers can be brought for separate threshing. While *tilyadora* threshing is



5. Regional distribution of labor contracts for harvesting commonly used in municipalities in the survey areas in 1987.

Table 2. Relations between commonly used threshing methods and harvesting labor contracts, 1978 and 1987.

Labor contract	No. of municipalities[a]						
	1978				1987		
	Tilyadora[b]	Mixture[c]	Hand beating	Total	Portable thresher only	Portable thresher and *tilyadora*	Total
Upahan/pakyaw	7 (70)	0 (0)	0 (0)	7 (16)	7 (17)	2 (25)	9 (18)
Hunusan/upahan/pakyaw	0 (0)	0 (0)	0 (0)	0 (0)	4 (10)	4 (50)	8 (17)
Hunusan	2 (20)	4 (33)	20 (95)	26 (61)	20 (49)	1 (12.5)	21 (43)
Gama	1 (10)	8 (67)	1 (5)	10 (23)	10 (24)	1 (12.5)	11 (22)
Total	10 (100)	12 (100)	21 (100)	43 (100)	41 (100)	8 (100)	49 (100)

[a]Figures in parentheses are percentages. [b]Includes animal treading. [c]Typically *tilyadora* in dry season and hand beating in wet season, although other combinations exist.

specific to the use of *upahan* harvesting, the use of the portable thresher is indifferent to the use of *upahan* or *hunusan* harvesting. This contrast is clearly indicated in Table 2, in which the relations between commonly used threshing methods and harvesting labor contracts are compared between 1978 and 1987.

HAS *GAMA* DECREASED OR INCREASED?

It is not clear whether the incidence of the *gama* contract has decreased or increased. There is a sign that its incidence has been decreasing in Laguna Province, in which the *gama* system originated. Our survey found that a significant portion of farmers along the east coast of Laguna de Bay had shifted from the *gama* back to the *hunusan* contract during 1978-87. According to those who shifted back to *hunusan*, it has become more difficult for farmers to find *gama* workers to conduct careful weeding and timely harvesting; this has been due mainly to increasing employment opportunities in the manufacture of labor-intensive commodities such as garments and footwear under contract arrangements by which middlemen deliver materials to workers (mainly female) in households or small workshops and collect finished products from them, making piece-rate payments. A typical income from such work is around ₱40/d, which is not only equal to or even higher than casual farm work but is stable the year round. Workers prefer such manufacturing work to *gama* work, which is highly seasonal and involves foregoing weeding wages for the sake of harvesting shares.

A major anomaly, however, is that we did not find a case along the west coast of Laguna de Bay in which the harvesting contract had shifted back from *gama* to *hunusan* within the past decade. Why the *gama* system has continued on the west coast, in which more nonfarm employment opportunities seem to be available because of its proximity to Metro Manila than on the east coast, remains unresolved.

Although the *gama* contract in Laguna appears to be declining, more cases of a *gama*-like contract called *atorga* were found in Pampanga in the 1987 than in the 1978 survey. The *atorga* arrangement requires harvest workers to help farmers in such tasks as repairing dikes and seedling pulling and bundling instead of weeding, to establish their rights to harvest a specific parcel of land and receive its crop share. Our investigation was unable to determine if the larger number of *atorga* cases found in the recent than in the previous survey reflects a real increase in the incidence of this contract or if the difference is due to different sample villages investigated.

Except in Pampanga, *gama*-like contracts were not found in Central Luzon. One reason *gama*-like contracts have not diffused in Central Luzon might be the recent spread of a permanent labor or semiattached labor contract called *kasugpong* (Hayami and associates 1987). In this contract, a landless worker or family takes responsibility for several farm tasks for a crop season and receives a lump-sum payment at harvest time in the form of a fixed quantity of rice or a crop share (usually 10%). This system might work as a substitute for *gama*-like contracts in reducing farmer-employers' labor as well as their efforts to supervise hired labor. This phenomenon needs more in-depth investigation.

CHANGES IN THE HARVESTERS' AND THRESHERS' SHARES

Where the *hunusan* or *gama* systems were used, the harvesters' shares naturally declined as threshing shifted from hand beating to portable threshers (Table 3). However, the sum of harvesters' and threshers' shares

Table 3. Changes in the rice output shares corresponding to shifts from hand beating to machine threshing by portable threshers, 1978 to 1987.

Item	Harvesters' or threshers' share (%)					1987	
	1978	1987			Change from 1978 to 1987 (2)-(1)		
	Harvester (1)	Harvester	Thresher	Total (2)		Wage rate at harvest time (₱/d)	Wet season rice yield (t/ha)
Hunusan							
Irrigated	14.5	10.4	6.5	16.9	2.4	28	4.2
Irrigated/rainfed	14.7	11.4	6.3	17.7	3.0	–	3.3
Rainfed	15.5	12.6	6.2	18.8	3.3	25	3.5
Average	14.6	11.1	6.4	17.5	2.9	27	3.9
Gama[a] (irrigated)	14.5	12.4	10.0	22.4	7.9	38	4.3

[a]Excluding *atorga*.

increased from 1978 to 1987 in both the *gama* and the *hunusan* cases under different irrigation conditions.

During this period, rice yields increased, especially in irrigated areas; average yield in the wet season increased from about 3 t/ha in 1978 to about 4 t/ha in 1987 (compare data in Table 3 with those in Kikuchi et al 1979). Meanwhile, the ratio of daily wage to the price of rice changed little—typically ₱11/workday vs ₱1/kg in 1978, and ₱30/workday vs ₱2.8/kg in 1987. Under such conditions, it seems more reasonable to expect decreases rather than increases in the combined share of harvesters and threshers.

One possible explanation for the increases instead of decreases in the combined share rate might be a premium payment for higher grain recovery from the use of portable threshers than hand threshing, which is estimated to be 1-6% of total yield (Toquero and Duff 1985). Factors underlying the reported increases in the harvesters' and threshers' shares remain to be investigated.

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Appendix 1. Harvesting systems in Central Luzon and Laguna, 1978.

Province and municipality	Barangay	Labor contract[a]	Threshing method[b]	Irrigation status[c]	Share (%)	
					Harvesters'[d]	Threshers' (payer)[e]
Bulacan						
San Miguel	Camias	G (A)	H	R	16.7	
	Bantug	S	H	I	16.7	
	Salakot	S	H	I	16.7	
San Ildefonso	Malipampang	S	H	R	16.7	
San Rafael	Caingin	S	H	R	16.7	
Pulilan	Longos	S	H	I	16.7	
Plaridel	Tabang	S	H	I	20.0	
Guiguinto	Santa Cruz	S	H	I	20.0	
	Tuktukan	S	H	I	25.0	
Nueva Ecija						
Gapan	Baluarte	S	H	I	14.3	
	Mangino	S	H	I	12.5	
	Kapalangan	S	H	I	14.3	
San Leonardo	Nieves	S	H	I	14.3	
	San Roque	G (A)	H	I	14.3	
	Poblacion	S	H	I	12.5	
	San Anton	S	H	I	14.3	
	Tambo Adorable	G (A)	H	I	14.3	
Bongabon	Curva	S	H	I	12.5	
Cabanatuan	Matungal	S	H	I	12.5	
	Bangad	S	H	I	12.5	
	Cabu	G (A)	H	I	12.5	
	Caalibangbangan	S	H	I	14.3	
Muñoz	Bantug	S	T	I	10.0	5.0 (F)
	Bakai	S	H	I	14.3	
	Maligaya	S	H	I	12.5	
	Sapang Asta	S	H	I	11.1	
Talavera	La Torre	S	H	I	14.3	
Palayan City	Manacnac	S	H	R	14.3	
San Jose City	Abar I	F	T	R		5.0 (F)
	Santo Tomas	F	T	R		5.0 (F)
	Santo Niño III	F	T	R		5.0 (F)
	Caanawan	S	H	I	12.5	
Lupao	Balbalungao	F	T	R		5.0 (F)
	Parista	F	T	R		5.0 (F)
Nampicuan	Poblacion	S	H	I	12.5	
Pangasinan						
Villasis	San Nicolas	G (A)	T	I	20.0	
Santa Maria	Pilar	F	T	I		5.0 (F)
Tayug	Trencera	F	T	I		5.0 (F)
	Balangbang	F	T	I		5.0 (F)
	Libertad	F	T	R		2.0 (F)
Umingan	Lauren	F	T	R		4.5 (F)
	Caurdinatahan	F	T	R		3.5 (F)
Calasiao	Kabilukaan	S	H	I	20.0	
Pozorrubio	Nama	G (A)	H	R	20.0	
Sison	Poblacion	S	H	I	20.0	
San Jacinto	Santa Maria	S	H	I	14.3	
Tarlac						
Moncada	San Julian	F	T	R		5.0 (F)
	Kamanggahan	S	T	R	10.0	5.0 (F)
	San Vicente	F	T	R		4.5 (F)
	San Juan	F	T	R		4.0 (F)
Mayantoc	Pitombayog	S/F	T	I		5.0 (F)
	San Bartolome	S/F	T	I		5.0 (F)
San Manuel	Legaspi	F	T	R		4.0 (F)
	Salcedo	K	T	R		5.0 (F)
Tarlac	Sapang Tagalog	S	T	I	10.0	6.0 (F)
	San Miguel	K	T	R		5.0 (F)
	Maaliwalu	S	H	I	12.5	
La Paz	Laong Cupang	S	H	I	12.5	
Capas	Santo Domingo	S	H	I	14.3	
	Dolores	S	H	I	14.3	
Concepcion	Santo Cristo	S	H	I	12.5	

Appendix 1 continued

Province and municipality	Barangay	Labor contract	Threshing method	Irrigation status	Share (%)	
					Harvesters	Threshers (payer)
Pampanga						
Apalit	Sulipon	S	H	I	16.7	
	Sampaloc	S	H	I	16.7	
Minalin	Santo Domingo	S	T	R	16.7	4.0 (H)
San Simon	Tulaoc	S	T	R	16.7	4.0 (H)
Santa Ana	Santa Lucia	G (A)	X	R	16.7	6.0 (H)
Laguna						
San Pedro		G (G)	X	I	12.5	6.0 (FH)
Biñan		S	X	I	12.5	6.0 (FH)
Cabuyao		G (G)	X	I	12.5	6.0 (FH)
Calamba		G (G)	X	I	12.5	6.0 (FH)
Los Baños		G (G)	X	I	12.5	6.0 (FH)
Bay		G (G)	X	I	12.5	6.0 (FH)
Calauan		G (G)	H	I	20.0	
Pila		G (G)	H	I	16.7	

[a]F = Fixed wage (*upahan*), S = output share (*hunusan*), G = output share with obligatory work (*gama* or *atorga*), K = area rate (*pakyaw*), G (G) = *gama* with weeding obligation, G(A) = *atorga* with dike repairing or seedling pulling and bunding. [b]T = *tilyadora*, X = axial-flow thresher, H = hand beating. [c]I = irrigated, R = rainfed. [d]Includes the threshers' share where hand beating was used, and excludes the threshers' share where machine was used. [e]Letters in parentheses indicate who pays the threshing fee: F = farmer, H = harvester, FH = farmer and harvester.

Appendix 2. Harvesting systems in Central Luzon and Laguna, 1987.

Province and municipality	Barangay and no. of respondents[a]	Labor contract[b,c]	Threshing method[c, d]	Irrigation status[e]	Share (%)		Wage rate at harvest time (₱/d)[h]	Wet season rice yield (t/ha)
					Harvesters[f]	Threshers (payer)[g]		
Bulacan								
Guiguinto	*Santa Rita (1)	S	X	I	16.7	(H)	30	4.4
Pulilan	*Cutcot (1)	S	X	I	14.3	(H)	30	3.5
San Ildefonso	*Malipampang (1)	S/K	X	R	11.1	6.0 (H)		
Plaridel	*Santa Ines (1)	S	X	I	14.3	10.0 (F)	35	3.3
San Rafael	Tambubong (1)	S	X	I	11.1	6.0 (F)		
	Sampaloc (1)	S	X	I	11.1	6.0 (F)		
	Galas (2)	S	X	R	16.7	(H)		
San Miguel	Bantug (1)	S	X	I	10.0	6.0 (F)		
	Salakot (1)	S	X	I	10.0	6.5 (F)		
	Salangan (2)	S	X	R	12.5	7.0 (F)		
	Cambio (2)	S	X	I	16.7	8.0 (F)		
	Camias (3)	S	X	R	10.0	6.0 (F)		
Nueva Ecija								
Gapan	Santo Cristo Norte (1)	S	X	I	10.0	6.0 (F)		
	Santo Cristo Sur (3)	S	X	I	10.0	6.0 (F)		
	San Roque (1)	S	X	I	10.0	6.0 (F)		
	Baluarte (1)	S	X	I	10.0	6.0 (F)		
San Leonardo	Nieves (1)	S	X	I	10.0	6.0 (F)		
	San Anton (1)	S	X	I	11.1	6.0 (F)		
	San Roque (2)	S	X	I	10.0	6.0 (F)		
	Tambo Adorable (3)	S	X	I	10.0	6.0 (F)		
	*Tabuating (13)	X	X	I	10.0	6.0 (F)		
Bongabon	Curva (4)	S	X	R	10.0	7.0 (F)		
Cabanatuan City	Caalibangbangan (1)	S	X	I	10.0	6.5 (F)		
	Mayapyap Sur (1)	S	X	I	10.0	6.0 (F)		
	Lourdes (1)	S	X	I	10.0	6.0 (F)		
	Cabu (1)	S	X	I	9.1	6.0 (F)		
	Bangad (3)	S	X	I	10.0	6.0 (F)		
Santo Domingo	*San Franciso (1)	S/F	X	R	10.0	6.0 (F)		
Muñoz	*Maligaya (1)	S	X/H	I	7.1	6.0 (F)	–	4.4
	Maragol (95)	S	X	I	7.7	6.0 (F)	23	
	Gabaldon (57)	F/S	X	R	7.7	6.0 (F)		
	Bantug (1)	S	X	I	7.7	6.0 (F)		
Talavera	Calipahan (1)	S	X	I	10.0	6.0 (F)		
	La Torre (1)	S	X	I	10.0	6.0 (F)		
	Poblacion (1)	S	X	I	10.0	6.0 (F)		
	San Miguel (2)	S	X	I	10.0	6.0 (F)		
	Bakal II (2)	S	X	I	8.3	6.5 (F)		
	San Pascual (3)	S	X	R	8.3	6.0 (F)		

Appendix 2 continued

Province and municipality	Barangay and no. of respondents[a]	Labor contract[b,c]	Threshing method[c,d]	Irrigation status[e]	Share (%)		Wage rate at harvest time (₱/d)[h]	Wet season rice yield (t/ha)
					Harvesters[f]	Threshers (payer)[g]		
Palayan City	Manacnac (1)	S	X	I	7.7	6.0 (F)		
San Jose City	Santo Niño (II) 4	S	X	I	10.0	6.5 (F)		
Lupao	Balbalungao (1)	F	X	R		6.5 (F)		
Nampicuan	*Poblacion (1)	F	X/T	R		6.0 (F)		
Pangasinan								
Viilasis	*Baraca (1)	F/S	X/T	R		6.0 (F)		
	San Nicolas (2)	S	X	R	16.7	(H)		
Urdaneta	*Nancayasan (1)	F/S	X/T	R		6.0 (F)		
	Anonas (1)	S	H	R	20.0			
	Camantiles (1)	S	H	I	20.0			
Rosales	*Tomana East (1)	S/K	X	I		6.0 (F)		
	Tomana West (3)	S	X	R	10.0	6.0 (F)		
Santa Maria	*Pilar (3)	K/F/S	X	I		6.5 (F)		
	Paitan (1)	F	X	I		6.5 (F)		
Tayug	Libertad (4)	K	X	R		6.0 (F)		
Umingan	Don Montano (3)	F	X	R		6.0 (F)		
	Lauren (3)	F	X	R		6.0 (F)		
Calasiao	*Mancup (1)	S/F	X/T	R	14.3	7.0 (F)		
Pozorrubio	*Cablong (1)	F/S	X	R		5.0 (F)		
	*Villegas (1)	F	X	R		5.0 (F)		
	Batakil (1)	F	X	I		5.0 (F)		
Sison	Azan Sur (5)	S	X	R	20.0	5.0 (F)		
	Poblacion (2)	F	X	I		5.0 (F)		
San Jacinto	*Magsaysay (1)	S	X	I	20.0	(H)	25	4.0
Tarlac								
Moncada	*Poblacion (1)	F	X/T	R		6.0 (F)		
	*Anao (1)	F	X	R		6.0 (F)		
	San Julian (2)	F	X	R		6.0 (F)		
Mayantoc	*San Bartolome (1)	F	X	I		6.0 (F)		
San Manuel	San Vicente (6)	F	X	R		6.5 (F)		
	San Miguel (1)	S/K	X/T	R	10.0	6.0 (F)		
	Salcedo (2)	K	X	R		7.0 (F)		
Tarlac	*Sapang Tagalog (1)	S/K	X	R	10.0	6.5 (F)		
	*San Miguel (3)	S	X	R	10.0	6.0 (F)	25	–
La Paz	*Carumutan (1)	S	X	I	10.0	6.5 (F)	25	3.5
Capas	*Santo Domingo II (1)	S	X	R	9.1	7.0 (F)	–	3.3
Concepcion	*Santo Cristo (1)	S	X	I	7.7	7.0 (F)		3.2
Pampanga								
Apalit	*Sucat (1)	G(A)	X	R	16.7	(H)		
Minalin	*San Francisco (1)	G(A)	X	R	20.0	(H)		
San Simon	*Santo Niño (1)	G(A)	X	I	16.7	(H)		
Guagua	*San Anton (1)	S/K	X	I	20.0	(H)		
	San Matias (1)	K	A	R		10.0 (F)		
Lubao	*San Agustin (1)	S/F	X	I	14.3	(H)		
	*San Nicolas II (1)	K	X	I		10.0 (F)		
	Santa Monica (1)	G(A)	X	I	25.0	(H)		
	Santo Tomas (6)	K	X	I	23.0	(H)		
Santa Ana	*San Bartolome (1)	G(A)/F)	X/T	I	16.7	(H)		
La Union								
Rosario	Camp 1 (3)	F	X	I		7.0 (F)		
Laguna								
Pila	*Tubuan (1)	G(G)/S	X	I	12.5	9.0 (FH)		
Calauan	*Dayap (3)	G(G)/S	X	I	10.0	10.0 (FH)		
Bay	*Santo Domingo (1)	G(G)/S	X	I	12.5	10.0 (F)		
Los Baños	*San Antonio (1)	G(G)	X	I	14.3	10.0 (F)	40	4.4
Calamba	*Parian (2)	G(G)	X	I	12.5	10.0 (F)	37	3.7
Cabuyao	*Niugan (2)	G(G)	X	R	10.0	10.0 (FH)	35	3.7
Santa Rosa	*Tagapo (2)	G(G)	X	I	10.0	10.0 (FH)	–	3.5
Biñan	*Platero (2)	G(G)	X	I	10.0	11.0 (FH)	–	3.5

[a]An asterisk (*) indicates the barangays covered by our 1987 survey on harvesting systems. [b]F = fixed wage (*upahan*), S = output share (*hunusan*), G = output share with obligatory work (*gama* or *atorga*), K = area rate (*pakyaw*), G(G) = *gama* with weeding obligation, G(A) = *atorga* with dike repairing or seedling pulling and bundling. [c]Where there are double entries, the first is more common than the second. [d]T = *tilyadora*, X = axial-flow thresher, H = hand beating, A = animal treading. [e]I = irrigated, R = rainfed. [f]Includes the thresher's share where hand beating was used, and excludes the thresher's share where machine or animal threshing was used. [g]Letters in parentheses indicate who pays the threshing fee: F = farmer, H = harvester, FH = farmer and harvester. [h]Includes the imputed value of food and drink. US$1 = ₱20.36, August 1987.

Appendix 3
Questionnaire for

RANDOM-WALK SURVEY ON LABOR ARRANGEMENTS
(August 1987)

Interviewer _____ Date _____ Province _____ Municipality _____ Barangay _____

Respondent _____ Social/Economic status[1] _____

Tenurial status[2]:

Present (since ____) _____

Previous _____ _____

Irrigation status[3]:

Present (since ____) _____

Previous _____

Rough rice yield (cavans[4]/ha):

1986-87 wet season _____ Dry season _____

Ten years ago _____ Twenty years ago _____ (traditional variety)

Rough rice price in 1986-87 (₱/kg) _____

[1]Farmer, wage worker, barangay captain, etc. [2]Owner, amortizing owner, leaseholder, share-tenant, subtenant, *kasugpong*, wage laborer. [3]Irrigated, rainfed, upland; double or single cropping. [4]1 cavan = 44 kg rough rice.

Harvesting (HV) and Threshing (TH)

	Labor contract (mark and remark if any)	TH method (year of introduction)	Harvesters' share (%)	Threshers' share (%)	Owner of thresher	Payer for thresher[a]	HV wage[b] (₱/d)	Labor days/ha[c]	
								HV	TH
				Present (since ____)					
Upahan									
Pakyaw									
Hunusan									
Gama									
Other									
				Previous (1977-78)					
Upahan									
Pakyaw									
Hunusan									
Gama									
Other									

[a]Share, harvester, farmer. [b]HV wage: Ask what would likely be the wage rate if *upahan* were used. [c]Labor days: Ask only for the present system.

Common form of contract in the area (specify, with percentages) _____ ( ) _____ ( ) _____ ( )

Kasugpong (K):

1. Does K exist in this area? Yes ____ No ____

2. Who[a] employs K? Large landlord (owning _____ ha) or small-medium farmer (status _____)

3. In the case of a large landlord, how much land did he/she own before land reform? _____ ha

4. K-contract arrangements:

   Payment (specify) _____

   Work obligations (specify) _____

5. Who is the K? Small farmer, landless laborer, or other? (specify) _____

6. K's relation to employer (specify)[b] _____ How long employed? _____

7. How many years ago did this system begin? _____

8. Has this system become more common in recent years? Yes ____ No ____

9. Is this system common in the area around your barangay? Yes ____ No ____

   If yes, specify its location _____

Sale of leasehold title (SLT) or mortgage of leasehold title (MLT):

1. Is SLT or MLT practiced in this area? Commonly ____ Rarely ____ Never ____

2. Which is more commonly used? SLT ____ MLT ____

3. Who is the buyer? Original landlord, farmer, other (specify) _____

4. Are landless workers increasing as a result of SLT? _____

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[a]Status: leaseholder, amortizing owner, etc. [b]Neighbor, relative, etc.

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