CLASS DIFFERENTIATION, LABOR EMPLOYMENT, AND INCOME DISTRIBUTION IN A WEST JAVA VILLAGE

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INTRODUCTION

JAVA is characterized by an extremely high population density, amounting to nearly five hundred persons per square mile. The population pressure on land had long been felt but it has become especially serious since the end of the nineteenth century. Since the beginning of this century when it was said that Java "filled up," population in Java and Madura has increased more than two and half times.

On the one hand, population growth would have added to the demand for food products, providing an incentive for the expansion of cultivation frontiers into more marginal areas. On the other, the increase in rural labor force would have increased competition to establish a right to cultivate the limited land area. Altogether, it seems reasonable to expect that the economic rent or the economic return to the service of land would have increased sharply whereas the return to labor would have declined relatively or even absolutely.

In general, an increase in the rate of return to land relative to that of labor promotes more inequal distributions of income and assets. If there is any differential in land holdings among people, the higher return to land implies the widening gap in the income between large and small holders. Further, the higher return to land provides a strong incentive for the rich to accumulate land, especially under the condition of underdeveloped capital market in that alternative investment opportunities, such as corporate stock and securities, are not easily available. The concentration of land holdings induced by the higher rate of land rental makes the income distribution more skewed, which promotes the further concentration of land—a vicious cycle towards polarization of peasant communities into large commercial farmers and landless workers, as envisioned by Marx [11] and Lenin [10].

In Java, despite the high population pressure and the increased commercialization, such polarization process has not been clearly visible. On the surface it

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appears that all villagers are sharing poverty relatively equally. According to Clifford Geertz [6], relatively homogeneous peasant communities were preserved in Java despite the high population pressure because of the great labor absorption capacity of wet rice culture using the highly labor-intensive technology, such as rice harvesting by *ani-ani* ("hand knife"), that enabled the successive intensification of labor application per unit of land without resulting in major decline in the marginal productivity of labor; the process was supported by the community principles of work and income sharing that impeded the introduction of labor-saving technology. Thus, Javanese agriculture "involuted" with almost constant productivity of labor and rural population continued to "share poverty."

Geertz's perspective has recently been challenged by a number of rural sociologists and agricultural economists. William Collier, among others, has criticized the Geertz thesis on the ground that a significant class differentiation or even a polarization has been in progress in rural Java, even though "large farmers" in the Java context are very small in the world standard; and that the "large farmers" try to increase profit by introducing labor-saving technologies and without observing traditional income sharing practices in the village community [2].

This study aims to identify the extent that the class differentiation or stratification has actually been in progress in a village community corresponding to population pressure and to investigate into the process by which village institutions such as land-tenure and labor-contract arrangements have been induced to change with significant effects on income distribution.

I. DATA COLLECTION

In order to identify changes in village institutions and income distribution, a census survey was conducted during January 1979 in a *kampung* ("hamlet") of a *desa* ("village") in Kabupaten Subang located in about 120 kilometers east of Jakarta and about 40 kilometers northeast of Bandung (Figure 1). Our survey was based on the interview with the heads and the wives of all the households in the *kampung*. The total number of households in the *kampung* was 113, of which three were excluded from our survey because of inability due to old age and mental disorder.

This *desa* was one of the villages covered by the Rice Intensification Survey (*Intensifikasi Padi Sawah*—hereafter referred to as the IPS Survey) conducted by the Agro-Economic Survey during the period from 1968/69 wet to 1972/73 wet seasons. The data collected from the IPS Survey provide the benchmark information with which historical changes can be ascertained.

II. POPULATION PRESSURE AND CLASS DIFFERENTIATION

The *kampung* under study is one of six hamlets of a *desa* characterized by rice monoculture. Most areas in the *desa* are irrigated rice fields (*sawah*), within which houses are clustered in each hamlet under the grove of coconuts and bananas. In almost all paddy fields rice is double-cropped for wet season

Fig. 1. Map of West Java

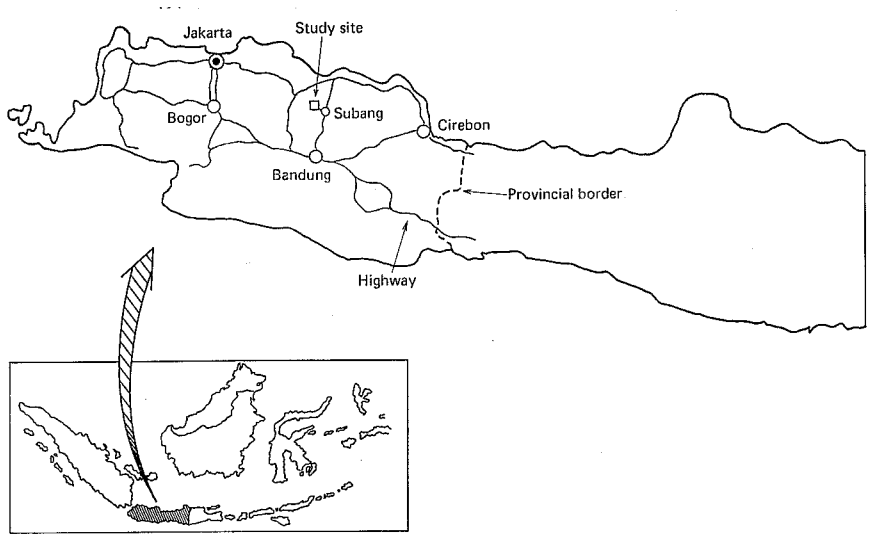
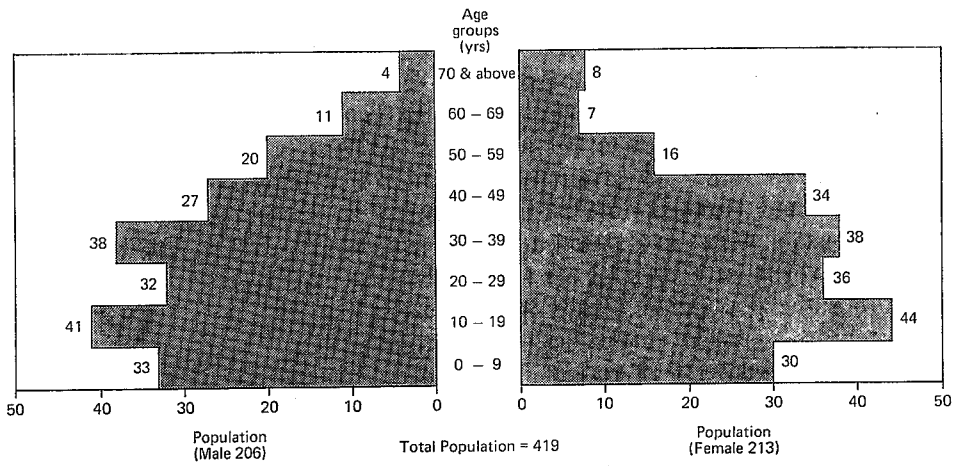


Fig. 2. Age Distribution of Population, January 1979



(November-April) and dry season (May-October). They say that there have been virtually no expansion in cultivated area and no significant improvement in irrigation systems for the past few decades.

At the time of our survey, the total population of the *kampung* was 419 persons. Data are not available to estimate population growth rates directly. However, judging from the population pyramid in Figure 2, it appears that a significant deceleration in the population growth rate has occurred for the past three to four decades. It was found that the average number of children per mother has declined dramatically (Table I). If we assume that the average reproductive period of women is thirty years (fifteen years to forty-five years old), it can be estimated as shown in Table I that the natural reproduction rate

TABLE I

AVERAGE NUMBER OF GROWN-UP CHILDREN PER MOTHER BY MOTHER'S AGE, AND THE ESTIMATES OF POPULATION GROWTH RATE

Mother's Age	Number of Cases	Average Number of Children	Population Growth Rate* (%)
80 years old and above	24	4.80	3.0
60–79	14	3.93	2.3
50–69	33	3.49	1.9
46–59	21	3.14	1.5
40–49	17	2.71	1.0
36–45	21	2.48	0.7
30–39	43	1.95	—
26–35	31	1.84	—
20–29	32	0.84	—
25 and below	42	0.71	—
Below 20	12	0.50	—

* Calculated by the formula: $(1+r)^{30}=(n/2)$; r=growth rate, n=average number of children.

would have declined from 3 per cent per year to less than 1 per cent during the past forty year period.

Such deceleration in the population growth rate in this hamlet might be typical of this area, because, according to the data from the Kabupaten Office of Subang, the population growth rate of the *kabupaten* declined from 2.1 per cent per year for 1961–70 to 0.7 per cent for 1970–76.

It was 1975 when the government program of birth control was introduced in this hamlet. However, the birth rate began to decline much earlier. They say that many wives had practiced indigenous birth-control methods (such as abortion) which were harmful for health. Such an information suggests that by the 1950s the population density had become so high and the income-earning opportunities so scarce that villagers were compelled to reduce family size even before the introduction of formal family planning.

Although the population growth rate seems to have decelerated for the past few decades, labor force should have continued to increase rather rapidly according to the continued increase in the population of economically active age. It appears, however, that the growth of labor force, too, begins to decelerate recently.

The fact that there has been no expansion in cultivated land area is clearly shown by the data in Table II in that no case was reported of land acquisition by present cultivators through opening new land. Before 1970, all the *sawah* plots were acquired by the farmers in this *kampung* either through inheritance or purchase; in earlier years the inheritance had been the dominant source of land acquisition and the purchase became a significant source after 1960. The land acquisition through rental or pawning arrangements began to be reported after 1970.

In this *kampung*, as in most villages in Java, owner farming was the dominant

TABLE II

ACQUISITION OF *Sawah* BY PRESENT CULTIVATORS

	Inherited	Purchase of Ownership Title	Rented in	Pawned in Ownership Title	Total
Before 1949					
No. of plots	18 (90)	2 (10)			20 (100)
Area (ha)	4.90(96)	0.21 (4)			5.11(100)
1950–59					
No. of plots	18 (95)	1 (5)			19 (100)
Area (ha)	3.70(96)	0.14 (4)			3.84(100)
1960–69					
No. of plots	16 (73)	6 (27)			22 (100)
Area (ha)	4.06(77)	1.19 (23)			5.25(100)
1970–74					
No. of plots	17 (65)	7 (27)	1 (4)	1 (4)	26 (100)
Area (ha)	4.01(72)	1.36 (24)	0.14 (3)	0.07 (1)	5.58(100)
1975–79					
No. of plots	10 (30)	8* (25)	10† (30)	5 (15)	33 (100)
Area (ha)	1.42(29)	0.99*(20)	2.06†(41)	0.48(10)	4.95(100)
Total					
No. of plots	79 (66)	24 (20)	11 (9)	6 (5)	120 (100)
Area (ha)	18.09(73)	3.89 (16)	2.20 (9)	0.55 (2)	24.73(100)

Note: Figures inside parentheses are percentage.

* Include one case in which a servant of a large farmer was given 0.14 ha by the master as grant.

† Include two sub-renting cases with 0.36 ha.

TABLE III

DISTRIBUTION OF *Sawah* LAND PLOTS BY TENURE STATUS, 1979

	Plots		Area		Average Area per Plot
	No.	%	Ha	%	(Ha)
Owned	80	83.3	21.98	88.9	0.27
Rented:					
Share tenancy	8	8.3	1.56	6.3	0.19
Leasehold tenancy	1	1.1	0.28	1.1	0.28
Pawned	5	5.2	0.55	2.2	0.11
Sub-rented	2	2.1	0.36	1.5	0.18
Total	96	100.0	24.73	100.0	0.26

form of land tenure. At the time of our survey, as much as 83 per cent of *sawah* plots and 89 per cent of *sawah* area were cultivated by owners themselves (Table III); 81 per cent of farmers were owner operators and pure tenants who owned no land were only 2 per cent (Table IV). However, as the data in Table II show, landlordism has been developing rather rapidly in recent years. It appears reasonable to hypothesize that the population pressure on limited land resources and the corresponding increase in the return to land relative to the return to labor has reached a stage in that the stratification of the hitherto homogeneous

TABLE IV

DISTRIBUTION OF FARMS BY TENURE STATUS, 1979

	Number of Farms		Area		Average Area per Farm
	No.	%	Ha	%	(Ha)
Owner operator	67	(81)	19.00	(77)	0.28
Owner/share*	9	(11)	2.98	(12)	0.33
Owner/lease	1	(1)	1.00	(4)	1.00
Owner/pawn	3	(4)	1.13	(5)	0.38
Share tenant	1	(1)	0.29	(1)	0.29
Pawn in	2	(2)	0.33	(1)	0.16
Total	83	(100)	24.73	(100)	0.30

* Include two cases of sub-renting under share arrangement.

TABLE V

SIZE DISTRIBUTION OF *Sawah* LANDOWNERSHIP AND OPERATIONAL LAND HOLDINGS, 1979

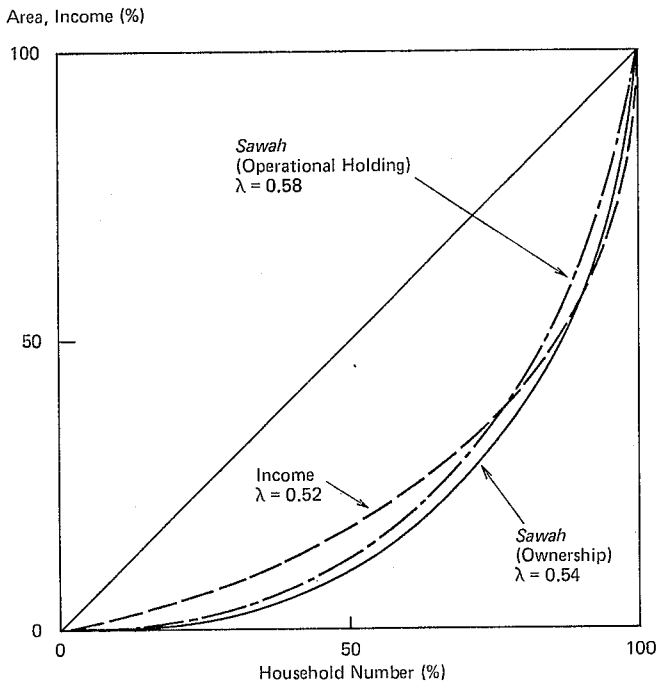
	Ownership Holdings				Operational Holdings			
	Number of Owners		Area		Number of Households		Area	
	No.	%	Ha	%	No.	%	Ha	%
1.00 ha and above	5	(4)	6.21	(25)	4	(4)	4.72	(19)
0.60–0.99 ha	4	(4)	3.23	(13)	4	(4)	3.30	(13)
0.30–0.59 ha	14	(13)	6.23	(25)	17	(15)	7.44	(30)
0.10–0.29 ha	41	(37)	7.85	(32)	41	(37)	8.17	(33)
0.01–0.10 ha	21	(19)	1.34	(5)	17	(15)	1.10	(5)
0	25	(23)	0	(0)	27	(25)	0	(0)
Total	110	(100)	24.86	(100)	110	(100)	24.73	(100)
Average area per household (ha)			0.23				0.22	

peasant community into landlord and tenant classes has begun to emerge significantly.

Class differentiation in terms of *sawah* landownership has already progressed to a high degree. Out of 110 households interviewed, twenty-five owned no land and twenty-one owned only less than 0.1 ha (Table V). The class differentiation has also been pronounced in terms of operational land holdings. Forty-four households had their operational land holdings less than 0.1 ha and earned their livelihood primarily from hired farm works. The size distributions of landownership and operational land holdings were highly skewed even though the size of the largest holding was as small as 1.5 ha. The size distribution of income was equally skewed as judged from comparisons in Lorenz curves and Gini coefficients (λ) in Figure 3.

We were unable to collect data to ascertain directly how the size distributions of income and land holdings have changed over time. It is our basic hypothesis that the income and asset distributions have become more inequal due to growing population pressure on land. This hypothesis is subject to empirical test in the analysis of the following sections.

Fig. 3. Lorenz Curves in the Distribution of Income and Landholdings (λ=Gini Coefficient)



III. CHANGES IN RICE FARMING

Concurrence of increasing population pressure and growing inequality, even if supported by data, does not represent evidence for the causal relation. It has often been argued that new technology such as modern varieties of rice and wheat is the major factor to promote polarization of rural communities and greater misery of the poor [1] [4] [6]. It is critical for our hypothesis testing to identify what changes have occurred in rice farming technology during the period of analysis.

A. *Production Costs and Returns*

Rice production in this *kampung* is characterized by the high level of yield per ha corresponding to the high application of fertilizers and chemicals (Table VI). Average paddy yield for the 1978 dry season was almost 3 tons per ha, in dry *gabah* ("paddy"). The level of fertilizer application was very high—the average nitrogen input was as high as 90 kg per ha. The fertilizer/rice price ratio was relatively favorable. On the average, farmers could barter 2.35 kg of dry paddy for 1 kg of nitrogen. No significant difference can be observed between large and small farmers in the levels of both rice yield and application of fertilizers and chemicals.

TABLE VI

RICE YIELD AND CURRENT INPUT PER HECTARE, GROSS VALUE ADDED RATIO, AND PRICES OF RICE AND FERTILIZER, 1978 DRY

		Large Farmer[a]	Small Farmer[b]	Average
Rice yield[c]	(kg/ha)	3,031	2,775	2,944
Current inputs:				
Seed	(kg/ha)	40	49	43
Urea	(kg/ha)	197	199	198
(Nitrogen)[d]	(kg/ha)	(89)	(90)	(89)
T.S.P.	(kg/ha)	37	20	31
Chemical	(Rp/ha)	546	504	532
Gross value added ratio (%)		90.3	89.4	90.0
Prices:				
Rice price	(1)		Rp 65/kg	
Urea price			Rp 69/kg	
(Nitrogen prices)[d]	(2)		(Rp 153/kg)	
T.S.P. price			Rp 69/kg	
(2)/(1)			2.35	

[a] Operational holdings of 0.3 ha and above.
[b] Operational holdings less than 0.3 ha.
[c] Dry *gabah*.
[d] Assume 45 per cent of nitrogen for urea.

TABLE VII

PRICES OF PADDY AND FERTILIZER, AND FERTILIZER INPUTS PER HECTARE, 1968, 1970, AND 1978

	Paddy Price (Rp/kg)	Fertilizer* Price (Rp/kg)	Fertilizer/Paddy Price Ratio (Rp/Rp)	Fertilizer† Inputs per Hectare (kg/ha)
1968	15.0	31.3	2.09	178
1970	20.0	26.6	1.33	203
1978	65.0	69.0	1.06	229

* Urea and T.S.P.
† Total of urea and T.S.P.

B. *Varieties and Fertilizers*

Despite the large fertilizer application, modern semidwarf varieties such as IR-varieties and Pelita have not been commonly used in this *kampung*. The modern varieties (MV) have been introduced since the late 1960s under the Bimas Program. However, because they were highly susceptible to insects and pests, many farmers who tried them have shifted back to traditional varieties. At the time of our survey, only 14 per cent of farmers were still adopting MV and the rest used traditional varieties such as Gembar and Sagon, although as much as 83 per cent of farmers had once tried MV.

Meanwhile, fertilizer application has increased from about 180 kg in 1968 to 230 kg in 1978 (Table VII). It appears that this increase was induced by the sharp decline in the fertilizer/paddy price ratio. The decline in the price ratio

TABLE VIII

LABOR INPUTS FOR RICE PRODUCTION PER HECTARE BY TASK, 1978 DRY SEASON

	Large Farmer		Small Farmer		Total	
	Hours/Ha	%	Hours/Ha	%	Hours/Ha	%
Land preparation:						
Family	111	(22)	309	(67)	179	(36)
Hired	398 [4]	(78)	153	(33)	315 [3]	(64)
Total	509	(100)	462	(100)	494	(100)
Transplanting:						
Family	23	(16)	55	(36)	34	(23)
Hired	121 [119]	(84)	96 [90]	(64)	112 [109]	(77)
Total	144	(100)	151	(100)	146	(100)
Weeding:						
Family	67	(33)	202	(80)	113	(52)
Hired	133 [81]	(67)	50 [21]	(20)	105 [61]	(48)
Total	200	(100)	252	(100)	218	(100)
Harvesting and threshing:						
Family	10	(3)	74	(24)	31	(10)
Hired	327 [327]	(97)	233 [225]	(76)	293 [292]	(90)
Total	337	(100)	307	(100)	324	(100)
Others:						
Family	53	(88)	88	(99)	65	(93)
Hired	7	(12)	1	(1)	5	(7)
Total	60	(100)	89	(100)	70	(100)
Total:						
Family	246	(21)	728	(58)	422	(34)
Hired	986 [531]	(79)	533 [336]	(42)	830 [465]	(66)
Total	1250	(100)	1261	(100)	1252	(100)

Note: Figures inside of the brackets are labor hours worked by *ceblokan* workers.

was, to a large extent, resulted from the government subsidy on fertilizer under the Bimas Program.

The average paddy yield for 1968–71 estimated from the IPS data was about 2,600 kg per ha, whereas the average yield for 1978 from our survey was 2,944 kg per ha. The relatively modest increase in rice yield corresponds to the absence of modern varieties adequate for the environmental condition specific to this area. It is difficult to ascertain from our data how significant the yield increase was, since the yields were subject to weather fluctuations. However, if we assume that our yield data reflect the real yield increase, it must have been resulted mainly from the increase in fertilizer application due to the government fertilizer subsidy.

C. *Labor Input*

Average labor requirement per ha in the 1978 dry season was 1,252 hours or 156 days assuming eight-hour work for one man-day. Land preparation used the largest share of labor, followed by harvesting, weeding, and transplanting in that order (Table VIII). Those four tasks that require large shares of labor input

TABLE IX

CHANGES IN LABOR INPUT PER HECTARE FOR RICE PRODUCTION, 1968–71 TO 1978

	1968–71 (Hours)	1978 (Hours)	Percentage Change: 1968–71 to 1978
Land preparation	420	494	18
Transplanting, weeding, and other crop care	316	434	37
Harvesting and threshing	324*	324	0
Total	1,060	1,252	18

* Assume same labor requirement as for 1978, because no data is available in IPS Survey for labor inputs in harvesting and threshing.

TABLE X

CHANGES IN THE COSTS OF MANUAL AND ANIMAL PLOWING AND THE INPUTS OF MANUAL LABOR AND ANIMAL WORK

	1968–71	1978	1978/1968–71
Nominal costs (Rp/day):			
Manual wage rate:			
Cash	100	350	3.5
Meal	84	200	2.3
Total	184	550	3.0
Animal rental rate	120	620	5.2
Paddy price (Rp/kg)	19.4	65.0	3.4
Real costs (Rp/ha):*			
Manual wage rate	184	162	0.9
Animal rental rate	120	182	1.5
Input:			
Manual (man-days/ha)†	52.5	61.8	1.2
Animal (animal days/ha)	16.4	9.2	0.6

* Deflated by the paddy-price index.

† Assume 8-hour work per day.

for rice production are characterized by high dependence on hired labor. There were large differences in the composition of family and hired labor between large and small farmers. On the average, large farmers depended on hired labor for nearly 80 per cent of total labor used for their rice production, whereas only 40 per cent of labor used for small farmers' production was supplied from the hired source. It is easy to infer that land preparation, transplanting, weeding, and harvesting of large farmers represent major employment opportunities for landless workers and small farmers.

It is estimated that average labor input for rice production per ha increased by 18 per cent from 1968–71 to 1978 (Table IX). The increase was especially large for weeding, reflecting the intensification of crop care. The increase in labor use for land preparation reflects the substitution of hand hoeing for animal plowing and harrowing due to the decline of manual wage rate relative to the rental rate of draft animal (cattle and carabao). The real wage rate of manual labor for land preparation declined by about 10 per cent, whereas the real rental rate of draft animal increased by about 50 per cent (Table X).

IV. CHANGES IN LABOR-CONTRACT RELATIONS

Growth in labor force and the resulting decline in the real wage rate have had pervasive impacts on employment relations among villagers. Changes in labor contracts and their effects on income distribution have been expressed most dramatically in the changes in rice harvesting systems. Rice harvesting represents the most important occasion in the village economy at which the output is shared among various resource contributors, such as landlords, farmers, and laborers. Thereby, traditional institutions based on the principles of mutual help and income sharing had governed labor-employment relations for harvesting works. Such traditional institutions have been induced to change by changes in relative factor endowments and technology.

A. *Changes in Rice Harvesting Systems*

Recent changes in rice harvesting in Java have attracted attention of economists and sociologists who are concerned about the income distribution problem in the rural sector. The traditional *bawon* system that allowed wide sharing of output among community members has been replaced by the system that limits participation in harvesting work and reduces the share of harvesters. The change has been attributed mainly to population pressure and new technology.

It was found in a number of places that the *bawon* system has been replaced by a new system called *tebasan* [2] [3] [4] [13]. In the *tebasan* system, farmers sell their standing crops to middlemen called *penebas* sometime before the harvest. Because the middlemen in their role as *penebas* are free from the traditional obligations of the village community, they close the harvest to the majority of villagers and employ a smaller number of regular workers to harvest their purchased crops. A major factor underlying the shift from *bawon* to *tebasan* is said to be population pressure. As the number of workers who want to participate in harvesting rises beyond a point, significant losses occur from physical damage such as trampled crops as well as from cheating and stealing. The *tebasan* system enables the reduction of such losses. Another major factor said to have facilitated the development of the *tebasan* system is the new rice technology in the form of MV. Short-stalked MV made the use of the sickle more efficient, thus reducing the number of workers needed for rice harvesting. The welfare implication of the *tebasan* system has been considered that the rich (farmers and *penebas*) gain at the expense of the poor (laborers); thereby it promotes more inequal distribution of income.

In this *kampung*, as well as in neighboring *kampungs* and *desas*, the *tebasan* system has not been introduced. However, the traditional *bawon* system has been replaced by another system called *ceblokan* which also intends to limit participation in harvesting. In the *ceblokan* system, workers who are employed for harvesting works are limited to those who performed extra services without pay for such tasks as transplanting and weeding. The adoption of the *ceblokan* system has the effect of reducing the real wage rate of harvesters because the same share of output (*bawon*) is paid for larger amount of work.

TABLE XI

CHANGES IN RICE HARVESTING SYSTEM (PERCENTAGE OF FARMER ADOPTERS)

	*Bawon**				*Ceblokan*†					
	PO	OV	OM	LI	1/6 (T)	1/7 (T)	1/7 (T+W)	1/7 (H+T)	1/7 (H+T+W)	Total
1978				4		72	19	1	4	100
1976–77				4	7	67	18	2	2	100
1974–75				7	15	67	10	1		100
1972–73				8	17	67	8			100
1970–71			2	10	33	51	4			100
1968–69	1	4	6	19	44	24	2			100
1966–67	3	10	8	27	52					100
1964–65	9	16	16	32	27					100
1962–63	16	34	33	17						100
1960–61	29	31	21	19						100
1950s	35	29	18	18						100

* *Bawon* system: PO—purely open, OV—open for villagers only, OM—open with maximum limit, LI—limited to invitees.

† *Ceblokan* system: 1/6, 1/7-harvesters' share; T, W, H-obligatory works to establish the harvesting right (T—transplanting, W—weeding, H—harrowing).

Although *ceblokan* has been introduced into the Subang area rather recently, it is an old system in several other places in Java recorded since the nineteenth century [14]; it has been commonly practiced for long, especially in the northeast corner of West Java such as Kabupatens Cirebon and Majalenka (for the regional distribution of *ceblokan*, see [8]).

In this *kampung*, the *ceblokan* system was first adopted in 1964 by seven farmers. It replaced the *bawon* system very rapidly and, by 1978, the farmers adopting *ceblokan* exceeded 95 per cent. However, even before the introduction of *ceblokan*, not all the farmers had practiced "purely open" *bawon* in the sense that everyone is allowed to participate in harvesting. The system nearest to the traditional "purely open" (PO) *bawon* harvesting as a communal activity was the case in which harvesting was open only to villagers in the same village (OV). Another system placed a further limit on the maximum number allowed to participate (OM). A more severe restriction was involved in the case that participants were limited to those who received specific invitations from farmers (LI). As clearly seen in Table XI, farmers had gradually shifted from more open *bawon* to more restricted *bawon* until *ceblokan* was introduced.

Likewise, the *ceblokan* system itself includes a spectrum of arrangements in terms of harvesters' share and obligatory works. Originally, *ceblokan* harvesters received traditional share of one sixth for additional service of rice transplanting without pay (usually meals were served even though cash wages were not paid). Later, their share was reduced to one seventh, and weeding and harrowing were added in the list of obligatory works required to establish the harvesting right. Changes in harvesting systems in this *kampung* as summarized in Table XI show successive shifts from more open and more generous arrangements to more restrictive and less generous arrangements. Underlying this process was the

TABLE XII

AVERAGE HIRED LABOR TIME AND WAGE EARNING PER HOUSEHOLD EMPLOYED IN RICE PRODUCTION, 1978 DRY SEASON

	Labor Hours Employed		Labor Days Employed		Wage Earned*	
	Hours	%	Days	%	Rp	%
Land preparation:						
Daily wage†	89.3	(35)	12.3	(32)	6,542	(44)
Ceblokan	2.9	(1)	0.6	(2)	86	(1)
Total	92.2	(36)	12.9	(34)	6,628	(45)
Transplanting:						
Ceblokan	31.7	(13)	5.9	(15)	670	(4)
Weeding:						
Daily wage	12.7	(5)	2.3	(6)	650	(4)
Ceblokan	23.1	(9)	4.4	(11)	566	(4)
Total	35.8	(14)	6.7	(17)	1,216	(8)
Harvesting & threshing:						
Ceblokan	89.2	(35)	12.2	(32)	6,260	(42)
Bawon	1.5	(1)	0.2	(1)	83	(0)
Total	90.7	(36)	12.4	(33)	6,343	(42)
Others:						
Daily wage	2.6	(1)	0.5	(1)	104	(1)
Total:						
Daily wage	104.6	(41)	15.1	(39)	7,296	(49)
Ceblokan	146.9	(58)	23.1	(60)	7,582	(51)
Bawon	1.5	(1)	0.2	(1)	83	(0.5)
Total	253.0	(100)	38.4	(100)	14,961	(100)

Note: Average for fifty-four small farmer households and twenty-three landless worker households.

* Include meal.

† Include wage payments according to area-rate contracts.

decline in the return to labor relative to the return to land and capital due to the growth of labor force against limited land resources.

By 1978 the shift from *bawon* to *ceblokan* had almost completed. The amounts of labor employed and wages earned under the *ceblokan* system became dominant in total hired employment and wage income of laborers. On the average of all households whose family members were hired for rice production during the 1978 dry season, labor employed under the *ceblokan* system was about 60 per cent of total hired-labor time and income from the *ceblokan* works was about 50 per cent of total wage earning (Table XII).

B. *Employer-Employee Relations*

In the shifts from the more open and generous arrangements to the less open and less generous ones, large farmers usually took a lead and small farmers followed. As the result, as shown in the upper case of Table XIII, a clear tendency was developed that the larger the farmers were, the less generous were their arrangements in the employment of harvesters (Table XIII). On the other

TABLE XIII

DISTRIBUTION OF EMPLOYERS AND EMPLOYEES IN RICE HARVESTING BY TYPE OF CONTRACT AND BY SIZE OF OPERATIONAL HOLDING, 1978 DRY SEASON

Farm-size Class (Ha)		Family Only	*Bawon* (1/7)	*Ceblokan* 1/7 (T)	*Ceblokan* 1/7(T+W) or 1/7(T+H)	*Ceblokan* 1/7 (T+W+H)	Total
Employer:							
Below 0.1	(no.)	6		11			17
	(%)	(35)		(65)			(100)
0.1 to 0.29	(no.)	1	2	34	4		41
	(%)	(2)	(5)	(83)	(10)		(100)
0.3 to 0.59	(no.)			10	6	1	17
	(%)			(59)	(35)	(6)	(100)
0.6 & above	(no.)			1	6	1	8
	(%)			(13)	(74)	(13)	(100)
Employee:							
0	(no.)			7	18		25
	(%)			(28)	(72)		(100)
0.01 to 0.1	(no.)			6	10	1	17
	(%)			(35)	(59)	(6)	(100)
0.1 to 0.29	(no.)		1	22	9	4	36
	(%)		(3)	(61)	(25)	(11)	(100)
0.3 to 0.59	(no.)			10	1		11
	(%)			(91)	(9)		(100)

Note: 1/7—harvesters' share; and T, W, H,—obligatory works to establish the harvesting right (T—transplanting, W—weeding, and H—harrowing).

hand, there was a tendency that the arrangements with which landless workers and near landless farmers (below 0.1 ha) were employed were less generous than those of medium-scale farmers (the lower case of Table XIII).

Such data suggest the relations in which the rich (large farmers) employed the poor (landless workers and near landless farmers), whereas the middle class people (medium-scale farmers) employed each other among themselves. Such relations are confirmed by the matrix that relates employers to employees for different farm size classes (Table XIV). The data show that, while landless workers and near landless farmers with land holdings below 0.1 ha depended most heavily on large farms with 0.6 ha and above for their employment opportunities. Medium-scale farmers in the size brackets of 0.1–0.29 ha and 0.3–0.59 ha found the largest employment opportunities in the farms of their own size classes. Therefore, the employment relations among medium-scale farmers were, by nature, equivalent to labor exchange. In contrast, the patron-client relation characterized the employment of landless workers by large farmers.

C. *Role of Ceblokan*

The *ceblokan* system can be considered as an institutional innovation for the employer farmers to reduce the wage rate for harvesting to a level equal to the market wage rate. In earlier days, when labor was scarcer and the rice yield

TABLE XIV

MATRIX OF EMPLOYER-EMPLOYEE RELATIONS IN RICE HARVESTING IN TERMS OF PADDY AREA CONTRACTED (HA), 1978 DRY SEASON

Employee / Employer	0 Ha (Landless)	0.01 to 0.1 Ha	0.1 to 0.29 Ha	0.30 to 0.59 Ha	Outside *Kampung*
Below 0.1 ha	0.13	0.71	0.24	0.02	0
	(2)	(14)	(3)	(18)	(0)
0.1 to 0.29 ha	1.31	1.41	3.26	0.62	0.35
	(20)	(28)	(37)	(31)	(23)
0.3 to 0.59 ha	1.56	1.18	2.50	0.88	0.72
	(24)	(24)	(29)	(43)	(46)
0.6 ha & above	2.96	1.54	2.15	0.36	0.48
	(46)	(31)	(25)	(18)	(31)
Outside *kampung*	0.52	0.13	0.52	0.14	—
	(8)	(3)	(6)	(7)	
Total	6.48	4.97	8.67	2.02	1.55
	(100)	(100)	(100)	(100)	(100)

Note: Percentages are in parentheses.

was lower, the one sixth share of output under the traditional *bawon* system might have been equivalent to the market wage rate close to the marginal product of harvesters' labor. However, as the labor supply became more abundant and the rice yield increased, one sixth of the output would have become substantially larger than the market wage rate.

In such a situation, farmers could increase their income by replacing the *bawon* system by the labor of daily wage workers. However, the cost arising from resistance to a change in the long-established custom in the village community would have been quite large. Another possibility was to reduce harvesters' share in the *bawon* system, which would have been easier and was, in fact, practiced. However, the reduction of the share rate, too, would have not been quite so consistent with the basic moral principles in the village such as mutual help and income sharing. In terms of the patron-client relations in the village community characterized by the multistranded tie, it would have involved less social frictions to add some additional obligations while maintaining the same share rate.

Thus, we hypothesize that the *ceblokan* system was an institutional innovation that entailed the least cost to reduce harvesters' share of output in line with the market wage rate. (The same role was played by the *gama* system in the Philippines [9].) As a test, an imputation was made of the wage rates for alternative harvesting arrangements. In the calculation, meals served for obligatory works such as transplanting and weeding were valued as one half of the market wage rate per day (meals were not served for harvesting works). The results summarized in Table XV indicate that harvesters' share under the *bawon* system with the one seventh share was 40 per cent higher than the market wage rate; by shifting to the *ceblokan* system with the obligation of transplanting alone the gap of harvesters' share from the market wage rate was reduced to 12 per cent;

TABLE XV

IMPUTATION OF WAGE RATES FOR HARVESTING WORKS

Number of working hours of *ceblokan* labor (hr/ha):			
(1)	Harvesting and threshing		324
(2)	Transplanting		111
(3)	Weeding		147
Actual share of *ceblokan* harvester:			
	Quantity of paddy (kg/ha)		421
(4)	Imputed value of paddy (Rp./ha)*		27,365
Imputed wage rate (Rp./hr):			
(A)	Bawon 1/7	(4)/(1)	84
(B)	Ceblokan 1/7(T)	(4)/[(1)+0.5(2)]†	72
(C)	Ceblokan 1/7(T+W)	(4)/[(1)+0.5(2)+0.5(3)]†	60
Market wage rate (Rp/hr)			60

* Use Rp 65/kg for the market price of paddy.

† Assume that the cost of meals served for transplanting and harvesting were one half of the market wage rate for those tasks.

by further adding weeding to the obligation, harvesters' share was equalized to the market wage rate. Such results are highly consistent with our hypothesis.

Another factor underlying the diffusion of *ceblokan* might be that it helps strengthen the patron-client relations between employers and employees by giving an exclusive right of harvesting to specific laborers. With the tightening of the patron-client bond the patron farmers can economize on the labor enforcement cost to supervise the performance of laborers. From the employee's side, *ceblokan* might also be referred because of the stronger patron-client bond as it reduces risk in finding employment.

The shift from *bawon* to *ceblokan* represents a shift from mutual help and income sharing within a whole village community to the patron-client and the reciprocity relations in smaller groups. However, this shift does not mean that some members of the community were excluded from employment opportunities. All members were inlaid into the employment matrix in the community, although the employer-employee relations were distinctly different among classes—the labor-exchange type among medium-class farmers and the patron-client type between large farmers and landless/near landless people.

Even, the disadvantaged members were not excluded. For example, it was two large farmers who adopted the least generous arrangements of *ceblokan* with the obligation of transplanting, weeding, and harrowing. However, they gave to widowed households special exemptions of harrowing work, because land preparation was considered male's task. This example suggests that the community moral principle of mutual help and income sharing has not entirely lost its power and that it entails cost to behave in contradiction with the principle.

Ceblokan has not contributed to the development of labor-saving technology. It was optional for harvesters whether to use *ani-ani* or sickle. In the harvest of the 1978 dry season almost all fields were harvested by *ani-ani*.

V. CHANGES IN INCOME DISTRIBUTION

A dismal picture has been drawn in previous sections on the economy of a rural community in West Java; income and asset distributions are highly skewed even though the average income and the average size of land holdings are very small; population pressure had long before reached its limit and the population growth decelerated but labor force has continued to increase; technology has been stagnant because modern varieties effective in the environmental condition of this specific location have not been available; and fertilizer application has increased not because of new technology but because of low fertilizer prices subsidized under the BIMAS Program. Gains in rice yields have not been so significant; the increase in labor force against limited land resources under stagnant technology resulted in the decrease in the economic return to labor; the real wage rate for land preparation has declined, inducing the substitution of hand hoeing to animal plowing; and the reduction in the real wage rate for harvesting works has been brought about through the institutional change in the form of the shift from the *bawon* to the *ceblokan* system.

The whole process suggests that the income distribution has become more skewed. Data are not available to identify over-time changes in the size distributions of income. Therefore, we will try to make inference based on changes in the shares of income from rice production.

A. *Factor Shares of Rice Output*

Changes in the average factor shares of rice output per ha from 1968–71 to 1978 were estimated (Table XVI). During the period the average yield per ha increased by a little more than 10 per cent. Both the payment to hired labor and the imputed cost of family labor increased very slightly, less than 5 per cent. Operator's surplus (residual) recorded a major increase in the case of owner farmers. In the case of tenant farmers, operators' surplus was almost zero and land rent paid to landlords was equivalent to owner farmers' surplus. Such results show clearly that the operators' surplus of owner farmers consisted mainly of the return to their land. Thus, the major gain in owner farmers' surplus implies the increase in the economic rent of land. Altogether, the relative share of labor declined and the relative share of land increased.

What do such estimates imply on the income distribution between farmers and landless laborers? Table XVII attempts to show the income (value added) from rice production per ha was distributed between farmers and hired laborers. Farmers' income consists of operator's surplus and the returns to family labor and capital. Farmers' total income in paddy terms increased from 1968–71 to 1978 by 25 per cent, whereas laborers' income increased by only 4 per cent. The wage earnings of laborers from preharvest activities were increased, mainly because of larger employment opportunities in land preparation due to the substitution of animal plowing by hand hoeing. But the increase was compensated for, to a large extent, by the decline in the earnings from harvest and post-

TABLE XVI

CHANGES IN FACTOR PAYMENTS AND FACTOR SHARES IN RICE PRODUCTION PER HECTARE, 1968–71 TO 1978

	Factor Payment (Kg/Ha)			Factor Share (%)		
	1968–71[a]	1978[b]		1978–71	1978	
	Owner	Owner[c]	Tenant[d]	Owner	Owner	Tenant
Rice output	2,600	2,942	3,080	100.0	100.0	100.0
Factor payment:[e]						
Current input[f]	380	328	356	14.6	11.1	11.6
Capital[g]	101	90	41	3.9	3.9	1.3
Labor	1,257	1,301	1,341	48.4	44.2	43.5
(Family)	(427)[h]	(438)	(476)	(16.4)	(14.9)	(15.4)
(Hired)	(830)[h]	(863)	(865)	(31.9)	(29.3)	(28.1)
Land	0	0	1,262	0	0	41.0
Operator's surplus	862	1,223	80	33.1	41.6	2.6

[a] Based on the IPS Survey for Phase I to V.
[b] Based on our survey.
[c] Averages of seventy-nine owner farmers cultivating 20.4 ha.
[d] Averages of nine tenant operators cultivating 1.8 ha.
[e] Factor payments converted to paddy equivalents by the factor-output price ratios.
[f] Seeds, fertilizers, chemicals, and irrigation fee.
[g] Animal rental for land preparation.
[h] Assume the same composition of family and hired labor as for 1978.

TABLE XVII

CHANGES IN SHARES OF INCOME FROM RICE PRODUCTION PER HECTARE, 1968–71 TO 1978

	Income in Paddy (Kg/Ha)		Income Share (%)	
	1968–71	1978	1968–71	1978
Value added*	2,220	2,614	100.0	100.0
Farmer:				
Family labor	427	438	19.2	16.8
Capital	101	90	4.6	3.4
Operator's surplus	862	1,223	38.8	46.8
Total	1,390	1,751	62.6	67.0
Hired laborer:				
Preharvest employment	397	443	17.9	16.9
Harvest & post-harvest employment	433	420	19.5	16.1
Total	830	863	37.4	33.0

Note: Data rearranged from Appendix Table XVI.
* Output value minus current input cost.

harvest employment, primarily due to decline in harvesters' share rate. On the other hand, farmers' income increase significantly, primarily due to the increase in the return to land in the form of operator's surplus. As the result, farmers' income share increased and laborer's share declined. The data clearly imply that the income distribution became more skewed.

It is most probable that the size distribution of income between farmers and laborers became more skewed than the data in Table XVII show. From 1968–71 to 1978 the number of landless and near landless households must have increased faster than the number of farmers. Therefore, the share of income per landless household would have declined by a greater extent than the share of income per ha. It is highly likely that per household or per capita income from rice production for landless and near landless households has declined in absolute terms, even though the rice income per ha has increased slightly.

B. *Economic Base for Greater Inequity*

The dismal process of growing poverty and inequity in the hamlet under study approximates the world predicted by classical economists like David Ricardo [12]. As the growth of population pressed hard on limited land resources under constant technology, cultivation frontiers are expanded to more marginal land and greater amounts of labor applied per unit of cultivated land; the cost of food production increases and food prices rise; in the long end, laborers' income will be lowered to a subsistence minimum barely sufficient to maintain stationary population and all the surplus will be captured by landlords in the form of increased land rent. This is exactly what has occurred in the hamlet under study.

The decline in the income share of laborers induced the institutional change such as the shift from the *bawon* to the *ceblokan* system. Such process should have involved struggles among different classes in the community. The process might have been facilitated, to a significant extent, by a relative decline in the bargaining position of the landless class since the suppression of the Communist Party in 1965.

However, if the basic economic factor underlying was the decreasing return to labor relative to land, it would have been difficult to stop the Ricardian process in the absence of effective policies to raise the relative productivity of labor by improving land infrastructure and developing land-saving and labor-using technology. Modern semidwarf varieties were tried but not accepted because they did not represent better technology in this area in the absence of adequate adaptive research and development. Both the data and the economic logic suggest that, contrary to the pervasive presumption, growing inequity was resulted not because of the introduction of modern technology but because of stagnation in technology.

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