RECENT CHANGES IN RICE HARVESTING METHODS

Some Serious Social Implications

Surveys carried out in the past few years give indications that changes are taking place in systems of rice harvesting and marketing in Java which may be of great significance. If these changes, which appear to have taken place in a rather short period of time, spread widely throughout Java they may have very important social implications. The changes were observed in the course of a number of sample surveys undertaken by the Agro-Economic Survey in December 1972 and January 1973 in four villages in the major rice producing areas of Central Java. Some 120 rice farmers and a number of village officials and traders were interviewed. This paper is a preliminary report on those observations.

TRADITIONAL HARVESTING METHODS

By tradition, Javanese and Sundanese rice farmers do not restrict anyone who wishes to participate in the harvest of their rice fields. The harvesters in the past were mostly women from within the village and from neighbouring villages. They used the *ani-ani*, a small hánd-knife with which they cut each stalk of rice separately. The use of this knife is closely associated with a traditional belief that the rice goddess would be offended if any other cutting tool were used. Every woman in the village would own such a knife, which is quite suitable for cutting the local varieties of rice since these mature at different times and the length of the stalks varies. The harvesters do not thresh the rice, but carry it in sheaves which they bind in the field and carry on shoulder poles to the owner's house. This method of harvesting depends on large numbers of persons to cut and carry the paddy. On the farms surveyed where this method of

harvesting was used, as many as 500 persons may be employed per hectare.

The farmers pay the harvesters by giving them a share of the crop (*bawon*). The traditional shares were seven, eight or nine for the owner to one for the harvester, and the division was made by bundles, and not by weight. Only after the harvest had been delivered to the owner and the shares given out did the owner decide how much of his crop to sell and how much to save for home consumption.

An exception to this way of marketing rice only after the harvest was sometimes found among the very poor farmers who needed cash to pay for labour during soil preparation, or to buy food in the pre-harvest (*paceklik*) period. They would then sell their crop for cash, sometimes several months before it was mature (*ijon*). Since they usually got a very low price for their crops when they sold them so long in advance of the harvest, this system was used only by those farmers in most urgent need of cash.

These methods of harvesting and marketing seem to be undergoing significant and possibly disruptive change. One factor is the great pressure of population on land. Individual farm sizes are becoming smaller as farms are divided and sub-divided from generation to generation.[1]

Large numbers of people, most of them landless labourers, are travelling further and further afield to find harvesting work. With so many people trying to share in the harvest, the amount of work each harvester gets has been becoming smaller, so they try to get larger shares than custom dictates. In one village, farmers were asked if they ever refused to allow the itinerant harvesters to participate. The farmers felt they had no choice. One farmer said that if the landowners tried to exclude the itinerant labourers from participation in the harvest 'there would be war'.[2]

[1] In some of the most heavily populated areas the interviewed farmers have indicated that a size limit has been reached for the very small farm operations. No longer can these farmers actually divide their land among their heirs because the operations would be too small to support their families. Either one of the children who has enough funds will buy the others' shares, or together they will sell the land to an outsider and divide the proceeds. These people then join the swelling ranks of the landless.

[2] Shortly before we returned to one of these villages for a second survey, a *penebas* was severely beaten by women harvesters because they could not join his harvest.

Furthermore, the farmers too are finding that their shares of the harvest are becoming smaller. The farmers in the survey said that nowadays the shares of the harvesters were in fact more like 1 to 6 than the customary 1 to 9. For various reasons the farmers felt powerless to control the division. Some survey farmers said they felt ashamed to give their neighbours and fellow villagers too small a share. If the harvesters tried to take more than their customary share, the farmers were not willing or able to refuse or to stop them. If a farmer knew that his fellow-villagers who were harvesting his rice were very poor, he was often reluctant to enforce the customary share. He felt a social obligation to let them have more than custom required. When the harvesters were from outside the village, the owner was less sympathetic but still seemed powerless to control the division of the crop. When one farmer was asked why he did not redistribute the shares when they were brought to his house, he replied that if he did, the harvesters would simply return later and demand more rice.

In order to improve their shares, farmers have to limit the numbers of harvesters. The responses to this problem appear to be somewhat different for the smaller, poorer farmers than for the larger farmers. The small farmers appear to be more bound to traditional systems of harvesting and to be somewhat more at the mercy of the swarms of harvesters.[3]

CEBLOKAN AND TEBASAN

One response by some small farmers is the system called *ceblokan* (in Sundanese) or *pajegan* (in Javanese). This system was observed in only one of the sample villages, one relatively far from the major rice growing areas. A group of women, often as many as 10 for a plot no larger than 0·15 hectare, will join together to transplant and weed a farmer's *sawah*. They are not paid for this work, but are given meals. At harvest time, however, this group of women have the sole right to harvest that farmer's crop, and no one else may join in without their permission. They receive one-sixth of the harvest, but since there are fewer participating, their shares are larger than under *bawon*. Usually the harvest lasts long enough — ten to twenty

[3] A clear negative correlation between size of holding and size of *bawon* has been observed by an anthropologist living in a village on Java . . . 'the farmers who can least afford to, give the most — confirmation that while the poor are still good at sharing their poverty, the rich are no longer much good at sharing their wealth'. Private communication with Mr Benjamin White.

days — so that one woman can join five to ten such groups. *Ceblokan* had been in use for about ten years in this village and had come to be adopted, according to the farmers, because of the very small size of farms. One farmer thought that *ceblokan* would soon be used also for soil preparation, work usually done by men.

This system has been effective in limiting the numbers of those participating and in keeping shares for fellow-villagers only. If the system spreads, it could easily increase the existing tension between villagers and outside harvesters; but in the village where this system was in use, pressures from outside harvesters were not as strong as in other villages.

Tebasan. In some of the more important rice producing areas, the response of many has been to adopt the *tebasan* system. *Tebas* is a Javanese word which means to buy almost-mature crops which the buyer must harvest at his own expense. In the past, especially for crops other than rice, *tebasan* was a cash-and-carry transaction. But in recent times, the trader (*penebas*) pays the farmer only at the time of harvest or several days after harvest, at least in the villages surveyed. *Tebasan* was found in all four of the Central Java villages studied and is more important than *ceblokan* both in its frequency and in its long-run implications. Just under half the farmers in the Survey sold some of their rice crop to *penebas* in the 1972 dry season. On average, they sold about two-thirds of their crop to the *penebas*, harvesting the rest under *bawon* in order to fulfil their social obligations to their neighbours. The remainder of the crop they kept for their own food.

The farmers say that the main reason they sell their crop to the *penebas* before harvest is to avoid the problems of supervising the harvest and dividing the shares. They much prefer the middleman to do this, so they do not have to worry about the numbers of harvesters or the division of shares; they can also expect a larger share for themselves. Several mentioned that as soon as the harvest was completed, they expected to buy back from the *penebas* some of the rice from their own fields. They were convinced that they received more if they sold at least part of their crop to a *penebas*; one farmer expected his income to be 25 per cent higher by *tebasan* than if he harvested his crop by *bawon*.

In the villages surveyed, the *penebas* were of three different origins: one was a group from within the village, one was made up of farmers from a nearby village and one was a group of

traders from a nearby town. Most of the village leaders said that the majority of the *penebas* were from outside the village where they purchase the crop. Those within the village were usually relatively large land owners and were also likely to be those with fairly close relationships with village leaders. If the *penebas* is also a farmer, he must sell his crop to another *penebas*; he cannot harvest it himself if he wants to limit the size of the harvesters' shares.

The *penebas* normally purchases the rice in the field from five to fifteen days before harvest. If he is from the same village as the farmer, payment is usually made about one week after harvest although a down payment of Rp 500–1,000 may be made to seal the agreement. If he is from another village, he will usually pay before the rice is carried out of the farmer's field. Farmers are not tied to any one buyer, but will select the one who gives the highest price; ordinarily four or five buying groups will approach each farmer.

In the villages surveyed, the *penebas* work in groups of two to four people, since harvesting may be taking place in several places and there must be someone to supervise each field. Usually one member of the team specialises in bargaining with the farmer and estimating the yield, while another organises the harvest in the field and a third receives the rice and pays the harvesters. Apparently this grouping is not for the purpose of mobilising capital; since the farmers are not normally paid until the *penebas* have sold the crop, there is no need for extensive capital.

In one of the villages, the system worked as follows: the *penebas* who have purchased a crop send letters to their selected harvesters in the village, giving them a right to help harvest the crop. The appointed harvesters gather at the house of the *penebas* before going to the fields. They wear distinctive coloured hats, or put their letters in their hats, so that the *penebas* can distinguish their own people. If the harvest is to be in another village, each *penebas* brings his own harvesters from his own village. The harvesters must carry the paddy to the *penebas'* house or to the specified rice hullers as part of their task. The *penebas* then sells the rice to buyers in the village or in nearby towns and only then does he complete his payment to the farmer.

The amount of land handled by one group of *penebas* varies, according to the survey. One group estimated that they would harvest about 50 ha of *sawah*, another group of four said they

would normally handle about 12 ha, half in one village and half in another. This group never went further than 2 kilometres to harvest a crop. Normally, the groups appeared to harvest about 20 ha each, with the number of plots ranging from 20 to well over 100.

Profits made by the *penebas* were reported only in one village, where they made a profit of Rp 200 per quintal of *beras*. Since the *penebas* do not operate with capital, if they make a poor estimate of the crop, they may not have the money to cover their loss. In this case, they usually re-negotiate the original price with the farmer. Sometimes a *penebas* will lose on a deal and disappear with the farmer's rice; or he may pay as much as he can of the agreed price and hope, if he gains enough on other deals, to repay the remainder. If the *penebas* gains on a transaction, however, the farmer still gets the original agreed price and no more.

Harvesters appear to take a different attitude when the *penebas* buys the crop than when the farmer shares out the harvest directly. Unlike the farmer, the *penebas* is recognised as a trader in this role (even though he may also be a farmer) and his right to a profit is accepted. The harvesters will accept conditions from a farmer in his role of *penebas* dealing with another farmer's crop which they will not accept from him as a farmer dealing with his own crop. Individual harvesters may benefit from working with a *penebas*, especially when he can control the numbers participating and so ensure larger returns for his chosen harvesters. On the other hand, the actual shares for harvesters as a group under *tebasan* are smaller than when the farmer divides the crop, harvesters normally getting 1 share to 11 or 12 for the *penebas*. Furthermore, when sickles are used the division is made in most cases by weight and not by bundle.

Thus the farmers are convinced that they benefit by selling through *tebasan*, the *penebas* also benefit and those harvesters with close relationships with the *penebas* also benefit. But the number of landless rural people who have fewer employment opportunities will rapidly increase in rural areas and those who have very small incomes may find that even these have decreased.

SICKLES AND SCALES

An important technical change in the method of harvesting is also being adopted, partly because of the use of *tebasan* and

partly because of the HYVs: this is the use of the sickle to harvest rice. Unlike the traditional varieties, the new high yielding varieties of rice are more suited to cutting by the sickle than they are by the *ani-ani*. The use of the sickle has been somewhat inhibited in the past by the traditional fear of offending the rice goddess. Some say that because the HYV come from abroad, the goddess is not offended when the sickle is used on these varieties. More important, possibly, is the fact that when rice is cut by sickle, it is threshed in the field. This affects the method of payment for harvesters. When rice is cut by *ani-ani*, the entire stalk is bunched in the field; each harvester chooses a bundle for his share, larger than the other bundles. When the rice is cut by sickle, however, it is threshed in the field and carried in sacks to the *penebas'* house and the harvesters are paid there in cash according to the weight of their harvest. It was only when the *penebas* began to use sickles and when the threshed *gabah* was taken to his home for division that scales began to be used to weigh out shares due to the harvesters. The harvesters must also provide their own sickles, threshing mats, and sacks to carry the rice.

Sickles were first used in one of these villages in 1972 with the arrival of C4-63 seeds. During a group interview with several village leaders, the introduction of this innovation was discussed. One progressive farmer who is also a *penebas* saw the sickle being used several seasons ago in a village 30 km from his own village. He saw that the owner's share of the crop was considerably larger when harvesters used the sickle. Two seasons ago this *penebas* began to use sickles for crops he had bought in his own village but used harvesters from outside the village first because the local people were not accustomed to seeing sickles used for cutting rice. Later, when it was more common, the people in this village were also hired to use sickles. They are used only on the high yielding varieties though.

With sickles, only about 75 man days are needed to harvest one hectare (25 people for 3 days), while with the *ani-ani*, 200 or more man-days may be used. With the sickle, the harvester can cut and thresh on the average 60 kg of *gabah* in a day; at the most a harvester might cut and thresh 100 kg *gabah*. Using the *ani-ani*, the most a harvester could cut would be 110 kg of *padi* a day (which would be equivalent to about 88 kg *gabah*). Thus, under *bawon* shares of one to 9, an *ani-ani* harvester would get 11·0 kg of *padi* in one day; and under *tebasan* shares of 1 to 11, at most 9·2 kg of *padi*. On average

however, *ani-ani* harvesters are paid only 3–4 kg *padi* per day, equivalent to about Rp 60. This may be compared to money wages paid to sickle harvesters in the 1972 season of Rp 180 per day.

The impact of these changes in harvesting methods on the cost of the harvest and the returns to the harvester may be seen from some calculations made in Table 1 for different methods of harvesting. To make the comparison, the same rice variety is used, that is, IR variety. The gross yield was estimated from averages of seven farmers who grew this variety and used sickles.

Under the customary *bawon* system, an average of 184 persons participate in the harvesting for each hectare; under *tebasan* about 150 where the *ani-ani* is being used and about 80 where the sickle is used. The effect on employment is thus

TABLE 1 *Calculations of Costs of Harvesting and Returns to Harvesters, Bawon and Tebasan*[a]

	Harvesting Method		
	Bawon	*Tebasan*	
	ani-ani and shares 1:6	*ani-ani* and shares 1:11	Sickle and money wage
Average number of harvesters per ha.	184[b]	150[c]	80[d]
Average gross yield IR rice (ton/ha *padi*)[e]	4·72	4·72	4·72
Cost of harvesting			
Share to harvester	14·3%	8·3%	[f]
Rice cost (ton/ha paddy)[g]	0·67	0·39	[f]
Money equivalent	Rp 10,050[c]	Rp 5,850[c]	Rp 7,560[g]
Return to harvester (pp/harvest)[h]	Rp 55	Rp 39	Rp 95

[a] Based on interviews in one village in Kendal, Central Java.
[b] Based on interviews with 22 sample farmers.
[c] Based on interviews with 2 *penebas*.
[d] Based on interviews in 3 group interviews.
[e] *Padi kering lumbung* (dried paddy). Only seven of the interviewed farmers planted the IR variety; this average was used for each method in order to make them comparable.
[f] Sickle harvesters are paid in cash only, not in paddy.
[g] Based on the price during August harvest time of Rp 1500 per quintal of *padi kering lumbung*.
[h] Based on a wage rate of Rp 200 per quintal *gabah* per harvester, using a conversion factor of 0·8 *gabah* to paddy.

a reduction of at least 18 per cent between *tebasan* and *bawon* where the *ani-ani* is used; when the comparison is between *bawon* with *ani-ani* and *tebasan* with sickle, the decrease is nearer 60 per cent.

With exploding population, decreases in employment of this magnitude can only mean serious employment problems in the rural areas as this new method spreads.

Harvesting costs decrease by about 42 per cent where *tebasan* is used (*ani-ani* and shares of 1 to 11) rather than *bawon* (*ani-ani* and actual shares of 1 to 6). The cost of harvesting with the sickle is somewhat higher because the harvesters must thresh the *padi*, provide their own mats, sickles, and sacks and carry larger loads. If the *ani-ani* is used, the cost is less since the harvesters do not thresh, the cost of the *ani-ani* is so small that virtually every harvester will have one (which is not the case with the sickle) and the loads to be carried are lighter since they are distributed among more people. The *penebas* may be willing to pay the somewhat higher cost for sickle harvesting because the trouble of controlling the harvesters is much less and family and neighbour relationships are probably much closer.

With harvests lasting on average from 10 to 20 days depending on quality of irrigation, a harvester may join in about 20 *bawon* harvests. Using the *ani-ani*, she might earn about Rp 1100 per season. If she joins *tebasan* harvests using the *ani-ani*, her income from harvest will probably be significantly lower unless her relationship with a *penebas* allows her to join in more harvests.

SOCIAL IMPLICATIONS

The danger for Java is that these changes will widen the income gap between landowners, traders and village leaders on one side and harvesters, especially the itinerant labourers who cannot effectively protest, on the other. From the analysis in this paper, it is clear that certain segments of the rural population are gaining at the expense of the poorer groups from these social changes. The process of change has been accelerated, because of the losses that would result through shattering if the new high yielding varieties were harvested in traditional ways. The use of the sickle is thus a logical consequence of the new rice technology, but the reduction in labour requirements by means of this technique could not be accomplished by the farmer without the *penebas'* ability to limit the number of harvesters.

The *penebas* system appears to be a response of the landowners to the large groups of harvesters both landless local people and itinerant labourers who descend on the villages. The *penebas* system emerges as a method of protecting their income and allows them to benefit more from the use of high yielding varieties. Although this system has existed for a long time, changes in limiting and selecting harvesters may restrict the benefits of the 'green revolution' to only a few people in the village and deny the benefits to less favoured segments of the rural population.

The question is what happens to the landless rural labourers on Java if these innovations spread along with the adoption of HYV. There may be a time lag of four to five years between the initial appearance of HYVs in an area and these restrictions and the use of sickles; if this is so, the incidence of these changes may increase quite suddenly in the near future. If the itinerant harvesters and landless or very poor village members cannot find alternative sources of income, it can be expected that social tensions will increase. Programs to deal with this problem are essential.

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