

THE BIMAS PROGRAM AND AGRICULTURAL LABOR IN INDONESIA

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INTRODUCTION

IT has been over a decade since the BIMAS/INMAS program launched a full-scale offensive to foster the intensification of rice cultivation in Indonesia. It was in May 1963 that the Ministry of Agriculture called for "Five Efforts in Agriculture" (Panca Usaha Tani) to modernize Indonesia's agriculture, which prompted the pilot plan undertaken by the Agricultural Institute of Bogor (IPB) and the Central Agricultural Institute in Kerawang in West Java. The DEMAS program (Demonstrasi Massal Swa Sembada Bahan Makanan or mass drive towards food self-sufficiency) followed, leading to the implementation of the BIMAS program (Bimbingan Massal Swa Sembada Bahan Makanan or mass guidance for food self-sufficiency) in the rainy season of 1965/66. Subsequently, the rainy season of 1967/68 witnessed the implementation of the new BIMAS program (Bimas Baru), with the use of such high-yielding varieties as IR-5 and IR-8, and the INMAS program (Intensifikasi Massal Swa Sembada Bahan Makanan or mass agricultural intensification for food self-sufficiency), the latter providing technical guidance but not financing services.

The present-day BIMAS/INMAS program was started in the 1970/71 rainy season. This particular series of programs was characterized by the establishment of the regional village leagues (WILUD—Wilayah Unit Desa) as the lowest-level administrative unit for 600 to 1,000 hectares of rice fields. Each WILUD covers two or more villages, and has (a) a village-unit operations body (BUUD—Badan Usaha Unit Desa) or village-unit cooperative (KUD—Koperasi Unit Desa), (b) an agricultural guidance staff (PPL—Penyeluh Pertanian Lapangan), (c) a KUD branch of the Indonesian People's Bank, and (d) a kiosk for selling fertilizer and insecticide [1].

The land area brought under the BIMAS/INMAS program showed a steady increase from 2,130,000 hectares in the fiscal year 1969 to 2,090,000 hectares in fiscal year 1970, 2,800,000 hectares in fiscal year 1971, 3,170,000 hectares in fiscal year 1972, and 3,390,000 hectares in fiscal year 1973. The total land cultivated for the production of rice amounted to 8,400,000 hectares by 1973, which meant that nearly half of the rice-producing land was covered by the program. Of this, as much as 55 per cent, or 2,250,000 hectares, participated in the

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new BIMAS/INMAS program, utilizing such high-yielding varieties as IRs, Pelita, and C-4. In the fiscal year 1974, however, the program covered 180,000 hectares less than the previous year.¹ Subsequently, the entire rice producing activities seem to have slackened, due primarily to the prevalence of a viral disease called "grassy stunt" (communicated by *wereng padi coklat*, or *Nilaparvata lugens*), the 1976 drought, and delays in debt servicing.²

Modern agricultural techniques brought to rural areas by the program have inevitably affected various aspects of village life. The optimism which once surrounded the green revolution has waned; its socioeconomic impact must now be carefully assessed by means of thorough rural surveys. It is, therefore, still too early to arrive at a conclusive evaluation of the BIMAS/INMAS program in terms of its impact on village life. In this article I will deal with the *tebasan* harvesting system which has prevailed in Central Java, Yogyakarta, and part of West Java since the early 1970s. This will be followed by a survey of the life of ordinary villagers and agricultural laborers in Desa Cipeles, Kecamatan Tomo in Semedang, West Java, touching on the impacts of the BIMAS program.

The description of West Javanese (Sundanese) village life is based on the survey the present writer conducted during his stay in Indonesia (February 1975 to January 1977). The survey itself lasted for four months, from September to December 1976, during which period he lived in the village for fifty days. The principal research method adopted included interviewing village officials, peasant farmers, agricultural laborers, and housewives, asking a set of prepared questions to randomly selected villagers in interviews in one hamlet (*kampung*), and collect-

¹ The BIMAS/INMAS program achieved the following results.

Fiscal Year	BIMAS		INMAS		Total
	Old	New	Old	New	
1968	745	18	834	—	1,597
1969	926	383	722	99	2,130
1970	803	445	571	334	2,093
1971	827	569	867	525	2,798
1972	621	582	1,166	800	3,169
1973	658	1,132	1,089	1,022	3,901
1974	474	2,202	410	638	3,723
1975	405	2,256	316	629	3,606

Source: Departmen Penerangan, *Pidato Presiden Republik Indonesia Jenderal Soeharto di depan Sidang Dewan Perwakilan Rakyat* [A speech by President Soeharto at the session of the House of Representatives], *August 15, 1974*, p. 341; *August 16, 1975*, p. 249; and *August 16, 1976*, p. 247.

² According to the announcement by President Permadi, of the Indonesian People's Bank, at the end of October 1976, the credit extended by the Bank to the BIMAS program during the nine harvest periods from the 1971/72 rainy season to the 1974/75 rainy season amounted to Rp. 124 billion, and the amount outstanding to Rp. 15 billion. The ratios of delayed repayment were 10.3 per cent for the 1974 dry season and 19 per cent for the 1974/75 rainy season (*Kompas*, November 1, 1976).

ing various data at village offices, county offices, county agricultural bureaus, and BUUD.

I. TEBASAN AND HARVESTING

For agricultural laborers with neither land nor sharecropping rights, rice-harvesting time is indeed a very important time because they are entitled to a share (*bawon*) of the crop if they help in the harvest as reapers (*penderep*). But their share has been declining over the long run, due to the decline in employment opportunities available to an ever-increasing population. D. H. Burger, for instance, has shown that in 1868 the reapers obtained about a third to a fifth of the total harvest in Pekalongan, Central Java, while receiving only a fifth to a sixth of the harvest at the same place in 1928. There were cases where the reapers' share went down to a twelfth [5, p. 16]. The present writer has witnessed a case in Sumedang, West Java, where this ratio was a fifteenth.

In addition to this deteriorating trend, the *tebasan* system of harvesting has been spreading very rapidly since about 1970 to various parts of Java, especially the wet rice fields around Yogyakarta, Central Java, and the northern coastal areas of West Java. Under this system, the contract for harvesting the rice, often high-yielding varieties, is concluded prior to the actual harvesting time, and the traditional freedom on the part of any willing or needy hand to join the harvesting team has become restricted. Also, the hand-sickle called *ani-ani* has begun to be replaced by a more sophisticated sickle, and wages have been paid in cash rather than in kind, bringing about a far-reaching impact on village life in many parts of Java.³

A. Traditional Harvesting System and the Emergence of Tebasan

The traditional harvesting practice in Java and Sunda allowed anybody to join the harvesting team in most cases. The workers thus engaged in harvesting were invariably women from the same or adjacent villages, who would use the *ani-ani* to reap several ears of paddy at a time. With the introduction of high-yielding varieties, however, the more sophisticated sickle came to be used rather than the *ani-ani*, for the following reasons: (a) The traditional varieties grew at different paces, making it difficult to reap an entire paddy at one time. Thus the most practical method was to reap the ears by *ani-ani* in small clumps, as and when they ripened. However, the non-light-sensitive, high-yielding varieties show a greater conformity in growth speed, although in tropical climates they do not mature at precisely the same time. (b) IRs 26, 28, 30, and 32 (but not IR-34) are short varieties with terminal leaves above the ear, so that the *ani-ani* is not very suitable for use in their harvesting. (c) Many of the traditional varieties (*bulu* varieties in particular) have large, heavy ears, while the high-yielding varieties produce a greater number of stalks and ears with fewer grains on each ear, again making the use of *ani-ani* less convenient.

³ See the following publications which deal with *tebasan* and recent changes in harvest patterns: [6] [13] [7] [11] [12] [4] [9] [8].

In contrast, the present writer would like to suggest a further factor contributing to the continued use of the *ani-ani* in some areas: i.e., the new, more efficient sickles, by reducing the need for large numbers of reapers, would result in greater unemployment among harvest workers. The traditional requirements of stability, therefore, seem to have opted to avoid the social tension thereby created.

Harvest workers have traditionally taken home about an eighth to a tenth of the total number of bundles of rice ears they collect and tie on a given day's work. The splitting of the land under cultivation into smaller units combined with a growing number of landless agricultural workers, however, tends to increase the number of harvest workers per unit of land. The survey by W. L. Collier et al. in Central Java in December 1972–January 1973 shows as many as five hundred workers per hectare [6, p. 37], and Budhisantoso observes that in a village in Western Java as many as 675 male and female workers swarmed to a hectare, completing the entire harvesting work within twenty minutes to half an hour [4, p. 28]. Furthermore, increases in the number of harvest workers make it more difficult to control and manage them, resulting, for instance, in more cases where workers try to take home more than custom allows them to do, taking advantage of the total confusion created by their inordinately large numbers. It is said that landowners are usually forced to overlook the workers' cheating for fear of being accused of excessive strictness.

It was in such a situation that *tebasan* emerged. It does seem, however, that the system itself had existed since much earlier. Sjafri Sairin, after surveying the four regencies in Yogyakarta Special District in 1976, reported that *tebasan* had existed there before 1950 [8, p. 64]. The root of the word *tebasan* is *tebas* (Javanese), meaning the purchase of crops immediately before they are ripe enough to be harvested, the price being paid by the purchaser himself. The purchaser, called *penebas*, pays the money either about a week before harvest, at the time of harvest, or within several days after harvest.

A *penebas* is usually made up of two to four people, who share the task of evaluating the paddy to be purchased, supervising the harvest workers and distributing the crop among themselves. If the paddy belongs to a landowner living in the same village, the account may be settled in a week or so after the actual harvest, but more generally the landowner lives in another village, in which case the payment is made five to fifteen days prior to the harvest.

Imposition of a limit on the number of harvest workers constitutes the single most marked characteristic of the *tebasan* system. In the case of Kendal Regency, Central Java [7, p. 26], the *penebas* sends out a letter (*girig*) to a definite number of people and accepts them only as harvest workers. The chosen ones report to the *penebas* with the letter of invitation, and start working with red or blue caps on. Those invited but unable to take part in the harvesting may transfer their right to friends or relatives. After the harvest is over, the workers carry the produce either to the *penebas*' house or a nearby mill. One *penebas* group may take charge of twelve to fifty hectares in one harvest period, averaging around twenty hectares. When harvesting takes place outside the village of the *penebas*, the *penebas* sometimes brings its own group of workers from its village.

TABLE I
RATIO OF FARMERS SELLING THEIR PADDY TO *Penebas* IN FOUR VILLAGES
IN TWO REGENCIES IN CENTRAL JAVA

Crop Season	Kendal		Pemalang	
	Village 1	Village 2	Village 3	Village 4
1968/69 rainy season	0.0	0.0	0.0	0.0
1969 dry season	0.0	0.0	0.0	0.0
1969/70 rainy season	0.0	0.0	0.0	11.1
1970 dry season	7.1	0.0	20.0	6.9
1970/71 rainy season	37.0	6.7	17.2	0.0
1972 dry season	26.9	3.7	37.9	75.9
1972/73 rainy season	37.5	42.8	—*	—*

Source: See [7].

Note: Thirty farmers were interviewed in each village.

* No interviews were conducted.

Although surveys carried out so far are not always clear about who the *penebas* comprises, the following general image may be inferred. The members are either (a) richer locals of the same community, usually relatively large landowners, (b) villagers in adjacent villages, or (c) merchants in nearby villages [8, p. 64]. Collier et al. report that most of the *penebas* are from other villages, and that when they live in the same village, they are usually close to the leaders of the village [6, p. 41]. The same point is also made by Sjafri Sairin, who says: "Sometimes a child or relative of the village chief becomes a member of a *penebas*. The chief himself, however, will not reveal that he 'has a share' in the *penebas*. He is afraid of possible damage done to his reputation in the village" [8, p. 64].

B. *The Spread of Tebasan*

Despite its long history, as mentioned above, it was only in the 1970s that the *tebasan* system began its rapid spread to many parts of central and eastern Java and to a few parts of Sunda. The areas to which the system spread are almost all characterized by the growth of high-yielding varieties of rice, as will be touched upon later. Various surveys carried out so far have confirmed the existence of the system in Kerawang Regency in West Java, Pemalang, Kendal, Jepara, and Klaten regencies in Central Java, and Bantul and Sleman regencies in Yogyakarta Special District. No survey reports covering East Java exist at present. All the places where the *tebasan* system operates are at low altitude, in the wet rice areas with well-established irrigation systems. In the neighborhood of Yogyakarta, *tebasan* is widely practiced in the Sleman and Bantul regencies, but no report of *tebasan* has been filed from Gunung Kidul, outside the wet rice areas.

Table I shows the rapid growth of *tebasan* since 1970, while Table II indicates that there is no clear-cut trend in the areas surrounding Yogyakarta.

Let us now examine the relationship between the prevalence of this system and the land area under high-yielding varieties. According to Collier et al., surveying villages in Kendal and Pemalang in Central Java, during seven harvest

TABLE II
THE YEARS IN WHICH *Tebasan* STARTED IN VILLAGES OF YOGYAKARTA SPECIAL DISTRICT
(Number of villages)

Years in Which <i>Tebasan</i> Started	Bantul Regency	Kulon Progo Regency	Sleman Regency	Gunung Kidul Regency	Total
Before 1950	11	1	2	—	14
1950-54	1	—	1	—	2
1955-59	—	—	—	—	—
1960-64	1	—	2	—	3
1965-69	1	—	—	—	1
1970-74	—	—	3	—	3
After 1975	1	—	2	—	3
Nonexistent	13	31	22	32	98
No answer	4	—	—	—	4
Total	32	32	32	32	128

Source: See [8].

Note: Figures are based on interviews conducted in 128 villages in the four regencies of Yogyakarta Special District.

TABLE III
RATIO OF FARMERS PLANTING HIGH-YIELDING VARIETIES (IRs, C-4, PELITA) AND
SELLING CROPS TO *Penebas* (TWO REGENCIES IN CENTRAL JAVA)
(%)

Crop Season	Kendal Regency		Pemalang Regency	
	Village A	Village B	Village A	Village B
1969/70 rainy season	*	*	*	0.0
1970 dry season	100.0	*	0.0	100.0
1970/71 rainy season	20.0	0.0	33.0	*
1972 dry season	33.0	100.0	27.0	64.0
1972/73 rainy season	67.0	100.0	—	—

Source: See [7].

Note: The number of sample families is thirty in each village.

* Denotes nonexistence among the sample families who sold their crops to *penebas*.

periods between the 1968/69 rainy season and the 1972/73 rainy season, *tebasan* was observable in four out of the twenty villages surveyed. In these four villages, planting of high-yielding varieties such as IRs, C-4, and Pelita, started on large scale at around the 1970 dry season which in timing corresponded very closely with the rapid pace at which *tebasan* started to spread (See Table I). There is a highly recognizable positive correlation in the ratio of farmers planting high-yielding varieties and selling their crops to *penebas* (See Table III). However, no significant correlation is reported between the size of wet paddy fields under cultivation and the number of farmers resorting to *tebasan* [6, pp. 14-16].

The change in the system of harvesting is accelerated further by the use of more sophisticated sickles (*sabit* in Javanese and *arit* in Sundanese), owing much to the introduction of high-yielding varieties. These sickles reportedly came into

use in Pemalang and Kendal in 1972, when C-4 was introduced. There are no data available to indicate whether *penebas* instruct their workers to use sickles or *ani-ani*; nor is the extent of sickle use shown anywhere. In the two villages in Kendal surveyed by Collier et al., the ratio of use between *ani-ani* and sickles was 100 to 31 in the first village, and 100 to 36 in the second.

C. *Tebasan's Actual Mode of Operation*

How much do farmers gain by opting for the *tebasan* system? Widya Utami and John Ihalauw present the following estimation from their survey of Klaten in the 1971 dry season [13, p. 55]. The price of dry unhulled rice was Rp.1,530 per quintal (100 kilograms). The crop on 0.16 hectares of land with the probable harvest of 12 quintals was sold to a *penebas* at Rp.14,000. Giving 20 per cent in weight off the wet unhulled rice for drying, the *penebas* ended up paying Rp.1,457 per quintal, which is approximately 5 per cent less than the market price. But if the landowner undertook to harvest the crop himself, he would have only 57.5 per cent⁴ of 12 quintals of wet rice remaining in his hand, amounting to only Rp.8,445 worth of dry unhulled rice at the going market price. He was much better off by simply selling the unharvested crop to the *penebas* with no further work left to do on his part. Thus, *tebasan* may appear a godsend to farmers in view of the actual costs of harvesting. Take another example: A farmer in Kendal, himself a *penebas*, contracts off about 75 per cent of his crops to be harvested by another *penebas*; otherwise, he claims, a mob of workers would inundate the paddy fields and take away about 25 per cent of the crop. He leaves 25 per cent of his crop to hand, solely as a gesture to pacify the anger of traditional harvest workers to whatever extent possible.

The *tebasan* system is consequently the object of a great deal of resentment on the part of many landless harvest workers. Within the generally rising number of harvest workers in densely populated areas of Central Java, there were reportedly two groups of harvest workers, one using *ani-ani* and the other only collecting gleanings. The second group (*pengasak*) could claim all of their catch for themselves, sharing none with the landowner. However, greater numbers of participants in harvesting have resulted in the disappearance of this clear distinction, causing only confusion to the detriment of the landowner. Some form of restriction on the number of workers and thus on the harvest costs has become all the more urgent. It was just at this time that the introduction of high-yielding varieties made it possible to replace *ani-ani* with the more efficient sickle. In addition, the newly emerging *tebasan* system provided a convenient pretext for cutting labor costs.

Estimating the extent to which this system reduces the work force involves considerable difficulties. None of the farmers has accurate records of the number of people participating in his harvest, and the irregular pattern of work participation makes it quite difficult to come up with reliable figures anyway. By comparison, the *penebas* seem to keep a good record of the work force they employ. The mention of a few actual cases should suffice here.

⁴ No mention is made as to how this figure is derived [13, p. 55].

An extreme example is reported from Jepara Regency [13, p. 55]. The traditional crop-sharing ratio was 9 to 1 in favor of the farmers, but the ratio has become 15 to 1 following the introduction of the new *penebas* system. In a particular village in Jepara, a farmer harvesting his crop himself had ninety-six people working on 0.161 hectares of land, while another farmer cultivating 0.14 hectares, less than 50 meters away, employed a *penebas* and had only three people harvesting. The numbers of workers employed per hectare were 480 and 21 respectively.

The detrimental effect of *tebasan* on harvest workers has recently been acknowledged by various quarters in Indonesia. *The Kompas*, in its December 4, 1976 issue, reported that the broker (*tengkulak*) operating in the *tebasan* system kept his own band of female workers and attempted to minimize the share going them so that they suffered considerable losses.

Let us examine the changes in the share ratio. First, the following categories of harvest workers must be established: (1) relatives of the owner of the rice field, (2) the farmer's neighborhood groups, and (3) others, including remoter acquaintances in the same village and complete strangers from outside the village. Widya Utami et al., after having surveyed Central Java, give the following ratios for the above categories: a half to a fifth for the first group, a fourth to an eighth for the second, and a tenth to a twelfth for the last.⁵ It may be safely generalized that the harvest workers with no special social relationship to the farmer usually receive about a tenth to a twelfth of the crop harvested by them, in most places (including West Java).

These figures are for the traditional harvesting method; under the *tebasan* system the share for the workers clearly decreases. Surveys recently carried out show ratios of about a fifteenth to a twentieth for the worker.

The actual amount received by individual harvest workers differs, depending on the number of workers involved and the size of the rice field. The compensation of about 0.8 kilograms of milled rice per worker per day is reported in a survey of Desa Sriharjo, Yogyakarta, by Masri Singarimbun and D. H. Penny. It is also reported that this amount was 3 kilograms in 1933 [9, p. 153]. On the other hand, Collier et al. report that the workers using *ani-ani* receive about 3 to 4 kilograms of hulled rice (2 to 2.8 kilograms of milled rice) a day, while the workers employed by a *tebasan* receive about three times as much in cash as their *ani-ani*-using counterparts [6, pp. 42-43]. Two to 2.8 kilograms of milled rice would barely feed a family of five for two days. In Desa Sriharjo, which could be classified as a poor village, a worker could participate in harvesting for only fifteen days a season. If he could count on two harvest seasons a year, he would be able to work thirty days a year as a harvest worker, receiving only a sixteen-day stock for the five members of his family. The Collier examples suggest that he averages about twenty-five days of work per harvest season.

D. Impact of *Tebasan*

The *tebasan* system has started to affect village life in a variety of ways. With

⁵ See [12, p. 13] [10, p. 65].

due reservation at this early stage, one can be reasonably sure of the following changes brought about by the introduction of this new harvesting arrangement: (1) a considerable reduction in the number of people permitted to join the harvesting team, (2) a declining share of the crop allotted to the workers, (3) increased benefit for the farmer, and (4) accelerated use of sickles instead of *ani-ani*.

There are clearly factors in these changes that would beget and further intensify class conflicts between landowning farmers and agricultural laborers and also between those who would be able to participate in *tebasan* and those who would not. The changes in the socioeconomic life of the village may be explained in the following terms. These changes are first created by the new relationship between the landowning farmers and the *penebas*, and this new relationship is derived from an almost purely economic, symbiotic interaction. Although special relations between powerful members of the village and their relatives should by no means be ignored, the essentially economic nature of the newer relations should not be underestimated either. The relations between the *penebas* and those workers who are allowed to participate in harvesting are also quite economic in nature. In other words, the introduction of the *tebasan* system has begun to replace the traditional patron-client relationship between the farmers and agricultural laborers with a new, essentially economic relationship between the *penebas* and harvest workers. There remains a problem concerning those agricultural laborers who are successful in securing a new patron in *penebas* and those who fail to do this. Herein lies a seed of grave tensions to come, potentially more serious than the tense relationship which already exists between landowners and agricultural workers in Indonesia.

Collier et al. have the following to say on *tebasan*, citing Geertz's concept of agricultural involution:

The labor-absorbing capacity (*daya serap*) of Javanese rice fields, which has so far employed new additional labor when needed, has probably reached its saturation point today. If farmers do not respect their traditional social duties any more, the process of agricultural involution will soon arrive at its terminal point. *Tebasan* is practiced in many places by many farmers and village merchants, which would not only prevent the further deepening of involution, but would also reduce the problems of Javanese wet rice agriculture. [7, p. 26]

To summarize: the expansion of *tebasan* from the viewpoint of the landowning farmers is a godsend which stops the unrestricted inflow of harvest workers and the accompanying acceleration of harvesting costs. It can be said that the grave crises faced by farm management in the recent past are forcing them to turn to this "savior." The mounting population pressure and the limited agricultural land available have already made it impossible to maintain the marginal productivity of labor and are invariably lowering per capita revenue. *Tebasan*, having thus rescued the farmers, however, has become the object of intense resentment on the part of landless agricultural laborers who have been deprived of their employment opportunities. Planting of high-yielding varieties and the accom-

panying inflow of modern technology are sure to bring about a powerful impact on other sectors of the economy as well as on agriculture. When one considers the impact of *tebasan* with this perspective, the high-yielding varieties of rice do not seem such miracle seeds, brightening village life in Indonesia, but rather seeds of uneasiness and instability.

II. SUNDANESE VILLAGES AND AGRICULTURAL LABOR

Villages in Sunda have not been researched as much as Central and East Javanese villages have. Nonetheless, it is of great interest to consider the ways in which Sundanese villages have adapted themselves to such recent phenomena as the introduction of high-yielding varieties and technical changes, in view of their proximity to large industrial cities and the long history of individual land possession, which was somewhat characteristic of the region. This chapter describes Sundanese village life in terms of the actual state of affairs in agricultural management, various occupations, and the working conditions of agricultural laborers within the context of the BIMAS program. As has been mentioned already, the content of this section is largely based upon the surveys conducted by the present writer.

A. *General Outline of Desa Cipeles, Sumedang Regency*

The town of Sumedang lies 45 kilometers east-northeast of Bandung, the capital of West Java Province. Along the national road connecting the towns of Sumedang and Cirebon lies Desa Cipeles, at the north end of the Priangan area. With Mt. Tampomas (1,684 meters high) at the center, Mt. Calangang (1,667 meters high) to the south, and the extended mountain ranges of Bandung Regency to the west, most of Sumedang Regency lies on a plateau 100 to 500 meters high. However, Desa Cipeles is situated just below the plateau, on the edge of the large northern plain of West Java, stretching from Cirebon and Indramayu all the way to Subang and further to Kerawang. It is 50 to 70 meters above sea level. To the north there is a national forest with some teak trees, and to the south, wet rice fields on slowly rising terraces, gradually reaching the neighboring village. On the eastern side it also rises slowly, until it borders onto the next village. Two rivers, one of which originates far away in the mountains of Garut Regency, meet right at the center of Cipeles.

The regency of Sumedang, with a population of 640,000 (1971 census), is one of the smaller regencies among the 20 in West Java. (There are five additional municipalities.) Sumedang has slightly less than 60,000 hectares of rice fields, of 226,000 tons of dried but unhulled rice. Thus in both size and production it is again among the smaller regencies. Despite this, its per hectare production of unhulled rice amounts to 3.68 tons, the seventh highest in West Java.⁶

Desa Cipeles is connected by national road with the town of Sumedang, the regency capital, and with Desa Tomo, the site of the county office, 23 and 4

⁶ These are all 1971 figures. See Biro Pusat Statistik, *Produksi Padi di Indonesia 1968 s/d 1973* [Central Bureau of Statistics, Rice production in Indonesia, 1968-73].

TABLE IV
LAND USE IN CIPELES

	(Hectares)
Irrigated and unirrigated rice fields	355
a. Technically irrigated*	—
b. Semi-technically irrigated*	60
c. Village irrigated*	250
d. Unirrigated	25
Dry land	158
a. House lot (residential)	18
b. Plowed field, etc. ^a	140
Forest ^b	651
Total	1,144^c

Source: Data supplied by the village office, county office, and the county agricultural bureau, with some adjustments made.

Note: The local Development Tax Register, giving all the private land ownership records, indicates that irrigated and unirrigated wet rice fields amount to 349.7 hectares and dry fields to 138.7 hectares (both under private ownership).

* "Technically irrigated" and "semi-technically irrigated" refer to irrigation facilities in which respectively more than and less than 50 per cent of the water distribution route from the major water intake to its final destination paddy fields is technically provided.

"Village irrigated" refers to those simple irrigation facilities that are provided by the village, mostly without the use of cement.

^a This seems to include orchards.

^b This indicates state-owned forest.

^c The data from the village and county offices give the total area as 1,079.6 hectares, which, however, does not match with the rest of the figures, thus requiring this adjustment.

kilometers away respectively. Since Desa Cipeles has no market of its own, villagers usually do their shopping in the town of Kadipaten in the neighboring regency, where there is a market and a number of Chinese-run shops. It is 68 kilometers to Bandung, the regency capital, 50 kilometers to Cirebon, a major harbor in West Java, and 250 kilometers to Jakarta, the nation's capital.

The land area of Cipeles is about 1,100 hectares, out of which 58 per cent is state-owned forest, leaving 480 hectares to be cultivated by villagers (see Table IV). Irrigated and unirrigated wet rice fields amount to 335 hectares, concentrating on rice growing alone. Cucumbers, tomatoes, aubergines (egg plants), and peas are also grown in the fields for home consumption. There is a small mango orchard, as well as small-scale planting of bamboo, coconut, and banana trees.

Out of the total population of 3,621 in July 1976, 34.5 per cent are under

TABLE V
ESTIMATED DEMOGRAPHIC CHANGE IN CIPELES

Year	Male	Female	Total
1961	1,681	1,634	3,315
1966	1,729	1,673	3,402
1971	1,789	1,817	3,606
1976	1,799	1,822	3,621

Source: Data provided by the Census and Statistics Office of Sumedang Regency.

fourteen years of age (see Table V). The corresponding figure for the entire state of West Java is 45 per cent (1971 census), so the birth rate in this particular village would seem to be considerably lower than the state average. The total population increased only by 9.2 per cent during the fifteen year period between 1961 and 1976. The total number of households in 1976 was 1084, with an average of 3.34 people per household, suggesting that the standard household is composed of a couple with one or two children.

B. Occupation

How village people earn their living is not easy to estimate. The meager statistics at the county office simply claim that 90 per cent of the villagers are occupied in agriculture, another 5 per cent in commerce or carpentry, and the remaining 5 per cent in wage labor (*buruh*). But this description is hardly enough to give us a clear picture. In fact, the villagers have proved quite resourceful in finding income-earning opportunities. In addition to agriculture, they are engaged in livestock raising, forestry, fishing (catching small fish and shrimps in the rivers), manufacturing (such as furniture production), construction, services and commerce, and public service (as teachers, military personnel, and public employees). Many work in other villages.

The principal occupation in this village is naturally the production of rice, but very few agricultural households depend solely on rice production. Table VI gives a rather specified list of occupations and the number of people so engaged, but even among these some seem to draw their principal incomes from occupations other than those under which they are classified here. Owner-managers of rice mills or lumber mills may find it quite possible to live on their proceeds, yet in addition often possess considerable tracts of wet rice fields, which usually provide them with even more than their mills earn. *Warung* booths (small kiosks selling food and sundries) are usually maintained by women as subsidiary occupations with capital investments of only Rp.5,000 to 10,000, although there are three or four *warung* booths with capital amounting to more than Rp.20,000.

We may safely conclude, therefore, that these occupations are seldom the sole income-earning activities of the villagers.

Mr. M. (aged sixty-five) is an average farmer with 200 batas of rice fields (1 bata equals approximately 14.3 square meters, 700 batas roughly making up a hectare) and 60 batas of unplowed land. His wife runs a small *warung* booth

TABLE VI
OCCUPATION IN CIPELES (OTHER THAN AGRICULTURE)

Occupation	Number of People Engaged
Primary school teachers	20
Active/retired military personnel	6
Barbers	11
Tailors	29
Blacksmiths	1
<i>Warung</i> managers	31
Rice mill managers	4
Lumber mill managers	20-30*
Meat handlers	1
Carpenters and wood workers	100-150
Midwives and circumcision performers	8
Total	231-291*

Source: Compilation by the present writer based on interviews with *tua kampung* ("hamlet chief") and data from the village office.

* Besides the nine registered woodworks there are a number of unregistered woodworks with no definite number of employees, due to seasonal and other fluctuations. Here the average number of workers is tentatively given as five.

which helps the family budget. Mr. N (aged sixty), with no land except for his residential lot, collects firewood, earns wages by working in others' rice fields as an agricultural laborer, and catches fish in the rivers, but again, his wife and the only remaining daughter help maintain the family by doing farming work such as rice planting. The pattern of employment is thus extremely complicated, impossible to render accurately in a simple picture.

C. Landownership and Farm Management

According to the 1973 Agricultural Census there was a total of about 2,470,000 agricultural farms in West Java Province and 1,520,000 hectares of land under plow, with the average land area of 0.62 hectares per farm [2, p. 1]. Since no agricultural laborers were taken into account in this census, the average land area per agricultural worker cannot be established. If the total land area under cultivation is divided by the 1971 general census figure of 3,880,000 for agriculture-fishery-forestry workers, one obtains the figure of 0.39 hectares. This figure would be even smaller if only wet rice fields are considered.

In Cipeles, the average hectareage per household of wet and dry land under cultivation (including housing lots and fields but excluding forest) is 0.455, broken down to 0.309 hectares of wet rice fields and 0.146 hectares of dry fields. The Local Development Tax Register, the most reliable data available compiled for the purpose of land tax calculation, is the basis upon which Table VII is compiled. We observe that from among the total of 1,084 households in

TABLE VII
THE AVERAGE SIZE OF LAND HELD BY LANDOWNERS IN CIPELES

Kampung to Which Owners Belong	Wet Rice Fields		Dry Land		Number of Households
	Number of Landowners	Average Land Size in Ha	Number of Landowners	Average Land Size in Ha	
I	181	0.257	159	0.141	201
II	52	0.413	83	0.111	117
III	203	0.445	202	0.275	305
IV	78	0.476	90	0.116	100
V	228	0.308	194	0.183	214
VI	86	0.423	143	0.399	147
Cipeles total	828	0.365	870	0.148	1,084
Villagers out of Cipeles	215	0.221	37	0.266	—

Source: Local Development Tax Register.

Desa Cipeles there are 828 persons owning wet rice fields and 870 persons owning dry fields, with the averages of 0.365 and 0.148 hectares respectively of wet rice fields and dry land (plowed fields and house lot).

There is some land in this village owned by non-villagers, who, however, mostly live in neighboring villages.

Among the landowners above mentioned, female owners account for 240 (29 per cent) for wet rice fields and 271 (31 per cent) for dry fields. In dealing with the households with two owners, computation difficulties arise in the cases where both owners are of a single sex. The ratio of landowning and non-landowning households cannot thus be arrived at simply from the set of data at hand. If all the female landowners are taken to constitute separate households, the land-ownership ratio turns out to be 76.4 per cent for wet rice fields and 80.3 per cent for dry fields. If half the female owners are deemed to constitute separate households either on their own or together with another male owner, the ratio will be 65.3 per cent and 67.8 per cent respectively. The actual ratios probably lie somewhere between these two sets of figures.

Among the 108 households in Kampung I⁷ surveyed (randomly chosen from the total of 201 households in that hamlet), 76 per cent of them owned wet rice fields and 47 per cent dry land (Table VIII). Among the wet rice field owners 40 per cent owned less than 0.1 hectares, and among the dry land owners as many as 61 per cent of them owned less than 0.1 hectares (Table IX). The average sizes of wet rice fields and dry land are really quite small: 0.277 hectares and 0.219 hectares respectively. These figures are not all that different from the previous series of figures derived from the Local Development Tax Register.

Little land available for plowing, small average units, and a large number of

⁷ In this area each village (*desa*) is made up of five or six hamlets (*kampung*), each hamlet of four to ten neighborhood organizations (*rukun tetangga*), and each neighborhood organization of twenty to thirty households. In Java *kampung* is referred to as *dukun*. Each *kampung* has own name.

TABLE VIII
PERCENTAGES, BY CLASSIFICATION, OF THE SAMPLE HOUSEHOLDS OWNING LAND
(Number of households)

Households	Wet Rice Fields*	Dry Fields†
Number of landowning households	82 (75.9%)	51 (47.2%)
Number of non-landowning households	26 (24.1%)	57 (52.8%)
Total	108 (100%)	108 (100%)

Source: Data derived from surveys of 108 randomly chosen households from a total of 201 households in Kampung I.

* This includes unirrigated wet rice fields.

† This excludes residential lots but includes orchards and bamboo forests.

TABLE IX
AGRICULTURAL LANDOWNERSHIP BY SIZE
(Number of households)

Size of the Land Owned	Wet Rice Fields	Dry Fields
0.001-0.100	33	31
0.101-0.200	18	6
0.201-0.300	11	2
0.301-0.400	1	1
0.401-0.500	6	3
0.501-0.700	1	1
0.701-1.000	9	5
1.101-1.500	1	0
1.501-2.000	1	1
Above 2.001	0	0
Unknown	1	1

Source: See Table VIII.

non-owners all lead to attempts at finding other sources of revenue besides agriculture. Table X indicates that about a half of the 108 households surveyed have nonagricultural revenues, but that only eight households depend solely on nonagricultural activities. Among eighty-two rice field owners forty-eight persons (amounting to 54 per cent) do some sharecropping and work as wage-earning agricultural laborers. Among those households having no rice fields, over 70 per cent have nonagricultural revenues. The occupations of the fifty-six villagers having nonagricultural revenue include managers of woodworks (two persons), wage earners at woodworks (twenty-two), managers and workers at *warung* booths (twelve), managers of rice mills (two), and miscellaneous, e.g., village officials, domestic servants, salaried men, and brokers (fifteen). In addition there are those who collect firewood or catch fish and shrimps in the rivers, not necessarily bringing in cash as such but nonetheless helping with the household finance.

Table X shows that among the 108 samples there are only eleven households which sharecrop any land at all. However, the chief of Kampung I and village officials relate that nearly half the villagers do some sharecropping. This contradiction arises mainly because sharecropping relations among close relatives

TABLE X
FORMS OF WET RICE FIELD MANAGEMENT AND REVENUES
(Number of households)

Forms of Rice Field Management	Revenue Classification				Total
	Farm Revenues Only		Having Other Revenues		
	Having Dry Field	Having No Dry Field	Having Dry Field	Having No Dry Field	
Rice field owners:					
Let whole land sharecropped	3	1	0	0	4
Let whole land sharecropped and sharecrop some	0	0	0	0	0
Let whole land sharecropped and wage-earn	0	1	0	0	1
Let whole land sharecropped, sharecrop, and wage-earn	0	0	0	0	0
Manage whole land	13	3	11	12	39
Manage part of land and let rest sharecropped	2	0	0	0	2
Manage whole land and sharecrop	3	0	2	0	5
Manage whole land and wage-earn	12	10	5	4	31
Manage whole land, sharecrop, and wage-earn	0	0	0	0	0
Subtotal	33	15	18	16	82
Non-rice field owners:					
Sharecrop only	0	0	0	2	2
Sharecrop and wage-earn	0	1	0	3	4
Wage-earn only	0	6	0	6	12
Nonagricultural revenues only	0	0	0	8	8
Subtotal	0	7	0	19	26
Total	33	22	18	35	108

Source: See Table VIII.

and especially between parents and children were not really revealed during the survey. Special caution is necessary here.

The most common sharecropping arrangement is what is generally called *maro* (or sometimes *paro*), where the crop is equally divided between the landlord and the sharecropper. Production costs such as the cost of seeds and fertilizer are sometimes shared but more often borne by the sharecropper. There are two other types of sharecropping, one called *pertiga* (or *mertelu* in Javanese), where one third of the crop goes to the sharecropper (*pertiga* literally means "one third"), and the other by the name of *perlina*, where two fifths goes to the sharecropper. But in Cipeles these latter two categories are rarely observable. There are a few cases where a fixed amount of the crop is to be paid out to the landlord as rent, known as *nyewa*, *sewa*, or *motong*. The sharecropper pays the landlord 2 kilograms of unhulled rice per *bata* of rice field as the rent, or 1.5 kilograms when planting during the dry season, bearing the cost of the seeds and fertilizer. Some villagers pawn (part of) their rice field for a few harvest seasons (called *lanja*) or with no time limit (called *gadè*). Villagers who obtain the right to plow

TABLE XI
SHARES OF CROP TO GO TO HARVEST WORKERS

Ratios	1/10	1/9	1/8	1/7	1/6	1/5	Total
Frequency	38	12	23	7	1	3	84

Source: From interviews.

Note: Frequency is measured by the number of given replies which fall into each ratio.

the rice field in place of interest payment would receive all the crop, but this is said to occur rather seldom. The purchase of the crop while still not ripe (*ijon*) is rarely heard of in Cipeles now, but the mango planters often resort to *ijon*.

D. Actual State of Affairs in Agricultural Wage Labor

There are forty-eight households among 108 engaged as wage-earning laborers in agriculture, amounting to 44.4 per cent of the total. Since the female work force engaged in weeding and harvesting is distinguished from the male work force (referred to as *kuli*), some women agricultural laborers may be excluded from the figure, making it highly probable that a greater number of households actually earn wages working in the rice fields. All the households that only earn laboring wages in agriculture also have nonagricultural sources of revenue. Note that nearly 30 per cent of the total number of households both manage their own rice fields as independent farmers and earn wages by working as agricultural laborers at the same time, and that nearly 30 per cent of them also need non-agricultural revenues. Even among rice fields owners only twenty-two households (amounting to 20 per cent) can feed themselves on income from their rice fields alone.

Wage earners are employed in a series of tasks needed for rice growing, starting from the initial tilling of the land (*ngawajar*) to harvesting (*motong parê*). Transplanting of rice plants, weeding, and harvesting are usually designated as women's tasks. The wages given to agricultural laborers for a day's work (usually from 6 to 12 o'clock) are one or two meals and Rp.250 to 400 (averaging around Rp.300) for men. (If no meals are provided, they receive Rp.350 to 500, averaging about 400.) Female workers receive meal(s) and Rp.100 to 200, usually Rp.200, but with no meals they receive Rp.200 to 260 (averaging around 250).

In Cipeles harvest work is not open to everybody, and participation is usually limited to those who worked transplanting the rice (and who ordinarily do weeding, too). The share of the crop going to these workers must be between one fifth and a tenth, but mostly tends towards the latter (see Table XI). Table XII mentions a number of cases of harvesting practice in Cipeles as observed in November 1976. As many as 165 harvest workers worked on a hectare of land. Sickles were used in only four cases out of fourteen, in two of which *ani-ani* were also used. Harvesting with the use of *ani-ani* required 191 workers per hectare, while the number dropped to ninety-seven with the use of sickles, demonstrating a major cut in the labor force requirement. In case No. 9 specifi-

TABLE XII
NUMBER OF HARVEST WORKERS AND THE TOOLS USED

Case Number	Land Area to Be Harvested (Ha)	Person-day Needed (Person×Day)	Tools Used	Share of Workers	Varieties Planted
1.	0.014	2 × 1	<i>ani-ani</i>	1/5 to 1/7	IR-28
2.	0.114	5 × 1	<i>ani-ani</i>	1/5	IR-28
3.	0.014	4 × 1	<i>ani-ani</i>	1/6	IR-28
4.	0.057	8 × 1	<i>ani-ani</i>	1/5	IR-28
5.	0.157	10 × 2	<i>ani-ani</i>	1/10	IR-28
6.	0.104	20 × 1	<i>ani-ani</i>	1/5	IR-28
7.	0.057	7 × 1	<i>ani-ani</i> and sickles	—	C-4
8.	0.357	39 × 3	<i>ani-ani</i>	—	C-4
9.	0.267	20 × 1	sickles	1/10	—
10.	0.214	20 × 3	<i>ani-ani</i>	1/10	IR-26 C-4
11.	0.143	18 × 1	sickles	1/10	IR-28
12.	0.071	6 × 1	<i>ani-ani</i>	1/10	C-4
13.	1.00	13 × 10	<i>ani-ani</i>	1/10	C-4
14.	0.286	14 × 2	<i>ani-ani</i> and sickles	—	C-4

Source: Taken from the cases observed by the present writer during November 1-20, 1976.

cally, more than a hundred people were needed when using *ani-ani* but the number dropped to twenty when using sickles. We must note, however, that only those who had transplanted (or their family members) were allowed to harvest and that the use of sickles had started in around 1972 and had begun to spread widely in 1975, but that up till now no trouble has been reported. In this particular village the rise in per hour productivity was absorbed by shorter workings hours for all the workers involved.

Among the 108 households surveyed in Kampung I, nineteen used sickles in 1976, among which one had been using them since 1972, two since 1974, and all the rest started using them in 1975. There were four rice mills, two constructed in 1971, and one each in 1972 and 1973. Most of the rice harvested in Cipeles is milled in these four mills, thus freeing women from the backbreaking work of manually husking rice, but at the same time depriving rice-pounding women (*tukang tumbuk*) of their employment opportunities.

E. *The BIMAS Program and Agricultural Labor*

In Desa Cipeles the rice cultivation intensification program BIMAS/INMAS was commenced in the rainy season of 1971/72. Prior to this season the BIMAS Gotong Royong program had been adopted in neighboring villages, but not in Cipeles. The land areas covered by the BIMAS/INMAS program have considerably increased year after year, although the data presented may not be completely accurate (see Table XIII). In the rainy season of 1975/76 the BIMAS

TABLE XIII
THE AREAS UNDER THE INTENSIFICATION PROGRAM IN CIPELES
(Hectares)

Crop Season	BIMAS	INMAS
1971/72 rainy season	29.500	350
1972 dry season	22.712	125
1972/73 rainy season	143	—
1973 dry season	30.250	—
1973/74 rainy season	266.250	—
1974 dry season	111.250	—
1974/75 rainy season	—*	—
1975 dry season	264.9	0.20
1975/76 rainy season	276.60	5.70
1976 dry season	105.80	—
1976/77 rainy season	300†	140†

Source: Compiled by the present writer from documents from BIMAS Project Operation Office in Second Class Local Autonomous District of Sumedang (Badan Pelaksanaan BIMAS Kabupaten Daerah Tingkat II Sumedang), County Agricultural Office (Dinas Pertanian Kecamatan), Unit Desa Branch of Indonesian People's Bank (BRI Unit Desa), etc.

* Documents from the Project Operation Office and the County Agricultural Office give the figures of 558 hectares. Since this is much higher than the total area of all the rice fields in Cipeles, it must be considered completely unreliable.

† These two are target figures.

program was tried on 276.6 hectares of rice fields and the INMAS program on 5.7 hectares, amounting together to 84 per cent of all the wet rice fields in this village. The speed at which the program has spread has been quite impressive during the past few years.

At present there are no reliable production data, but a tentative conclusion drawn from interviews with hamlet chiefs and village officials would suggest that there has been a significant improvement in per hectare production as a result of the introduction of the program. Approximate figures indicate that the harvest has been increased from 2.5–3 tons to around 3.5–4 tons. If the average per hectare production is assumed to be 3.75 tons on 500 hectares of the total harvest area (assuming that half the rice fields are used twice a year), the total quantity of unhulled rice produced in Cipeles would be 1,875 tons, or about 1,000 tons of refined rice. This amounts to 276 kilograms of milled rice per head of village population.

About 80 to 90 per cent of the village farmers plant high-yielding varieties. The most popular are IR-26 and IR-28, followed by Pelita. C-4 is also widely planted. IR-26 has begun to suffer in popularity despite its high yield, because of its inferior taste. IR-30 was scheduled to be planted in the rainy season of 1976/77.

No firm conclusion can be drawn from the presently available data regarding

TABLE XIV
AMOUNT OF LABOR NEEDED FOR RICE CULTIVATION
(Person-day per hectare)

Tasks	Labor Needed
Sowing	6
Transplanting	41
Weeding	74
Fertilizing	5
Applying chemicals	4
Harvesting	68
Tilling	68
Total	266

Note: Compiled by the present writer based on interviews with twelve Cipeles villagers.

whether or not the introduction of the BIMAS program has facilitated labor utilization. Most of the *kampung* chiefs and agricultural officials claim that labor utilization has improved somewhat, but only one indicated that there has been any kind of significant improvement. The variety IR-28 matures in only 105 days, making three plantings a year easily possible. The Cipeles irrigation facilities at the moment only allow two crops a year in many rice fields, but in the future, once the water problem is solved, they would be able to plant three times a year, effecting a better utilization of labor. One must be aware of the possibility, however, that greater use of sickles, mechanized rice mills, and tractors will tend drastically to reduce the demand for labor.

Table XIV gives the estimated labor needed for various phases of rice cultivation in terms of person-days per hectare. Assuming that these figures are reasonably realistic, the total labor needed in Cipeles to cultivate the assumed 500 hectares of rice fields is 133,000 person-days. This figure divided by the number of villagers over fifteen years of age is fifty-six, meaning that the adult labor force in this village work an average of only fifty-six days a year on rice cultivation. Even if men only were considered there would hardly be anybody working more than a hundred days a year. The agricultural survey carried out in Sumedang Regency by Agricultural Institute of Bogor [3, p. 20] gives the figure of 314.8 people (regency average) as being needed to grow rice on one hectare of wet rice fields in the rainy season of 1972, and 226 persons for another village in the same county as Cipeles, indicating a reasonable accuracy in the figures arrived at by this writer.

In Desa Cipeles the impact of the rice intensification program has not as yet been particularly conspicuous but there are apparent signs of things to come.

CONCLUDING REMARKS

Available data as yet allow no comprehensive evaluation of the various impacts effected by the green revolution. However, aggregate rice production (in milled

rice) increased from 11,670,000 tons in 1968 to 15,430,000 tons in 1975, achieving a 50 per cent jump in seven years or an annual growth rate of 4.1 per cent. In view of the 1955-65 growth rate of 1.4 per cent per annum (below the population increase), the green revolution has certainly brought about a considerable production expansion. Such an achievement, however, has been due largely to the introduction of high-yielding varieties of rice and the greater use of fertilizer and agricultural chemicals, and not to any significant degree of expansion in the rice fields under cultivation (the latter contributing only 25 per cent to the increase in production).

Despite its increase in production, Indonesia has been unable to achieve self-sufficiency in rice, importing 1.2 to 1.6 million tons of rice yearly since 1972 (over 2 million tons in 1977). Such a state of dependency in her food supply will probably lead to greater efforts to promote agricultural intensification programs even further.

Of particular interest and concern, however, is the fact that modern technology as a concomitant element of intensified agricultural activities raises output, but at the same time brings tensions to traditional rural society. Mechanization and the expansion of the *tebasan* system for agricultural labor have already begun to aggravate class differentiation in Indonesia's agricultural society. A great number of agricultural laborers at the bottom of the economic pile in the overcrowded Javanese villages are now on the verge of starvation, being unable to feed themselves. These are the people who are gradually deprived of their employment opportunities because of steadily advancing modern technology.

Sundanese villages are no exceptions to the general tide of "development" in the country. The ability of Javanese rice fields to absorb laborers has been reputed to have no limits, partly through shared poverty, but one now sees the light changing from green to yellow. Modern technology and economic rationalization have awakened some of the farmers. The *ani-ani*, wooden hand mills, and goddesses of rice have been threatened by sickles, mechanized rice mills, and *tebasan*.

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