

PN-AAZ-859

EN 5670

EMPLOYMENT TRENDS IN
LOWLAND JAVANESE VILLAGES

By:

William L. Collier, P.T. Indeco Duta Utama
Ir. Gunawan Wiradi, Agro Economic Survey
Soentoro, Center for Agro Economic Research
Makali, Agro Economic Survey
Kabul Santoso, Jember University

April 1988

The opinions and views expressed in this paper are those of
the authors and do not necessarily represent the views of
USAID or any other agency.

EXECUTIVE SUMMARY

This study describes recent economic and social trends, with special emphasis on income and employment, in thirteen villages in lowland, rural Central and East Java. Because all of the team members have been working regularly in the study villages for the past twenty years, they were able to examine these trends in light of Javanese rural development throughout this period.

The findings suggest that major changes have been occurring in employment patterns and the underlying structure of employment opportunities in rural lowland Java. In the agriculture sector, rice production has increased tremendously over the past 15 years due to shorter cropping cycles and higher yields. Increased land utilization has meant a rapidly increased absorption of labor per hectare. However, at the same time a process of mechanization (generally with simple devices) has been occurring. This somewhat slower process has had the effect of decreasing the amount of labor needed per hectare. By the mid-1980s, in many villages, job losses through mechanization appeared to be overtaking job creation through high yielding rice technologies.

Without the growth of non-agricultural job opportunities, rural employment conditions would have been much worse. Off-farm jobs, however, have become increasingly available, so much so that there appear to be agricultural labor shortages in some areas, despite increased wages for agricultural labor. These off-farm job opportunities have been created in two areas.

First, in local communities, employment in village production and trade activities has greatly increased. Today, employment in the study villages' local enterprises ranges from 6% to 55% of village employment.

Second, daily and seasonal migration to towns and cities has created new employment opportunities for village-based laborers. The research team found evidence of major migrations on both short- and long-term bases.

Judging from the numbers of villagers migrating to the towns and cities, there appears to be a zone of influence surrounding the major urban areas. This zone may extend for a radius of over 30 kilometers from the towns and cities. This becomes more significant when one realizes that most of the lowland cities in Java are within 30 kilometers of a town or city.

Several factors appear to be influencing basic changes in the underlying structure of employment opportunities in survey villages. Increased investments in non-agriculture enterprises, both at the village level and in nearby towns and large cities, have created many new employment opportunities. Major improvements in rural road networks have opened up new labor markets for village workers.

Improvements in the education system have broadened the skill base of rural people. At the same time, the aspirations of rural youth are undergoing a transformation. Most now express an explicit preference for non-agriculture employment citing higher pay, less demanding work and prestige as the basis for this shift.

Although the findings of this study are still tentative, to the extent that the study villages are representative of what is occurring in lowland rural Java, it may no longer be adequate to approach rural income and employment questions only from an agricultural, village-based production perspective. The trends cited in this study suggest that the future of the "rural dynamic" lies in small towns where much of the new employment and capital generation activities are occurring.

EXECUTIVE SUMMARY

Bahasa Indonesia

Studi ini memberikan gambaran mengenai gejala-gejala ekonomi dan sosial sekarang ini (dengan penekanan khusus pada pendapatan dan kesempatan kerja) di 13 buah desa di dataran rendah Jawa Tengah dan Jawa Timur. Oleh karena semua anggota kelompok peneliti telah bekerja di desa-desa penelitian selama 20 tahun, mereka berhasil mempelajari gejala-gejala tersebut dari segi pengembangan pedesaan di Jawa selama ini.

Kesimpulan-kesimpulan tersebut menunjukkan adanya perubahan-perubahan besar yang terjadi dalam pola penempatan tenaga kerja dan struktur dasar dari kesempatan kerja di daerah dataran rendah pedesaan di Jawa. Dalam sektor pertanian, produksi beras telah meningkat secara menyolok dalam 15 tahun terakhir ini karena putaran musim panen yang lebih cepat dan hasil yang lebih banyak. Meluasnya pemakaian tanah pertanian menunjukkan adanya peningkatan yang pesat dari penyerapan tenaga kerja tiap hektar. Namun demikian, pada waktu yang bersamaan terjadi proses mekanisasi (umumnya dengan menggunakan alat-alat yang sederhana). Proses yang agak lambat ini telah mengakibatkan berkurangnya jumlah tenaga kerja yang diperlukan untuk tiap hektar tanah. Pada pertengahan tahun 1980an, di banyak desa, kehilangan kesempatan kerja karena adanya penggunaan mesin-mesin nampaknya melampaui pengadaan kesempatan kerja melalui teknologi penanaman padi yang banyak hasilnya.

Tanpa adanya penambahan lapangan kerja di luar bidang pertanian, kondisi kesempatan kerja di pedesaan akan jauh lebih buruk. Namun demikian, lapangan pekerjaan di luar bidang pertanian bertambah begitu banyak sehingga nampak adanya kekurangan tenaga kerja pertanian di beberapa daerah walaupun ada kenaikan upah buruh pertanian. Kesempatan kerja di luar bidang pertanian ini diciptakan dalam 2 lingkungan.

Pertama, dalam masyarakat setempat, kesempatan kerja di desa dalam usaha-usaha menghasilkan produk-produk dan perdagangan telah banyak meningkat. Sekarang ini, kesempatan kerja di perusahaan-perusahaan desa penelitian berkisar dari 6 persen hingga 55 persen dari keseluruhan kesempatan kerja di desa.

Kedua, perpindahan penduduk secara harian dan musiman ke kota-kota kecil dan besar telah menimbulkan adanya lapangan kerja baru bagi buruh-buruh dari desa. Kelompok peneliti telah menemukan bukti-bukti adanya perpindahan penduduk besar-besaran baik untuk jangka waktu pendek maupun panjang.

Ditinjau dari jumlah penduduk desa yang pindah ke kota-kota kecil dan besar, nampaknya ada pengaruh di lingkungan daerah perkotaan. Pengaruh ini dapat meluas seputar lebih dari 30 kilometer dari kota. Hal ini akan menjadi makin penting setelah disadari bahwa sebagian besar kota di dataran rendah Jawa berada dalam radius 30 kilometer dari sebuah kota kecil atau besar.

Beberapa faktor nampaknya mempengaruhi perubahan-perubahan dalam struktur dasar kesempatan kerja di desa-desa penelitian. Penanaman modal yang meningkat dalam perusahaan non-pertanian, baik di desa maupun di kota kecil dan besar, telah menambah banyak lapangan kerja baru. Kemajuan besar dalam jaringan jalan di pedesaan telah membuka pasaran tenaga kerja baru bagi para pekerja dari desa.

Perbaikan dalam sistem pendidikan telah meluaskan ketrampilan penduduk desa. Pada saat yang bersamaan, cita-cita kaum muda di pedesaan mengalami perubahan. Kebanyakan di antara mereka sekarang mengutarakan dengan tegas pilihan mereka untuk bekerja di bidang non-pertanian serta menyebutkan upah yang lebih tinggi, pekerjaan yang tidak begitu menuntut banyak waktu & tenaga, dan gengsi sebagai dasar adanya perubahan ini.

Meskipun kesimpulan-kesimpulan dari studi ini masih bersifat sementara, selama desa-desa penelitian masih menjadi gambaran apa yang terjadi di dataran rendah pedesaan di Jawa, mungkin tidak cocok lagi untuk mengadakan pendekatan terhadap persoalan-persoalan mengenai pendapatan dan kesempatan kerja di desa hanya dari segi pertanian. Gejala-gejala yang disebutkan dalam studi ini memberi kesan bahwa masa depan dinamika pedesaan terletak di kota-kota kecil dimana kebanyakan kegiatan-kegiatan penempatan tenaga kerja baru dan penyerapan modal berlangsung.

C O N T E N T S

	<u>Page</u>
EXECUTIVE SUMMARY	1
EXECUTIVE SUMMARY (Bahasa Indonesia)	111
1. INTRODUCTION	1
1.1 Purpose of the Study	1
1.2 Methodology	1
1.3 The Survey Villages	2
1.4 Organization of the Report	4
2. RURAL EMPLOYMENT: CHANGING STRUCTURE OF OPPORTUNITIES	5
2.1 Changing Structure of Employment Oppourtunities	5
2.2 Agricultural Employment	5
2.3 Non-Agricultural Employment	10
2.4 Non-Local Employment	11
3. AGRICULTURAL TRANSFORMATION	14
3.1 Commercialization of Lowland Agriculture	14
3.2 Intensification	16
3.3 Increased Yields in Rice Cultivation	18
3.4 Mechanization of Agriculture	19
3.5 Land Ownership and Tenancy	22
4. GROWTH OF VILLAGE-BASED ENTERPRISES	26
4.1 Entrepreneurs	26
4.2 Capital Resources and Credit	26
4.3 Village Cooperatives	29
5. SOCIAL FACTORS LEADING TO URBAN MIGRATION	30
5.1 Improved Transportation	30
5.2 Improved Information Flows	31
5.3 Education	33
6. CONCLUSIONS AND PROPOSITIONS	35

T A B L E S

	<u>Page</u>
1. Agricultural Land in the Resurveyed Villages, 1987	3
2. Populations and Densities of the Villages, 1987	4
3. Total Labor Use in Work Hours per Ha per Crop in Rice Production from 1927 to 1987 for the Resurveyed Villages	6
4. Real Hourly Wage in Rice Equivalents (kilos/hr) for Plowing Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87) ..	7
5. Real Hourly Wage in Rice Equivalents (kilos/hr) for Hoeing Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87) ..	8
6. Real Hourly Wage in Rice Equivalents (kilos/hr) for Planting Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87) ..	9
7. Employment in Enterprises within the Villages, 1987	10
8. Numbers of Persons Employed (Daily or Seasonally) Outside Villages in 1987	12
9. Indicators for the Commercialization of Agriculture, 1980-1987, in the Resurveyed Villages in 1987	15
10. Cropping Patterns in the Resurveyed Villages	17
11. Area of Irrigated Fields Planted in Sugar Cane in the Resurveyed Villages in 1987	18
12. Unmilled Rice Yields per Ha for the Resurveyed Villages, 1971, 1980, and 1987	19
13. Number of Machines for Mechanization and Use of Threshers in the Resurveyed Villages	20
14. Padi Tractors and Percentage of Land Prepared by Tractor in the Resurveyed Villages in the Wet Season, 1986/87	21
15. Number of Landowners and Landless Households (HH) and the Gini Index in the Villages, 1981	23
16. Trends in Land Ownership in the Villages, 1987	24
17. Capital Flows in the Villages, 1987	27
18. Activities of the KUD in the Resurveyed Villages, 1987	29
19. Distance of Resurvey Villages from Urban Areas and Roads, 1987 ...	31

	<u>Page</u>
20. Electricity in the Villages in 1987	32
21. Television Sets and Radios in the Villages, 1987	33
22. Level of Education by Percentage of Population in the Resurveyed Villages, 1987	34

1. INTRODUCTION

1.1 PURPOSE OF THE STUDY

This study examines current economic and social trends in thirteen villages in lowland, rural Central and East Java. While the study is concerned primarily with recent trends (since about 1982), these were examined in light of Javanese rural development over the past fifteen years. The central question examined in the study is what has been occurring in terms of income and employment opportunities. Factors such as agricultural change, the growth of village enterprises, and changes in infrastructure and attitudes were examined to provide partial explanations of why changes in opportunities are occurring.

1.2 METHODOLOGY

The approach used here is similar to Rapid Rural Appraisal,* in that a wide range of topics was covered through exploratory interviews over a short time. The study benefited, however, from the fact that various team members had worked more or less continuously in the thirteen study villages over the past twenty years.

Earlier studies in which these researchers took part were examined to provide indications of past economic and social trends. The first is the Rice Intensification Survey, a major activity of the Agro Economic Survey of Indonesia (AES), which was conducted between 1967 and 1975. To examine the impact of high yielding rice varieties on farmers and rural society, this study surveyed thirty-seven villages. Twenty of the sample villages from this study were on Java; ten of these villages were resurveyed for the present study. The second is the Rural Dynamics Study, also under the auspices of the AES. Between 1976 and 1982, respondents in twenty villages in East and West Java were interviewed several times for this study. Five of the villages in this study were included in the resurvey. Last, in 1980, the Agricultural Development Council gave several small grants to students and staff at Jember University to conduct studies in villages that had been studied between 1927 and 1931. Three of the villages in these studies were included in the resurvey.

The resurvey was carried out over a twenty-one day period. Each village was visited for one or two days. Because all members of the research team have been or are members of the Agro Economic Survey and one or more of them had visited each of the survey villages (from five to twenty times for periods of several days to one or two months at a time) over the period 1969-1985,** the team members' detailed knowledge of the villages and long-term relations with key village members allowed the collection of a great deal of information in a very short period.

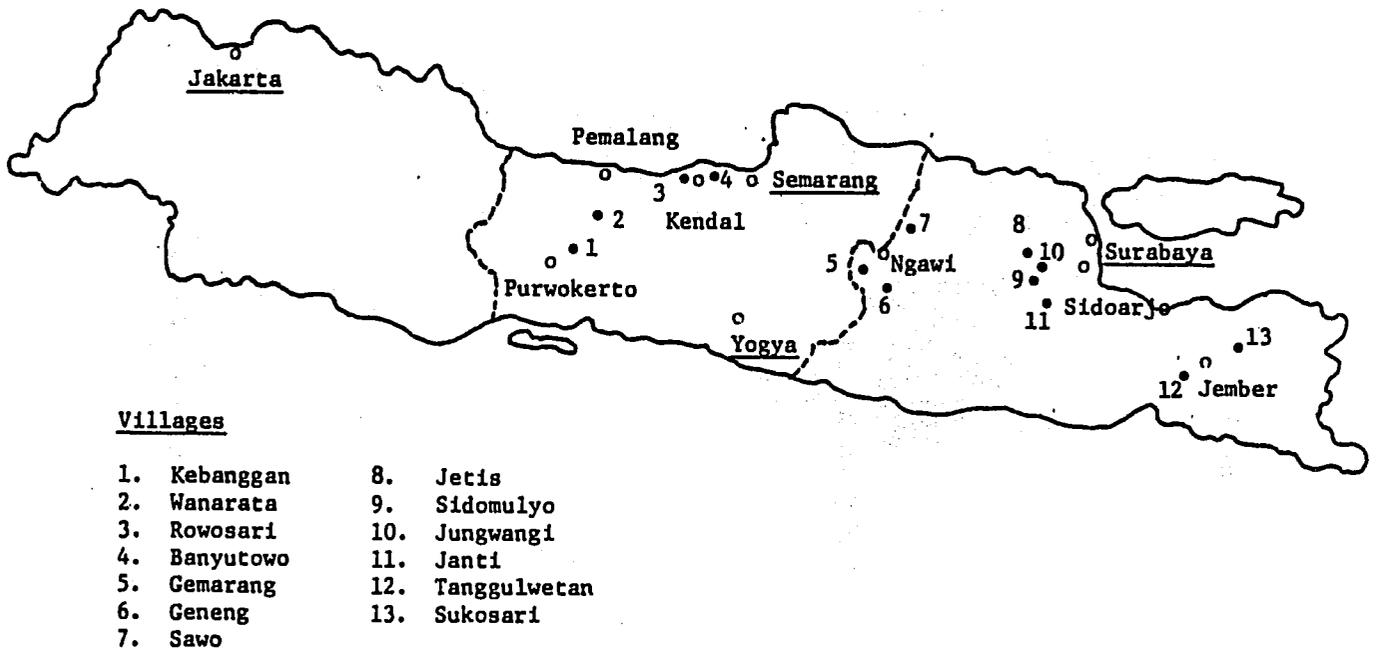
* This technique uses a generalist's knowledge and perspective to review a wide range of fields, both qualitatively and quantitatively. The objective in Rapid Rural Appraisal is to identify indicators of the general conditions and dynamics of a rural area.

** The results of this work are summarized in "Acceleration of Rural Development in Java," Bulletin of Indonesian Economic Studies, November 1982.

1.3 THE SURVEY VILLAGES

The thirteen villages in this resurvey are located in lowland, well-irrigated, rice producing areas in East and Central Java. As can be seen in Figure 1, the four Central Java villages are spread from the south near the city of Purwokerto to the north coast near Pemalang and Kendal. Of these, only Wanarata Village could be considered to lie in a somewhat upland area. In East Java, the three villages near the town of Ngawi are in a major rice producing area located in the central part of the province, four are situated in a semicircle about 30 to 40 km from the major city of Surabaya and two are near the town of Jember, which is a major estate crops producing area in the eastern part of the province.

Figure 1. Locations of the Sample Villages



1.3.1 Land Area

As can be seen in Table 1, the land resources of these villages vary from 75 ha of irrigated fields (sawah) in Janti to 882 ha in Gemarang. All of the villages have good irrigation facilities. However, the village of Jetis has the poorest system, which was damaged in the early 1970s. Most of the villages can produce between two and a half to three rice crops per year. Some of the villages also produce tobacco in the dry season.

Table 1. Agricultural Land (Ha) in the Resurveyed Villages, 1987

Village	Irrigated (Sawah)	Rainfed	Dry Land	House Garden	Others	Total
Central Java:						
Kebanggan	139	0	0	36	6	181
Wanarata	540	0	124	124	1,057	1,844
Rowosari	113	0	12	34	14	172
Banyutowo	194	9	0	40	65	308
East Java:						
Gemarang	882	36	68	171	26	1,182
Geneng	524	0	49	97	48	719
Sawo	114	28	24	35	13	213
Jetis	98	61	15	80	7	261
Sidomulyo	116	0	8	46	2	172
Junwangi	102	0	0	35	0	137
Janti	75	0	0	46	2	123
Tanggulwetan	465	0	242	34	51	791
Sukosari	341	0	66	64	15	486

Source: Resurvey of the villages, September 1987.

1.3.2 Population

The villages' population sizes and densities vary widely (Table 2). Tanggulwetan is the largest, with 12,511 persons, and has been incorporated into the nearby town of Tanggul. However, it still has major areas of sawah (465 ha) and dry land (242 ha). The population densities of the study villages ranged from 451 persons per square kilometer in Wanarata to 1944 in Janti.

Table 2. Populations and Densities of the Villages, 1987

Villages	Population	Number of Households	Population Per km2
Central Java:			
Kebanggan	2,892	583	1,598
Wanarata	8,317	1,785	451
Rowosari	3,073	635	1,787
Banyutowo	2,849	834	925
East Java:			
Gemarang	7,851	1,858	664
Geneng	8,109	2,553	1,128
Sawo	2,343	564	1,100
Jetis	3,117	783	1,194
Sidomulyo	2,759	580	1,604
Junwangi	2,625	512	1,916
Janti	2,391	511	1,944
Tanggulwetan	12,511	3,006	1,582
Sukosari	5,695	1,862	1,172

Source: Resurvey of the villages, September 1987.

1.4 ORGANIZATION OF THE REPORT

This report begins with an overview of the study's findings concerning changing employment patterns and opportunities in the sample villages. Three basic categories of employment are considered - local agricultural, local non-agricultural, and migrant labor. The chapters which follow then examine some of the reasons why rural employment patterns have been changing in recent years. A conclusion section summarizes the findings of the study.

2. RURAL EMPLOYMENT: CHANGING STRUCTURE OF OPPORTUNITIES

2.1 CHANGING STRUCTURE OF EMPLOYMENT OPPORTUNITIES

Major changes are occurring in employment patterns and in the underlying structure of employment opportunities in rural areas of lowland Java. In agricultural employment, increases in labor demand up through the early 1980s, due to more intensive rice cropping and higher yields, have peaked and are being slowly reversed as various tasks become mechanized. At the same time, young village men and women are increasingly finding employment on a daily, seasonal, or permanent basis in the towns and cities.

This section provides a brief overview of the findings of the survey specifically on the topic of employment and wages. It focuses on three basic categories of employment source: local agricultural employment, local non-agricultural employment, and non-local (migrant) employment.

2.2 AGRICULTURAL EMPLOYMENT

Given a choice, young Javanese men in rural areas are seeking employment outside of agricultural labor. In the resurvey villages in which alternative opportunities were limited, young men continued to work as wage earners in the fields, but in other areas older, less educated men were a disproportionate source of labor. This was the case despite reports of agricultural labor shortages in some villages, particularly in peak demand seasons.

Women's employment in agricultural labor has also declined. Until recent years women performed major tasks in the cultivation of rice. Now many of these jobs have been eliminated by mechanization and institutional changes. Mechanical jobs replacing women's labor have tended to be considered "men's work." Younger, better educated women have subsequently tended to seek employment in increasing numbers outside their home villages. Older, less educated women now have fewer job opportunities in agriculture. Some find work in small-scale village enterprises.

In most of the resurvey villages there has been a noticeable decline in labor use per ha per crop in rice production. This decline is especially significant for female employment in harvesting, threshing and weeding. There has also been a decline in male labor use in soil preparation. This decline has been offset by the increase in crops per year. But it is clear that rice production will not absorb more farm laborers and the numbers of persons employed in cultivation and post-harvest processing, at least in the major rice producing areas of Java, can be expected to continue to decrease.

As an example of this decline, in Wanarata Village rice production used an average of 1047 person hours per ha for local rice varieties in the 1969-1971 period. This increased to 1360 hours for the high yielding varieties (HYVs) in 1980 and then declined to 664 hours in 1987 (Table 3). In

Junwangi Village it took 2208 person hours per ha per crop in the 1925-1931 period, then declined to 1492 hours in 1980 and then to 676 hours per ha per crop in 1987. As shown in Table 3, in some of the villages there was a slight increase from the 1970s to the 1980s, but in all of the villages there was a decline between 1980 and 1987.

Table 3. Total Labor Use in Work Hours Per Ha per Crop in Rice Production from 1927 to 1987 for the Resurveyed Villages

Villages	1925-31	1969-1971		1980	1987	
		Local	HYV		With Tractor	Without Tractor
Central Java:						
Kebanggan	-			1251	968	1128
Wanarata	-	1047		1360	664	-
Rowosari	-			1028	849	1018
Banyutowo		1698		-	877	1026
East Java:						
Gemarang	-	1034	1062	1112	836	938
Geneng	-	1327		1191	897	1049
Sawo	1012			1406		1269
Jetis	1547			1453		1152
Sidomulyo	-	1067	862	-		1280
Junwangi	2208			1492		676
Janti	-	1331		1204		961
Tanggulwetan	-			-	736	836
Sukosari		-				1026

Sources: Surveys by the Agro Economic Survey and by Jember University for 1971 and 1980, and by the Resurvey Team in September 1987. The information on rice yields for Sawo in the 1925-1930 period is from de Vries, Alers and Winotoatmodjo, Landbouw, 1929/30, pp. 690, 695 and 696. The rice yield figure in Junwangi is from Vink, Djojodihardjo, and Brand, Landbouw, 1931/32, p. 410. The rice yield figure for Jetis is from Vink, Djojodihardjo and Iskandar, Landbouw, 1931/32, pp. 127 and 137.

During the last eighteen years, real wages for farm laborers have steadily increased in all thirteen study villages. This wage was measured by

the amount of rice that could be purchased by the wage for one hour of work in plowing by men, hoeing by men, and planting by women.

For the period 1970 to 1980, the real wage for plowing increased by more than 40 percent in six of the villages; between 1980 and 1987, it increased by over 40 percent in three of the villages (Table 4). For hoeing the real wage increased by more than 70 percent in eight of the resurveyed villages between 1970 and 1980, with the largest increase being 131 percent in Gemarang village; between 1980 and 1987, it increased by 50 percent or more in seven of the villages (Table 5). For planting the real wage increased by more than 50 percent in five of the villages between 1970 and 1980, with the largest increase being 129 percent in Geneng; between 1980 and 1987, it increased by over 50 percent in eight of the villages (Table 6).

Table 4. Real Hourly Wage in Rice Equivalents (kilos/hr) for Plowing Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87)*

Resurveyed Villages	Year			Percent Increase	
	70/71	80/81	86/87	70/71-80/81	80/81-86/87
Central Java:					
Kebanggan	2.63	3.11	4.50	18	45
Wanarata	2.06	3.00	3.61	46	20
Rowosari	2.78	5.32	5.28	91	-1
Banyutowo	2.88	4.17	4.51	45	8
East Java:					
Gemarang	2.90	4.38	5.63	51	29
Geneng	2.78	5.73	5.71	106	-1
Sawo	-	2.78	4.25	-	53
Jetis	-	2.87	3.65	-	27
Sidomulyo	3.08	3.78	4.38	23	16
Junwangi	-	175**	294**	-	68
Janti	3.45	5.00	5.47	45	9
Tanggulwetan	2.35	3.20	3.41	36	7
Sukosari	2.35	2.50	3.00	6	20

* The real wage per hour is the actual wage per day divided by the number of hours for the operation in the day. The values of the meals provided have been added to this wage; the total was then divided by the price of rice at the time of the operation.

** This is the wage for contract plowing.

Source: Surveys by the Agro Economic Survey and by Jember University for 1971 and 1980, and by the Resurvey Team in September 1987.

Table 5. Real Hourly Wage in Rice Equivalents (kilos/hr) for Hoeing Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87)*

Resurveyed Villages	Year			Percent Increase	
	70/71	80/81	86/87	70/71-80/81	80/81-86/87
Central Java:					
Kebanggan	.61	.78	1.33	28	71
Wanarata	.68	.76	.78	12	3
Rowosari	.55	.99	1.41	80	42
Banyutowo	.58	1.19	1.79	105	50
East Java:					
Gemarang	.54	1.25	1.98	131	58
Geneng	.53	1.16	1.61	119	39
Sawo	-	.79	1.12	-	42
Jetis	-	.63	1.34	-	113
Sidomulyo	.56	1.11	1.56	98	40
Junwangi	-	.93	1.26	-	35
Janti	.55	.98	1.63	78	66
Tanggulwetan	.55	1.17	1.27	113	9
Sukosari	.48	.83	1.25	73	51

* The real wage per hour is the actual wage per day divided by the number of hours for the operation in the day. The values of the meals provided have been added to this wage; the total was then divided by the price of rice at the time of the operation.

Source: Surveys by the Agro Economic Survey and by Jember University for 1971 and 1980, and by the Resurvey Team in September 1987.

Table 6. Real Hourly Wage in Rice Equivalents (kilos/hr) for Planting Rice in the Resurveyed Villages (1970/71, 1980/81, and 1986/87)*

Resurveyed Villages	Year			Percent Increase	
	70/71	80/81	86/87	70/71-80/81	80/81-86/87
Central Java:					
Kebanggan	.40	.66	1.17	65	77
Wanarata	.54	.76	.78	41	3
Rowosari	.55	.68	1.17	24	72
Banyutowo	.58	.73	1.22	26	67
East Java:					
Gemarang	.44	.70	1.25	59	79
Geneng	.35	.80	1.07	129	34
Sawo	-	.42	.70	-	67
Jetis	-	.42	.86	-	105
Sidomulyo	.35	.69	.78	97	13
Junwangi	-	.38	.74	-	94
Janti	.27	.55	1.04	104	89
Tanggulwetan	.46	.50	.69	9	38
Sukosari	.46	*	*	-	-

* The real wage per hour is the actual wage per day divided by the number of hours for the operation in the day. The values of the meals provided have been added to this wage; the total was then divided by the price of rice at the time of the operation.

Source: Surveys by the Agro Economic Survey and by Jember University for 1971 and 1980, and by the Resurvey Team in September 1987.

Although it is difficult to quantify, farmers and village leaders in nine of the thirteen villages felt there were not enough farm laborers in their villages at peak periods of rice cultivation. Some of the villages reported that farm laborers were coming from outside their village to work in their fields. This perception of a shortage is supported by the increase in the real wage for these farm laborers.

2.3 NON-AGRICULTURAL EMPLOYMENT

As a result of increased capital, both in the villages and from entrepreneurs outside the villages, employment in village enterprises and trading activities has greatly expanded in the resurveyed villages over the last five to ten years. Each of the thirteen study villages has some small-scale enterprises. These include construction, food processing, tile production, brick making and many others.

In the thirteen study villages, the employment in small-scale enterprises ranges from 6 percent to 55 percent of the population above 15 years of age, and in seven of the villages more than 15 percent of the villagers are employed in these enterprises (Table 7). This non-agricultural employment in the villages normally uses persons with lower levels of education than employment outside of the villages.

Table 7. Employment in Enterprises within the Villages, 1987

Village	Percentage of the Population above 15 Years of Age Employed in Enterprises within Village				Percentage of Total
	Construction	Food Proc.	Tile/Brick	Others	
Central Java:					
Keganggan	11	1	1	15	28
Wanarata	1	1	5	5	12
Rowosari	9	1	2	20	32
Banyutowo	9	1	2	8	20
East Java:					
Gemarang	2	1	1	4	7
Geneng	2	1	11	5	19
Sawo	3	1	-	15	19
Jetis	-	1	8	2	11
Sidomulyo	3	4	-	7	14
Junwangi*	3	1	.5	2	6
Janti	16	9	-	30	55
Sukosari	3	1	2	18	24
Tanggulwetan*	1	0	-	8	9

* No information available on village population above 15 years of age; thus, the total population was used.

Source: Resurvey of the Villages, September 1987.

In Wanarata Village, for example, the roof tile industry absorbs a large number of the villagers. There are nine tile factories, all of which are owned by people from this village. The largest one employs 80 family heads. A large number of laborers carry the clay to the factory and earn a living from this activity. The tiles are marketed in several cities in Central Java.

A food processing industry has been created by the villagers in Janti. There are 18 krupuk (a type of shrimp chip like a potato chip) enterprises there; each one has at least eight workers and twenty traders to sell the krupuk. Together, these enterprises produce about 1.8 tons of krupuk per day. This village sells krupuk throughout East Java, Bali, and Timor, and has tried to set up an agent in Banjarmasin. Although these enterprises are owned by villagers, it appears that two outside businessmen are providing credit for the inputs, e.g., tapioca. It also appears that one of these businessmen is setting up a krupuk factory in this village. The other krupuk makers could face substantial competition from this businessman. Another enterprise in this village is a broiler chicken operation, set up by several persons using credit from the feed company. The size of their operation ranges from 3,000 to 5,000 chickens.

2.4 NON-LOCAL EMPLOYMENT

The major employment characteristic of all but two of the thirteen villages is the large numbers of persons leaving them for employment in the nearby towns on a daily migration basis and in the more distant cities of Jakarta and Surabaya on a seasonal or yearly basis. All along the north coast of Java and in some more inland areas there are large towns and cities which have undergone a transformation caused by the opening of a large number of factories producing a wide range of products. These factories are even sending buses to these rural areas to pick up their workers. This industrialization of the towns and the absorption of young, educated (at least a primary school certificate) persons seems to have greatly expanded in the early 1980s.

Only two villages (Sukosari and Sawo) did not have substantial out migration. This seemed to be due to the villages' lower education levels, the distance to a major center of factory employment, and a lack of good access to employment in Sawo. In Sukosari there is almost no employment outside of the village due to the presence of a large, state owned tobacco factory which absorbs large numbers of villagers from this village and others. The population of Sawo declined from 2700 in 1979 to 2300 in 1987, due to the number of people leaving this village for lack of village-based employment.

In the other eleven villages, villagers within approximately 30 kilometers of employment centers commute to work on a daily basis. In the resurvey, nine of the thirteen villages have from one to two hundred persons migrating each day to work; some are picked up by the company buses in their villages. Thus, for most of these lowland villages there is good access to employment in factories, services and construction for those persons who are qualified.

Occupational multiplicity is one of the basic features which has characterized Javanese society for a long time. People leaving their villages for employment in nearby towns on a daily or seasonal basis is not new, especially in areas near sugar cane factories (e.g., Gemarang and Geneng). These outmigrants, both young and old, male and female (other than the sugar factory workers) work as petty traders, bricklayers, carpenters, and becak (pedicab) drivers. However, the number of outmigrants has greatly increased in the last few years and is now made up mostly of young, educated villagers. Table 8 shows the numbers of people leaving these villages on a daily and seasonal basis to work in factories in nearby towns, as servants and becak drivers in distant cities, and to go abroad for employment.

Table 8. Numbers of Persons Employed (Daily or Seasonally) Outside Villages in 1987

Villages	Factory					Total
	Management	Manual Laborers	Servants/ Becak	Other Manual	Saudi/ Malaysia	
Central Java:						
Kebanggan	0	100	10	-	-	110
Wanarata	0	0	50	65	2	117
Rowosari	0	0	30	100	1	131
Banyutowo	0	100	6	0	2	108
East Java:						
Gemarang	10	300	25	0	0	335
Geneng	0	300	0	60	12	372
Sawo	0	0	0	0	2	2
Jetis	0	133	10	122	0	265
Sidomulyo	0	157	11	0	0	168
Junwangi	47	113	27	42	1	230
Janti	9	51	18	18	0	96
Tanggulwetan	5	25	50	0	7	87
Sukosari	0	0	0	2	0	2

Source: Resurvey of the villages, September 1987.

In Banyutowo Village, key informants said that out migration has greatly increased during the last ten years. One hundred young people (60 males and 40 females) are working in the plywood factory in Kaliwungu about 15 km from Kendal and in textile factories. They will gather in the nearby town where factory buses take them to work 18 km away. School drop-outs are working

seasonally in the so-called "desa proyek," located in another subdistrict. Also, six women have gone to Jakarta and two to Saudi Arabia.

A similar situation was found in Rowosari Village, which has experienced major out migration since the brown plant hopper infestation in 1975. More than two hundred villagers (70 percent female) have gone to Jakarta to work as servants. They know where to go in Jakarta to make the arrangements to find work as servants. When these women return from Jakarta, they do not want to work as farm laborers. The men who work in Jakarta are construction workers, becak drivers, and tailors. The ages of these migrants range from 17 to 40. Although their seasonal migration to Jakarta began because they needed employment during the plant hopper problem in 1976, at present, they go because they prefer working in Jakarta.

In Geneng Village two persons have gone to Saudi Arabia to find work and ten are preparing to go to Malaysia. One hundred persons (75 percent men) are working in Surabaya and Jakarta. The men work in construction or are in the military and the women work in stores or factories. Sixty persons were sent three times to South Sumatra for several months each to work in sugar cane fields. Those going to Jakarta from Geneng had at least a primary school degree and some a secondary school degree. This movement of people began in 1950, but greatly accelerated in 1975 because more persons had a primary school education and had the contacts through friends to find jobs. Since 1975, the number of people leaving each year has remained the same. The majority leaving are the children of farm laborers, most of whom are landless.

Kebanggan villagers felt that the incomes of people working outside the village and non-land owning families have substantially improved over the last ten years. Before 1976 it was difficult to find work as a farm laborer and nobody was working outside of the village. During the 1976 brown plant hopper infestation, younger persons had to go outside of the village in search of work. They went to Purwokerto and worked in the noodle factory and in construction. In 1987 over one hundred persons (male and female) are working in non-agricultural jobs outside of the village. Most work in Purwokerto in food processing industries and construction. The numbers leaving are increasing. At least ten women have gone to Jakarta to work as servants and sixty families have been transmigrated. Ten persons have also spontaneously migrated to Sumatra to join relatives in transmigration projects.

Factory employment is high for villages within 10 or 20 kilometers of an industrial area. Jetis, Sidomulyo, Junwangi, and Janti, for example, are clustered around the urban complex of Surabaya-Sidoardjo-Mojokerto. This complex provides many opportunities for factory employment, as is shown by the number of persons migrating from the village on a daily basis (Table 8). For the villages more distant from industrial centers (Wanarata, Rowosari, Gemarang, Geneng and Tanggulwetan) a significant number of persons are migrating on a seasonal basis to Jakarta and Surabaya to work as servants, becak drivers, and construction workers. Although a slowdown in factory and construction work would have been expected because of the decline in oil revenues, there were only a few indications of persons returning to the villages because they were not able to find work.

3. AGRICULTURAL TRANSFORMATION

Agricultural practices in lowland Java are now composed of an intensification of the cropping system, substantially increased rice yields, and mechanization of rice production, all of which have led to increasing commercialization. Combining these trends with the declining labor use per ha per crop in rice production and rising real wages for laborers (described in Section 2) gives a clear indication that major changes are occurring in the rural villages in lowland Java. Rather surprisingly, most of these trends indicate major advances in development.

3.1 COMMERCIALIZATION OF LOWLAND AGRICULTURE

During the last twenty years, Javanese farmers have become very aware of costs and returns in rice production. They are taking steps to reduce their costs by mechanizing field preparation, using sickles in the rice harvest, and using hand and diesel powered threshers. They have closed the rice harvest by not allowing massive numbers of women (500 per ha) to harvest, but instead using 10 to 20 men in the harvest. Overall, they have greatly reduced the employment of women and men in rice production. The farmers are making decisions on what crops to produce based on their calculations of the potential profits. They are selling most of their rice at harvest time. Renting rather than sharecropping has spread throughout Java, indicating a change in farmers' perceptions of the profits to be made from agriculture. Rice production in Java has thus become a commercial enterprise, with farmers making rational decisions on input use, labor utilization, crop selection and sale of the produce.

One of the major factors that promoted this change from a more subsistence oriented agriculture to a more modern commercially oriented agriculture was the 1974 to 1976 disaster where the brown plant hopper wiped out the entire rice crops of these farmers. With the very obvious benefits of the development of improved rice varieties, resistant to the brown plant hopper, the rice farmers very rapidly adopted these varieties and overcame the infestation problem. It was immediately apparent to these farmers that rice intensification and a more modern approach to agriculture were very profitable.

Another factor promoting the commercialization of agriculture is the rice buyers coming to these villages from outside. They are introducing new ideas, new agricultural tools and new institutions. The use of sickles and mechanical threshers in the rice harvest and paying a wage for harvesting rather than a share of the harvest have been promoted by these rice buyers.

The resurvey team evaluated various indicators for each village to give a general picture of these villages' agricultural commercialization (see Table 9). In seven of the villages, labor use in rice production was decreasing, in five villages it was not declining further and in one village it increased. This increase was due to improved water management, thus allocating more labor to production.

In the seven villages where labor use was decreasing, it appeared that farmers were making strong efforts to reduce their costs in rice production. This was done by using mechanical equipment and reducing the number of laborers in various operations by having contract groups do the work.

A strong indicator of commercialization is the way the harvest is conducted. The traditional system of opening a harvest to anybody was very expensive for the farmers because of the large share given to the harvesters, both as agreed and through pilferage, and trampling losses. The closed harvests indicate that the farmers do not allow large numbers of harvesters and usually select who will do the harvesting. As shown in Table 9, nine of the villages had very definitely closed their rice harvests and the other four used a partially closed system that allowed substantial control over the harvest. In some of these villages, there are contract harvest groups who use only seven or eight harvesters; in villages using the closed system the number is never more than fifteen men using sickles. The open harvest could reach 500 or 600 women per hectare using the hand held rice knife. A closed harvest is so different from the traditional system of 10 to 15 years ago that a person can tell at a glance which is being used.

Table 9. Indicators for the Commercialization of Agriculture, 1980-1987, in the Resurveyed Villages in 1987

Villages	Labor Use in Rice Prod.	Efforts to Reduce Costs	Harvest Open/Closed	Sale of Rice (%)	Wage* for labor
Central Java:					
Kebanggan	Decrease	Increase	Closed	25-50	S/D
Wanarata	Stable	Stable	Closed	50	C/D
Rowosari	Decrease	Increase	Closed	75-100	C/D
Banyutowo	Decrease	Increase	Closed	50	C/D
East Java:					
Gemarang	Decrease	Increase	Closed	50-75	C/D
Geneng	Decrease	Increase	Closed	50-75	C/D
Sawo	Increase	Stable	Closed	25-50	D
Jetis	Decrease	Increase	Semi-C	25-50	D
Sidomulyo	Stable	Stable	Semi-C	25-50	D
Junwangi	Stable	Stable	Semi-C	25-50	C/D
Janti	Stable	Stable	Semi-C	25-50	C/D
Tanggulw.	Decrease	Increase	Closed	50-75	S/D
Sukosari	Stable	Stable	Closed	50-75	S/D

* C = contract labor group
 D = daily wage
 S = share of the harvest

Source: Resurvey of the villages, September 1987.

3.2 INTENSIFICATION

In 1970 most of the farmers were producing rice in the wet season and either a secondary crop or rice in the dry season. High yielding, early maturing rice varieties were introduced to Java in the late 1960s and early 1970s. In the early and mid 1980s a number of new rice varieties were introduced which have even shorter growing seasons and are resistant to various pests and diseases. With the shift to the HYVs in all of the villages except Jetis, a significant number of the farmers were able to add another rice crop to their cropping systems. They either can plant rice three times in one year or five times in two years, with the decision being to allow the land to lay idle for a short period or to plant a secondary crop. The major constraints to the three crops per year system are inadequate water management in the dry season, the need for better integrated pest management techniques, especially for rats, and the farmers' perceived need for the land to lie fallow for a short period of time.

Viewing these changes in cropping patterns (shown in Table 10), it is evident that there was a major increase in cropping intensity between 1970 and 1981 and then another less obvious, but still major, increase between 1981 and 1987. The table also shows that when a third crop has been added, it has often been rice rather than a secondary crop.

Table 10 shows that in six of the resurveyed villages, the cultivation of sugar cane has increased since 1981. As shown in Table 11, in seven of the villages more than 30 percent of their irrigated land is in sugar cane and this reaches over 50 percent in Janti. Often, the farmers are renting their land rather than participating in the cane intensification programs. The farmers, almost uniformly, complained about having to put their land in sugar cane.

Since 1985 in one of the villages, the farmers have only been willing to plant 15 ha of their irrigated land in sugar cane because they would suffer a financial loss. Consequently, in 1986/1987, 4 ha of the village's unirrigated lands were planted in sugar cane.

Table 10. Cropping Patterns in the Resurveyed Villages

Villages	1970	(%)	1981	(%)	1987	(%)
Central Java:						
Kebanggan	R-S		R-R-S	35	R-R-S	55
	R-R		R-R	50	R-R	37
Wanarata	R-S		R-R-S	10	R-R-S	40
	R		R-R	80	R-R	50
Rowosari	R-R		R-R-S		R-R-T	16
	R-S		R-R-T		R-R-S	31
					R-R-R	44
Banyutowo	R-R		R-R		R-R-R	50
	R-S		R-R-R		R-R	27
	R		R-R-S			
East Java:						
Gemarang	R-S		R-R-S	62	C	44
	R-R		R-R-R	9	R-R-S	36
	R-C		R-S-S	5	R-R-R	15
			C	23	R-R	4
Geneng	R-S		R-R-S		R-R-R	15
	R-R		R-R		R-R-S	16
	R-C		R-C		R-C	29
					C	38
Sawo	R-S-S		R-S-S		R-R-S	
	(1930)		R-R-S		R-C	
	C		R-R-T		R-T-S	
			C		C	
Sidomulyo	C-S	33	C-S	32	C	15
	R-C	33	R-C	34	C-S	13
	R-S	34	R-R-S	34	R-C	16
					R-R-S	56
Jetis	R-S		R-S		C	9
	C		C		C-S	33
	(1930)				R-C	26
					R-S	18
					S	13
Junwangi	R-R-S		R-R-R		C	13
	C		C		C-S	19
	(1930)				R-C	19
					R-R-S	39
					R-R-R	10
Janti	C-S	33	C-S	33	C	17
	R-C	33	R-R-S	34	C-S	34
	R-S	34	R-C	33	R-R-C	32
					R-R-R	13
				R-R-S	4	
Tanggulwetan	R-R		R-R-S		C-S	39
	R-S		R-C		R-R-S	32
	R-C		R-C		R-R-R	18
Sukosari	R-R		R-R-R	54	R-R-T	29
	R-S		R-R-T	28	R-R-R	6
	R-T		R-R-S	18	R-R-S	29
					R-R	30
					R-S	6

R = Rice
 S = Secondary Crops
 C = Sugar Cane
 T = Tobacco

Sources: Information from past surveys by the Agro Economic Survey, Jember University, articles in *Landbouw*, 1930, and the Resurvey of the Villages in September 1987.

Table 11. Area of Irrigated Fields Planted in Sugar Cane in the Resurveyed Villages in 1987

Villages	TRI I (Ha)	TRI II (Ha)	TRB (Ha)	Total (Ha)	% of Land in Sugar Cane
Central Java:					
Kebanggan	6	4	0	10	7
Wanarata	0	0	0	0	0
Rowosari	0	0	0	0	0
Banyutowo	17	0	0	17	8
East Java:					
Gemarang	115	160	100	375	41
Geneng	161	50	0	211	40
Sawo	15	0	0	15	11
Jetis	60	0	18	78	49
Sidomulyo	33	16	0	49	42
Junwangi	22	11	0	33	32
Janti	27	12	0	39	52
Tanggulwetan	58	123	0	181	40
Sukosari	0	0	0	0	0

Source: Resurvey of the villages, September 1987.

3.3 INCREASED YIELDS IN RICE CULTIVATION

Today, farmers with a sufficient supply of irrigation water and good pest management are achieving yields of 5 to 7 tons of unmilled rice per ha, as opposed to 3 to 5 tons in 1971 and 4 to 6 tons in 1980. Between 1971 and 1980, rice yields increased by 88 percent in Sukosari, 53 percent in Janti, 66 percent in Geneng, and 49 percent in Wanarata (Table 12). Between 1980 and 1987, the rice yields increased by 55 percent in Junwangi, 44 percent in Rowosari, 34 percent in Geneng, and 24 percent in Sawo.

As an example, in Gemarang Village farmers plant three crops per year in a rice-rice-secondary crop system. The secondary crops are soybeans, corn, tobacco, or cucumbers. The rice yield averages 6 tons of unmilled rice per ha, and farmers stated they felt they could get even higher yields. They are using IR 36 Super and Sumeru varieties. The harvest yield increases began three years ago with the arrival of these new rice varieties. Another farmer claimed he could get yields from IR 36 of 7.0 tons of unmilled rice per ha if he had sufficient water and fertilizer. This farmer said he could plant rice three times per year, but the third crop is usually heavily damaged by rats.

Table 12. Unmilled Rice Yields Per Ha for the Resurveyed Villages, 1971, 1980, and 1987

Resurveyed Villages	Unmilled Rice Yield ton/ha				Percentage Increase	
	1925-30	1971	1980	1987	71 - 80	80 - 87
Central Java:						
Kebanggan		2.8	3.5	4.3	27	21
Wanarata		2.9	4.3	4.9	49	17
Rowosari		3.5	4.2	6.0	18	44
Banyutowo		4.2	-	5.9		38
East Java:						
Gemarang		4.5	6.0	6.7	33	12
Geneng		3.1	5.2	6.9	66	34
Sawo	1.31	-	5.3	6.5	-	24
Jetis	3.05	-	4.3	5.2	-	20
Sidomulyo		4.0	-	5.0		25
Junwangi	3.80	-	3.7	5.8	-	55
Janti		3.4	5.2	5.3	53	1
Tanggulwetan		2.8	-	5.4		90
Sukosari		2.5	4.6	4.9	88	5

Source: Surveys by the Agro Economic Survey and by Jember University for 1971 and 1980, and by the Resurvey Team in September 1987. The information on rice yields for Sawo in the 1925-1930 period is from de Vries, Alers and Winotoatmodjo, *Landbouw*, 1929/30, pp. 690, 695 and 696. The rice yields in Junwangi are from Vink, Djojodihardjo, and Brand, *Landbouw*, 1931/32, p. 410. The rice yields for Jetis are from Vink, Djododihardjo and Iskandar, *Landbouw*, 1931/32, pp. 127 and 137.

3.4 MECHANIZATION OF AGRICULTURE

The first steps toward the mechanization of rice production began in the early 1970s with the change from hand pounding in the milling of rice to the use of hullers. This made it possible for farmers to lower the cost of milling and to reduce the number of persons employed in milling. It would be fair to say that hand pounding rice has completely disappeared from the major rice producing regions of Java. Although the discussions of ten years ago about the best method for milling rice were not conclusive, the entrepreneurs of rural Java have obviously selected the small rice mill (huller operation) as the appropriate machine. Table 13 shows that all but two of the villages

have these small rice mills. Rather than have very large rice mills in the cities, the rough rice is being purchased by owners and/or agents of small mills in the villages. Competition is very strong and the owners/agents who seem to be winning are those who have sufficient capital to become large rice buyers. As an example, it was estimated that a rice mill operator in Sukosari had Rp. 400 million to fund his rice buying operations.

Table 13. Number of Machines for Mechanization and Use of Treshers in the Resurveyed Villages

Village	Padi Tractors Owned Locally		Rice Mills		Water Pumps		Use of Thresher
	No.	Year	No.	Year	No.	Year	Yes/No
Central Java:							
Kebanggan	2	1987	2	1982	0	-	No
Wanarata	0	-	5	1975	0	-	No
Rowosari	1	1982	3	1974	0	-	Yes
Banyutowo	0	-	1	1987	0	-	Yes
East Java:							
Gemarang	4	1978	4	1976	4		Yes
Geneng	7	1972	5	1970	42	1980	Yes
Sawo	0	-	0	-	7		Yes
Jetis	0	-	1		10		Yes
Sidomulyo	0	-	1		0		No
Junwangi	0	-	3	1975	0		No
Janti	0	-	0	-	0		No
Tanggulwetan	1	1979	3		0		No
Sukosari	0	-	4	1969	0		Yes

Source: Resurvey of the villages, September 1987.

Another change, which began in the mid-1970s and has been accelerating to the present time, is the use of two-wheeled padi tractors to prepare the fields for rice planting. Although not as widespread as the use of sickles, padi tractors are now a common sight in most villages in lowland Java. These hand tractors were first adopted by farmers with more than 5 ha of rice fields and in villages with large areas of irrigated land. In the early 1980s social scientists in South East Asia were debating the wisdom of introducing padi tractors because of the impact on employment opportunities. In lowland Java the debate is over; both large and small farmers use padi tractors because of the lower cost.

Padi tractors in five of the study villages plowed from 60 to 90 percent of the villages' irrigated fields (they have just been adopted in the two other villages). Gemarang Village, for example, has four padi tractors and many are used from outside this village (Table 14). Most of the land is prepared by tractors rather than by water buffalo, whose numbers have been declining, perhaps by 50 percent, in the last five years. Farmers felt that the padi tractors were adopted before the decline of the buffalos. Therefore, it may be that some of the buffalos were sold because there was not enough work for them. They still use the buffalos for harrowing the land.

Table 14. Padi Tractors and Percentage of Land Prepared by Tractor in the Resurveyed Villages in the Wet Season, 1986/87

Village	Number of Tractors Operating in the Village		Area of Rice (Ha)	% by Tractor
	Tractors in Village	Tractors from Outside Village		
Keganggan	2	0	129	16
Rowosari	1	2	113	60
Banyutowo	0	15	186	80
Gemarang	4	5	643	70
Geneng	7	3	314	90
Sawo	0	1	126	5
Tanggulwetan	1	6	284	60

Source: Resurvey of the villages, September 1987.

Beginning in the early 1980s, several villages began using mechanical threshers with hand operated devices (Table 13). By using mechanical threshers to thresh in the field and transporting the rice to their houses by carrying it in burlap bags, farmers have greatly reduced the loss of rice in the harvest. In some areas of Java, farmers are now using diesel powered threshers.

In the 1981/1982 wet season, threshers were already being used in Gemarang Village, but the traditional hand harvesting method was still common. However, during the last three years, almost all the harvest laborers have been using these mechanical threshers, which are produced locally and are operated by pedaling with the legs. An even greater change occurred in 1984 when Geneng Village began using power operated threshers. Five threshers powered by diesel motors and twenty new pedal operated threshers are now in use in Geneng. In each neighborhood there is a harvest group and each one has a pedal thresher.

A less dramatic but important change has been the introduction of mechanical weeders in rice cultivation. This began in the 1970s with the use of straight row planting methods. It reduced the number of persons needed in weeding and the costs.

A final change, which is just beginning and is limited to specific areas, is the use of water pumps for improved water management, primarily in the dry season (Table 13). This innovation has no negative effect on labor use, but does improve the yields of rice in the dry season.

Two years ago, the Proyek Pengembangan Air Tanah (P2AT) under the Public Works Department drilled and installed water pumps in Gemarang Village's deep wells (220 meters). Each pump can irrigate between 50 and 100 ha. For the first two years of operation, P2AT has supplied diesel fuel and provided the operational expenses for the pumps. Now, the farmers must pay the operational costs of these pumps. Often the pumps are not in operation because the farmers do not provide enough money (Rp. 10,000) to maintain them.

In Geneng Village, where the water pumps have been purchased and maintained by individual farmers, the situation is much more successful. In this village there are 42 water pumps and shallow wells up to 24 meters deep. Farmers contract to water a field for 24 hours. They estimated in the dry season they would use a water pump for 40 hours to irrigate one hectare. They also receive some water from the local irrigation system on a rotation basis. In the wet season they use the water pump for 10 hours per ha. Geneng farmers use the pumps in groups and water a block from one well. Before water pumps were introduced here in 1980, their yields in the dry season were an average of 3.0 ton/ha. Today, they can get yields of 6.5 to 7.0 tons/ha of rice.

3.5 LAND OWNERSHIP AND TENANCY

In assessing the land control situation in a village, the observations made from the brief visits to the resurveyed villages should be treated with caution. It is very difficult to determine what is the actual land control situation because it is a sensitive issue and the village records are not satisfactory. However, the researchers' knowledge of these villages and past in-depth surveys make it possible to identify trends.

Very careful censuses carried out by the Agro-Economic Survey in 1981 in hamlets in seven of the resurveyed villages estimated the number of owners and landless. Table 15 shows that the percentage of landless ranged from 50 percent to 66 percent, except in Wanarata where it was only 28 percent. The average size of holding per farmer-owner ranged from .44 ha to .95 ha.

Table 15. Number of Landowners and Landless Households (HH) and the Gini Index in the Villages, 1981

Villages	No. of Respond. (HH)	Percentage		Average Size of Holding	
		Landless (%)	Owners (%)	Per HH (ha)	Per Owner (ha)
Central Java:					
Kebanggan	143	58	42	.29	.68
Wanarata	138	28	72	.32	.44
Rowosari	106	64	36	.31	.87
East Java:					
Gemarang*	213	66	34	.21	.59
Geneng	131	60	40	.37	.95
Janti	132	56	44	.22	.51
Sukosari	114	50	50	.37	.73

* The census in Gemarang village was a partial census in 1983 and is reported in Wiradi and Manning, 1984, pp. 20-33.

Source: Based on an Agro-Economic Survey census of households in randomly selected hamlets in each of these villages and reported in Faisal Kasryno, 1984, p. 52.

In six of the thirteen sample villages, there was a strong indication that landlessness increased during the last five years (Table 16). Also, in six of these villages there is a strong indication that during the last ten years land ownership has become more skewed towards a small number of persons owning an increasingly large share of the villages' land (over 5 ha per person). In one of the villages, one person owned 100 ha of land.

Table 16. Trends in Land Ownership in the Villages, 1987

Village	Continuance of Traditional System (yes/no)	Trend in Landlessness	Frequency of Sales	Outsiders Owning Land	Villagers Owning More Than 5 ha
Central Java:					
Kebanggan	Yes	Stable	Almost None	Almost None	Almost None
Wanarata	No	Stable	Few	Few	Many
Banyutowo	Yes	Stable	Few	None	Many
Rowosari	No	Increasing	Few	Many	Few
East Java:					
Gemarang	No	Increasing	Many	Many	Many
Geneng	Yes	Increasing	Many	Few	Many
Sawo	Yes	Stable	Almost None	Almost None	None
Jetis	Yes	Stable	Almost None	Almost None	None
Sidomulyo	Yes	Increasing	Many	Many	Few
Junwangi	Yes	Stable	Few	Almost None	Almost None
Janti	Yes	Stable	Almost None	None	None
Sukosari	No	Increasing	Many	Few	Many
Tanggulwetan	No	Increasing	Many	Many	Many

Source: Resurvey of the villages, September 1987.

In five of the villages, there is a very active land market. In Geneng Village, for example, in the last five years there have been 185 land sales. Today, in one village 75 percent of the land is owned by outsiders, in another village 69 percent, and in two 40 percent. In four villages, none of the land is owned by outsiders. Some persons will buy land and then sell it before using it. The frequency of land sales appears to be increasing in most of the villages, which could lead to even more outsiders owning land in these villages.

In all but two of the resurveyed villages (Sukosari and Tanggulwetan), the form of land tenure before 1960 was basically "communal." After the enactment of the Agrarian Law of 1960, tenure was converted into private ownership. Supposedly, agricultural land can now be sold to anybody, and the holders are no longer obliged to follow communal regulations and responsibilities. However, in most of these villages, some of the traditional regulations still persist. In these villages, it is possible for landless households to have access to land through various tenancy arrangements. Yet,

this access is limited because in Javanese rural society, the owner-operated farm is the dominant pattern.

In the villages of Kebanggan, Janti and Sukosari, there exists a very traditional system of tenancy called kedokan which is still the predominate system for cultivation. It is a type of labor contract where the kedokan laborers have to do specific tasks at certain stages of rice cultivation without pay. They are compensated by the right to harvest the rice crop and receive a specific and larger share than the common harvesters. Traditionally, these tasks were either transplanting or hoeing or both. Since 1981 the burden of the kedokan laborers has become heavier, with unpaid weeding being added to their duties. It is important to point out that even in Kebanggan and Janti Villages, where the process of commercialization is obvious, the kedokan institution is still strong.

In Kebanggan almost 100 percent of the landowners operate their farms using the pracangan system. Under this system, the person who has agreed to work the land of the owner or renter receives one-fifth of the harvest and if common harvesters want to join, they would receive one-fifteenths. If a land owner operated his own farm and had an open harvest, then the common harvesters asked for a one-tenth share but the land owners were only willing to give a one-twelfth share. In adjacent villages a one-tenth share is given, but during the harvest in Kebanggan village, the farm laborers did not go to these adjacent villages. They instead preferred to join the harvest on the kedokan farms and get a smaller share. The explanation is possibly that the villagers have strong social ties in the village.

Although the dominant form of tenancy (renting), does not seem to have changed in these villages, there is an indication that renting has become very common for both the local villagers and outsiders. Renting to outsiders often occurs where sugar cane cultivation is profitable, e.g., in Gemarang, Geneng and Jetis Villages. In many villages land renting is more common than sharecropping because a person can rent a piece of land and operate this land using the kedokan system for cultivation and harvesting the rice.

In only five of the villages has the traditional system of land control disappeared. Since most of these villages are in sugar cane producing areas, the traditional system is related to this industry. Villagers have specific responsibilities if they hold land and there is a rotation system for the cane planting. Only in Tanggulwetan did the traditional system disappear in a cane producing village.

4. GROWTH OF VILLAGE-BASED ENTERPRISES

Rural labor in the resurveyed villages is clearly being absorbed in part by a range of local village enterprises. The development of such enterprises is dependent on consumer demand, entrepreneurs, capital availability, and efficient marketing channels. This section discusses some of the various factors which appear to be effecting improvements in local non-agricultural employment opportunities and explores the current employment situation in village enterprises.

4.1 ENTREPRENEURS

In most of the resurveyed villages there are at least several entrepreneurs who have set up various types of agribusiness and non-agricultural firms. They are promoting economic growth in these villages.

Usually, village entrepreneurs select products which are in demand in the cities and villages. They improve the quality of traditional products, introduce new products and link rural villages with urban markets. An example is the rice mill owner in Junwangi Village. He was a rice trader in 1977-1978 and a driver in 1979-1984. After borrowing money from a person whom he worked for as a driver, he set up a huller/rice mill in 1984. He now has 25 buyers and he loans them money to purchase rough rice and bring it to his mill. These buyers then sell the rice and repay him.

Village entrepreneurs frequently try to expand their operations and to introduce new enterprises. In Geneng Village, for example, one businesswoman produced only 30 bottles of traditional medicine per day in 1972 but was able to expand in a few years to 3000 bottles per day. With the profits she bought 22 hectares of rice fields, set up a rice mill and built rice storage facilities. Since 1983 she has established nine businesses, rents 400 ha of sugar cane and is a large supplier of milled rice to BULOG (the government logistics agency).

The influence of the urban businessmen in the employment of villagers is rapidly expanding. A large number of the factories in the towns are owned by urban businessmen and many of the rice mills are owned or funded by them.

4.2 CAPITAL RESOURCES AND CREDIT

4.2.1 Capital Flows

Financial capital flows in three ways in these rural villages: (1) capital flowing within the rural villages for industry and agriculture, (2) capital flowing to the villages from outside, primarily urban areas, and (3) capital flowing from the village to urban and other rural areas. This resurvey found that during the last five years the most prominent flow is capital from outside being used for industry and trade inside the villages. This is primarily for the rice trade and small scale industry, as shown in Table 17.

Usually, the capital flowing to these villages comes from people in the cities, who use their capital to expand their activities both in trade/industry and in agriculture. The funds in agriculture are for the rice mills, the rice trade and renting land for sugar cane and even planting rice. This capital can reach up to Rp. 400 million per operation, especially in buying, milling and selling rice.

The major problem with this flow of large amounts of capital to the villages is that the local or village rice mill operators and traders cannot compete with the rice buyers and mill operators with access to large amounts of financing. In two cases these funds are creating problems for the indigenous rice mills and the krupuk (shrimp cracker) industry.

Table 17. Capital Flows in the Villages, 1987

Villages	Village Sources for the Village	Outside Sources for the Village	Village Sources for Outside the Village
Central Java:			
Kebanggan	None	Increasing	None
Wonoroto	Increasing	Increasing	Increasing
Rowosari	Increasing	Increasing	Increasing
Banyutowo	None	Increasing	None
East Java:			
Gemarang	Increasing	Increasing	Increasing
Geneng	Increasing	Increasing	Increasing
Sawo	None	Increasing	No Information
Jetis	None	Increasing	No Information
Sidomulyo	Increasing	Increasing	No Information
Junwangi	Increasing	Increasing	Increasing
Janti	Increasing	Increasing	Increasing
Tangulwetan	Increasing	Increasing	Increasing
Sukosari	None	Increasing	None

Source: Resurvey of the villages, September 1987.

However, there has also been a major increase of funds flowing from village sources to village industry and trade. In eight of the thirteen villages during the last five years, there has been a rapid increase of village funds for village activities. These funds, which come from village entrepreneurs who are setting up productive activities, have had a substantial impact on employment. Examples are the roof tile and rice mills in Wanarata Village, the brick and roof tile industries in Geneng Village, shops and rice mills in Rowosari, and tools in Sukosari.

In addition, in seven of the resurveyed villages capital flowed out of the village but not in large amounts. It was primarily for buying and/or renting land, rice mills and the rice trade.

4.2.2 Credit Sources

For at least fifteen years the government provided farmers with rice production credits through various forms of the BIMAS program. Two or three years ago this loan program was discontinued. During this resurvey, not one person complained about the discontinuation of this program, which indicates that most of these farmers have sufficient capital to purchase the necessary inputs for the high yielding rice varieties. In fact, with the major increases in rice production, there is substantially more capital in the villages for supporting production and consumption, as evidenced by continuing increases in fertilizer use.

However, closing down the BIMAS program does not mean the government is not providing credit to rural villages. Rather, credit is being given in different forms. The formal credit programs channeling funds to the villages are the Kupedes program by Bank Rakyat Indonesia (BRI), the KUT program credit to farm enterprises, and the subdistrict level BKD (Bank Kredit Desa in Central and East Java) and KURK (East Java) programs.

The BRI is providing credit at the village level through the Simpedes and Kupedes programs. The Simpedes is a savings program which has quickly expanded, with surplus funds coming primarily from people in the cities. The Kupedes is becoming rather well known in these rural villages, especially among the traders and businessmen. In Janti Village twelve businessmen have borrowed from Rp. 500,000 to Rp. 2,000,000 from the BRI.

The BKD program provides credit in amounts ranging from Rp. 10,000 to Rp. 200,000 and there are a relatively large number of borrowers. However, this credit is not being used for local enterprise development, but rather for small traders. The Kredit Candak Kulak (KCK) program, which is channeled through the KUD (Village Cooperatives), is not functioning in the resurveyed villages.

Funded by the BRI and other government banks, the KIK (Kredit Investasi Kecil or Small Investment Credit) and the KMKP (Kredit Modal Kerja Permanen or Permanent Working Capital Credit) programs are better able to have an economic impact at the village level. They provide loans of Rp. 5 to Rp. 20 million to businessmen in the villages who are capable of making productive investments.

Informal credit programs with high interest rates are being carried out by individuals from both the urban and rural areas. These private lenders were present in all of the resurveyed villages. They provide loans to rural villagers at rates of more than 40 percent per month. Many of the borrowers are the poorer villagers.

4.3 VILLAGE COOPERATIVES

In all of the resurveyed villages the village cooperatives have declined in terms of activities and influence in the last five years. The activities which have declined are supply of agricultural inputs, e.g., fertilizer; purchases of food commodities (only in Sawo Village are they still important); savings and loans which include the KCK program; and rice milling which has been somewhat constant but only as a miller for traders (Table 18). In twelve of the resurveyed villages the cooperatives mill the rice of private traders who will then use the cooperative's quota to sell to BULOG, thus giving the cooperative a commission of Rp. 3 to Rp. 6 per kg.

The only activity that may have increased is the support of the Tebu Rakyat Intensifikasi (TRI), the sugar cane planting program.

Table 18. Activities of the KUD in the Resurveyed Villages, 1987

Village	Coop. in Village	Activities						Coop. Change in Last 5 Years
		Rice	PR	KCK Mill	TRI	KSP	Others	
Central Java:								
Keganggan	No	Yes	None	Dec.	None	Dec.	-	Decrease
Wonoroto	No	Yes	None	Dec.	None	Stable	-	Decrease
Rowosari	Yes	Yes	None	Dec.	None	Stable	PLN	Decrease
Banyutowo	No	Yes	None	Dec.	Yes	n.a.	-	Decrease
East Java:								
Gemarang	Yes	None	None	Dec.	Yes	Dec.	-	Decrease
Geneng	Yes	Yes	None	Dec.	Yes	n.a.	-	Decrease
Sawo	No	Yes	Yes	Stable	Yes	Inc.	-	Stable
Jetis	No	Yes	Yes	Dec.	Yes	Stable	-	Decrease
Sidomulyo	Yes	Yes	None	Dec.	Yes	Stable	-	Decrease
Junwangi	No	Yes	None	Dec.	Yes	n.a.	-	Decrease
Janti	No	Yes	None	Dec.	Yes	n.a.	-	Decrease
Tanggulw.	No	Yes	None	Dec.	Yes	Inc.	-	Decrease
Sukosari	Yes	Yes	None	Stable	None	Inc.	-	Stable

Source: Resurvey of the villages, September 1987.

5. SOCIAL FACTORS LEADING TO URBAN MIGRATION

A combination of factors has promoted the movement of rural workers to towns and cities. First, the brown plant hopper disaster forced villagers to go to the cities looking for work. Later, they were able to establish links with persons in these urban areas so that it was relatively easy for others to follow them. There has been a transportation revolution in rural Java with good roads and cheap bus services in all the villages, at least in the lowland areas. Information on the urban areas is also now readily available because most villagers have radios and many have TV sets. Last, the government has been very active in promoting education in rural villages and many young people have been able to get the necessary degrees for employment in urban areas. These factors have worked to change the aspirations of the young people of lowland Java toward better paying jobs in cities and towns.

5.1 IMPROVED TRANSPORTATION

Perhaps of more importance than the Green Revolution for Java is the transportation revolution. In the past very few rural villagers would leave their villages but during the last twenty years there have been major improvements in the road networks and the availability of trucks and buses in the villages of Java. It is possible for villagers to travel cheaply on a daily, weekly or seasonal basis to centers with factory jobs, construction work, service jobs and agricultural employment throughout Java. Now almost everybody is traveling throughout Java.

In 1969 ten of the resurveyed villages were randomly chosen for their location in major rice producing areas with good irrigation facilities. At the time of the selection all of these villages were obviously rural and rather isolated from urban areas. Yet by 1987 ten of the villages were within 2 to 32 km of major towns and cities on Java and from 0 km to 100 km of an industrial area (see Table 19). Two could be classified as being swallowed by expanding urban areas and eight are very close to urban areas. Further, all of these villages are near a highway and all have year-round access by vehicles. It is thus very easy and inexpensive for villagers to travel from the village to either a nearby town or a distant city. In almost all of these villages, public transport is always available. Only in Wanarata would the villager have to walk several kilometers or get a ride from a friend to reach the highway to get a bus.

Table 19. Distance of Resurvey Villages from Urban Areas and Roads, 1987

Villages	Distance From Major City/Town (Km)	Distance From Industrial Area (Km)	Distance From Highway (Km)	Road To Village (Type)
Central Java:				
Kebanggan	5	5	4	Gravel
Wanarata	17	17	2	Dirt
Rowosari	24	70	6	Asphalt
Banyutowo	2	18	2	Dirt
East Java:				
Gemarang	10	100	0	Asphalt
Geneng	10	90	2	Asphalt
Sawo	22	80	0	Asphalt
Jetis	9	9	4	Asphalt
Sidomulyo	21	7	0	Asphalt
Junwangi	18	17	3	Asphalt
Janti	19	19	11	Asphalt
Tanggulwetan	32	100	0	Asphalt
Sukosari	25	0	4	Asphalt

Source: Resurvey of the villages, September 1987.

5.2 IMPROVED INFORMATION FLOWS

All but one of the study villages have been hooked up to Indonesia's electricity network (see Table 20). Those villages not yet receiving this service have installed diesel generators for electrification and are scheduled to receive electricity in the next year.

Most of this electrification has occurred in the last couple of years. The villagers primarily use it for lighting and security at night, for their color and black and white TVs, and for ironing. Some of the resurveyed villages have begun to use electricity for such economic activities as making shrimp crackers, battery recharging businesses, ice making, and electronic repair shops. It may take several years for the remaining villages to initiate these types of activities.

Table 20. Electricity in the Villages in 1987

Villages	Type Gov/Private	Year Installed	No. of Households	Economic Uses
Central Java:				
Kebanggan	Gov.	1987	21	None
Wanarata	Private	1981	80	None
Rowosari	Gov.	1985	120	Increasing
Banyutowo	Gov.	1987	24	None
East Java:				
Gemarang	Private	1976	120	None
Geneng	Private	1980	220	None
Sawo	Planned	-	-	-
Jetis	Gov.	1987	170	Increasing
Sidomulyo	Gov.	1985	310	None
Junwangi	Gov.	1985	333	None
Janti	Gov.	1982	200	Increasing
Tanggulwetan	Gov.	1986	125	Increasing
Sukosari	Gov.	1987	10	None

Source: Resurvey of the villages, September 1987.

As a result of electrification, every villager in Java, at least in the lowland areas, has regular access to television. Six of the resurveyed villages had at least 100 TV sets and in Junwangi Village there were 200 sets (Table 21). In five of the villages 10 percent or more of the villagers own TV sets. Since many people will watch one set, it is very probable that most of the villagers have access to a TV set. An even higher percentage of households own radios. This access means that the dissemination of information is very rapid throughout Java. Obviously, what is occurring in the cities is immediately known in these villages.

Table 21. Television Sets and Radios in the Villages, 1987

Villages	Television Sets			Radios	
	Number	% of HH	Year*	Number	% of HH
Central Java:					
Kebanggan	62	11	1978	254	44
Wonoroto	170	10	1975	735	41
Rowosari	34	5	1979	210	33
Banyutowo	17	2	1976	70	8
East Java:					
Gemarang	87	5	1976	-	31
Geneng	156	6	1980	314	12
Sawo	21	4	1980	119	21
Jetis	135	17	1980	289	34
Sidomulyo	36	6	1982	62	11
Junwangi	200	39	1980	150	29
Janti	104	20	1978	-	-
Tanggulwetan	135	4	1972	47	2
Sukosari	34	2	1982	41	2

* This is the year the first TV entered the village.

Source: Resurvey of the villages, September 1987.

5.3 EDUCATION

A third revolution in village life is the access to a reasonable education for all of the young people in Java. Every village has a primary school, the youth of every village are within easy traveling distance of a secondary school, and most have access to a high school. Of the resurveyed villages, one had a university (a teachers' training university) and two were within walking distance of universities.

Beginning in the early 1980s, it was apparent to both farmers and agricultural laborers that it was necessary for their children to have an education if they were to qualify for non-agricultural jobs. (Villagers, for example, know that most factory jobs require at least a primary school certificate.) During this resurvey, farmers would often mention education as the first priority for the use of their funds from agricultural activities. Even landless laborers recognized the importance of an education so that their children would qualify for factory employment in nearby cities and towns.

The level of education achieved by persons from these villages is quite high. In one village there were 46 university graduates, another had 38, a third had 20 and a fourth had 15 graduates. In the villages for which information was available, the number of high school graduates ranged from 22 to 875 (see Table 22). Six of the thirteen had more than 100 high school graduates living in the village. The percentage of the population with a secondary school education ranged from 42 in Tanggulwetan to only 3 percent in Sawo. In four of the villages, 25 percent or more of the population had a secondary school degree.

Unfortunately, village statistics do not differentiate between registered villagers who live permanently in the village and those who return only once a year in order to maintain their residence in the village. Therefore, it is impossible to state how many of the educated villagers shown in Table 22 are permanent residents of these villages. In some of the villages, especially those near Surabaya, it may be that most of them are permanent; in the more rural villages, these educated persons may only return infrequently to the village.

Table 22. Level of Education by Percentage of Population in the Resurveyed Villages, 1987

Villages	Grade School (SD)	%	Secondary School (SLMP)	%	High School (SLTA)	%	University/ Academy	%
Central Java:								
Kebanggan	693	24	115	4	115	4	5	.1
Wanarata	4,359	52	415	5	92	1	46	.5
Rowosari	-	n.a.	-	n.a.	-	n.a.	-	n.a.
Banyutowo	734	26	55	2	30	1	2	0
East Java:								
Gemarang	1,287	16	1,022	13	646	8	3	.2
Geneng	1,756	22	386	5	211	3	4	0
Sawo	1,412	60	46	2	22	.9	3	.1
Jetis								
Sidomulyo	292	11	187	7	150	5	4	.1
Junwangi	-	n.a.	-	n.a.	-	n.a.	-	n.a.
Janti	654	27	378	16	431	18	20	.8
Tanggulwetan	984	8	1,374	11	875	7	15	.1
Sukosari	-	n.a.	-	n.a.	55	.9	38	.6

Source: Resurvey of the villages, September 1987.

6. CONCLUSIONS AND PROPOSITIONS

The findings of the thirteen village resurvey suggest that major changes have been occurring in the structure of agricultural labor opportunities in rural lowland Java. Over the past fifteen years, rice production has increased tremendously due to shorter cropping cycles and higher yields. Land is being more intensively utilized which has meant a rapidly increased absorption of labor per hectare. However, at the same time a process of mechanization, generally with simple (appropriate technology) devices, has been occurring. This somewhat slower process has had the effect of decreasing the amount of labor needed per hectare.

Up until the early 1980s in most areas there appears to have been an overall increase in the absorption of labor per hectare. However, as villages have made the transition to new rice varieties, water resources have become abundant and secure, and farmers have become relatively efficient at new cropping systems, thus making further potential increases in labor per hectare much more difficult. By the mid-1980s, in many villages job losses through mechanization appeared to be overtaking job creation through high yielding rice technologies.

Clearly, without the growth of non-agricultural job opportunities, rural employment conditions would have been much worse. Off-farm jobs, however, have become increasingly available, so much so that there appear to be agricultural labor shortages in peak seasons in some areas, despite increased wages for agricultural labor.

Within local communities, employment in village production and trade activities has greatly increased. Employment in local enterprises ranged from 6% to 55% of village employment. Key factors effecting increases in such enterprises include larger numbers of local entrepreneurs, greater attention of village elites to non-agricultural business opportunities, and much improved capital resources and credit availability for local entrepreneurs. Village cooperatives have not been a major factor and in most cases their activities have been declining.

Daily and seasonal migration to towns and cities is the other major opportunity with a potential for absorbing large numbers of village-based laborers. The survey team found evidence of major migrations on both short- and long-term bases. Why these young people prefer working outside agriculture is not totally clear. It does appear that many can find continuous off-farm employment. Some informations also indicated that they seek off-farm employment for gengsi, or to have a higher social standing. Even if they earned less than what they could in farm labor, they still preferred to leave the village and/or work in non-farm employment. These persons have relatively more education and are embarrassed to do farm labor. Yet, in Jetis Village some work outside as sand haulers just because of gengsi.

This migration to urban areas on a daily and seasonal basis does not appear to be a result of work shortages within the villages. Rather, it seems to be that the cities are drawing them away through higher paid and less demanding jobs. As a result of increased mobility due to improved transportation and increased information and educations, the aspirations of the young have clearly changed.

Judging from the numbers of villagers migrating daily to these towns and cities, there appears to be a zone of influence surrounding the major urban areas. This zone may extend for a radius of more than 30 kilometers from the towns and cities. This does not seem like much until one looks at a map of Java and then realizes that most of the lowland villages in Java are within 30 kilometers of a town or city.

The findings of this report are still tentative and need to be further verified. However, to the extent that the study villages are representative of what is occurring in lowland rural Java, the study suggests that it is no longer adequate to approach rural income and employment questions only from an agricultural, village-based production perspective. Javanese villages and village households send increasing numbers of laborers to small towns and larger urban centers. At the same time, towns people invest more in village-based production. These trends suggest that the future of the "rural dynamic" lies in small towns where much of the new employment and capital generation activities are occurring.

PUBLICATIONS OF GENERAL INTEREST
AVAILABLE FROM USAID/INDONESIA

1. A Preliminary View of Indonesia's Employment Problem and Some Options for Solving It, by Robert L. Rucker, October 1985.
2. Demographic Background and Births Averted: Indonesian Family Planning, 1980-1984, by John A. Ross, Terry Hull, Lulu D. Cost, and David L. Piet, October 1985.
3. Public Expenditure Impact: Education and Health, Indonesian Family Planning, by Dennis N.W. Chao, John A. Ross, and David L. Piet, October 1985.
4. A Survey of Private Sector Training in Indonesia, by Grant Cox, November 1985.
5. An Epidemiological Approach to Health Planning and Problem Solving: A Case Study from Aceh Province, Indonesia, by Steven L. Solter, Ali Azir Hasibuan, and Burhanuddin Yusuf, February 1986.
6. Developing Manpower for Indonesia's National Family Planning Program: BKKBN's Experience with Overseas Graduate Training 1983-1985, by Santoso S. Hamijoyo, Thomas R. D'Agnes, and Slamet Sudarman, April 1986.
7. The High Performance Sederhana Irrigation Systems Project, by David M. Robinson, May 1986.
8. The Sederhana Assessment Study for West Java, West Sumatra, North Sumatra and South Sulawesi Provinces, Indonesia, by P.T. EXSA International Co. Ltd., May 1986.
9. Model Farm Program Benefits: The Citanduy Watershed, by Bungaran Saragih, Paul C. Haszar and Harold C. Cochrane, June 1986.
10. A Study of the Grade System (Sistem Nilai): A New Development in Child Growth Monitoring Techniques, by William S. Cole, John E. Hull, Bambang Samekto and Linawati Nesrif, December 1986.
11. Village Kader Study: An Investigation of Kaders in Five West Java Villages, by Mary Judd, with Adriani Sumantri and Haswinar Arifin, June 1987.
12. Natural Resources and Environmental Management in Indonesia: An Overview, by James Tarrant, Ed Barbier, Ronald J. Greenberg, Mary Louise Higgins, Stephen F. Lintner, Cynthia Mackie, Laura Murphy, and Harvey Van Veldhuizen, November 1987.
13. A Preliminary Study of Employment Trends in Lowland Javanese Villages, by William L. Collier, Jr. Gunawan Wiradi, Soentoro, Makali, and Kabul Santoso, April 1988.