

Chapter 12

Agrarian, Agricultural, and Wage Changes in Comal 1905–2012: Trending with the Indonesian Economy

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Abstract

This chapter focuses on the changes in population, household, arable land per household, and rice production during 1990 to 2012 in comparison with the changes during 1904 to 1990 in the villages of Pesantren and Karang Tengah. Rice production increased dramatically until 1990 because of the introduction of high-yielding varieties (HYVs), fertilizers, and pesticides. Meanwhile, rice production fell during 1990 and 2012. This was partly the result of the abolition of the Soeharto-era *Tebu Rakyat Intensifikasi* (TRI) program that obliged farmers to plant sugarcane and rice. During 1990 and 2012 land and labor productivity increased somewhat, partly because of mechanization and the use of fertilizers and pesticides (including herbicides). Farmers relied on more family labor rather than hired labor. The wage rate increased from 1990 to 2012, with the real wage rate rising constantly for the period.

This fact is consistent with the decrease in the use of hired labor and the growth of labor-saving businesses such as *sengon* tree planting in mountain slopes or marginal lands, and sugarcane planting as a niche business.

The macro-economic changes in the last three decades show characteristics of de-industrialization, stagnation of manufacturing and agriculture, and development of the tertiary sector (both in employment and production) and nontradable goods. These phenomena are consistent with the findings in Comal, such as the development of the tertiary sector, the rise of the informal sector, and de-agrarization.

Keywords: agricultural production, hired labor, wage rate, labor-saving businesses, de-industrialization, primary commodity exports

12.1 INTRODUCTION

Previous chapters have shown the notable changes that took place in Comal during the last two decades. Among these, first is de-agrarization, in which households with agricultural land now only comprise 20% of the 1,000 respondent households (Chapter 3); second, the increase in employment opportunities in the tertiary sector, such as trade and service, and transportation (Chapter 6); third, the growth of informal sectors such as small and micro businesses (bakery, construction, and trade) (Chapters 6); fourth, the development of labor-saving businesses such as *sengon* tree planting in mountain slopes (Chapter 4) or marginal lands (Chapter 8); and fifth, the development of sugarcane production as a side business (Chapter 5).

These changes may be mutually related and may have been influenced by the changes in the macro economy. In the primary sector (agriculture, forestry, and fishery), some businesses are active, such as *meranti* trees (Chapter 11). However, sugarcane production became a niche business rather than the main business that it was during the colonial era in 1904–1905 as noted in van Moll and ‘sJacob’s study or before the great recession in 1930, as well as during the

Soeharto era when the government supported through the TRI (*Tebu Rakyat Intensifikasi*, or intensive people's sugarcane planting program) (Chapter 5).

On the other hand, rice farming remains important to the rural economy in Comal. Changes in rice production, productivity, and labor absorption have a big impact on the rural economy. How do the conditions in rice farming and production during 1990 and 2012 compare with those during 1905 and 1990? And what about the change in agricultural workers' wages? The fourth change—the development of labor-saving businesses—will have an impact on the wage rate: it can be assumed that the wage rate will improve along with the growth of labor-saving businesses.

How does Comal play into the macro economy? In this study, the author will explain the macro-economic changes that have impacted on Comal area's social economy in the last two decades since 1990, and how these have followed the trend of industrialization and de-industrialization, an increase in the production and employment of tertiary sector, the dominance of the informal sector, and the relationship between the primary commodity export sector (oil palm and coal) and the nontradable goods sector.

12.2 DEVELOPMENT OF AGRICULTURE AND CHANGES IN LABOR ABSORPTION AND WAGE RATES

12.2.1 Changes in Population, Household, Agricultural Land, and Rice Production in Karang Tengah and Pesantren

Mizuno (2001: 172–176) has shown the rice farming production in the villages of Karang Tengah and Pesantren from the viewpoints of ricefield and agricultural field per household, rice production, rice output per person, labor productivity, and labor input with data from 1988–1990 compared with data in 1904.

Table 12.1 shows the changes in population, household, area of ricefield, agricultural land, and rice production during 1988–1990 and 2010–2012, in comparison with the change in 1903–1905 and 1988–1990.

Table 12.1 Changes in population, area of ricefield, agricultural land, and rice production in Karang Tengah and Pesantren 1903–1905, 1988–1990, and 2010–2012

	Karang Tengah			Pesantren		
	1903– 1905	1988– 1990	2010– 2012	1903– 1905	1988– 1990	2010– 2012
Persons	549	2,520	3,332	1,118	7,132	12,699
Household	111	482	882	224	1,426	2,612
Persons per household	4.9	5.2	3.8	5	5	4,9
<i>Sawah</i> (wet rice-field) (ha)	58.6	57.4	57.4	165.7	266.7	271,5
<i>Sawah</i> per household (ha)	0.53	0.12	0.07	0.77	0.19	0,10
Agricultural land plus fish pond (ha)	65.2	57.4	57.38	172.1	823.2	1071,5
Agricultural land and fish pond per household (ha)	0.59	0.12	0.07	0.76	0.34	0,41
<i>Beras</i> (milled rice) output (kg)	106.8	282.1	266.5	301.9	982.9	734,8
<i>Beras</i> output per person (ton)	194.5	111.9	80	270	137.8	57,86

Note: 1. Figures in lines 1 to 7 are for 1903, 1988, and 2010; 2. Figures in lines 8 to 9 are for 1905, 1990, and 2010.

Sources: 1903–1905 figures give in lines 1, 2, 4, 6 are from van Moll and ‘sJacob (1913b), 1988–1990, 2010–2012 are from official records in each village

Table 12.2 shows the annual growth rate on the data shown in Table 12.1 in the two villages in 1988–1990 and 2010–2012, in comparison with those in 1903–1905 and 1988–1990.

Table 12.2 Annual growth rate in population, area of ricefield, agricultural land, and rice production in Karang Tengah and Pesantren in 1903–1905, 1988–1990, and 2010–2012

Village	Karang Tengah		Pesantren	
	1903–1905	1988–1990	1903–1905	1988–1990
Years	1988–1990	2010–2012	1988–1990	2010–2012
Persons	1.81	1.28	2.20	2.66
Household	1.74	2.78	2.20	2.79
Persons per household	0.07	-1.42	0.00	-0.01
<i>Sawah</i>	-0.02	0.00	0.56	0.08
<i>Sawah</i> per household	-1.73	-2.42	-1.63	-2.70
Agricultural land plus fish pond	-0.15	0.00	.000	1.21
Agricultural land per household	-1.86	-2.78	-0.94	0.86
<i>Beras</i> output	1.15	-0.26	1.40	-1.31
<i>Beras</i> output per person	-0.65	-1.52	-0.79	-3.87

Note and sources: the same with Table 12.1

Table 12.1 and Table 12.2 show that the population increased in both villages and more notably so in Pesantren. The rate of population growth in Pesantren in 1988–1990 and 2010–2012 increased to 2.66%, from 2.20% for the period 1903–1905 to 1988–1990. On the other hand, in Karang Tengah, the growth rate decreased to 1.28% from 1.81% during the same periods.

The population growth rate in Karang Tengah is somewhat similar to that of the entire Java Island, i.e., 1.49% for 1903–1905 and 1990, and 1.02% for 1990 and 2012. The population growth rate was higher in Pesantren because the village has always had a frontier, which is the

new plain created by the alluvial soil that the Comal River carried, as discussed in Chapters 1 (Pujo Semedi) and 2 (Schaik).

On the other hand, the number of households grew faster than the growth of the population, that is, in Karang Tengah, where the number of households grew by 2.78% while population growth was at 1.28%. The number of household members decreased clearly from 5.2 persons in 1988/1990 to 3.8 persons in 2012, which may be partly because of the decrease in the number of children. Kano (Chapter 3) adds the factor of outmigration among the youth.

This process hastened the decrease in agricultural land per household at Karang Tengah, from 0.12 hectare per household in 1990 to 0.07 hectare in 2012 (both in ricefields and whole agricultural lands).

This story was somewhat different in Pesantren, where the number of household members decreased slightly from 5.0 to 4.9, while the area of ricefield per household decreased from 0.19 hectare to 0.10 hectare. However, agricultural land-holdings, including fish ponds, increased from 0.34 hectare to 0.41 hectare.

The production of rice decreased during the time, from 282.1 kilos in 1988–1990 to 266.5 kilos in 2012 at Karang Tengah, and from 982.9 kilos in 1988–1990 to 734.8 kilos in 2012, in Pesantren. This decrease in rice production was the consequence of the abolition of the TRI program, which had conscripted all rice farmers. The program implemented the rotation system of planting among sugarcane, wet rice and secondary crop such as soybean on the ricefields. But when the TRI was scrapped, many of the farmers did not plant sugarcane and rice; instead, they planted red onion and chili, while others made bricks out of the clay in ricefields. Hence, rice production in the two villages fell, causing the sector to stagnate.

While rice production decreased, however, the productivity of ricelands increased slightly. Table 12.3 shows the changes in rice production among sample households in the two villages. In Karang Tengah, rice land productivity increased from 1,846 kilos in 1990 to

2,367 kilos in 2012. In Pesantren, rice production per hectare increased from 1,721 kilos in 1990 to 2,922 kilos in 2012.

For 1990, results of the survey by authors in 1990. For 2012 results of the survey by authors in 2012.

Table 12.3 Rice production per hectare (milled rice) in Karang Tengah and Pesantren in 1903–1905, 1988–1990, and 2010–2012

Years	1903–1905		1990		2012	
Season	Rainy Season	Dry Season	Rainy Season	Dry Season	Rainy Season	Dry Season
Karang Tengah	935	837	1,846	1,549	2,367	1,933
Pesantren	935	837	1,721	2,709	2,922	690

Sources: For 1903–1905, van Moll and ‘sJacob (1913b)

12.2.2 Rice Farming Management in Karang Tengah and Pesantren in 1903–1905, 1990, and 2012

This section discusses the management of rice farming from the viewpoint of cost composition—seeds, fertilizer, pesticide, and labor—by comparing data in 1903–1905, 1990, and 2012.

Table 12.4 shows the production costs for a one-time crop per hectare of ricefield, and the share of the production costs to the total production values in 1905 and 1990 in the survey area in Comal.

During the time of van Moll and ‘sJacob in 1903–1905, there was almost no use of fertilizers, but farming was labor intensive. Other costs (“Others” in the table) in Table 12.4 for 1905 included the cost of seeds (2.5 florin) and contributions to festivals and gifts (3.5 florin), specifically for the *slametan* (communal feast), offers (Muslim religious sacrifice) and the *zakat* (Muslim religious tax). The use of labor will be discussed later, but the extent was quite clear, for example harvest laborers who got 1/5–1/8 of the amount of paddy they themselves harvested. According to

van Moll and 'sJacob (1913a: 36–37), the use of labor expressed in the wage rate (including unpaid family labor) was around 30.30–42.40 florin; on the other hand, the paid wages came to 24.54–31.94 florin per *bouw* (0.7-hectare ricefield) for one crop.

In 1905, there were many varieties of the rice seeds. Van Moll and 'sJacob (1913a: 27) cited 20 local varieties and their respective productivities. The colonial government had made efforts to collect local varieties and create better varieties in the 20th century, but it was only in 1905 when the Buitenzorg Agricultural Experiment Station (*Het Proefstation voor den Landbouw te Buitenzorg*) was set up, followed by the Buitenzorg selection garden in 1908 (Graaf et al. eds., 1918: 523). Several new varieties were created especially after 1928 (Meutlen, 1932/33); hence all varieties mentioned by van Moll and 'sJacob (1913a: 27) were real local varieties.

The use of fertilizers was not mentioned at all by van Moll and 'sJacob (1913a), although there were detailed descriptions of tillage, agricultural wages, and production costs. At least the farmers appeared to have incurred no expense for fertilizers. According to Meutlen (1932–1933), the Buitenzorg Agricultural Experiment Station started discussing the use of fertilizers, both chemical and green manure, only in 1918. Many studies on green manure were conducted and some experimental chemical fertilizers were tried in 1924 in Central and East Java (Alphen, 1925/26) Some chemical fertilizers were supplied in collaboration with Volkscredietbank (People's credit bank), but the trial could not continue because of the Great Depression (Van Der Kolff, 1935/36). Thus we can conclude that farmers did not use fertilizers in 1905. Also, in 1903–1905, there were no reports citing mechanization.

Table 12.4 Production costs for one-time crop per hectare of ricefield, and the share of the production costs to total production values in 1905 and 1990 in the survey area

	Comal 1905		Comal 1990	
	Value (florin)	Percentage	Value (rupiah)	Percentage
Production Cost				
Fertilizer	0	0	110,624	16.19
Pesticide	0	0	43,192	6.32
Labor	39.8	41.8	195,601	28.63
Others	8.57	9.0	5,000	0.73
Total Cost	48.37	50.81	354,417	51.87
Production	38.97 picul dried paddy		3,416 kg dried <i>gabah</i> (unhulled rice)	
Price	2.5 florin/picul		200 rupiah/kg	
Gross production value	95.20	100	683,286	100
Farmer's income	46.83	49.19	328,869	48.13

Note: The production in 1905 was in terms of (*padi*) or dry stalk harvested rice (*padi gagang kering giling*). The production in 1990 was in terms of *gabah kering giling* or dried unhulled rice.

Sources: For 1905 data from van Moll and 'sJacob (1913a) were processed; for 1990 data from Tanaka (1994: 148–149) were processed

In 1990, as Table 12.4 shows, production had increased, thanks to the government policy to adopt beginning in the 1960s the high-yielding varieties (HYV) of rice to increase production. In 1990, all farmers surveyed used HYVs such as IR 36, IR 46, IR 64, and Cisadane. One of the reasons why HYVs can produce more is that they are highly responsive to the use of fertilizers. HYVs can accommodate the intensive use of fertilizers while producing high yields; on the other hand, local varieties

would fall down if subjected to the aggressive use of fertilizers. On the other hand, heavy use of chemical fertilizers made the rice vulnerable to harmful insects, which then compelled farmers to use pesticides. These were evident in the field survey: Heavy use of chemical fertilizers required as much use of pesticides. In turn, these costs ate into labor wages. As will be discussed later, more family members were being mobilized to work in the farm rather than paid labor. Also, agriculture was increasingly becoming mechanized, with the hand tractor growing more popular among the farmers. At the time the ricefield was used both for rice farming and sugarcane cultivation, so quick work with the plough was essential.

Table 12.5 Production costs and their share to the gross production value in Karang Tengah and Pesantren for the 2011–2012 rainy season

	Karang Tengah		Pesantren	
	Value (rupiah)	Share (%)	Value (rupiah)	Share (%)
Production costs				
Fertilizer	969,163	6,71	2,162,361	11.38
Pesticide	711,139	4,92	845,331	4.45
Labor	4,727,627	32,74	6,763,873	35.61
Others	336,690	2,33	988,482	5.20
Total costs	6,744,619	46,71	9,216,650	48.52
Production	3,610		4,643	
Price	4,000		4,000	
Gross production value	4,440,529	100	18,993,912	100.00
Farmer's income	7,695,909	53,29	9,777,262	51.48

Note: Production is in terms of *gabah kering panen* or harvested dried unhulled rice.

Source: Authors' fieldwork

Table 12.5 shows the production costs and the share to the gross production value in Karang Tengah and Pesantren for the rainy season in 2011–2012. How about the varieties used? Among farmers in Karang Tengah the *Denok* variety, which was bred by the BATAN (Badan Tenaga Nuklir Nasional, or the National Nuclear Energy Agency), was popular. After the *reformasi*, several organizations, among them the local government such as the *kabupaten*, the Departments of Education, and the Agency of Research and Technology, raced to breed new rice varieties. *Tegalgondo* was another HYV, which was bred by an agricultural experiments center in Central Java Province. During the Soeharto era, Department of Agriculture, working with the International Rice Research Institute (IRRI), took the lead in developing HYVs in Indonesia. The creation of new varieties was concentrated in these institutions during the era.

Some survey respondents revived local varieties such as the *Bang Gendit*. During the Soeharto era, the government made all efforts to promote the HYVs created in these institutions, and to expel local varieties that had existed in 1980s. The prevalence of *Bang Gendit* in the survey area reflects the changes that had been taking place in Indonesia. Local varieties that used to be rejected found their way back to the ricefields. Biodiversity is given attention, and many consumers prefer the local variety to the HYVs.

Fertilizers and pesticides were widely used. This time, herbicides started to be applied increasingly to crops while mechanization proceeded steadily, with the threshing machine now more popular.

Rice farming in the two villages are largely for household consumption. In Pesantren, 62% of production was for the household's consumption; in Karang Tengah it was 83%. The cost of wage labor continues to be important in farm management. The next section will discuss the use of labor.

12.2.3 Changes in Labor Absorption and Hired Labor in Karang Tengah and Pesantren

Table 12.6 shows the changes in labor input per hectare of ricefield according to the seasons, year, and locations.

It shows the decrease in the use of hired labor from 1990 to 2012 in both villages: In Karang Tengah it went down from 1,279 hours per hectare in the 1990 rainy season to 383 hours in 2012, and from 977 hours in the 1990 dry season to 245 hours in the 2012 dry season. For Pesantren, 1,180 hours in the 1990 dry season decreased to 440 hours in the 2012 dry season.

It is generally problematic to calculate the working hours or labor input for rice cultivation because it is difficult to calculate daily work hours put in by family members in rice production, such as water control. On the other hand, the working hours of hired labor are relatively certain because the farmers remember the payment according to the number of working days pegged for hired labor.

Along with the decrease in the use of hired labor, we find an increase in the use of family labor. For example, in Karang Tengah, the amount of family labor for the 1990 dry season was 1,079, while the amount of family labor for the 2012 dry season was 1,639. In Pesantren, the amount of family labor for the 1990 dry season was 360, while the amount of family labor in the 2012 dry season was 718. The phenomenon of peasantization—the increasing use of and reliance on family labor rather than hired labor—had become apparent in both villages.

Thus, it can be said that for the last 22 years, the productivity of rice farming increased slightly, even as the use of fertilizers and pesticides continues to be important. On the other hand, the use of hired labor decreased drastically, even as the share of the cost of hired labor continues to be important. These observations bear out the phenomenon of peasantization.

Table 12.6 Labor input per crop of rice farming per hectare in Karang Tengah and Pesantren in 1903–1905, 1990, 1990, and 2012

Year	1903–1905			1990						2012					
	Family labor	hired labor	Total	Rainy Season			Dry Season			Rainy Season			Dry Season		
Season	Family Labor	Hired Labor	Total	Family Labor	Hired Labor	Total	Family Labor	Hired Labor	Total	Family Labor	Hired Labor	Total	Family Labor	Hired Labor	Total
Karang Tengah	1,149	1,279	1,408	1,149	1,279	2,428	1,079	977	2,056	2,703	383	3,086	1,639	245	1,884
Pesantren	n.a	n.a	1,408	n.a	n.a	n.a	360	1,180	1,540	544	706	1250	718	440	1158

Source: Same as Table 12.3

Table 12.7 shows the changes in labor productivity for rice farming between 1903–1905 and 1990, 1990, and 2012.

Table 12.7 Rice farming labor productivity in Karang Tengah and Pesantren in 1903–1905, 1990, 1990, and 2012 (milled rice (g)/hour)

	1903–1905		1990		2012	
	Rainy Season	Dry Season	Rainy Season	Dry Season	Rainy Season	Dry Season
Karang Tengah	0.66	0.59	0.76	0.75	0.77	1.03
Pesantren	0.66	0.59	n.a	1.17	2.30	0.60

Source: Same as Table 12.3 and Table 12.6

These data were calculated directly from the data presented in Table 12.3 and Table 12.6, hence the deviations, such as the data of Pesantren, dry season in 2012, were found. These deviations in the data notwithstanding, the rough trend of labor productivity increasing on account of mechanization and the use of inputs such as fertilizers, pesticides, and herbicides can be seen. The tractor was already in use in 1990, but the rice threshing machine gained popularity later. Herbicides were not used at all in 1990; today many farmers rely on herbicides to control weeds.

Thus, it can be said that the development of rice farming is one of a capital-intensive orientation rather than a (hired) labor-intensive orientation, although land productivity did not increase rapidly. The most important factor here would be the changes in the level of hired labor. The next section discusses the changes in the wage rate for hired labor, which explains the decrease in the use of hired labor.

12.2.4 Changes in the Agricultural Wage Rate in Karang Tengah and Pesantren in 1903–1990 and 1990–2012

On the wages of the agricultural labor, van Moll and 'sJacob (1913a: 35, 38) mentioned that the price of *padi* per *pikul* of 61,7 kilo was 2,5 guilder in 1903–1905. These conditions were already discussed in Mizuno (2001: 176–180) in comparison with those in 1990, and also in Mizuno (1994: 179–198).

Table 12.8 shows the changes in the wage rate for agricultural hired labor—transplanting, seedling bringing, and hoeing. Women were usually in charge of transplanting. For example, in Karang Tengah, in 1990, work from 7 to 11 in the morning was paid 450 to 500 rupiah plus one meal, or 600 rupiah without a meal. The latter was valued at 100 rupiah, so that the wage for transplanting in Karang Tengah ranged from 550 to 600 rupiah with work in the morning. Although less common, in some cases, the same work was done in the afternoon until 3 or 4 p.m., as was the case in Pesantren in 1990. The latter fetched 1,000 to 1,500 rupiah, and one or two meals (1,000 rupiah plus one or two meals, or 1,500 rupiah and one meal). In Pesantren at the time of survey, transplanting was done only in the morning—for 500 rupiah without a meal, 1,000 rupiah without meal, or 700 rupiah without a meal. Because of the many variations the authors noted this as the wage for transplanting.

In 1904, women carried out transplanting from 6 in the morning until 12 noon. The worker was given 2.5 cents, one meal, tobacco (which was equivalent to 1 cent), and cooked sticky rice. All these came to 10 cents (van Moll and 'sJacob, 1913a: 35).

Table 12.8 Change in the wage rate for agricultural works in 1904, 1990, and 2012 at current prices (unit in 1904: cent, unit in 1990 and 2012: rupiah)

	1903–1905 (cent)	1990 (rupiah)	2012 (rupiah)
Transplanting/women	10 (1/2 day)	500–1,000(1/2 day); 1,100–1,600(1 day)	15,000–40,000
Transporting the seedling male	17 (1 day)	1,000–1,150(1/2 day)	20,000–50,000
Hoeing	13.5 (1/2 day)	1000(1/2 day); 2,000–2,500(1 day)	30,000–65,000

Sources: Data for 1903–1905 from van Moll and ‘sJacob (1913a), and data for 1990 and 2012 from the field survey in 1990 and 2102

Table 12.8 shows the wage rates in 1903–1905, 1990, and 2012. We compare these data using conversion rates to arrive at their values for the respective years, i.e., convert the value in 1903–1905 to that in 1990.

Mizuno (2001, 176) has gleaned the value of 1 cent in 1904 vis-à-vis the value in 1990, from first volume of van Moll and ‘sJacob’s report, which states that the price of *padi* per *pikul* of 61.76 kilo is 2.5 guiders (van Moll and ‘sJacob, 1913a: 35, 38). From this information, it is possible to compare the price of *padi* in the research area in 1904 with its price in 1990, given certain assumptions. First, the price of rice (*padi*) recorded by van Moll and ‘sJacob is taken to mean the price of dry stalk harvested rice (*padi gagang kering giling*). Second, the ratio between *padi gagang kering giling* and *gabah kering gering* is taken to be 100: 76.5 (BPS, 1976: ii). Third, the ratio between *gabah kering panen* and *gabah kering giling* is taken to be 100: 85 (BPS, 1985: ii). Thus, the ratio between *padi gagang kering giling* and *gabah kering panen* is 100: 90. Hence the price

of dry stalk harvested rice (*padi gagang kering giling*) in the survey area in 1903 was 4.05 cents per kilo (250 cents divided by 61.76 kilos).

Meanwhile, during the dry season harvest period in 1990, the price of *gabah kering panen* was approximately by Rp250 per kg. Since in van Moll and 'sJacob's report the value of *padi gagang kering giling* is given as 4.05 cents per kilo in 1903 as mentioned above, the price of *gabah kering panen* must have been 4.5 cents per kilo because the ratio between *padi gagang kering giling* and *gabah kering panen* is 100: 90, again as mentioned above. As a result, the price of Rp250 in 1990 had the same value with 4.5 cents in 1903, and this ratio can be used to convert the value in 1904 to that in 1990.

Thus, we can convert the wage in 1904 for transplanting of 10 cents to the wage for the same task of Rp550 in 1990.

On the other hand, we can calculate the wage rate in 2012 with the price in 1990 using the date of inflation from BPS, which shows the inflation rate every year. So, we can calculate the value of the wage rate in 2012 with the value in 1990.

With these ways we calculated the wage of replanting, transporting, and hoeing in 1903, 1990, and 2012 with the value in 1990.

Table 12.9 Changes in wage rate in 1904, 1990, and 2012, at the constant price in 1990

	1904	1990	2012
Transplanting	555	700–1,700	1,603–4,277
Transporting seedlings	944	1,000–1150	2,131–5,346
Hoeing	750	1,000–2,500	3,207–6,950

Source: Same as Table 12.8

These data show that wage rates in 1990 were not so different from the wage rate in 1904 despite the time difference (from 1904 to 1990). On the other hand, the wage rates in 2012, with the constant price of 1990, differed significantly from the wage rates in 1990.

The increase in real wage rate during 1990 and 2012 may be seen in the amount of rice that could be bought by agricultural wages.

In 1904, female laborers were paid 10 cents for transplanting work. On the other hand, the price of dry stalk harvested rice (*padi gagang kering giling*) in the survey area in 1903 was 4.05 cents per kilo as mentioned above, so a female laborer could buy 2.47 kg of dry stalk harvested rice (*padi gagang kering giling*), which means 1.70 kg of *gabah kering panen*, or 1.46 kilos of *gabah kering giling*, or 0.92 kg of rice.

In 1990, the price of *gabah kering panen* was 200 rupiah; so the wage of females for transplanting (500–1,000 rupiah) work was equivalent to 2.5 to 5 kg of *gabah kering panen*, or 1.4 to 2.8 kilos of rice.

In 2012, the wage of females for transplanting was around 15,000–40,000 rupiah and the price of *gabah kering panen* was around 4,000 rupiah/kg. So, the female labor's wage could buy 3.75 to 10 kilos of *gabah kering panen*, or 1.79 to 5.6 kilos of rice.

For the work of male hoeing, the daily wage was 13.5 cents in 1904, which could buy 3.33 kilos of *gabah kering panen*, or 1.87 kg of rice. On the other hand, the wage in 1990 of 1,000–2,500 rupiah meant 5–12.5 kg of *gabah kering panen*, or 2.8–7 kg of rice. The wage in 2012 was 30,000–65,000 rupiah, which meant 7.5–16.25 kg of *gabah kering panen*, or 4.2–9.1 kg of rice.

These data on wages' worth of rice or their *gabah kering panen* equivalent show the increase in agricultural labor wages.

From these data, we can calculate the yearly growth rate between 1903 and 1990, and between 1990 and 2012 for each task in these areas.

Table 12.10 shows the annual growth rate of wages for these tasks in 1903–1990 and 1990–2012 based on the data shown in Table 12.9.

Table 12.10 Annual growth rate of wage rates in 1904, 1990, and 2012, at the constant price of 1990 (%)

	1903–1990	1990–2012
Transplanting	0.91	4.16
Transporting seedlings	0.15	5.83
Hoeing	1.00	4.96

Source: Same as Table 12.8

In order to calculate the annual growth rate for 1990 and 2012, the medians of the wage for each task were used—for example, for transplanting the wage rate was 700 to 1,700, so the median, 1,150, was used to calculate the annual growth rate.

From Table 12.10, it is clear that during the period 1903–1905 and in 1990, the growth rate was quite low. This is understandable if we remember the period of lower economic growth, for example, from 1930 to 1950, and oversupply of labor (hence high unemployment) in 1990. On the other hand, the annual growth rate from 1990 to 2012 was impressive—more than 7% from 1990 to 1996, and more than 5% from 2002 to 2012—although there was a sharp drop in 1997 and 1998 to almost -13% in 1998. Such macro economic movements can change the situation, such as tightening labor supply-demand conditions. The wage rate in 1990 was thought as that under the condition of labor oversupply.

There are some hypotheses as to why wage rates in the period increased steadily. One such hypothesis is that Indonesia experienced a turning point in the economy, from one with an unlimited supply of labor, or a labor surplus economy, to a labor shortage economy. According to the theory of Lewis (1954) and Fei & Ranis (1964), the wage rate is the average product of labor before the turning point; on the other hand, the wage rate becomes the marginal productivity of labor, and wage increases according to the increase in industrial labor demand after the turning point. But here is not the place to verify the foregoing hypothesis.

In any case, the increase in the wage rate in the survey area from 1990 to 2012 is consistent with the phenomenon of peasanization of rice farming, the development of labor-saving businesses such as *segon* tree planting in mountain slopes (Chapter 4) or marginal lands (Chapter 9), and the growth of sugarcane planting as a side business.

12.3 DE-INDUSTRIALIZATION AND THE DEVELOPMENT OF THE INFORMAL AND NONTRADABLE SECTORS

This section discusses the macro-economic background for the economic changes that have place in Comal in the last two decades.



Figure 12.1 Yearly growth rate of GDP and the manufacturing and agricultural sectors
 Source: Statistik Indonesia (BPS) every year

Figure 12.1 shows that the GDP growth rate during the Soeharto era was more than 7% except in 1997 at the onset of the Asian financial crisis. The growth of manufacturing was around 10% per year, and its growth rate always outstripped that of GDP. On the other hand, the growth rate of GDP was around 5% after *reformasi*. Since 2001 until 2019, the manufacturing growth rate has always trailed GDP.

Hence, we can see the phenomenon of de-industrialization happening since 2001. A stagnant manufacturing sector has not contributed much to the total labor force in Indonesia.

Figure 12.2 shows the changes in employment share to total employment by agriculture, manufacturing, and the tertiary sector along with the change in the production share to total production of those industries.

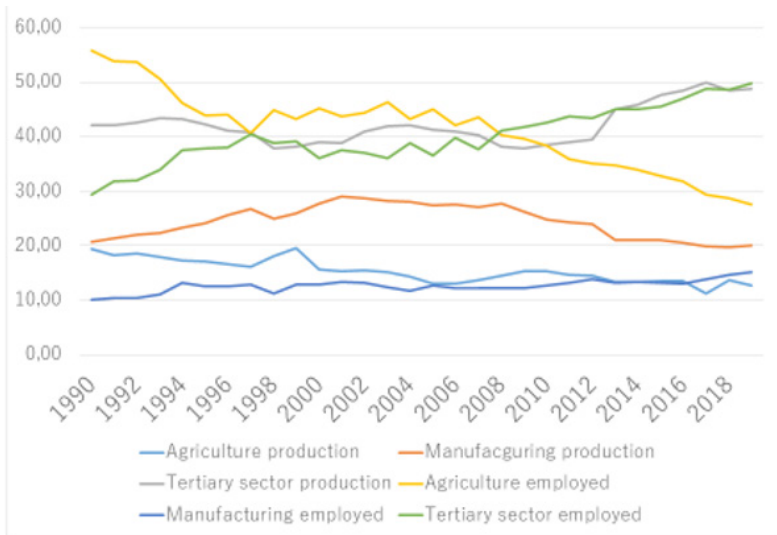


Figure 12.2 Production and employment changes among sectors
 Source: Statistik Indonesia (BPS) every year

Figure 12.2 shows that the share of agricultural production and manufacturing has been stagnant for the last three decades. Notably, the share of manufacturing decreased since 2002 from almost 30% to 20% in 2013 and thereafter; on the other hand, the share of tertiary-sector production increased. With regard to employment, the share of manufacturing has been flat for the last three decades, while the share of agriculture declined during 1990 and 1997 and has been falling since 2008 until today. On the other hand, the employment share of the tertiary sector has been on the rise since 1990 until today.

The phenomenon of de-industrialization has been accompanied by the development of the nontradable goods sector and the stagnation of the tradable goods sector.

Figure 12.3 shows the trend in production share of the tradable and nontradable goods sector.

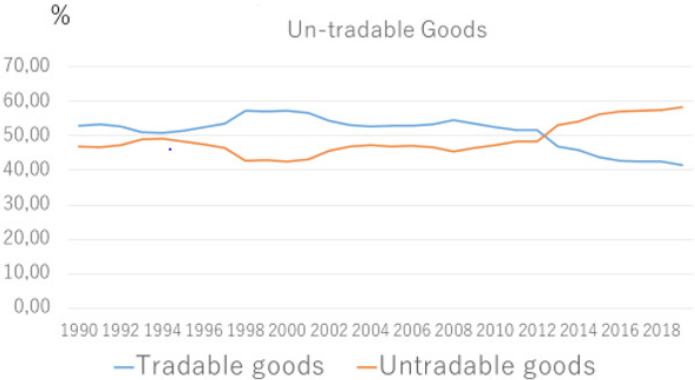


Figure 12.3 Change of the share of tradable goods and untradable goods
Source: Statistik Ekonomi dan Keuangan, Bank Indonesia

Figure 12.3 shows the rising trend of the nontradable goods sector since 2002 until 2019, and the decline of tradable goods. Had Indonesia pursued export-oriented industrialization—the conventional industrialization model in East Asia—the share of manufacturing sector production, manufacturing sector employment, and tradable goods production would have increased. However, that was not the case in Indonesia.

So, what has been the main driver of the Indonesian economy? Among the major industries that have developed since 2002–2003 are the export of oil palm and coal.

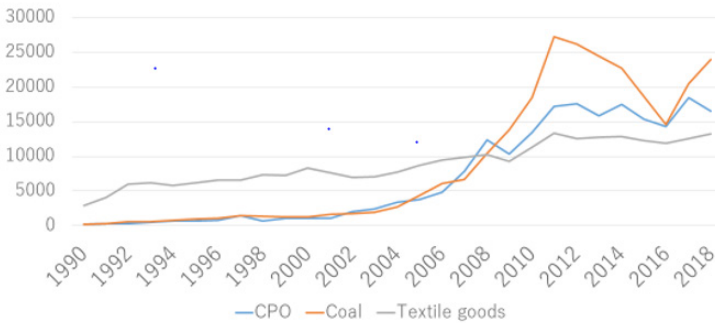


Figure 12.4 Export of CPO, coal, and textile goods in Indonesia
 Source: Indikator Ekonomi, BPS each year/month

Figure 12.4 shows the increase in the export of CPO (Crude Palm Oil), coal, and textile goods. It shows the rapid rise in CPO and coal exports since around 2003, followed by textile goods, whose performance, however, is not as impressive as CPO and coal exports.

De-industrialization, stagnation of the tradable goods sector, and primary commodity export growth remind us of the so-called Dutch disease (Corden and Neary, 1982) since around 2004. Strong exports of CPO and coal have brought considerable income to both the oil palm companies and smallholders (as well as their laborers), and the coal mining industry. The influx of cash boosted consumption, which in turn stimulated the sales of both tradable and nontradable goods, thus causing price increases in these commodities. But while the price of nontradable goods increases on the back of such demands, the price of tradable goods does not, because of the inflow of imported goods. The price increase in nontradable goods stimulates investments in the sector, thus helping it grow further.

Thus, far this paper has shown industrial changes in Indonesia especially since 2003 as characterized by de-industrialization and stagnation of the manufacturing and tradable goods sectors on the one hand, and the growth of tertiary sector production and employment as well as primary commodity

exports. The growth of the informal sector is closely related to the development of the tertiary sector.

12.4 CONCLUSION

In Karang Tengah, the population increased somewhat during 1990 and 2012, but the number of households increased significantly, as agricultural landholdings per household fell sharply. On the other hand, in Pesantren, the population and number of households increased impressively, as did agricultural landholdings, including fish ponds, because of its expanding frontier. Even so, rice production therein fell, as it did in Karang Tengah. This was partly the result of the abolition of the Soeharto-era TRI program that obliged farmers to plant sugarcane and rice.

Rice production increased dramatically until 1990 because of the introduction of HYVs, fertilizers, and pesticides. Meanwhile, land and labor productivity increased somewhat during 1990 and 2012, partly because of mechanization and the use of fertilizers and pesticides (including herbicides). Farmers relied on more family labor rather than hired labor, although the share of wages in for the entire farming management cost remained important.

The wage rate increased from 1990 to 2012, with the real wage rate rising constantly for the period. This is evident in the amount of rice that the wages of hired labor could buy. This fact is consistent with the decrease in the use of hired labor and the growth of labor-saving businesses such as *senon* tree planting in mountain slopes or marginal lands, and sugarcane planting as a niche business.

The macro-economic changes in the last three decades show characteristics of de-industrialization, stagnation of manufacturing and agriculture, and development of the tertiary sector (both in employment and production) and nontradable goods. These phenomena are consistent with the findings in Comal, such as the development of the tertiary sector, the growth of the informal sector, and de-agrarization. Against this backdrop, this chapter points out the development patterns in Indonesia—i.e., not after the conventional East Asian Model of export-oriented industrialization, but, rather, the development of primary commodity exports such as oil palm and coal.

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