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The road to drain or gain: Dutch private investment and economic development in late colonial and early independent Indonesia

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Chapter 4. Impact on the domestic economy

4.1 Introduction

In this chapter I will be focusing on various kinds of linkages between foreign firms and the domestic economy in the Netherlands Indies between 1910 and 1942. It is necessary to start out with the definition of linkages in economic theory. The concept has been elaborated by the economist Albert O. Hirschman.¹ Hirschman distinguishes between four types of linkages: backward, forward, final demand and fiscal linkages. The following section provides a brief theoretical framework as a logical point of departure. I then discuss different areas of the economy in relationship to each of these linkages.²

The first type, backward linkages, occurs when there is investment in the facilities that lead to the creation of a particular project – namely, when goods are produced that make production processes possible for a specific company or industry. If, for instance, the oil industry needs steel pipelines, then that demand can either be met by imported pipes or be produced locally, near the industrial site where they are required. In the colonial context, however, only the latter situation – local production – can be considered a backward linkage. Various locally produced goods represent backward linkages. A private railway for the transport of export goods can also be considered a backward linkage.

Forward linkages, the second type emerge when the output of an industry is used in other industries to manufacture a new product or raise its quality by processing it. For example, if in the rubber industry a remilling factory is established to turn crude rubber into a product with a higher value, then this forms a forward linkage. Most crude oil in the Netherlands Indies was usually refined before being shipped abroad as kerosene, gasoline, lamp oil or other derivatives. Prime examples of forward linkages include the large refineries at Pangkalan Brandan and Palembang in Sumatra, Balikpapan in East Kalimantan and Cepu in Java. One additional positive effect of foreign investment in the colonial state may be that a foreign firm attracts other

¹ According to a more general definition, linkages are relationships and interactions between tasks, functions, departments and organisations that promote the flow of information, ideas and integration in achieving shared objectives, Christian Blind Mission, *Toolkit for DPO's. Voluntary national reviews* (Bensheim: CBM, 2018) 35.

² Hirschman, 'A generalized linkage approach to development, with special reference to staples', 72–73; Albert O. Hirschman, *Essays in trespassing: Economics to politics and beyond* (Cambridge: Cambridge University Press, 1981) 63–75.

Impact on the domestic economy

companies or provides additional work for existing companies in the form of backward linkages.³

Final demand linkages are the third type. They can also be conceived as indirect backward linkages. Final demand linkages result from both backward and forward linkages in the sense that the activities of the foreign firms provide income for workers, which generates new consumer demand. This income is then spent on imports or goods produced by domestic industries. Such economic effects are effectively consumption linkages. Companies pay wages and offer compensation for land use. Such payments can be conceived as final demand linkages.⁴

The fourth type is fiscal linkages. These are the effects of government expenditure as a result of taxes paid by foreign firms. However, the capability and willingness of the government to tax is crucial. Specialized industries such as rubber and oil processing can have important side effects here. The oil industry in the Netherlands Indies generated large profits and could, in principle, provide substantial tax revenues. The state could use such tax proceeds to the benefit of the local economy and society. The results of fiscal linkages are more easily seen in a long-term perspective, such as in the construction of physical infrastructure by the government which might further economic development in the future. The direct influence of fiscal linkages, therefore, is more difficult to measure than backward linkages.⁵

Mining and petroleum companies were often located in enclave economies. An enclave is characterized by the absence of linkages with the surrounding economy, although refineries could possibly generate local demand for consumer goods and construction materials. Even an isolated industry would have had some influence on its surroundings. By passing on

³ Touwen, *Extremes in the archipelago*, 32–33; Hirschman, *The strategy of economic development*, 98–100.

⁴ Melville H. Watkins, 'A staple theory of economic growth,' *The Canadian Journal of Economics and Political Science*, Vol. 29 (1963), 141–158, in particular 145–146; Thee, *Plantation agriculture and export growth*, 50; Touwen, *Extremes in the archipelago*, 32–33; Hirschman, *Essays in trespassing*, 67–71.

⁵ Hirschman, 'A generalized linkage approach to development, with special reference to staples', 72–75; Hirschman, *Essays in trespassing*, 65–67; Touwen, *Extremes in the archipelago*, 32–33; Malcolm Gillis, *Economics of development* (New York: Norton, 1987) 416–418; Booth, 'Foreign trade and domestic development in the colonial economy', 269–272; Alec Cairncross, 'The market and the state', in: Thomas Wilson and Andrew S. Skinner (eds), *Market and the state. Essays in honour of Adam Smith* (Oxford: The Clarendon Press, 1977) 113–134, in particular 130; William Arthur Lewis, 'Development and distribution', in: Alec Cairncross and Mohinder Puri (eds), *Employment, income distribution and development strategy. Problems of the developing countries. Essays in honour of H.W. Singer* (London: Macmillan, 1976) 26–42, in particular 26–29.

skills, technology can be transferred from the enclave to the indigenous economy so that both economies might produce more or less similar products. If the indigenous people obtain entrepreneurial skills and apply them in other industries as well, the effect can be considerable.⁶

4.2 Backward linkages

If there was one industry where linkages should have materialized, it has to be the sugar industry. It was dominated by Dutch capital and in the first quarter of the twentieth century it supplied the most important export crop of the Netherlands Indies. In 1920, sugar represented 49% of the total value of exports from the Netherlands Indies.⁷ At its peak, the industry employed more than one million people.⁸ What was the effect of the influx of foreign capital on infrastructure, in particular irrigation, railways and roads? These works were intended to meet the demands of the sugar estates in the first place, but the indigenous population could benefit as well.⁹ This section discusses irrigation, railways and other infrastructure, supply of fuel and, finally, local activities in Java. Infrastructure could be provided by the state, private business, a public-private combination or local community. I here focus mainly on the second and third category.

Irrigation

Irrigation was crucial for the sugar industry. Around 90% of the sugar cane was planted on fields that needed to be irrigated. A stable water supply and irrigation systems can be seen as a backward linkage of the sugar industry. The indigenous rice production, however, also needed plenty of water and occupied a larger area than sugar. The two crops competed for the water supply and the local government was responsible for providing the indigenous population with enough water. There were several options available to deal

⁶ Booth, 'Foreign trade and domestic development in the colonial economy', 271–272; Lewis, 'Development and distribution', 26–29; H. Myint, 'The "classical theory" of international trade and the underdeveloped countries,' *Economic Journal*, Vol. 68 (1958) 317–337, in particular 320.

⁷ Lindblad, 'De handel tussen Nederland en Nederlands-Indië, 1874–1939', 286–289.

⁸ Bosma, *The sugar plantation in India and Indonesia: Industrial production, 1770–2010*, 159; Lindblad, 'De handel tussen Nederland en Nederlands-Indië, 1874–1939', 286–289.

⁹ Lukman Sutrisno, *The sugar industry and rural development: The development of cane cultivation for export on rural Java: 1830–1934* (PhD thesis, Cornell University, Ithaca, NY, 1980) 1.

Impact on the domestic economy

with this question. During the wet season, irrigation of the rice fields would be favoured. Another option was the day-and-night arrangement:¹⁰ the sugar companies could use the available irrigation water during the morning and the afternoon, whereas during the evening and the night it could be used by the indigenous population. This meant that the indigenous population had to work on the field in darkness, which made it more difficult for them to regulate the water supply and see what they were doing.¹¹

Whether this was a fair system can be debated. Control often remained in the hands of the Dutch authorities. Moreover, there was smallholder sugar cane. This was considered a secondary crop and usually denied water in the dry season, while sugar cultivation on the estates was intensive and, as a consequence, exhausted the water supply. According to Gordon, this was the reason why the production of smallholder sugar cane remained very limited compared to estate production.¹²

Moreover, although the sugar estates only used around one-third of the irrigated sawah area, they still got to use the water supply for half of the time.¹³ Sometimes, the indigenous overseer, or *mandor*, would be paid by the sugar companies to keep irrigation water flowing to the estate lands for a longer time, reducing the water available to the local farmers.¹⁴

Sometimes the local authorities interfered. For instance, the sugar company Pradjekan, in Besuki in East Java, made use of irrigation water from six o'clock in the morning until four o'clock in the afternoon, but if indigenous crops were planted near the sugar estates, this time was reduced to six hours, from twelve to six in the afternoon. If water was scarce, the water supply could also be regulated by a commission installed by the head of local government.¹⁵ In order to make the water supply more efficient, both for indigenous and

¹⁰ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 180; J. Th. Metzelaar, 'Irrigatie', in: C.J.J. van Hall and C. van de Koppel (eds), *De landbouw in den Indischen archipel. Deel I. Algemeen gedeelte* ('s-Gravenhage, Van Hoeve, 1946) 201–238, in particular 217; Knight, *Commodities and colonialism*, 113–120.

¹¹ Sutrisno, *The sugar industry and rural development*, 98.

¹² Alec Gordon, 'The agrarian question in colonial Java: Coercion and colonial capitalist sugar plantations, 1870–1941', *The Journal of Peasant Studies* 27 1 (1999) 1–34, in particular 22; R.E. Elson, *Javanese peasants and the colonial sugar industry: Impact and change in an East Java Residency, 1830–1940* (Oxford: Oxford University Press, 1984) 169.

¹³ W. Huender, *Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera* ('s-Gravenhage: Martinus Nijhoff, 1921) 99–101.

¹⁴ Sutrisno, *The sugar industry and rural development*, 87–88, 101; Aard J. Hartveld, *Raising cane: Linkages, organizations and negotiations in Malang's sugar industry, East Java* (Delft: Eburon, 1996) 49.

¹⁵ NL-HaNa: Memories van Overgave, 1852–1962 (MvO), 116, Besoeki, 1907.

Impact on the domestic economy

foreign private estates, larger reservoirs, or *waduk*, were constructed by both the government and private companies. Through this system, water could be collected and reused.¹⁶ In the early twentieth century, these *waduk* became more popular and it was expected that they would eventually replace the day-and-night schedule and be more beneficial to the indigenous population. However, there were also complaints about the *waduk*. It was difficult for the indigenous planters and the sugar companies to get sufficient water when they were both using the water supply and the sugar companies were often favoured. Moreover, water did also evaporate in the *waduk*. Sometimes, even if there was a *waduk*, the indigenous population and the foreign companies still decided to use the day-and-night schedule.¹⁷

In the residencies of Kedu and Jepara, in Central Java, the amount of irrigation water available was not sufficient, which made it necessary to opt for the day and night system in certain parts of the residencies. During the day, the sugar companies could use the irrigation water and for the rest of the time the indigenous population made use of it. However, in 1931 the provincial irrigation department advised the government to allow the indigenous population to use the water from three o'clock in the afternoon instead of four o'clock. It was stated that the indigenous population could thereby use their land more efficiently, which would lead to a higher yield. The sugar companies complained that this would negatively affect their production and said that the indigenous population had not complained about the previous schedule. The regents agreed with the company and, therefore, thought that adjustments were not necessary. A special commission was created to examine this issue, but failed to provide an answer. Complaints about the *waduk* were voiced in these residencies as well. Yet, the governmental Departement der Burgerlijke Openbare Werken (B.O.W., Department of Civil Public Works) argued that costs for improvements of irrigation systems were too high. In 1930, the irrigation commission came up with a new plan which was less expensive, but the financial position of the government had weakened by this time; in 1931, an experiment with only three *waduk* was initiated. The sugar companies in this area paid f300 in total, while the villages had to pay f900. Results were not yet available when the resident finished writing his report.¹⁸

Nevertheless, for the sugar industry the provision of an adequate water supply was necessary. Although the B.O.W. was responsible for major

¹⁶ Metzelaar, 'Irrigatie', 218; Sutrisno, *The sugar industry and rural development*, 99.

¹⁷ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 180–190, 202; Van der Mandere, *De Javasuikerindustrie in heden en verleden*; Metzelaar, 'Irrigatie', 219–221.

¹⁸ NL-HaNa: MvO, 72, Koedoes, 1932.

Impact on the domestic economy

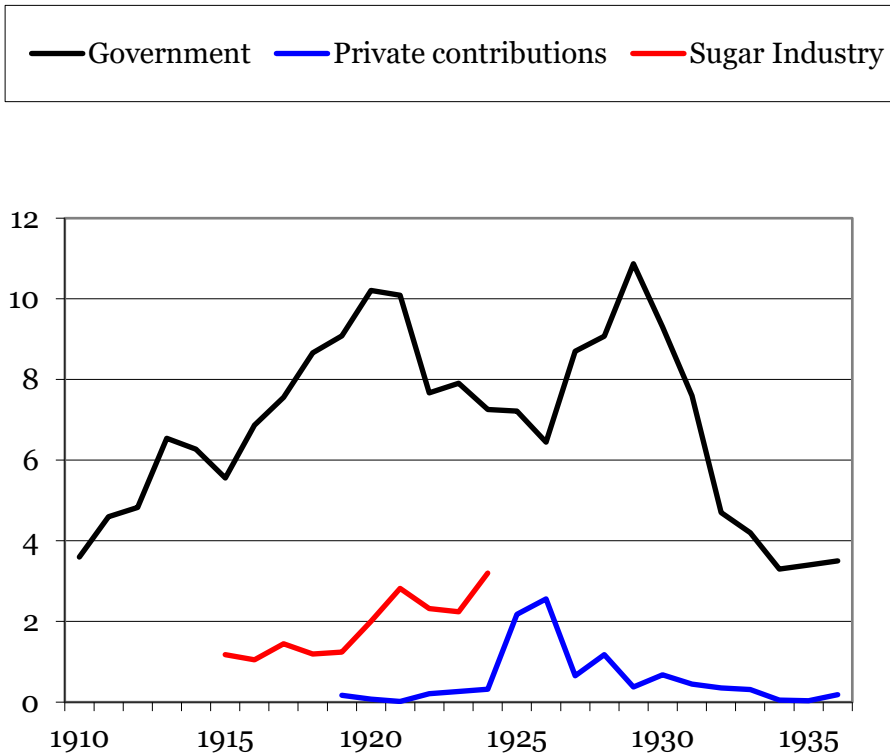
irrigation works in Java, it took until 1918 before the B.O.W. was involved in irrigation in Yogyakarta and Surakarta. In many other parts of Java, private foreign companies remained important for the construction of irrigation works.¹⁹ Between 1919 and 1936, private companies paid at least 7.3% of the expenses for irrigation works that were initiated by the colonial government. Since 1919, the sugar industry was obliged to contribute to these irrigation works. In particular, when the sugar industry was booming during the second half of the 1920s, private outlays on irrigation were substantial. In 1926, 28% of the expenses for government-initiated irrigation projects originated from private contributions. Presumably, the sugar companies were responsible for the lion's share.²⁰ At the end of the 1920s, private contributions fell, and as a result the colonial government had to spend more on irrigation.

¹⁹ Van der Eng, *Agricultural growth in Indonesia*, 51.

²⁰ Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java, 1832–1942*, 5, 355; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 136.

Impact on the domestic economy

Figure 4.1. Total government expenditure and corporate contributions to investment in irrigation, in million guilders, 1910–1936.



Source: Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java, 1832–1942*, 355; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 136.

The older and larger irrigation systems had usually been constructed by the government. However, several newer ones, in particularly those close to sugar factories, such as Pangka in Tegal, Sindanglaut near the city of Cirebon, Gunung Rowo in Pati, Banyuputih in Besuki, Watudakon in Surabaya and smaller irrigation systems in Berbek (East Java), were financed almost entirely by private companies. They are examples of the initiatives that were taken by sugar companies to construct irrigation works. In 1910, a sugar planter wanted to build a factory in Soka in Pejagoan. In order to acquire enough irrigation water, he wanted to create a reservoir. However, several thousands of people had to move and an important road had to be redirected. Moreover, it was expected that the construction of the dam would lead to

numerous problems. Therefore, the government did not grant a permit for this factory.²¹

The contributions from private companies for other irrigation works differed, but for the improvement of irrigation in the Sidoarjo area in East Java, a total amount of f4.5 million had to be paid, of which the sugar companies contributed f1.1 million. For the canal in Madiun, total costs were f2.5 million, and the four surrounding companies paid f485,000 in total. A survey, which was based on 153 factories, showed that during the period 1915–1924, a total of f18.7 million was spent on irrigation by the sugar industry or f12,220 per factory per year.²² This was nearly one-quarter of the total expenditure on irrigation by the colonial government, which amounted to f80.9 million during the same time period (Figure 4.1).

New factories that wanted to expand from the 1920s onwards had to pay at least three-eighths of the irrigation costs and also contribute to the maintenance. The sugar factory Petjangaän wanted to build a *waduk* in 1925 which would cost f300,000 and of which the indigenous population would also benefit, but the company would use only half of the water. This plan was not allowed by the government which shows that the authorities still had a say in the allocation of irrigation water.²³ The local situation was important when deciding whether a concession would be granted or not. In Pati, in Central Java, for instance, a *waduk* called Gembong was finished in 1933 at a cost of f1 million. Two sugar companies, Langsee and Trangkil, each paid f300,000 each. For compensation, the government agreed that both companies could increase their area under cultivation.²⁴

Even though an enquiry about the importance of a *waduk* claimed that no expansion of indigenous crops had occurred after *waduk* were constructed,

²¹ NL-HaNa: MvO, 60, Kedoe, 1912.

²² Knight, *Commodities and colonialism*, 171, 173, 177, 179, 183, 192, 194; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 110–111; J. Th. Metzelaar, *Het wadoekstelsel en zijn waarde voor den landbouw* (Buitenzorg: Archipel, 1932) 70–71, 110–111, 130–131; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 180–188, 202; Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java, 1832–1942*, 5, appendix C, E.

²³ Adriaan Neijtzell de Wilde, *Een en ander omtrent den welvaartstoestand der inlandsche bevolking in de gouvernementslanden van Java en Madoera (de particuliere landerijen uitgezonderd)* (Weltevreden: Visser & Co, 1913); 188; Booth, *Agricultural development in Indonesia*, 78; E.W.H. Clason, 'Economische beschouwingen over de irrigatie op Java en Madoera', *De ingenieur in Nederlandsch-Indië*, Vol. 1 (1936) 1–25, in particular 17; Goedhart, *Eerherstel voor de plantage*, 36; M. van Geuns, *De suikeronderneming Djatiroto en de regeling van het werkcontract op Java* (Surabaya: E. Fuhri & Co., 1908) 8; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 184–188.

²⁴ NL-HaNa: MvO, 538, Japara-Rembang, 1936.

Impact on the domestic economy

the presence of sugar companies and their construction of irrigation works could be beneficial to the indigenous population. The irrigation systems made it possible for both rice and sugar to be planted in the dry as well as the wet season. It provided irrigation water to areas that otherwise would not have been planted, as the example of the sugar company Asembagoes in East Java shows. River water flowing to the sea was pumped back to the fields, not only stimulating sugar cultivation, but also providing plenty of water for indigenous crops.²⁵

The government was more likely to make agreements with sugar companies in East Java if the companies constructed or improved existing irrigation works.²⁶ In Ponorogo, the head of the provincial irrigation department allowed new sugar cultivation if a *waduk* was constructed by the future sugar company. It was considered that the presence of a sugar company would also be beneficial for the indigenous population.²⁷ However, in Probolinggo, the sugar companies had less luck. In 1927, three sugar companies promised to contribute to irrigation works with a total amount of f199,500, but this was deemed insufficient by the director of B.O.W. and the sugar company Oemboel planned to withdraw, even though it initially wanted to contribute f40,000.²⁸ Overall, the construction of new irrigation works and improvement of existing ones show that a backward linkage effect did materialize. On the one hand there was competition for water between smallholders and estates; on the other, estates did make a contribution to financing irrigation works although the state was responsible for the lion's share. However, the financial contribution from the estate sector was usually not large compared to that of the state.

Railways and other infrastructure

Next to irrigation works, railways were highly important for the development of the sugar industry and could offer benefits to the local indigenous population as well.²⁹ Constructing and maintaining railways and roads were partly done by private foreign companies. Paved roads and new bridges

²⁵ Metzelaar, *Het wadoekstelsel en zijn waarde voor den landbouw*, 792; NL-HaNa: MvO, 123, Bondowoso, 1929.

²⁶ NL-HaNa: MvO, 120, Besoeki, 1922; NL-HaNa: MvO, 88, Soerabaja, 1908.

²⁷ NL-HaNa: MvO, 102, Ponorogo, 1930.

²⁸ NL-HaNa: MvO, 115, Probolinggo, 1932.

²⁹ J.H.F. Kohlbrugge, *Is grondverhuur aan suikerfabrieken een zegen of een vloek voor den Javaan?* (Haarlem: H.D. Tjeenk Willink & Zoon, 1909) 21–22; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 186–190, 202; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 110–111, 130.

Impact on the domestic economy

replaced old ones suffering from heavy use by the foreign estates. We need to distinguish carefully between the railways owned by railway companies and those constructed by sugar companies. There were numerous factory lines belonging to sugar enterprises and other plantations spread across Java and Sumatra. Some of these networks, usually with 600 to 700mm gauges, were dozens of kilometres long because they linked cane fields with factories, and then connected up with public railways and tramlines. In 1924, the 171 sugar factories taken together had a railway network with a length of 10,033km. In 1924, the railway companies had 708 locomotives, whereas the sugar companies alone possessed 565 steam and 128 other locomotives.³⁰

Usually, the lines constructed by sugar companies did not cater for the transport of passengers, but company personnel and labourers would be carried in primitive carriages.³¹ The rail traffic was becoming increasingly heavy. The government considered whether railways previously constructed by sugar companies in Bondowoso and Besuki for transport of sugar cane should be replaced or removed to make way for new roads. The sugar companies Tangerang and Pradjekan had already improved their rail lines. Rail lines next to the main roads from Besuki to Mlandingan were in bad condition and could be hazardous. Eventually, some of the earlier railways and roads in Bondowoso and Besuki were indeed replaced or removed to make way for new railways with the same track width. The companies contributed to these new lines as well. The state railway from Jember to Panarukan drew most of its income from the transport of sugar, tobacco, coffee and rubber from estates in Bondowoso and Jember. In Besuki, the road from Sumbergading to Sempol was improved, partly with funding from private companies in 1927 and 1928, but funds were still insufficient to guarantee a safe passable road all year round.³²

In Pasuruan, the condition of the roads deteriorated quickly when the sugar companies harvested the sugar cane and used the roads intensively. This situation persisted until the roads were gravelled again in the new season. Due to the construction of more rail lines by the sugar companies, normal roads remained in better condition for longer. But if the finances of private companies worsened, it was expected that maintenance or construction of new roads would be neglected.³³ Near Pronojiwo a company road was constructed in 1930 that could be used by cars and was connected to the main road leading

³⁰ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 57.

³¹ Wim Ravesteijn and Jan Kop, *For profit and prosperity: The contribution made by Dutch engineers to public works in Indonesia: 1800–2000* (Leiden: KITLV Press, 2008) 111.

³² NL-HaNa: MvO, 123, Bondowoso, 1929.

³³ NL-HaNa: MvO, 112, Pasoeroean, 1924.

Impact on the domestic economy

to companies in three other places as well. In 1929 another road was connected to the main road that would go to a company in the direction of Malang and was used every day by trucks. Thanks to this road the area became less isolated. In order to connect more companies to the main roads it was expected that other companies would contribute as well.³⁴

Sugar companies were responsible for the infrastructure between their factories and the ports. Several railways were constructed in conjunction with sugar plantations. Although it is not always clear to what extent estates contributed to the construction, around 30% of the transported goods were goods for the sugar industry. The profits of these railways, due to cargo transports, were often two to three times as high as that from transporting passengers. The sugar industry also meant good business for shipping companies which transported the sugar.³⁵ Bridges were constructed or improved and made from stone instead of wood and could also be used by the indigenous population.³⁶

In Probolinggo, improvements of the infrastructure took place with the construction of a small railway and the maintenance of village roads connecting the sugar factories and the railway. Hand-carts were rented from the local population for transport over such roads. This activity was a clear example of a backward linkage. It is, however, difficult to assess whether this had a more than marginal effect on the local economy.³⁷

Supply of fuel

For the increasing shipping activities in the archipelago, the supply of coal and oil formed a substantial backward linkage. After goods had been transported from inland to the port, they were shipped abroad. KPM was the largest company in inter-island and overseas shipping and included a large number of ports in the archipelago in its network.³⁸ It was a vertically integrated company, gradually increasing its range of services. In addition to agencies, hotels, port services, loading and unloading facilities, docks and wharfs for repairs and shipbuilding were established. Indigenous entrepreneurs also

³⁴ NL-HaNa: MvO, 115, Probolinggo, 1932.

³⁵ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 148; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 134.

³⁶ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 134.

³⁷ Lindblad, 'Business strategies in late colonial Indonesia', 215.

³⁸ M.G. de Boer, and J.C. Westermann, *Een halve eeuw pakketvaart, 1891-1941* (Amsterdam: De Bussy, 1941) 302; Lindblad, *Between Dayak and Dutch*, 165.

traded with KPM. In Makassar, for instance, local traders tried to sell their products to people on the ships.³⁹

The large KPM vessels usually visited several ports during their trips in order to refuel. The KPM ships used either coal or oil. The growing number and size of the vessels led to a rising demand for these products. It was important for KPM and other shipping companies to have a reliable supply of coal. For this, long-term contracts were drawn up.⁴⁰ In 1903, the coal mining company Pulau Laut was founded on the like-named island near Southeast Kalimantan on the assumption that KPM would buy its coal here. This assumption backfired, since the shipping company only bought 4,000 tons in the second year of operations of Pulau Laut. In 1914, Pulau Laut was sold to the colonial government. In the same year, the Steenkolen-Maatschappij Parapattan (Parapattan Coal Company) was founded in a remote area in East Kalimantan. The pioneer V.A. Cools and the regent of Sambaliung, Datu Ranik, borrowed capital for this investment from KPM. However, the Parapattan company had constant difficulties repaying the loan, and eventually KPM bought the shares back.⁴¹ By 1920, KPM had become the sole owner of Parapattan. It now showed more willingness to invest in it. In 1924, KPM claimed to have already spent f9.3 million making the mine fit for large-scale production. Between 1925 and 1930, total output increased rapidly. In coal mining, competition was fierce and Parapattan enjoyed a more privileged position than Pulau Laut since the former was the sole supplier for KPM.⁴² However, in order to retain its monopoly in the transport of government employees and goods throughout the entire archipelago, KPM from 1931 onwards had to buy at least 100,000 tons of coal each year from the state mines in Sumatra. Therefore, output at Parapattan had to be reduced.

³⁹ De Boer and Westermann, *Een halve eeuw pakketvaart, 1891–1941*, 244–246; À Campo, *Engines of empire*, 347–348.

⁴⁰ À Campo, *Engines of empire*, 378–379.

⁴¹ NL-HaNa: Steenkolenmaatschappij Parapattan N.V., 1922–1955, 1, Annual report 1915, 1–2; J. Thomas Lindblad, 'Westers en niet-westers economisch gedrag in Zuid-Oost Kalimantan, c. 1900–1940', *Bijdragen tot de Taal-, Land- en Volkenkunde*, Vol. 142 (1986) 215–237 in particular 229; À Campo, *Engines of empire*, 387–389.

⁴² J. Baks, 'De steenkolenmaatschappij "Poeloe Laoet" in Zuidoost-Borneo, 1903–1913', in: A.H.P. Clemens and J. Thomas Lindblad, *Het belang van de buitengewesten economische expansie en koloniale staatsvorming in de buitengewesten van Nederlands-Indië, 1870–1942* (Amsterdam: NEHA, 1989) 123–150 in particular 134; Lindblad, 'Westers en niet-westers economisch gedrag in Zuid-Oost Kalimantan, c. 1900–1940', 229–233; J. Thomas Lindblad, 'Strak beleid en batig slot. De Oost-Borneo Maatschappij, 1888–1940', *Economisch- en Sociaal-Historisch Jaarboek*, Vol. 48 (1985) 182–211, in particular 184.

Impact on the domestic economy

Nevertheless, KPM made Parapattan the largest coal mine in Kalimantan. By 1939, an output of 303,000 tons was reached.⁴³

Similar to oil and tin mining, coal mining also gave rise to Western enclaves, but their effect on the local economy was slightly larger than that of oil. They contributed more to local infrastructure, while they attracted large numbers of indigenous workers. Parapattan constructed railways for transport of coal and a wharf for the ships. Similar facilities were established at state mines of Pulau Laut and Ombilin, near Sawahlunto, in West Sumatra. The latter mine proved an important impetus for the construction of port facilities at Emmahaven, now Teluk Bayur, near Padang and a small-gauge railway running 150km from the mine to the coast.⁴⁴ KPM also procured coal from local suppliers. However, this was on a far smaller scale. Although the quality was lower, this coal was usually cheaper than coal from Western-owned mines in the Netherlands Indies, and therefore a welcome supplement.⁴⁵

It is clear that KPM required an impressive amount of coal, but even at an early stage the company was experimenting with oil to empower its ships. Oil was purchased from the Royal Dutch company and other smaller petroleum producers. KPM also transported large machinery, building materials and other equipment for these firms.⁴⁶ As one of the dominant industries in colonial Indonesia, the oil companies also stimulated traffic in ports. Private investment was undertaken in bulk-handling facilities in oil ports in North Sumatra, Palembang, Balikpapan and Tarakan. The infrastructure created by the oil companies only served the specific needs of the industry. Examples include a road constructed to Pangkalan Susu in North Sumatra in 1933, the maintenance of a 450km road network in Palembang, the Manggar airfield outside Balikpapan in 1936, a new highway from Jambi to Palembang in 1938, and roads and an airstrip in Tarakan. Some roads constructed by BPM near Palembang lay close to smallholder activities and were also used by the indigenous population, more so than in Pangkalan Susu or in Tarakan, which were more remotely located. Petroleum companies also contributed to roads constructed by the government. BPM, for instance,

⁴³ NL-HaNa: Steenkolenmaatschappij Parapattan N.V., 1, Annual report 1939, 3; Lindblad, *Between Dayak and Dutch*, 92–95; À Campo, *Engines of empire*, 387.

⁴⁴ De Boer, and Westermann, *Een halve eeuw pakketvaart, 1891–1941*, 409–416; Touwen, *Extremes in the archipelago*, 314.

⁴⁵ À Campo, *Engines of empire*, 385; Baks, 'De steenkolenmaatschappij "Poeloe Laoet" in Zuidoost-Borneo, 1903–1913', 137; Lindblad, 'Ondernemen in Nederlands-Indië c. 1900–1940', 707.

⁴⁶ À Campo, *Engines of empire*, 380–384.

Impact on the domestic economy

supported the construction of a highway between Balikpapan and Samarinda with a length of 110km.⁴⁷

Other backward linkages affected other countries. Equipment for Royal Dutch was largely imported from third countries. Storage tanks and a bridge across the Lapan river in North Sumatra came from Belgium. Equipment for buildings and tools were ordered in Germany. Tin plates and other goods came from England, while rails, locomotives and wagons were constructed at Decauville in France. Increasingly, machines were imported from the United States. However, some equipment was also provided by the Dutch company Stork & Co., and between 1907 and 1940 BPM ordered 150 vessels from Dutch wharfs for the transport of oil.⁴⁸

Local activity in Java

In Java, on the other hand, there was much local economic activity as a direct consequence of the presence of the sugar companies. The local firms often supplied basic products to the estates, such as firewood and bricks. These deliveries provided another f6.7 million of income for the indigenous population in 1924.⁴⁹

The presence of Dutch sugar companies in Java attracted several categories of indigenous craftsmen. Carpenters, masons and smiths found work because of the sugar industry. In Mojokerto and Jombang, the stone and tile industry grew, although indigenous crafts were sometimes replaced by larger foreign companies or imports from Europe. However, this was no consequence of the presence of the sugar industry as such. Home-based industries remained popular as a result of the shortage of formally trained indigenous labourers.⁵⁰

⁴⁷ Lindblad, 'The petroleum industry in Indonesia before the Second World War', 72; Touwen, *Extremes in the archipelago*, 149–150; Lindblad, *Between Dayak and Dutch*, 166; Vincent J.H. Houben, 'The pre-modern economies of the archipelago' in: Howard W. Dick, Vincent J.H. Houben, J. Thomas Lindblad and Thee Kian Wie, *The emergence of a national economy. An economic history of Indonesia, 1800–2000* (Crows Nest, NSW: Allen and Unwin, 2002) 35–55, in particular 38.

⁴⁸ Gerretson, *History of the Royal Dutch*, Vol. 1, 144; Van der Eng, 'Exploring exploitation: The Netherlands and colonial Indonesia 1870–1940', 303; Keetie E. Sluyterman, *Kerende kansen: Het Nederlandse bedrijfsleven in de twintigste eeuw* (Amsterdam: Boom, 2003) 63.

⁴⁹ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 124, 126, 128, 140, 144, 146–160, 174–176; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 135.

⁵⁰ Th.G.H. Stibbe, *Verslag van de Suiker-enquête-commissie* (Surabaya: Suiker-enquête-commissie, 1921) 285–289.

Impact on the domestic economy

Import of heavy machinery from the Netherlands can be seen as a potential backward linkage that failed to materialize. At the beginning of the 1910s, 30% of the boilers used to generate steam power for the sugar industry were constructed in the Netherlands, and their number kept increasing. For various factories specializing in machines, electrical tools and locomotives, manufacturing for the sugar industry was responsible for an average of respectively 50%, 33% and 10% of turnover during the years 1923–1925. In 1924, the export of machines and tools from the Netherlands to the Netherlands Indies was valued at f13.9 million, of which nearly f6 million accounted for the sugar industry alone.⁵¹

To sum up, we have observed different kinds of backward linkages. The most important one was infrastructure, which remained visible and present even after the economic depression of the 1930s and after independence as well.

4.3 Forward linkages

Forward linkages were less present than backward linkages. Here I have briefly described major forward linkages in the late-colonial period. A few examples are given of cases where the output of one industry was directly used in another to create a new product.

In the sugar industry in the mid-nineteenth century, the raw product – sugar cane – was shipped overseas, to be refined in the Netherlands. Later on, this was carried out in the Netherlands Indies itself, using Dutch-made engineering equipment for processing the cane. From the 1920s onwards, when more foreign non-Dutch companies were established in the Netherlands Indies, the import of equipment for sugar refining from Great Britain and the US increased.⁵²

⁵¹ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 116–117; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 124–128, 140, 152; Van der Eng, *Economic benefits from colonial assets*, 13; Lindblad, 'De handel tussen Nederland en Nederlands-Indië, 1874–1939', 257; Lindblad, 'The late colonial state and economic expansion, 1900–1930', 139–140; W.A.I.M. Segers and Petrus Johannes van Dooren, *Changing economy in Indonesia (CEI): A selection of statistical source material from the early 19th century up to 1940. Vol. 8: Manufacturing industry, 1870–1942* (The Hague: Nijhoff, 1987) 16; Stibbe, *Verslag van de Suiker-enquête-commissie*, 299–300.

⁵² Van der Eng, 'Exploring exploitation: The Netherlands and colonial Indonesia 1870–1940', 304; Van der Eng, *Economic benefits from colonial assets*, 13; Jan Aart de Jonge, *De industrialisatie in Nederland tussen 1850 en 1914* (Nijmegen: Socialistische Uitgeverij Nijmegen, 1976) 358; Ravesteijn and Kop, *For profit and prosperity*, 111; S.A. Reitsma, *Gedenkboek der staatsspoor- en tramwegen in*

Impact on the domestic economy

Sugar from Java was also being refined in Japan, and Chinese traders played a key role as intermediaries between the sugar factories and Japanese refineries. Sugar refineries also increasingly processed raw sugar into a more pure and whiter form using the limestone that was locally available. This process was cheaper than refining raw sugar cane, but at the end of the 1920s, exports of raw sugar still exceeded those of processed sugar.⁵³ Overall, the sugar industry remained dominated by private foreign estates, usually with Dutch owners. In Jombang, near Surabaya, indigenous sugar producers also operated a sugar mill in the early 1920s. Initially, these producers wanted to sell their product to foreign companies, but the foreign estates were reluctant to buy, so the indigenous producers decided to refine it for local use only.⁵⁴

The production of sugar in the Netherlands Indies gave rise to a conflict of interest with domestic producers in the Netherlands. Sugar refineries in Amsterdam might have been interested in procuring cane sugar from the Netherlands Indies, but this product competed with domestic beet sugar, and the costs of transporting crude cane to the Netherlands was considerable. The Dutch sugar refinery Wester Suikerraffinaderij, for instance, did show some backward integration, but was not interested in cane sugar from the Netherlands Indies.⁵⁵

Oil

Unlike the sugar industry, in the petroleum industry refining did largely take place in the Netherlands Indies before the product was shipped abroad. As refineries enlarged their capacity, so exports of crude oil declined and that of refined oil increased. In 1910, one-half of the exported oil consisted of crude oil; in 1920, only one-quarter.⁵⁶ The largest refineries were in Balikpapan in East Kalimantan, where oil from Kutai and Tarakan was refined, in Pangkalan Brandan in North Sumatra, at Plaju in Palembang and in Cepu in Central Java. These refineries formed one of the most prominent forward linkages in the Netherlands Indies. Machinery and equipment were largely imported, for instance from the Dutch firm Stork. Moreover, when a new factory was set up by the BPM for kerosene processing in Balikpapan in 1916, visitors even had to sign a non-disclosure agreement out of fear that the specialized technology

Nederlandsch-Indië, 1875–1925 (Weltevreden: Topografische Inrichting, 1925) 80–81.

⁵³ Knight, *Commodities and colonialism*, 29–31, 40–46, 219.

⁵⁴ NL-HaNa: MvO, 88, Soerabaja, 1908.

⁵⁵ Sluyterman, *Dutch enterprise in the twentieth century*, 44; Thee, *Plantation agriculture and export growth*, 126.

⁵⁶ Clemens, Lindblad and Touwen, *CEI. Vol. 12b*, 34–35.

would fall into the hands of competitors. Therefore, there was little impact on the local economy apart from port-related activities like the transport of refined oil to ports from where it was exported. From Pangkalan Susu in North Sumatra, refined oil from the BPM refinery at Pangkalan Brandan was shipped abroad. The transport of unprocessed oil was often inefficient and costly.⁵⁷ Rotterdam became an important location for a refinery for Royal Dutch Shell where further processing took place. This city also played a major role in processing copra and other vegetable oil products for the production of margarine and soap.⁵⁸

Rubber processing

By contrast to the sugar and oil industry, indigenous smallholders were responsible for a significant share of the export of rubber. From an early stage, the colonial government gave priority to improving rubber cultivation, but after 1910 research by foreign private companies played a larger role. Yet there was virtually no interaction between the estate rubber companies and nearby smallholders. In its turn, the government also tried to encourage local processing of smallholder rubber in Palembang and Jambi, which in 1915 led to rubber cooperatives. This encouraged rubber smallholders to process the product into dry rubber sheets, which brought a higher price than the unprocessed rubber slabs containing more water and debris.⁵⁹

⁵⁷ Touwen, *Extremes in the archipelago*, 147–148; Sluyterman, *Dutch enterprise in the twentieth century*, 49; Christopher Anderson Airriess, *A port system in a developing regional economy: Evolution and response in North Sumatra* (PhD thesis, University of Kentucky, Lexington, KY, 1989) 72; Wood, *Intermediate cities in the resource frontier*, 180–181; Sluyterman, *Kerende kansen*, 63; Lindblad, *Between Dayak and Dutch*, 79–83.

⁵⁸ Van der Eng, *Economic benefits from colonial assets*, 9.

⁵⁹ Touwen, 'Voordeel van veelzijdigheid. De economische ontwikkeling van Palembang en Djambi tussen 1900 en 1940', 145; Colin Barlow and John Drabble, 'Government and the emerging rubber industries in Indonesia and Malaya 1900–1940', in: Anne Booth, William Joseph O'Malley and Anna Weidemann (eds), *Indonesian economic history in the Dutch colonial era* (New Haven, CT: Yale Center for International Studies, 1990) 187–209, in particular 201–202; R. Broersma, *Handel en bedrijf in Zuid- en Oost-Borneo* ('s-Gravenhage: Naeff, 1927) 111; Abr. Luytjes, *De bevolkingsrubbercultuur in Nederlandsch-Indië. 2: Zuider- en Oosterafdeeling van Borneo* (Weltevreden: Landsdrukkerij, 1925) 40–42; Ozinga, *De economische ontwikkeling der Westerafdeeling van Borneo en de bevolkingsrubbercultuur*, 263–265; Abr. Luytjes, *De bevolkingsrubbercultuur in Nederlandsch-Indië. 7: Eindrapport: Samenvatting der verschenen publicaties en beoordeeling van den tegenwoordigen toestand* (Weltevreden: Landsdrukkerij, 1927) 1–2.

Impact on the domestic economy

Smallholder rubber was initially exported to Singapore where sheets were produced from the slabs, mostly in Chinese-owned factories. Chinese traders played a major role in the transport of smallholder rubber, which motivated the KPM to try to benefit from this trade as well. The Rubber Union was founded in 1926 and sponsored the construction of four rubber factories in Kalimantan and Sumatra. This initiative was not supported by the colonial government, and the last of the four factories closed their doors in 1931. Nevertheless, with the increasing share of smallholder rubber the processing of rubber took place more often in the Netherlands Indies in factories constructed near the prime rubber-producing areas. By the end of the 1930s, almost all smallholder rubber was processed in the Netherlands Indies before being exported.

Estate rubber was processed locally from the beginning, and only a few technological changes occurred in the estate rubber industry. Smoked sheets of rubber was the product of choice. Unlike the indigenous processing centres, where hand-driven sheeting machines were used, engine-driven machines replaced hand-operated machines in the estate rubber industry. Over time, experiments were made with other types of rubber products and sprayed rubber was produced in Java and in Sumatra, which resulted in rubber in powder form. Latex was also shipped abroad in unprocessed form or in a higher concentration, containing about 60% rubber. The concentrated product was obtained through centrifuging the latex or by adding creaming agents that separated the lighter cream from the heavier skim in the latex. Ammonia or other chemicals were added to prevent coagulation during transport.⁶⁰

Thee Kian Wie argues that the processing facilities of the rubber estates, and those of oil palm plantations as well, were an integral part of the plantations and, therefore, do not present a good example of forward linkage. Tyre companies might be a better case and both the American Goodyear Tire Company and Pirelli from Italy benefitted from the high output of the rubber industry.⁶¹

⁶⁰ Pieter Honig and Frans Verdoorn, *Science and scientists in the Netherlands Indies* (New York: Board for the Netherlands Indies, Surinam and Curaçao, 1945) 347–351; Touwen, *Extremes in the archipelago*, 204–205; J.G.J.A. Maas and F.T. Bokma, 'Rubbercultuur der ondernemingen', in: C.J.J. van Hall and C. van de Koppel (eds), *De landbouw in de Indischen Archipel. Deel III. Industriële gewassen en register* ('s-Gravenhage: Van Hoeve, 1950) 237–426, in particular 357–405, 460.

⁶¹ Frances Gouda and Thijs Brocades Zaalberg, *American visions of the Netherlands East Indies/Indonesia. US foreign policy and Indonesian nationalism, 1920–1949* (Amsterdam: Amsterdam University Press, 2002) 77; Maas and Bokma, 'Rubbercultuur der ondernemingen', 404.

Impact on the domestic economy

After the First World War, the production of various other goods increased in the Netherlands Indies, contributing to self-sufficiency, but a take-off into industrialisation did not occur. The production of paper and paint increased, and in Sumatra an aluminium production plant was established thanks to cooperation between the government and the Billiton company. The aluminium was further processed in Java and could be used for various applications such as electrical wiring.⁶²

Tin smelting was a forward linkage and had great potential to become an important linkage in the Netherlands when demand for tin products for technical uses increased. However, Dutch tin-can manufacturers preferred to import tin plates from Germany and, unfortunately, smelting of tin did not take place on an appreciable scale in the Netherlands Indies. Barely any smelting was done on the island Belitung, whereas on neighbouring Bangka island three smelters were active in 1930. Plans for a central smelter in Java that would serve both Bangka and Belitung never materialized. Most of the smelting of the tin ore from the Billiton company was done by the Straits Trading Company in Singapore, and from 1933 onwards in Arnhem in the Netherlands, and after 1940 even in Texas in the United States.⁶³

Additional examples of forward linkages in other industries can be found for instance in soap factories that used palm oil as the basic raw material. In Batavia, an oil and soap factory was constructed by Unilever. However, such companies can only be considered as rare examples of apparent forward linkages.⁶⁴

⁶² J.H. Boeke, *Indische economie. II: De nieuwe economische overheidspolitiek in Nederlandsch-Indië* (Haarlem: Tjeenk Willink, 1940) 99–101; Th. A. Fruin, *Het economische aspect van het Indonesische vraagstuk* (Amsterdam: Vrij Nederland, 1947) 23–27.

⁶³ Lindblad, 'Business strategies in late colonial Indonesia', 219–223; Allen and Donnithorne, *Western enterprise in Indonesia and Malaya*, 171; NL-HaNa: MvO, 246, Banka en onderhorigheden, 1928; Mary Somers Heidhues, *Bangka tin and Mentok pepper: Chinese settlement on an Indonesian Island* (Singapore: Institute of Southeast Asian Studies, 1992) 15, 182; Touwen, *Extremes in the archipelago*, 88, 137; Sluyterman, *Dutch enterprise in the twentieth century*, 44; Thee, *Plantation agriculture and export growth*, 126.

⁶⁴ Thee, *Plantation agriculture and export growth*, 131; Thee Kian Wie, *Explorations in Indonesian economic history* (Jakarta: Lembaga Penerbit Fakultas Ekonomi, 1994) 101; Goedhart, *Eerherstel voor de plantage*, 320.

4.4 Final demand linkages

Compensation for land use

More significant for the indigenous population were final demand linkages. We will look at compensation for land use, wages of workers and additional indirect benefits for workers. Estimates of the land used by estates and indigenous smallholders vary as observers apply different criteria for measuring land use. It is not always clear if they refer to the entire area of land or only the cultivable part of it. Nevertheless, estimates of the occupation of land by foreign private estates vary between 3% and 8–18% as a proportion of total irrigable land in Java. In East Java, however, sugar estates occupied around 70% of the soil in some villages. A peak occupation rate of 84% of all land was reported for Lower Deli in Sumatra in 1930.⁶⁵

Van der Eng states that arable land occupied by estates in Java gradually dropped from 18% in 1910 to 10% in 1940, whereas in the Outer Islands between the 1910s and 1920s it increased from nearly 30% to slightly more than 45%, which reflects the prosperity in that decade. During the 1930s land use in the Outer Island dropped significantly from nearly 40% at the beginning of this decade to less than 20%. The decline in Java during the 1930s on the other hand was only the continuation of an existing trend. Overall, the share of land that was actually cultivated in the Netherlands Indies was lower. Crops were rotated and with this cycle the land management of villages had to take into account the needs of the sugar estates in the first place. Indigenous food crops, therefore, came in the second place.⁶⁶

⁶⁵ Berkhuisen, *De drainagetheorie voor Indonesië*, 112–113; Karl J. Pelzer, *Planter and peasant: Colonial policy and the agrarian struggle in East Sumatra, 1863–1947* (s-Gravenhage: Nijhoff, 1978) 105; Boeke, *The structure of Netherlands Indian economy*, 83–84; Departement van Landbouw, Nijverheid en Handel, *De landbouwexportgewassen van Nederlandsch-Indië in 1938–1940* (Weltevreden: Albrecht & Co., 1949) 51–53.

⁶⁶ Pierre van der Eng, *Agricultural growth in Indonesia: Productivity change and policy impact since 1880* (London: Macmillan, 1996) 26, 52, 208–215, 283–288; Alec Gordon, *Notes on the transition from colonial to post colonial economic formations in modern Indonesia* (n.p., 1979) 7; Alec Gordon, 'The collapse of Java's colonial sugar system and the breakdown of independent Indonesia's economy', in: Francien van Anrooij (ed.) *Between people and statistics. Essays on modern Indonesian history* (The Hague: Martinus Nijhoff, 1979) 251–266, in particular 254–255; Mubyarto, 'The sugar industry', *Bulletin of Indonesian Economic Studies*, Vol. 5 (1969) 37–59, in particular 45; Boeke and Holmes, *Indonesian economics: The concept of dualism in theory and policy*, 153–155; Jan Jacob van Klaveren, *The Dutch colonial system in the East Indies* (The Hague: Nijhoff, 1953) 150–156;

Impact on the domestic economy

Knight notes that these calculations often overlook a common overlay between planting, harvest and clearing after the leased land had been returned to the indigenous landowners. This argument has been put forward earlier by Geertz. Moreover, in order to prevent the soil from exhaustion, crops were rotated. From April to June nearly twice the 6% of arable land estimated for cane sugar would be occupied by estates, even more if we include fallow land. Only by September did this proportion drop to the average of 6%. During the time most suited for cultivation of food crops by indigenous farmers, less land was available to them.⁶⁷

Java was densely populated and all fertile soil was already occupied either by Western estates or indigenous farmers. This resulted in rivalries between estates and indigenous smallholders about the quality rather than availability of farm land. The occupation of land by estates had a significant impact and hindered indigenous agriculture and economic development. It is likely that the best grounds were occupied by large sugar estates ever since the Cultivation System.⁶⁸ Therefore, the contraction of sugar production in the early 1930s benefitted the local population in the sense that it allowed food crop cultivation to expand. Between 1929 and 1934, the area planted with rice expanded by more than 400,000 hectares, which was accompanied by a decline in the area used for sugar cane. On the one hand, this generated a moderate growth in food crop production, but on the other hand an important source of wage employment for the indigenous population vanished.⁶⁹

Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 68–80.

⁶⁷ Knight, Roger G., 'Did 'Dependency' really get it wrong? The Indonesian sugar industry, 1880–1942', in: J. Thomas Lindblad (ed.), *Historical foundations of a national economy in Indonesia, 1890s–1990s* (Amsterdam: North Holland, 1996) 155–174, in particular 163; Boeke, *The structure of Netherlands Indian economy*, 83–84; Van der Eng, *Agricultural growth in Indonesia*, 217–223; Lindblad, 'The late colonial state and economic expansion, 1900–1930', 135; Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 250; Booth, *Agricultural development in Indonesia*, 44; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 87.

⁶⁸ Berkhuisen, *De drainagetheorie voor Indonesië*, 112–113; Haccoû, *De Indische exportproducten*, 87; Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 299–300; Goedhart, *Eerherstel voor de plantage*, 95–96; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 64, 82, 178; E.G.J. Gimbrère, *Eenige beschouwingen over de financiering van de suikerindustrie en den suikerhandel op Java* (Tilburg, Drukkerij Henri Bergmans, 1928) 39; Booth, *Agricultural development in Indonesia*, 44; Van der Eng, *Agricultural growth in Indonesia*, 283–288, 303–308; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 74–76.

⁶⁹ Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 40, 110; Wim Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java*,

Impact on the domestic economy

Just as with the exploitation of the soil, the extraction of natural resources such as oil, tin and minerals also need to be taken into account. Putman Cramer argues that mining companies were more closely connected with the colonial state than other private companies. Therefore, the state received a sizeable slice of profits. However, it is not clear whether this also included compensation for the permanent loss of such resources for Indonesia. Putman Cramer also states that foreign companies did not exploit the soil because the land would not have been suitable for production anyway. If foreign firms would leave, the cultivable land could still be used for agricultural production.⁷⁰ Initially, Berkhuyzen agrees with Putman Cramer. The largest part of the coal output from government mines was used for domestic purposes and did not leave the colony. For tin, petroleum and bauxite, however, he argues that colonial Indonesia was clearly not compensated for the loss of these replenishable resources. On the other hand, Berkhuyzen asserts that it was of no use to wait with the exploitation of such resources as synthetic production would possibly in the future make exploitation less profitable anyhow.⁷¹

The estates without doubt used a significant amount of arable land. The relevant question here is whether the indigenous population was adequately compensated for the land use by foreign estates or if it was more profitable for indigenous landowners to cultivate their own crops. The positive effect of backward linkages could be lost if estates did not pay enough to compensate for the use of land.⁷²

Land was leased from indigenous landowners, or acquired through arrangements with indigenous rulers in Surakarta and Yogyakarta.⁷³ Outside Java, most concessions were granted by local indigenous sultans, who amassed sizeable fortunes from these concessions.⁷⁴ Foreign estates could not own land and had to lease it from indigenous landowners.⁷⁵ During the sugar

1832–1942 (Delft: Delft University Press, 1997) 274; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 94.

⁷⁰ G.J.W. Putman Cramer, 'De Indische begroting 1923 in de tweede kamer der Staten-Generaal', *De Economist*, Vol. 72 (1923) 186–204; in particular 201–202.

⁷¹ Berkhuyzen, *De drainagetheorie voor Indonesië*, 120–124; Putman Cramer, 'De Indische begroting 1923 in de tweede kamer der Staten-Generaal', 201–202.

⁷² Van der Eng, *The 'colonial drain' from Indonesia, 1823–1990*, 26–28; Boeke, *Economie van Indonesië*, 224–225; Van der Eng, 'Extractive institutions, colonial drain and underdevelopment', 15–16.

⁷³ Van der Eng, *Agricultural growth in Indonesia*, 52, 208–215.

⁷⁴ Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 299; Pelzer, *Planter and peasant*, 86–89.

⁷⁵ Gordon, *Notes on the transition from colonial to post colonial economic formations in modern Indonesia*, 6; Mubyarto, 'The sugar industry', 39; Huender,

Impact on the domestic economy

boom in the 1920s, around 200,000 hectares were being used by sugar companies. More than 80% was rented from around 300,000–400,000 Indonesian farmers who owned on average 0.7 hectares each. Due to the rotation of crops, it was possible that up to two-thirds of the more than 200,000 hectares could not be used by the indigenous population at a certain time.⁷⁶

In accordance with the *Agrarische Wet* (Agrarian Law) in 1870, estates could lease uncultivated land for a period of 75 years. When the number of estates grew, the surrounding village land was used as well and more contracts with local landowners were made.⁷⁷ In 1918 the *Grondhuurordonnantie* (Land Lease Ordinance) replaced previous acts and determined that no more than one-third of the arable land that belonged to a village could be leased to non-Indonesians. Moreover, a minimum rent was imposed on contracts running for more than 3.5 years. This minimum rent was usually higher than what factories had paid before and contracts could be made for a period up to 21.5 years. Long-term contracts were preferred by the sugar companies. The intention was that the payments corresponded to the value of the crops landowners would get if they cultivated the plot themselves.⁷⁸

Even before the introduction of the *Grondhuurordonnantie* sugar companies sometimes faced restrictions. In 1916, sugar companies near Malang (in East Java) wishing to increase their area did not get permission to do so because the food the locals could grow themselves in this area was considered to be too low.⁷⁹ One year later, the resident of Kedu in Central Java stated that the large area of land used by sugar companies could have serious consequences for the rice supply if there was a bad harvest. Therefore, the resident K. Peereboom claimed, it was a blessing that the expansion of the sugar companies was halted and that it was becoming increasingly difficult for existing companies to expand production.⁸⁰ After the introduction of the *Grondhuurordonnantie*, we encounter more examples of estates that could

Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera, 89–91.

⁷⁶ Sutrisno, *The sugar industry and rural development*, 123.

⁷⁷ Creutzberg and Van Dooren, *CEI. Vol. 1*, 24.

⁷⁸ *Ibid.*, 25; Van der Eng, *Agricultural growth in Indonesia*, 217–223; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 114; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 43–53; Elson, *Javanese peasants and the colonial sugar industry*, 184; G.H. van der Kolff, 'Sugar and welfare in Java', in: Phillips Ruopp (ed.) *Approaches to community development* (The Hague: Van Hoeve, 1953) 188–206, in particular 195; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 86.

⁷⁹ NL-HaNa: MvO, 107, Pasoeroean, 1907.

⁸⁰ NL-HaNa: MvO, 61, Kedoe, 1917.

not expand their activities, for instance a cassava plantation owned by HVA in Kediri.⁸¹

However, Gordon argued that in reality the Land Lease Ordinance reinforced the ability of the estates to ensure that they could cultivate the land for an extended time period. He claims that the compensation the landowners received for leasing out their land was too low; this was due to the complexity of the contracts and the fact that landowners usually did not negotiate individual contracts. Boeke confirms that the minimum rent prices, in practice, served as the maximum, but he states that overall rents were up to one-third higher than before the introduction of the Land Lease Ordinance. Gordon also argues that the *grondhuur* was related to the price of local food crops and not to the price of sugar, which widened the gap between world market prices and domestic food prices in Java. However, he fails to mention that sugar prices dropped rapidly in the 1930s, which, if *grondhuur* were linked to sugar prices, would mean a substantial decline in rent for the landowners as well. Moreover, it is likely that landowners indirectly benefitted from the high sugar prices in the 1920s.⁸²

Van der Eng argues that it was more lucrative for landowners to lease out their land to estates than to produce crops on their own in the period after 1930. He calculates that before the 1930s, the average rent that landowners received was lower than the potential value of production if they cultivated the land themselves. In 1921, compensation by sugar estates from *grondhuur* was only around 40% of the minimum potential production, but the tipping point was at the end of the 1920s when it rose to around 100%. Moreover, the cost of hired labour was not included, which meant that, in reality, the total profit for landowners would have been lower if they produced their own crops.⁸³ In

⁸¹ NL-HaNa: MvO, 104, Kediri, 1924.

⁸² Gordon, *Notes on the transition from colonial to post colonial economic formations in modern Indonesia*, 7; W.L. Korthals Altes and Petrus Johannes van Dooren, *Changing economy in Indonesia (CEI): A selection of statistical source material from the early 19th century up to 1940. Vol. 15: Prices (non-rice) 1814–1940* (Amsterdam: KIT, 1994) 97–99; Gordon, 'The collapse of Java's colonial sugar system and the breakdown of independent Indonesia's economy', 254–255; Mubyarto, 'The sugar industry', 45; Boeke and Holmes, *Indonesian economics: The concept of dualism in theory and policy*, 153–155; Boeke, *The structure of Netherlands Indian economy*, 83–84; Van Klaveren, *The Dutch colonial system in the East Indies*, 150–156; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 68–80; Goedhart, *Eerherstel voor de plantage*, 95.

⁸³ Van der Eng, *Agricultural growth in Indonesia*, 215–223; De Wilde, *Een en ander omtrent den welvaartstoestand der inlandsche bevolking in de gouvernementlanden van Java en Madoera*, 102–103; Van der Eng, *The 'colonial drain' from Indonesia, 1823–1990*, 25; Henri van der Mandere, *Wat voor de "suiker" van belang was bij de behandeling der Indische Begroting 1922 in*

the case of the cultivation of other crops that were less exhausting than sugar production, landowners could make more use of their own land for growing of food crops.⁸⁴ In fertile areas where farmers worked efficiently it could be less lucrative for landowners to rent out their land and the difference in yield would be smaller.⁸⁵

Nevertheless, it is unclear to what extent indigenous landowners were forced to lease out their land, and the question remains whether enough compensation was paid. This can be considered as an opportunity cost. The displacement effect in terms of land use and loss of potential income affected economic development unfavourably. One of the reasons for indigenous farmers to rent out land was that they needed cash on short notice.⁸⁶ This argument is brought forward by Elson. Cash would help the landowners to pay for expenses if there was a poor harvest. The fact was that these landowners had few chances of acquiring cash when confronted with a bad harvest.⁸⁷

In 1921, an inquiry was organized into the sugar industry. Various complaints were voiced by indigenous landowners. They were of the opinion that the estates should pay more attention to the wishes of the landowners and complained that land was not rented in complete agreement with landowners. Leasing out of land was allegedly not voluntary and the rents were too low. The commission investigating these issues, however, did not find much evidence to confirm this charge. The compensation for the rent could be low, but was unlikely to be too low.⁸⁸ Gordon disputes the outcome of this inquiry; according to him, the commission was too optimistic.⁸⁹ Deals were made with village heads who acted as mediators between estates and landowners. In reality, the village heads tried to impose the will of the sugar company on their subordinates, in return for benefits and bribes of various kinds.⁹⁰

Volksraad en Staten-Generaal (Amsterdam: De Bussy, 1922) 78–79; Van der Eng, 'Extractive institutions, colonial drain and underdevelopment', 14.

⁸⁴ Huender, *Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera*, 108.

⁸⁵ Kohlbrugge, *Is grondverhuur aan suikerfabrieken een zegen of een vloek voor den Javaan?*, 12–13, 16.

⁸⁶ Huender, *Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera*, 89–91; Boeke, *Economie van Indonesië*, 106–111; De Wilde, *Een en ander omtrent den welvaartstoestand der inlandsche bevolking in de gouvernementslanden van Java en Madoera*, 117–119.

⁸⁷ Elson, *Javanese peasants and the colonial sugar industry*, 178.

⁸⁸ Stibbe, *Verslag van de Suiker-enquête-commissie*, 75–81, 125, 298; Gerrit Jacobus van der Flier, *Grondrentetheorieën en de grondhuren in de Java-suiker-industrie* (Amsterdam: Holdert & Co., 1932) 94–112.

⁸⁹ Gordon, *The agrarian question in colonial Java: coercion and colonial capitalist sugar plantations, 1870–1941*, 15.

⁹⁰ Elson, *Javanese peasants and the colonial sugar industry*, 235–237.

Impact on the domestic economy

Few landowners wanted to rent their land to sugar estates because they knew they could do better when using the land themselves. They were forced to rent the land to sugar estates. Gordon argues that without regulation introduced by the government, the situation would have been even worse.⁹¹ His focus is on the period before the introduction of the Land Lease Ordinance. He refers to Kohlbrugge, who in 1909, wrote that landowners were indeed forced to rent out their land to sugar companies. It is debatable whether the slightly higher compensation in this forced system was sufficient.⁹² Eventually, cheap land for sugar companies and distortion of the activities by the indigenous population prevented sugar villages in Java from reaching a rapid sustained development. But again, there was some degree of compensation.⁹³ As Geertz noted, planting of new sugar crops usually took place before the old ones were harvested. By implication, more land was used by the Western estates than was officially registered.⁹⁴

Direct payments to the indigenous population consisted of wages, compensation for land use and payments for equipment and materials. Wages formed the largest expenditure for the sugar companies. During the 1920s more than f90 million per year was spent on wages, which was nearly 80% of total expenditures by sugar companies benefitting the indigenous population. Only 5% consisted of payments for equipment and materials. For the period 1900–1910, before the introduction of the Land Lease Ordinance, payments for rent by sugar companies were around 10–11%. This increased to 11–14% in 1911–1921 and between 1922 and 1930 it rose further to 15–20%. During the mid–1920s more than f15 million per year was spent by the sugar companies on the use of land. After the economic depression of the 1930s these payments increased to 25–45% when profits were lower and less money was paid to the indigenous population in the form of wages and other expenditure. In

⁹¹ Gordon, *Notes on the transition from colonial to post colonial economic formations in modern Indonesia*, 7; Gordon, 'The collapse of Java's colonial sugar system and the breakdown of independent Indonesia's economy', 254–255; Mubyarto, 'The sugar industry', 45; Boeke and Holmes, *Indonesian economics: The concept of dualism in theory and policy*, 153–155; Van Klaveren, *The Dutch colonial system in the East Indies*, 150–156; Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 68–80.

⁹² Kohlbrugge, *Is grondverhuur aan suikerfabrieken een zegen of een vloek voor den Javaan?*, 10, 26–43.

⁹³ Sutrisno, *The sugar industry and rural development*, 139.

⁹⁴ Geertz, *Agricultural involution the processes of ecological change in Indonesia*, 87.

prosperous years, total payments to landowners could be up to f25 million, but after the economic depression it could even fall below f4 million.⁹⁵

The economic depression of the 1930s hit the sugar industry badly, which caused a rapid decline in proceeds from land lease. The companies tried to terminate long-term contracts and landowners received some compensation for this, but amounts varied significantly and sometimes resulted in court cases that were often won by the landowners.⁹⁶ Plantation owners were also willing to renegotiate deals with landowners. Old contracts were not continued, numerous estates closed down or ceased production, which meant an end to the payment of *grondhuur*.⁹⁷ As a consequence, demand for land fell and landowners reduced their prices by 10–20%. In Madiun, in East Java, estates could make use of even cheaper options, but they declined to do so and claimed that these prices were below a reasonable minimum.⁹⁸

To conclude, the land lease that foreign estates paid also varied according to region. If the quality of the soil was higher, if there was more competition with indigenous tenants, and if good irrigation systems existed, then the land lease could be more expensive. It can therefore be argued that irrigation systems constructed by foreign private estates benefitted the indigenous population in two ways. First, it made the soil more suitable for cultivating crops, which led to a higher productivity, and, second, the indigenous landowners could ask for a higher land lease after irrigation works had been constructed.⁹⁹ The presence of sugar factories could also be more

⁹⁵ Huender, *Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera*, 89–91; Boeke, *Economie van Indonesië*, 106–111; De Wilde, *Een en ander omtrent den welvaartstoestand der inlandsche bevolking in de gouvernementslanden van Java en Madoera*, 117–119; Boeke, *The structure of Netherlands Indian economy*, 84; Van der Mandere, *Wat voor de “suiker” van belang was bij de behandeling der Indische Begrooting 1922 in Volksraad en Staten-Generaal*, 19; Berkhuisen, *De drainagetheorie voor Indonesië*, 114; Elson, *Javanese peasants and the colonial sugar industry*, 239; Van der Eng, *Agricultural growth in Indonesia*, 215; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 116, 148–178; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 119–120; Karl J. Pelzer, *Pioneer settlement in the Asiatic tropics. Studies in land utilization and agricultural colonization in Southeastern Asia* (New York: American Geographical Society, 1945) 256.

⁹⁶ NL-HaNa: MvO, 81, Japara-Rembang, 1936.

⁹⁷ NL-HaNa: MvO, 67, Bagelen, 1932; NL-HaNa: MvO, 122, Besoeki, 1934; NL-HaNa: MvO, 81, Japara-Rembang, 1936.

⁹⁸ NL-HaNa: MvO, 563, Madioen, 1932.

⁹⁹ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 110–111, 130; Ravesteijn, *De zegenrijke heeren der wateren: Irrigatie en staat op Java, 1832–1942*, 357; Van der Eng, ‘Extractive institutions, colonial drain and underdevelopment’, 4, 14; Van der Eng, *The ‘colonial drain’ from Indonesia, 1823–*

Impact on the domestic economy

beneficial to indigenous Indonesians without land than for those owning land. Workers received wages from the sugar industry and benefitted from other final demand linkages, such as housing, schooling and medical care.¹⁰⁰

Wages

The compensation for use of land by foreign companies may have been felt to be too low among landowners. On the other hand, large numbers of landless Indonesians found employment in the sugar industry. The wages were supposedly the result of demand and supply in the labour market. The question is whether these wages were adequate or at least equivalent to wages that could be earned in the indigenous economy?¹⁰¹

Employment provided by foreign firms and estates affected only a small part of the total indigenous labour force. Most Indonesians preferred an indigenous employer to a foreign boss, if this meant less hard work and better conditions and even if it might mean lower incomes.¹⁰² A census of 1930 shows that only 4% of the indigenous working population in Java was employed by sugar estates, whereas even less, 3%, worked at other foreign-owned plantations. It has to be taken into account that during this time the sugar industry started to lose momentum and producers were already feeling the impact of the economic depression. Around 40% of the workforce in the sugar industry consisted of women. In the Outer Islands the share of the indigenous population that was employed by foreign companies was similar to the one in Java (7%). The mining industry absorbed only 0.5% of all available labour.

The proportion of 7% of the total workforce includes both men and women, but not seasonal workers. In the census of 1930 seasonal workers are included in a large rest category, which consists of around 10% of the total workforce, but could be up to 30% in areas with more business activities. Without doubt, at least part of this work force found employment as seasonal worker in a foreign company. There was a substantial seasonal workforce in

1990, 25–26; Van der Mandere, *Wat voor de “suiker” van belang was bij de behandeling der Indische Begroting 1922 in Volksraad en Staten-Generaal*, 78–79; Haccoû, *De Indische exportproducten*, 89–90; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 180, 184, 186–190, 202; NL-HaNa: MvO, 93, Madioen, 1907.

¹⁰⁰ Kohlbrugge, *Is grondverhuur aan suikerfabrieken een zegen of een vloek voor den Javaan?*, 93.

¹⁰¹ Huender, *Overzicht van den economischen toestand der inheemsche bevolking van Java en Madoera*, 101; Van der Eng, *The 'colonial drain' from Indonesia, 1823–1990*, 26; Van der Eng, 'Extractive institutions, colonial drain and underdevelopment', 15.

¹⁰² Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 125.

the sugar industry, in particular during the harvest.¹⁰³ Therefore, even in 1930, it is likely that more than 4% of the indigenous working population in Java was employed by the sugar industry. Income estimates for 1939 vary from 7% to 7.7% of indigenous income for estates in Java. For the Outer Islands, this proportion was 8–10%.¹⁰⁴ The overwhelming majority of wages, therefore, was earned in the indigenous economy. One can dispute whether the indigenous population actually depended on foreign employers to any significant extent or not.¹⁰⁵

The sugar industry was the largest foreign employer in Java.¹⁰⁶ Up to 1.4 million workers were mobilized by the sugar industry in 1925, when production was in full swing. This figure comprised one million cultivators, 250,000 cane cutters and 150,000 factory workers.¹⁰⁷ A stark contrast to the 1930s, when sugar production was reduced to less than half of its previous volume. Next to those workers, there were considerable local economic activities. Small shops or *warung* were set up near the plantations. The factories created and maintained markets and shops which stimulated interaction between the factory and the indigenous population. The earnings of the large number of workers in the sugar industry generated an increased local demand, which testifies to a forward linkage.¹⁰⁸

¹⁰³ Van der Eng, 'Extractive institutions, colonial drain and underdevelopment', 13; Departement van Landbouw, Nijverheid en Handel, *Volkstelling 1930, Deel I (Census of 1930 in the Netherlands Indies, Vol. I)* (Batavia: Landsdrukkerij, 1933) 86, 89–90; Departement van Landbouw, Nijverheid en Handel, *Volkstelling 1930, Deel III (Census of 1930 in the Netherlands Indies, Vol. III)* (Batavia: Landsdrukkerij, 1933) 91, 93–95; Departement van Landbouw, Nijverheid en Handel, *Volkstelling 1930, Deel VIII*, 122–125; Berkhuysen, *De drainagetheorie voor Indonesië*, 107; Haccoû, *De Indische exportproducten*, 88.

¹⁰⁴ Burger, *Sociologisch-economische geschiedenis van Indonesia, Vol. 2*, 109.

¹⁰⁵ Van der Eng, 'Extractive institutions, colonial drain and underdevelopment', 13; Departement van Landbouw, Nijverheid en Handel, *Volkstelling 1930, Deel VIII*, 122–125; Berkhuysen, *De drainagetheorie voor Indonesië*, 107; Haccoû, *De Indische exportproducten*, 88.

¹⁰⁶ Van der Eng, *Agricultural growth in Indonesia*, 212.

¹⁰⁷ Bosma, *The sugar plantation in India and Indonesia: Industrial production, 1770–2010*, 159. In 1930 60.7 million people lived in the Netherlands Indies. In Java and Madura this number was 41.7 million and 98% can be considered as indigenous Indonesian: Departement van Landbouw, Nijverheid en Handel, *Volkstelling 1930, Deel VIII*.

¹⁰⁸ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 124, 126, 128, 140, 144, 146–160, 174–176; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 135; John W. Mellor, *Agricultural development and economic transformation. Promoting growth with poverty reduction* (New York: Palgrave Macmillan, 2017) 23–25.

Impact on the domestic economy

During the peak years in the 1920s, the sugar industry was responsible for 8.4–11.5% of all indigenous income in Java.¹⁰⁹ The sugar industry was surely the largest foreign branch in the 1920s in terms of wages paid. The total wage bill had increased rapidly during the 1910s and remained at a high level throughout the 1920s, with a peak in 1928 at f106 million, or the equivalent of roughly 3% of indigenous national income. The sugar industry virtually collapsed in the first half of the 1930s. Compared with the 1920s, only a fraction of the wages were paid in 1936. In real terms, indigenous income from the sugar industry in 1934 was only 20% of what it had been in 1929, and in 1938 it was still only 39%. The availability of rice and other food products per capita fell after 1930. The collapse of the sugar industry was not mitigated by increasing output of food products on the land previously used by the sugar industry. For workers lucky enough to keep their jobs during the depression, their real income would increase by 50%.¹¹⁰ Total wages paid to the indigenous population were around 33 to 37.5% of total production costs in the sugar industry in the period 1910–1925. However, the share of profits was similar to 41% of the production costs. The largest share of these profits, comparable with 20–30% of the production costs, was transmitted overseas.¹¹¹

Let us now shift our attention to Sumatra and examine estate wages there. Compared with the workforce in the sugar industry in Java, the workforce in North Sumatra, which consisted of coolies, was smaller. During the second half of the 1910s, total numbers increased to 250,000 but dropped in the early 1920s to less than 200,000. Then numbers rose again, reaching a maximum in 1929, when slightly more than 300,000 coolies were employed in North Sumatra. During the economic depression of the 1930s, figures fell again, and in the late 1930s only 200,000 coolies were employed (Figure 4.2).¹¹² Initially, coolies came mainly from China. In the early twentieth

¹⁰⁹ Van der Mandere, *De Javasuikeerindustrie in heden en verleden*, 127.

¹¹⁰ Mangkusuwondo, *Industrialization efforts in Indonesia*, 69; Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 110–111; Creutzberg and Van Dooren, *CEI. Vol. 5*, 70; Henri Fievez de Malines van Ginkel, *Verslag van den economischen toestand der inlandsche bevolking* (Weltevreden: Landsdrukkerij, 1924) 196–199, for the year 1913; Van der Mandere, *De Javasuikeerindustrie in heden en verleden*, 119–120, for the period 1916–1926; Pelzer, *Pioneer settlement in the Asiatic tropics*, 256, for the years 1928–1938.

¹¹¹ Berkhuisen, *De drainagetheorie voor Indonesië*, 98; Burger, *Sociologisch-economische geschiedenis van Indonesia, Vol. 2*, 107. Another calculation by Haccoû shows that during the 1920s wages were 30% of the production costs in the sugar industry and 40% in the rubber industry, Haccoû, *De Indische exportproducten*, 91.

¹¹² J. Thomas Lindblad, 'Coolies in Deli: Labour conditions in Western enterprises in East Sumatra, 1910–1938', in: Vincent J.H. Houben and J. Thomas Lindblad (eds), *Coolie labour in colonial Indonesia: A study of labour relations in the Outer*

Impact on the domestic economy

century, around two-thirds of the coolies were Chinese and one-third Javanese. At the end of the 1910s around 25,000 Chinese coolies were left in North Sumatra and all new coolies were Javanese. One reason for this shift from Chinese to Javanese coolies was that Javanese coolies were cheaper than Chinese coolies. In addition, the Javanese were assumed to be more easily disciplined. The import of cheap labour could have lowered the overall wage level. This effect could also have materialised in the area surrounding the foreign estates and affected other businesses, even after the contracts of the coolies expired. This competition for lower wages could have prevented the economic development in these areas.¹¹³

As with the sugar industry in Java, wages paid by members of the employers' organisations DPV, most of whom were in the tobacco industry in North Sumatra, plummeted in the 1930s. In the rubber industry, on the other hand, wages paid by members of the AVROS recovered after the International Rubber Restriction Agreement of 1934, which facilitated a recovery of the rubber industry.¹¹⁴ But even in this industry, at the end of the 1930s, the average wage bill paid was only slightly more than one-half compared to the peak (Figure 4.3).

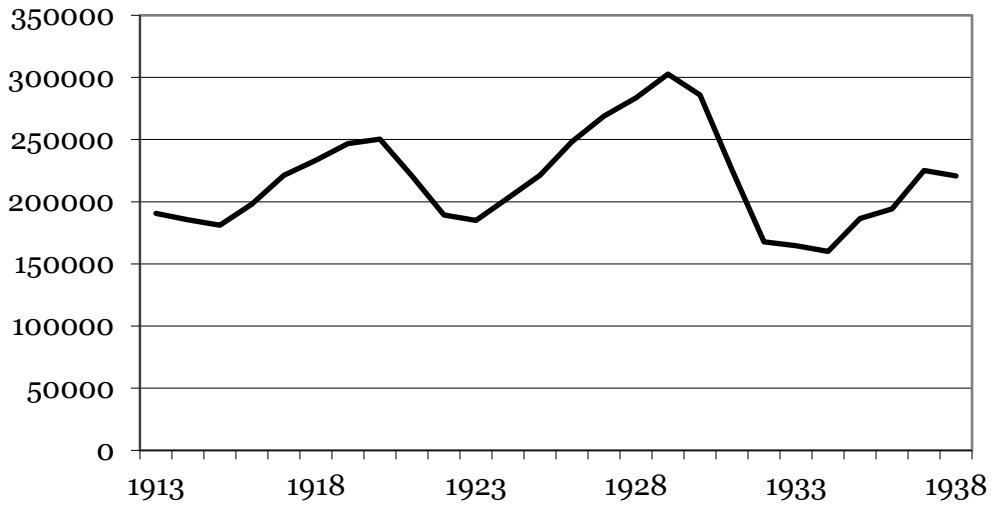
Islands, c. 1900–1940 (Wiesbaden: Harrassowitz Verlag, 1999) 43–78, in particular 52–58.

¹¹³ Vincent J.H. Houben, 'Introduction: The coolie system in colonial Indonesia', in: Vincent J.H. Houben and J. Thomas Lindblad (eds), *Coolie labour in colonial Indonesia: A study of labour relations in the Outer Islands, c. 1900–1940* (Wiesbaden: Harrassowitz Verlag, 1999) 1–25, in particular 3; Lindblad, 'Coolies in Deli: Labour conditions in Western enterprises in East Sumatra, 1910–1938', 25, 52; Jan Breman, *Taming the coolie beast: Plantation society and the colonial order in Southeast Asia* (Delhi: Oxford University Press, 1989) 50–64; Ann Stoler, *Capitalism and confrontation in Sumatra's plantation belt, 1870–1979* (Ann Arbor: The University of Michigan Press, 1995) 3–4.

¹¹⁴ Hiroyoshi Kanō, *Indonesian exports, peasant agriculture and the world economy, 1850–2000: Economic structures in a Southeast Asian state* (Singapore: NUS Press, 2008) 62.

Impact on the domestic economy

Figure 4.2. Total number of coolies in North Sumatra, 1910–1938.



Source: Lindblad, 'Coolies in Deli: Labour conditions in Western enterprises in East Sumatra, 1910–1938', 52–58, 72.

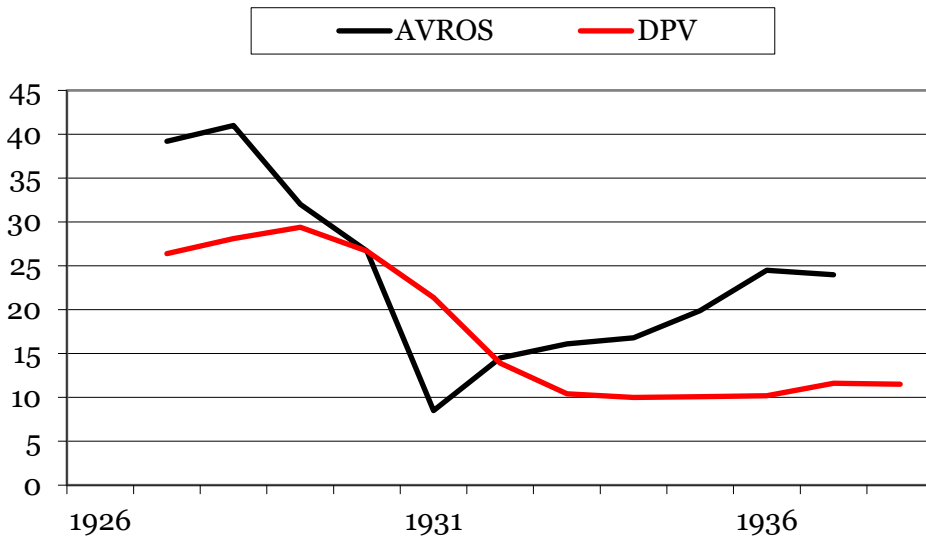
Wages for unskilled labourers at plantations in Java did not necessarily differ from wages for similar work. However, in the indigenous industries, part-time work and piece wages were more common. People usually got paid on the basis of the work that had been done, instead of receiving a fixed daily wage.¹¹⁵ Van der Eng claims that the wages of coolies in the Outer Islands were usually lower than the income local dwellers in the Outer Islands could have earned had they been self-employed. Outside Java, it was more difficult for foreign estates to hire local workers for low wages.¹¹⁶ Yet, minimum coolie wages in North Sumatra remained virtually constant throughout the 1910s.

¹¹⁵ Van der Eng, *The 'colonial drain' from Indonesia, 1823–1990*, 23; Nico Dros and Petrus Johannes van Dooren, *Changing economy in Indonesia (CEI): A selection of statistical source material from the early 19th century up to 1940. Vol. 13: Wages 1820–1940* (Amsterdam: KIT, 1992) 31–32, 111–141; Van Zanden and Marks, *An economic history of Indonesia 1800–2010*, 115–117; Putman Cramer, 'De Indische begroting 1923 in de tweede kamer der Staten-Generaal', 201–202; Van Ginkel, *Verslag van den economischen toestand der inlandsche bevolking*, 194.

¹¹⁶ Van der Eng, *The 'colonial drain' from Indonesia, 1823–1990*, 23–24.

Impact on the domestic economy

Figure 4.3. Total wage payments to indigenous employees by AVROS and DPV members, in million guilders, 1926–1938.



Source: Deli Planters Vereeniging (DPV), *Jaarverslag* (Medan: Köhler & Co., 1914–1938); Algemene Vereeniging van Rubberplanters ter Oostkust van Sumatra (AVROS), *Jaarverslag* (Medan: Algemene Vereeniging van Rubberplanters ter Oostkust van Sumatra, 1910–1940).

Common wages for male coolies were around 35–40 cents per day during the 1910s. For females it was even lower, at 30–35 cents per day. In 1920, nominal coolie wages increased by around 60% compared to 1919, but this was primarily compensation for rapid inflation and did not reflect a more generous attitude on the part of foreign employers. Between 1918 and 1920 rice prices rose from 18 cents to 29 cents per kg. Price rises in the Outer Islands were possibly higher than in Java, but supporting evidence is scarce.¹¹⁷

The DPV and AVROS sought to maintain the cheap labour policy by cooperation between employers in order to avoid competition. The organisations claimed that they would prefer to improve working conditions rather than to control workers by coercive measures.¹¹⁸ It is questionable whether the form of contract labour used, with its harsh penal sanction, can be considered as free market labour. The penal sanction was the chief device

¹¹⁷ Creutzberg and Van Dooren, *CEI. Vol. 5*, 75; Touwen, 'Regional inequalities in Indonesia in the late colonial period', 110; Lindblad, 'Coolies in Deli: Labour conditions in Western enterprises in East Sumatra, 1910–1938', 53.

¹¹⁸ Thee, *Plantation agriculture and export growth*, 96–98.

for control of the coolie labour. During the 1920s the employers' organisations AVROS and DPV defended the penal sanction. In 1931, the penal sanction was abolished by the colonial government in the Netherlands Indies and from 1931 onwards, tobacco companies would only hire 'free' labourers, under contract but without penal sanction. It is unlikely that wages were determined solely by demand and supply of labour in the indigenous economy nor that wages in foreign-controlled industries fully reflected the value of labour in comparison to alternatives in the indigenous economy. The extensive use of immigrant labour was bound to have exerted a downward pressure on local wage levels at large.¹¹⁹

Overall, wages showed considerable variation depending on region and industry. Coolie wages in North Sumatra were only slightly higher in the 1930s than in the Javanese sugar industry. In the petroleum industry, differences were larger and on average wages were higher in the Outer Islands than in Java. Skilled workers earned more than unskilled workers in both the indigenous and foreign-owned industries and based on wages alone there was not much difference between an indigenous or a foreign employer (Appendix 25).¹²⁰ Summing up, we may say that over time large amounts flowed into the domestic economy from foreign firms. It is important to contrast such flows with macroeconomic variables such as GDP.

In 1924, which was a good year for the sugar industry, these estates accounted for nearly one-half of the total wages paid by foreign private companies in the Netherlands Indies. The sugar industry spent f92.2 million on wages, whereas other foreign private companies taken together paid f99.7 million.¹²¹ In Java alone, f21 million was paid by rubber companies, f17.4 million by the tea industry, f15 million by coffee plantations and in the

¹¹⁹ Ellen Leenarts, 'Coolie wages in Western enterprise in the Outer Islands', in: Vincent J.H. Houben and J. Thomas Lindblad (eds), *Coolie labour in colonial Indonesia: A study of labour relations in the Outer Islands, c. 1900–1940* (Wiesbaden: Harrassowitz Verlag, 1999) 131–156, in particular 138–141; Stoler, *Capitalism and confrontation in Sumatra's plantation belt, 1870–1979*, 42; Gerlof D. Homan, 'That 'beautiful tobacco': The Sumatra cigar wrapper and the American tariff, c. 1880–1941', *Economisch- en Sociaal-Historisch Jaarboek*, Vol. 50 (1987) 145–156, in particular 151–154; H.J. Langeveld, 'Arbeidstoestanden op de ondernemingen ter oostkust van Sumatra tussen 1920 en 1940 in het licht van het verdwijnen van de poenale sanctie op de arbeidscontracten', *Economisch- en Sociaal-Historisch Jaarboek*, Vol. 41 (1978) 294–368, in particular 301–304.

¹²⁰ Dros and Van Dooren, *CEI. Vol. 13*, 109–126, 131–137.

¹²¹ Gordon, 'The collapse of Java's colonial sugar system and the breakdown of independent Indonesia's economy', 260; Van der Mandere, *De Javasuikeerindustrie in heden en verleden*, 122; Mangkusuwondo, *Industrialization efforts in Indonesia*, 68.

Impact on the domestic economy

Netherlands Indies as a whole f17.5 million by tobacco estates and f9.2 million by petroleum companies (Figure 4.4 and Appendix 24).

In 1924, the colonial government paid f158.8 million in wages to the indigenous population. This was less than the f191.1 million spent by all foreign estates combined. However, the colonial government had paid f187.4 million in 1920 and f191.3 million in 1922.¹²² In 1924 the GDP of the Netherlands Indies was f4,728 million, of which f3,459 million accrued to indigenous Indonesians. If we compare this figure with the wages paid in the sugar industry, these wages corresponded to 2.7% of total indigenous income of the Netherlands Indies, and if we include income from other foreign private companies that proportion increases to 5.5%.¹²³

Wages for Europeans were on average 47 times higher than those of indigenous Indonesians in 1930 and for Chinese they were 5 times as high. In 1939 wage differences had increased to 61 and 8 times the wages for indigenous Indonesians, respectively. Europeans obviously had different kinds of occupations and greater opportunities to move into jobs with higher wages.¹²⁴ Differences between Indonesians and Europeans, therefore, were strikingly large and continued to increase until the end of the 1930s.¹²⁵ The number of European workers on estates was of course much smaller than the number of Indonesian workers. The share of indigenous wages paid by foreign firms in the macro-economy was still substantial. Between 1927 and 1936, DPV members paid 80–85% of their salaries to indigenous workers.¹²⁶

¹²² Van Ginkel, *Verslag van den economischen toestand der inlandsche bevolking, 196–199*; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 164.

¹²³ Creutzberg and Van Dooren, *CEI. Vol. 5*, 70.

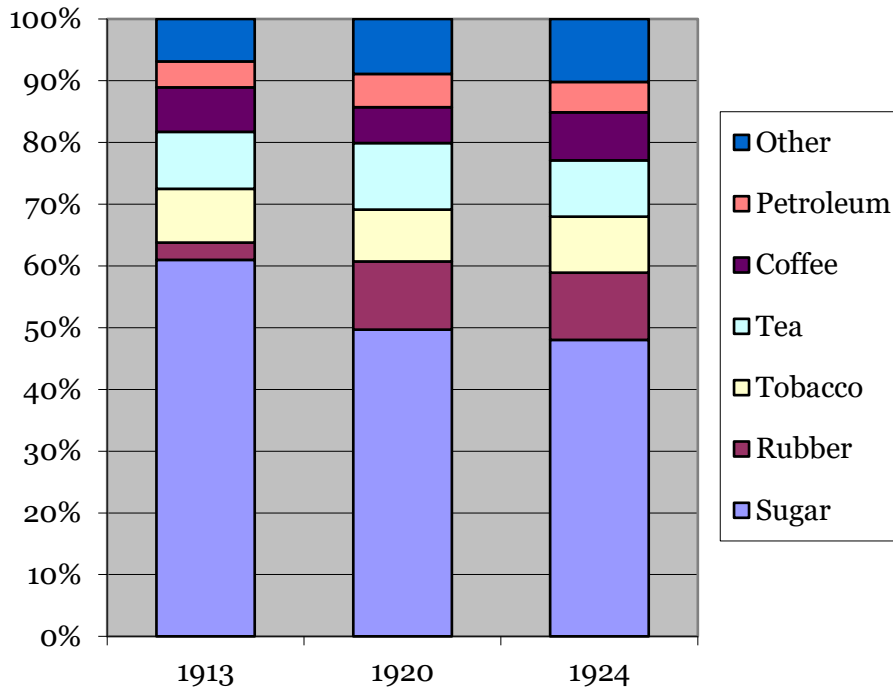
¹²⁴ Polak, *The national income of the Netherlands Indies, 1921–1939*, 49.

¹²⁵ Creutzberg and Van Dooren, *CEI. Vol. 5*, 76–77; Van Zanden and Marks, *An economic history of Indonesia 1800–2010*, 117–118.

¹²⁶ Deli Planters Vereeniging (DPV), *Jaarverslag 1914–1938*.

Impact on the domestic economy

Figure 4.4. Total wage payments as a proportion of total wage bill by sector, in 1913, 1920 and 1924.



Source: De Malines van Ginkel, *Verlag van den economischen toestand der inlandsche bevolking, 196–199*; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 164.

Note: data for rubber, tea and coffee are only for Java.

*'Social provision'*¹²⁷

In addition to payments for wages and use of land, foreign employers also incurred expenditure that benefitted indigenous workers indirectly, such as healthcare, housing and schooling. This corporate social responsibility mainly served to increase the productivity of the workforce. It was a response to criticism of poor working conditions in factories, including work by children and women. The companies agreed that labour conditions should be improved, but not at the expense of profitability.¹²⁸ This attitude was common

¹²⁷ For this paragraph I am particularly indebted to Frank Ochsendorf.

¹²⁸ Archie B. Carroll, 'A history of corporate social responsibility: Concepts and practices', in: A. Crane et al. (eds), *The Oxford handbook of corporate social*

in the sugar industry in Java. At the Sugar Congress in Surabaya in 1911, the chairman, A. Paets tot Gansoyen, stated that the sugar industry was a business run with the intention of making a profit. It was not a philanthropic organisation with the purpose of benefiting the indigenous population. According to him, the sugar companies should only treat their indigenous workers well and make sure that they were compensated fairly for their work. This mentality was still present in the sugar industry in 1928 when the Ethical Policy had already been implemented for almost three decades.¹²⁹ We must not overestimate the philanthropy of the companies. J.H.F. Kohlbrugge argued that employers in the Netherlands did more for their employees than sugar companies in the Netherlands Indies.¹³⁰ Although expenditure for such purposes was little, we can nevertheless observe indirect benefits of a qualitative character that need to be taken into account, in particular with respect to housing, healthcare, drinking water and education.

Expenditures for such benefits fluctuated a great deal, but reached a maximum in the sugar industry during the boom of the 1920s (Figure 4.5). These costs were of a comparable magnitude to outlays on irrigation and infrastructure. Taking all such outgoings together, including those for irrigation and infrastructure, f46 million was spent in total during the years 1915–1924. This was less than 10% of the amount the sugar companies paid in the form of wages for indigenous employees.¹³¹

responsibility (Oxford: Oxford University Press, 2008) 19–46, in particular 2–4; Frank Ochsendorf, 'Colonial corporate social responsibility: Company healthcare in Java, East Sumatra and Belitung, 1910–1940', *Lembaran Sejarah*, Vol. 14 (2018) 83–97, in particular 94–96.

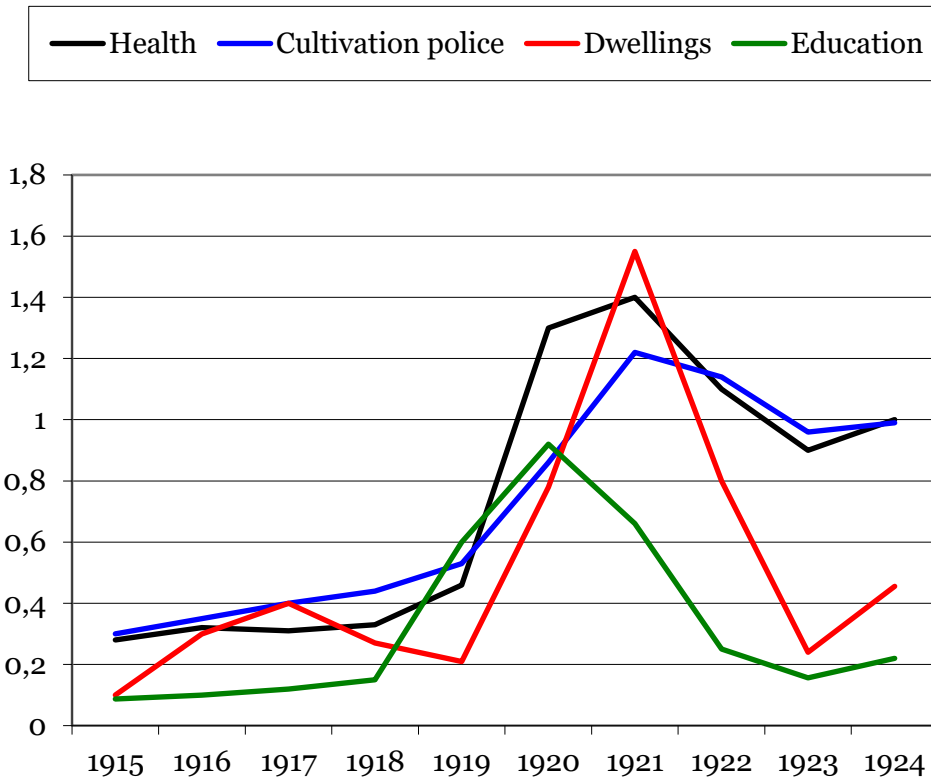
¹²⁹ J. Poll, *Handelingen van het 10^{de} congres van het Algemeen Syndicaat van Suikerfabrikanten in Nederlandsch-Indië* (Surabaya: H. Van Ingen, 1928) 11.

¹³⁰ Kohlbrugge, *Is grondverhuur aan suikerfabrieken een zegen of een vloek voor den Javaan?*, 24–25.

¹³¹ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 119–120, 136; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 186–190, 202.

Impact on the domestic economy

Figure 4.5. Total social expenditures by sugar companies in Java, 1915–1924, in million guilders.

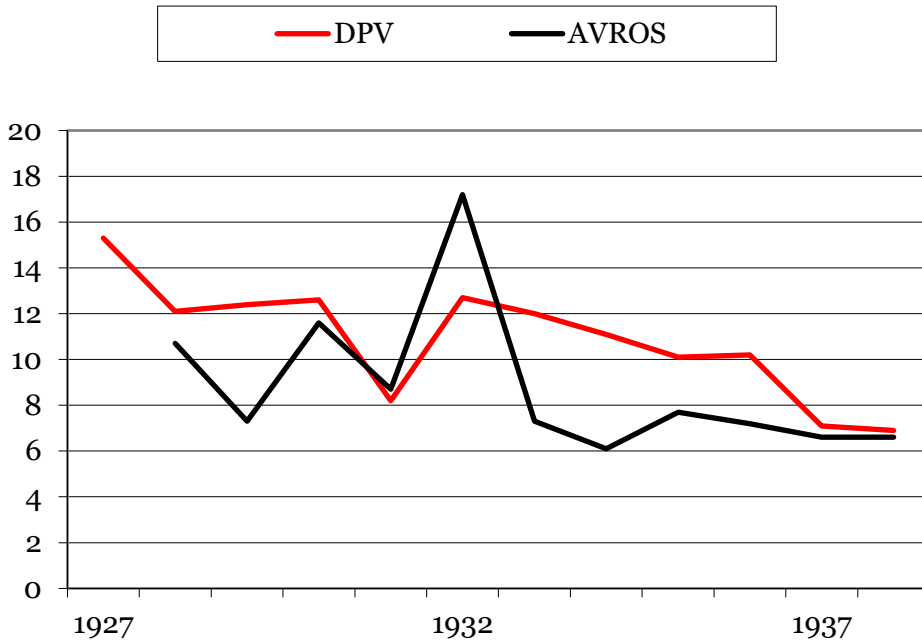


Source: Van der Mandere, *De Javasuijkerindustrie in heden en verleden*, 136.

A comparison with North Sumatra offers additional insights. Expenditures on additional employment benefits in the tobacco and rubber industries in North Sumatra were higher than in Java sugar when calculated as a proportion of indigenous income. For DPV and AVROS members, the expenditure on healthcare and housing alone were higher, corresponding to 10% of the amount spent on wages for indigenous employees (Figure 4.6).

Impact on the domestic economy

Figure 4.6. Corporate expenditure on healthcare and housing of the indigenous workforce at DPV and AVROS members, 1927–1938, as proportion of total wage bill.



Source: Deli Planters Vereeniging (DPV), *Jaarverslag 1914–1938*; Algemene Vereeniging van Rubberplanters ter Oostkust van Sumatra (AVROS), *Jaarverslag 1910–1940*.

Note: For DPV, these costs are specified as medical help and expenditure for rice and housing, whereas for AVROS these expenditures are mentioned as hospital costs and expenditures for rice.

Housing

The construction of homes and hospitals by foreign employers had a more direct impact on the indigenous workforce, than irrigation works and roads, which were initially constructed to facilitate production. With homes and hospitals, the indigenous workers were the first to benefit.¹³² From 1880 foreign firms were legally required to provide housing for contract coolies in North Sumatra, but the quality of living conditions were very poor. Initially,

¹³² Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 131–132; Van Geuns, *De suikeronderneming Djatiroto en de regeling van het werkcontract op Java*, 7; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 196–212.

workers were crowded into barracks that were built of the simplest materials possible. Families lived separately from the barracks provided for single workers. Only with the introduction of the Labour Inspectorate in 1908 did the housing situation began to gradually improve. More attention, for example, was given to hygienic matters.¹³³

The Senembah tobacco company was the first one to build houses for individual families. By 1917 it had constructed 725 such houses. This number grew gradually until in 1935, 2,901 of them had been built. Before the economic depression of the 1930s, it was becoming increasingly popular to attract full-time employees, and these workers required decent housing.¹³⁴

The sugar industry, with its large contingent of seasonal labourers, spent f5 million in total on construction and improvement of accommodation between 1915 and 1924. However, this was on average f3,351 spent by each company every year. Therefore, the construction of dwellings only occurred on a smaller scale in the direct vicinity of the companies. Due to the large number of workers in the sugar industry, it was impossible to provide decent housing for everyone. Gradually, the situation improved and more houses were constructed from stone instead of wood.¹³⁵

This trend was visible elsewhere as well. In Pangkalan Brandan in North Sumatra, BPM housed contract coolies in primitive shacks in the early years, but then the situation improved. After experimenting with rows of mass dwellings in the early twentieth century a *desa* (village) was created in 1911, consisting of 200 houses and plots. Every individual dwelling was adequate for one family and the plots could be used for cultivating various crops. The framework of the houses consisted of wooden poles provided for free to the coolies, but they had to cover them by themselves. Unfortunately, this system proved unsuccessful. In 1914 cases of plague had been noted in North Sumatra and the *desa* built by BPM had deteriorated and was infested with rats, so that

¹³³ J. Tideman, 'De huisvesting der contractkoelies ter Oostkust van Sumatra', *Koloniale Studiën*, Vol. 3 (1919) 125–150, in particular 125–127; E.P. Snijders, 'Koeliehuisvesting en geneeskundige dienst op rubberondernemingen', in: N.L. Swart & A.A.L. Rutgers (eds), *Handboek voor de rubbercultuur in Nederlandsch-Indië* (Amsterdam: De Bussy, 1921) 727–775, in particular 735; Kantoor van Arbeid, *Eerste verslag van den dienst der arbeidsinspectie en koeliewerving in Nederlandsch-Indië; Deel I. Oostkust van Sumatra* (Batavia: G. Kolff & Co, 1913) 77–78; Stoler, *Capitalism and confrontation in Sumatra's plantation belt, 1870–1979*, 40.

¹³⁴ H. Heinemann, 'Het hygiënisch werk der Senembah-Maatschappij gedurende de laatste jaren', *Geneeskundig Tijdschrift voor Nederlandsch-Indië*, Vol. 75 (1935) 524–533, in particular 527–533; H. Meijer, *De Deli Spoorweg Maatschappij: Driekwart eeuw koloniaal spoor* (Zutphen: De Walburg Pers, 1987) 74–76.

¹³⁵ Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 132–133; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 200–202.

there was no other solution than to demolish the houses and replace them with stone houses, even though this meant additional expenses for the company.¹³⁶

The indigenous population also benefitted indirectly from the presence of security forces on the estates. The sugar companies in Java spent more money on the so-called *cultuurpolitie* ('cultivation police') than they paid for the housing of their workers. The protection of the crops and estates from theft and fire was the main task but this would obviously also contribute to the safety of indigenous workers on the plantations.¹³⁷ These security forces were mostly present at sugar estates in Java as a consequence of a lack of local police.¹³⁸ The experiences from estates in Jember, Tanggul and Tenggarang were positive, and as a result other sugar companies in East Java also set up these forces. During the 1920s, other industries also made use of the cultivation police. In Blitar, Jember, Kediri and Malang, coffee plantations had similar forces after initially relying on the official police and even the military. In Kedewan, in East Java, the BPM also employed private security forces.¹³⁹ However, when the economic situation deteriorated in the 1930s, the size of these security forces dropped considerably, and in Jember and Kediri they were abolished altogether.¹⁴⁰

Hospitals

In Java, the sugar industry played an important role in improving the healthcare of its workers. The facilities at the different sugar companies, however, varied in size and quality.¹⁴¹ A survey by the Sugar Syndicate in 1919 showed that of the 138 listed companies only six had their own private hospitals with full-time doctors. One of them was the Djatiroto factory, owned by HVA. It was more common for a doctor to visit several plantations a week, though he was not able to solve every medical complaint for every estate

¹³⁶ Gerretson, *History of the Royal Dutch*, Vol. 4, 77–79.

¹³⁷ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 192; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 135–136; Bosma, *The sugar plantation in India and Indonesia: Industrial production, 1770–2010*, 190.

¹³⁸ Other companies such as the BPM also maintained security forces in Balikpapan for the protection of their oil refinery, Lindblad, 'The petroleum industry in Indonesia before the Second World War', 72.

¹³⁹ NL-HaNa: MvO, 82, Blora, 1930; NL-HaNa: MvO, 121, Besoeki, 1925.

¹⁴⁰ NL-HaNa: MvO, 84, Oost-Java, 1933; NL-HaNa: MvO, 123, Bondowoso, 1929; NL-HaNa: MvO, 115, Probolinggo, 1932.

¹⁴¹ P.W.L. Penris, 'Het aandeel der landbouwondernemingen op Java in de geneeskundige voorzieningen van Nederlandsch Indië', *Nederlands Tijdschrift voor Geneeskunde*, Vol. 92 (1948) 1438–1445, in particular 1438.

worker. Some companies worked together to build a hospital; in Situbondo, in East Java, a hospital was operated by eight different sugar companies and here, both indigenous and European employees were treated.¹⁴²

In those few places that boasted a company hospital – at Cirebon, Mojokerto, Pekalongan, Purwokerto and Tegal, as well as Djatiroto – badly injured workers could be treated on-site. However, these facilities were mostly out of reach for those who did not work for the companies.¹⁴³ Less severe injuries were usually treated in the more scattered polyclinics, and medicines for all kinds of diseases were distributed from here. Treatment was often available for free, and for the surrounding villages as well.¹⁴⁴ This was done to increase the number of local people able to work, and to prevent diseases from spreading to the estates and their workforce. More systematic attempts to eradicate diseases or prevent malaria from occurring did not take place, and vaccinations were not common.¹⁴⁵ After 1900, there was a rise in the number of indigenous patients, as the population was becoming more accustomed to Western healthcare and medicine. By 1930, there were 60 hospitals run by companies in Java.¹⁴⁶

In North Sumatra, the situation was different for coolie labourers. It was mandatory for the employers to provide medical care for their workers and families. Although the Coolie Ordinance was rather ambiguous about what was considered reasonable healthcare, the coolies also had an obligation to look after themselves. They were required to get vaccinations and other treatments when injured or sick. In this way, it was possible to provide more efficient and large-scale medical care. In 1930 the number of hospitals run by companies reached a total of 47, the highest so far, but by 1940 this number had dropped to 28 hospitals.¹⁴⁷ Nevertheless, improvements in medical care did take place in the long run and research was done in private laboratories.

¹⁴² NL-HaNa: MvO, 123, Bondowoso, 1929; Ochsendorf, 'Colonial corporate social responsibility', 84–87.

¹⁴³ NL-HaNa: MvO, 91, Modjokerto, 1931.

¹⁴⁴ Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 196–197.

¹⁴⁵ J.J. van Loghem, 'Geneeskundige en hygiënische voorziening op en om suikerfabrieken', *Archief voor de suikerindustrie in Nederlandsch-Indië. Orgaan van het Algemeen Syndicaat van Suikerfabrikanten in Ned.-Indië*, Vol. 28 (1920) 839–859, in particular 846.

¹⁴⁶ Sjoerd Zondervan, *Patients of the colonial state: The rise of a hospital system* (PhD thesis, Maastricht University, 2016) 168, 170.

¹⁴⁷ Kantoor van Arbeid, *Eerste verslag van den dienst der arbeidsinspectie en koeliewerving in Nederlandsch-Indië; Deel I. Oostkust van Sumatra*, 79; W. Kouwenaar, 'De gezondheidszorg ter Oostkust van Sumatra, 1911–1935', *Geneeskundig Tijdschrift voor Nederlandsch-Indië, Feestbundel*, Vol. 76 (1936) 286–302, in particular 287.

Impact on the domestic economy

The one at the Senembah Company, for instance, played a key role in the development of vaccines and preventive measures.¹⁴⁸ Gradually, death rates of workers dropped and their life expectancy rose; yet both figures improved from a very low starting point and the difference between an estate labourer and a villager was not significant. On the downside the distance between hospitals could be quite large, which meant that they were out of reach for many workers or their families, and making it often impossible to receive treatment for even minor injuries. Apart from constructing hospitals, the companies also tried to improve the living conditions of their workers by providing rice at reduced prices.¹⁴⁹

Schools

The indigenous population was more likely to benefit directly from education provided by the estates.¹⁵⁰ Under the auspices of the Ethical Policy, plantation holders in North Sumatra were urged to improve the education of the children and the workforce. However, in 1913 the facilities provided by the estates were poorly developed. Once estate owners realized that the children of the workforce who became educated would start finding other work, employers grew reluctant to provide further education. They were afraid that eventually nobody would be willing to work on the estates anymore, since children from the nearby villages also received schooling from the plantations.¹⁵¹

The estates in North Sumatra were urged by the government to improve the education they provided and by 1920 there were 50 schools in

¹⁴⁸ G.T. Haneveld, 'Van slavenhospitaal tot verantwoorde bedrijfsgezondheidszorg; medisch werk in de cultuurondernemingen van Sumatra', in: G.M. van Heteren, A. de Knecht-van Eekelen and M.J.D. Poulissen (eds), *Nederlandse geneeskunde in de Indische archipel, 1816–1942* (Amsterdam: Atlanta, 1989) 69–82, in particular 72, 77–79.

¹⁴⁹ W. Kouwenaar, 'Geneeskundige voorziening op Sumatra's Oostkust', *Nederlands Tijdschrift voor Geneeskunde*, Vol. 92 (1948) 1293–1301, in particular 1299; H. Gooszen, *A demographic history of the Indonesian archipelago* (Leiden: KITLV Press, 1999) 201; Kantoor van Arbeid, *Eerste verslag van den dienst der arbeidsinspectie en koeliewerving in Nederlandsch-Indië; Deel I. Oostkust van Sumatra*, 81; M. Straub, *Kindersterfte ter Oostkust van Sumatra* (Amsterdam: KIT, 1928) 1–5; Stoler, *Capitalism and confrontation in Sumatra's plantation belt, 1870–1979*, 43; Ochsendorf, 'Colonial corporate social responsibility', 87–89.

¹⁵⁰ Besides education estates also provided leisure activities for their workers such as sporting facilities, cinemas and sometimes even libraries, Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 202–204.

¹⁵¹ Kantoor van Arbeid, *Eerste verslag van den dienst der arbeidsinspectie en koeliewerving in Nederlandsch-Indië; Deel I. Oostkust van Sumatra*, 85.

North Sumatra.¹⁵² Nevertheless, only one in 20 of the indigenous population attended school in the Deli region, whereas for the total Outer Islands combined this share was as low as one in 50. But, this tells us more about the public education provided by the government than estate education alone, since in 1930 only 7% of all children on estates received any form of education. Moreover, sometimes children did enter the workforce and work on estates instead of going to school. Apparently, the estate holders were not eager to provide education to children who would eventually leave the estates and find better employment due to the schooling they received at the estate. Despite all their good intentions, the estates held by the view that education was a job for the colonial government.¹⁵³

The Senembah Company also declared that the task of its own schools was to bring discipline and order to children and employees. The education given was relevant for and similar to the work that had to be done on the plantations. This was considered more important than to make the children literate with the possibility that they would find employment elsewhere. Similar visions on education were common at the sugar plantations in Java as well.¹⁵⁴

Other aspects of the accumulation of knowledge included spillovers or demonstration effects. The example of smallholder rubber cultivation has been discussed extensively. Thee Kian Wie and Van der Eng argue that the demonstration effect was important for the development of the indigenous rubber production in Sumatra and Kalimantan. They claim that the technique for rubber cultivation was learned at the estates, with former estate workers starting out as independent smallholders. More likely, the vast Chinese trading network played a role as well in stimulating smallholder trade.¹⁵⁵ Booth argues that most smallholder activities did not develop in the proximity of large Western plantations. Therefore, the demonstration effects were small.¹⁵⁶ Touwen argues that even if techniques of rubber tapping could have

¹⁵² NL-HaNa: MvO, 184, Oostkust van Sumatra, 1917; NL-HaNa: Deli Maatschappij, Dochtermaatschappijen en Gefuseerde Bedrijven N.V., 1869–1989, 32–36, Decennial report regarding the developments of the Deli Company.

¹⁵³ Deli Planters Vereeniging (DPV), *Jaarverslag 1914–1938; Statistical abstract for the Netherlands Indies, 1930* (Weltevreden: Centraal Kantoor voor de Statistiek, 1931); Kantoor van Arbeid, *Verslag van den dienst der Arbeidsinspectie 1921/22* (Weltevreden: Kolff, 1923) 24.

¹⁵⁴ Senembah Maatschappij, *Leerplan voor de scholen der Senembah Mij.* (Medan: Varekamp, 1926); NL-HaNa: Cultuurmaatschappij Kadhipaten N.V., 1905–1957, 239, Received letters from representatives, 16–04–1926.

¹⁵⁵ Thee, *Plantation agriculture and export growth*, 17–18; Van der Eng, *Agricultural growth in Indonesia*, 233; Lindblad, *Between Dayak and Dutch*, 61.

¹⁵⁶ Booth, *Agricultural development in Indonesia*, 17, 221.

been learnt from former estate workers, this was only relevant in the early stages of production. The knowledge would have been acquired anyway, since the process was not very complicated. Moreover, production was stimulated by intermediary traders such as the Chinese, which shows that their influence was important as well for smallholder production.¹⁵⁷

Besides providing various benefits for employees directly, estates also paid taxes to the colonial government. As a result, foreign private companies contributed indirectly to irrigation works, infrastructure, healthcare, schooling and other services that were initiated by the government. We will turn to these contributions now.

4.5 Fiscal linkages

Taselaar argues that economic cooperation between business organisations in the Netherlands Indies and the Netherlands was often problematic, and that there was a lack of interest in the Dutch government for private business initiatives in the colony. One consequence of the government policy, notably keeping the gold standard, was that exports of manufactured goods from the Netherlands Indies to the Netherlands were disadvantaged.¹⁵⁸ Whether a different policy would have led to a higher output of finished products and caused more linkages, falls outside the scope of this dissertation.

However, the system of taxation in the Netherlands Indies also had important repercussions for private foreign companies there. Various taxes were levied in the Netherlands Indies, including personal income tax, land tax, import and export tax and various excise taxes paid by either the indigenous population, the foreign population or both. In this section I have focused on the tax burden borne by foreign firms, in particular corporate tax. Such taxes may be considered to form fiscal linkages generating income for the colonial state, which was financially separate from the mother country from 1867. This income was spent on, and may have been beneficial, to indigenous Indonesians, either directly or indirectly.¹⁵⁹

The tax base for the colonial state changed around 1900. Substantial profits were made from the Cultivation System up to 1870 and then replaced

¹⁵⁷ Touwen, *Extremes in the archipelago*, 192–193.

¹⁵⁸ Taselaar, *De Nederlandse koloniale lobby*, 461–462.

¹⁵⁹ Anne Booth, 'The burden of taxation in colonial Indonesia in the twentieth century', *Journal of Southeast Asian studies*, Vol. 11 (1980) 91–109, in particular 93; Touwen, *Extremes in the archipelago*, 127; P. Creutzberg and Petrus Johannes van Dooren, *Changing economy in Indonesia (CEI): A selection of statistical source material from the early 19th century up to 1940. Vol. 2: Public finance 1816–1939* (The Hague: Nijhoff, 1976) 19–25.

by other types of taxes.¹⁶⁰ In 1878 the *patentrecht* (patent right tax) was introduced in Java. Its explicit purpose was to tax Dutch corporations operating on the island. The indigenous population had been subject to a similar tax since 1839. The patent right tax could be levied on all kinds of profits that were made by the Dutch. This tax amounted to 2% of the total income, but many sources of income were excluded. People who earned a salary or were employed by the government or worked for a Dutch trading company which was subject to income tax in the Netherlands were exempted from paying this tax. In practice, it did not prove easy to tax Dutch companies, and in 1897 they were exempted from paying this tax. As a compensation, the colonial authorities would receive payments originating from corporate taxes paid in the Netherlands. In fact, these companies did not pay any tax at all. Even Dutch insurance companies liable to pay the patent right tax did not pay tax after 1897 in the Netherlands Indies. In 1905, the situation changed when profits made by Dutch companies in the Netherlands Indies were taxed at a rate of 1%. A low rate applied as these companies had already been taxed in the Netherlands. In 1908 a general income tax for Europeans was introduced that also applied to Dutch-owned companies. Paid-out dividends were taxed if profits exceeded 5% of stated equity. A progressive tax rate was initially applied, but in 1913 it was altered into a fixed rate of 6%. On top of this tax, an *extrawinstbelasting* ('extra-profit' tax) could be levied, with a progressive rate from 6% up to 36% on the profits in excess of 10% of equity.¹⁶¹

When the First World War broke out, new taxes were introduced. A sugar tax implemented in 1916 was short-lived, since in 1917 the *oorlogswinstbelasting* (war profit tax) was introduced to compensate for

¹⁶⁰ Lindblad, 'Economische aspecten van de Nederlandse expansie in de Indonesische archipel, 1870–1914', 243.

¹⁶¹ Abdul Wahid, *From revenue farming to state monopoly: The political economy of taxation in colonial Indonesia, Java c. 1816–1942* (PhD thesis, Utrecht University, 2013) 47, 265–266; J.H.R. Sinninghe Damsté, *De wet op de dividend en tantiëmebelasting* (Zwolle: Tjeenk Willink, 1939) 167–169; Lancée, *Beknopt overzicht van het Nederlandsch-Indisch belastingrecht*, 6–8; Maarten R. Manse, R. Arendsen and M. Klever, 'De Indische loonbelasting in perspectief: Fiscale innovatie in koloniale context', *Maandblad Belasting Beschouwingen*, Vol. 87 (2018) 20–30, in particular 21–23; Maarten R. Manse, *Promise, pretence and pragmatism. Governance and taxation in colonial Indonesia, 1870–1940* (PhD thesis, Leiden University, 2021) 82–91; R.N.J. Kamerling, *De N.V. Oliefabrieken Insulinde in Nederlands-Indië: bedrijfsvoering in het onbekende* (Franeker: Wever, 1982) 196–200; M.W.F. Treub, *Nadere beschouwing over de Indische vennootschapsbelasting* (Weltevreden: Boekhandel Visser & Co., 1923) 9; Treub, *Nota van Mr. M.W.F. Treub*, 52–55; J.L. Vleming and J. van Gelderen, *Theorie en practijk van de Indische Belastingen: Lezingen gehouden te Weltevreden in de openbare vergadering van 4 april 1923* (Weltevreden: Indonesische Drukkerij, 1923) 22–23.

government losses as a result of the war. Profits during the First World War that were higher than average profits in normal years could be taxed at a rate of up to 30%, but only if it could be proven that such excessive profits were a result of the special conditions of war. Normal average profits were calculated by taking the average over the years 1911–1913.

Companies that could prove having paid tax in the Netherlands could be exempted from paying this tax anew in the Netherlands Indies. Yet, half of the revenue from this tax was to be transferred from the Dutch treasury to the Netherlands Indies. The sugar industry in Java was one sector contributing significantly to the treasury through this tax, since it benefitted considerably from growing demand and rising prices. Between 1920 and 1924 the sugar industry contributed at least 10% of the income of the treasury in the Netherlands Indies. Calculations for the total proceeds from the war profit tax from the estate economy run as high as f238 million in total between 1916 and 1925. These taxes provoked vehement protest from the oil industry. The petroleum companies, together with other mining companies, paid a fee to the owner of the land, whether an indigenous sultan or the colonial government. The BPM, for instance, reserved f1.4 million for concessions in 1925, and in Southeast Kalimantan the sultan received 36% of the fee, the colonial government 44% and the Oost-Borneo Maatschappij (OBM, East Borneo Company) 20%.¹⁶²

In 1925 a *vennootschapsbelasting* (corporate income tax) was introduced in the colony, which remained effective during the entire colonial period and even afterwards. It replaced existing profit taxes. 10% of the net profit was taxed and went to the treasury of the Netherlands Indies. Regressive taxation was obviously preferred by most companies over a progressive rate. Compared with other taxes at this time, the rate was quite high, especially when compared to other colonies. Companies with headquarters in the

¹⁶² Wahid, *From revenue farming to state monopoly*, 172; Lancée, *Beknopt overzicht van het Nederlandsch-Indisch belastingrecht*, 8; *Oorlogswinstbelasting voor Nederlandsch-Indië* ('s-Gravenhage: Martinus Nijhoff, 1918), 1; C. Schlick, 'De Indische oorlogswinstbelasting', *Economisch-Statistische Berichten*, Vol. 25 (1940) 158–160, in particular 158–159; De Ruiter, *Het mijnwezen in Nederlands-Oost-Indië 1850–1950*, 173; Taselaar, *De Nederlandse koloniale lobby*, 226–236; Van Zanden and Marks, *An economic history of Indonesia 1800–2010*, 127; Tichelaar, *De Java-suikerindustrie en hare beteekenis voor land en volk*, 130–144; Van der Mandere, *De Javasuikerindustrie in heden en verleden*, 104–105; F.W. Diehl, 'Revenue farming and colonial finances in the Netherlands East Indies, 1816–1925', in: John Butcher and Howard Dick (eds), *The rise and fall of revenue farming. Business elites and the emergence of the modern state in Southeast Asia* (New York: St. Martin's Press, 1993) 196–232, in particular 205; Jonker and Van Zanden, *A history of Royal Dutch Shell: From challenger to joint industry leaders, 1890–1939*, 267–269; Lindblad, *Between Dayak and Dutch*, 140.

Impact on the domestic economy

Netherlands could only be taxed for the portion of profit made in the Netherlands Indies. If tax had been paid in the Netherlands as well, they would be partly exempted from paying corporate income tax in the Netherlands Indies. During the latter half of the 1920s and 1930s, the fiscal system was developed further. The rate of corporate income tax was gradually raised and amounted to 20% in 1934.¹⁶³

How much of the total tax yield originated from foreign companies? Corporate and personal taxes were the two most important taxes levied by the colonial government. Taken together, they accounted for more than 30% of total tax revenue for the colonial government from the 1920s onwards. Land tax paid by the indigenous population remained another important tax, but its share in total tax revenue gradually dropped. Import tax and various excises were significant as well (Table 4.1). They were paid by both the indigenous population and foreign estates, and included the highly controversial tax on indigenous rubber implemented in 1934, but which only applied to estates from 1936. Taxes on Japanese imports from 1933 benefitted Dutch manufacturing more than supporting local production.

¹⁶³ Lindblad, *Between Dayak and Dutch*, 139; J.H.A. Logeman, *De grondslagen der vennootschapsbelasting in Nederland en Indië* ('s-Gravenhage: Boekdrukkerij S.S. Korhuis, 1923) 8; A. Ritz, *De Indische inkomstenbelasting voor de naamlooze vennootschap* (Amsterdam: De Bussy, 1923) 2–8; Bernardus Johan Frederik Steinmetz, *De progressieve winstbelasting en het Nederlandsch-Indische belastingvraagstuk: Een fiscaal-vergelijkende en fiscaal-economische studie* (Amsterdam: De Bussy, 1923) 16–17; R. Mansury, *The Indonesian income tax: A case study in tax reform* (PhD thesis, Erasmus University Rotterdam, 1992) 13–16; Diehl, 'Revenue farming and colonial finances in the Netherlands East Indies, 1816–1925', 205; W.F. Prins, *Het belastingrecht van Indonesië* (Groningen: J.B. Wolters, 1951) 143; Wahid, *From revenue farming to state monopoly*, 266; Ondernemersraad voor Nederlandsch-Indië, *Advies van den Ondernemersraad voor Nederlandsch-Indië aan den Minister van Koloniën, betreffende het "eerste verslag van de commissie tot herziening van het belastingstelsel in Nederlandsch-Indië* (Helder: De Boer, 1924) 12; Frans Herman Visman, *Verslag van de commissie tot bestudeering van staatsrechtelijke hervormingen, ingesteld bij gouvernementsbesluit van 14 september 1940, No. 1x/KAB. Brief ter aanbieding van het verslag aan zijne excellentie den gouverneur-generaal en deel 1 Indië's ontwikkeling tusschen den Eersten en den Tweeden Wereldoorlog* (Batavia: Landsdrukkerij, 1941) 42–43; Booth, *Agricultural development in Indonesia*, 220; Ondernemersraad voor Nederlandsch-Indië, *De praktijk over de werking der Indische belastingen* ('s-Gravenhage: Ondernemersraad voor Nederlandsch-Indië, 1923) 5–28; J.L. Vleming, *De strijd om de Indische vennootschapsbelasting. Overzicht en beschouwing* (Haarlem: H.D. Tjeenk Willink & zoon, 1924) 1–5; I.I. Korndorffer, 'Enkele opmerkingen in zake belastingen op naamloze vennootschappen in Indië', *Koloniale Studiën*, Vol. 6 (1922) 158–172, in particular 162.

Impact on the domestic economy

Table 4.1. Composition of colonial tax revenues in the Netherlands Indies in the period 1901–1940.

year	Income taxes		Land tax	Export taxes	Import taxes	Excises	Others
	personal	corporate					
1901–1905	8		32	3	18	10	29
1906–1910	13		26	3	20	12	26
1911–1915	20		21	3	23	11	22
1916–1920	22		16	3	23	9	27
1921–1925	37		9	3	19	7	25
1926–1930	15	17	11	4	25	11	17
1931–1935	21	5	13	4	22	18	17
1936–1940	16	16	8	12	18	21	9

Source: Wahid, *From revenue farming to state monopoly*, 274; Booth, 'The burden of taxation in colonial Indonesia in the twentieth century', 93.

During the 1930s, the income of the colonial state fell less sharply than GDP. In 1921 the GDP of the Netherlands Indies was f3,955 million; by 1934 it had dropped to f1,556 million. Meanwhile, revenue from taxes dropped from f332.9 million in 1921 to f221.6 million in 1934.¹⁶⁴ Expressed as a percentage of GDP, total tax revenue exceeded 10% during the 1930s. The yield from taxes was around one-third of the total revenue of the colonial government in the early 1910s, but this proportion increased to roughly two-thirds in the 1930s. Government monopolies and profits from government-owned companies accounted for the remaining share.

Overall, there was a rapid increase of tax yields after the end of the First World War. Tax revenues then remained relatively stable until the economic depression of the 1930s. Prior to the introduction of the corporate income tax in 1926, yields from taxes on companies amounted to f42.1 million, after 1926

¹⁶⁴ Creutzberg and Van Dooren, *CEI. Vol. 2*, 64–67.

Impact on the domestic economy

this amount rose to f71.9 million.¹⁶⁵ In the following years, up to the economic depression this tax yielded around f50 million each year. During the decade 1921–1930, company tax contributed 4.3% of total government revenue for the colonial state (Figure 4.7 and Table 4.2). During the depression, however, revenue from this tax dropped sharply to less than f10 million annually. Yields from this tax only recovered in 1938. In 1940, the total government revenue was f771 million, of which f46 million or 6% originated from corporate income tax.¹⁶⁶

¹⁶⁵ Joost Mellegers, *Government revenue in the Netherlands East Indies 1821–1940* (<http://www.iisg.nl/indonesianeconomy/>) last accessed, December 16, 2021. Note: Only includes direct taxes paid by companies, not war profit tax or import and export duties. War profit tax is in the source included in income tax. It is likely that a significant share of the income tax between 1919 and 1925 consisted of war profit tax. Adding this tax to the total company tax would show a steady increase of total tax revenue from the late 1910s until 1926.

¹⁶⁶ Wahid, *From revenue farming to state monopoly*, 273–274; Burger, *Sociologisch-economische geschiedenis van Indonesia*, Vol. 2, 113–116; Weijer, 'De groote cultures', 302–304; Visman, *Verslag van de commissie tot bestudeering van staatsrechtelijke hervormingen*, 42–43; Creutzberg and Van Dooren, *CEI*. Vol. 5, 70; Creutzberg and Van Dooren, *CEI*. Vol. 2, 64–67; Sluyterman, *Dutch enterprise in the twentieth century*, 105; Pierre van der Eng, 'Surplus mobilisation in farm agriculture: A comparison of Java and Japan, 1870–1940', *Bulletin of Indonesian Economic Studies*, Vol. 42 (2006) 35–58, in particular 41.

Impact on the domestic economy

Figure 4.7. Company tax as a percentage of total government revenue in the colonial state, 1910–1940.



Source: Mellegers, *Government revenue in the Netherlands East Indies 1821–1940*; Creutzberg and Van Dooren, *CEI. Vol. 2*, 64–67; *Koloniaal Verslag (Bijlagen C van het verslag der handelingen van de Tweede Kamer der Staten-Generaal)* ('s-Gravenhage: Algemeene Landsdrukkerij, 1868–1924); *Verslag van bestuur en staat van Nederlandsch-Indië, Suriname en Curaçao* ('s-Gravenhage: Algemeene Landsdrukkerij, 1924–1930); *Indisch Verslag* ('s-Gravenhage: Algemeene Landsdrukkerij, 1930–1940).

Impact on the domestic economy

Table 4.2. Yields from various taxes as a share of total government revenue, 1910–1940.

	Company tax	Personal income tax	Import duties	Export duties	Total
1910–1920	2.7	5.5	7.4	0.8	16.4
1921–1930	4.3	12.5	9.6	1.4	27.8
1931–1940	3.9	6.6	8.5	3.6	22.6
1910–1940	3.8	8.9	8.6	2	23.3

Source: Mellegers, *Government revenue in the Netherlands East Indies 1821–1940*; Creutzberg and Van Dooren, *CEI. Vol. 2*, 64–67; *Koloniaal Verslag (Bijlagen C van het verslag der handelingen van de Tweede Kamer der Staten-Generaal)*; *Verslag van bestuur en staat van Nederlandsch-Indië, Suriname en Curaçao*; *Indisch Verslag*.

Revenue from personal income taxation was more stable than those from corporate income taxes. There was over time a slightly declining trend, although the minimum taxable income for Europeans was reduced in the early 1920s, with tax rates being more progressive than in the Netherlands. Revenue from personal income tax for the colonial state fell from around f65 million in 1925 to f36 million per year in the late 1930s. Wahid argues that the tax burden on the indigenous population gradually lessened. This could imply that Europeans and ‘Foreign Asiatics’ were taxed more heavily, and also that the taxation of companies became more important.¹⁶⁷ Booth, however, argues that the tax burden of the indigenous population did increase after 1920 and that foreign private companies had more leverage in influencing the tax policies of the colonial government. They were more successful in forestalling tax increases by claiming that it would damage their international competitive position.¹⁶⁸

Foreign companies also contributed to other taxes. Company staff paid personal income tax, while import and export taxes also affected private firms. Indigenous Indonesians paid slightly less than half of all taxes combined over the period 1910–1940. But this proportion declined from the 1920s. The share of indigenous Indonesians in GDP was around 70%. Burger argues that the

¹⁶⁷ Wahid, *From revenue farming to state monopoly*, 273–274.

¹⁶⁸ Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 147.

Impact on the domestic economy

higher share of tax revenue from non-Indonesians resulted from taxes paid by foreign companies. Burger argues that direct and indirect taxes originating from activities of Western companies amounted to around 40% of total tax income in the Netherlands Indies prior to the Japanese occupation.¹⁶⁹

During the period 1910–1940, the total government revenue was f17.8 billion for the whole period, of which f674 million from company tax, f1,538 million from personal income tax, f1,501 million from import duties and f334 million from export duties. The burden of this tax was carried by shareholders overseas, while non-indigenous residents of the Netherlands Indies only accounted for 10%. Personal income tax and import duties were the foremost sources of tax revenue for the colonial state. Non-indigenous residents contributed about 30% of import and export duties, and 40% of excise taxes.¹⁷⁰ Between 70 and 90% of total personal income tax was paid by non-indigenous residents. It is likely that a substantial share of these taxes originated from the activities of foreign private companies. Therefore, the overall contribution of direct and indirect taxes by foreign firms to the colonial state exceeded 10% of total tax revenue, or roughly 5% of total government revenue, even taking into account that tax evasion by Europeans was estimated at around 10% by Polak. However, it does not seem very likely that 40% of total tax in some years originated from foreign companies as Burger at the time argued.¹⁷¹

It is hazardous to estimate how much the indigenous population benefitted from public expenditure financed by these taxes. Proceeds from taxes from all areas were collected by the exchequer in Batavia. From there, funds were distributed to regional authorities.¹⁷² In the early twentieth

¹⁶⁹ Lindblad, *Between Dayak and Dutch*, 150; H.J. van Brink, *De Indische ordonnantiën op de inkomsten- en productenbelastingen. Verzameld en van eene leiding voorzien* (Amsterdam: De Bussy, 1921) 10, 172; Lancée, *Beknopt overzicht van het Nederlandsch-Indisch belastingrecht*, 12; Rudolf Johann Willem Reys, *De inkomstenbelasting der inlanders en met hen gelijkgestelden in Nederlandsch Oost-Indië* ('s-Gravenhage: Nijhoff, 1925) 78–82; Mansury, *The Indonesian income tax*, 10–13; Wahid, *From revenue farming to state monopoly*, 48; Burger, *Sociologisch-economische geschiedenis van Indonesia, Vol. 2*, 113–116.

¹⁷⁰ For instance, between 1928 and 1935 the excises paid by BPM and Nederlandsche Koloniale Petroleum Maatschappij (Netherlands Colonial Petroleum Company, NKPM) in Cepu amounted to more than f5 million each year; NL-HaNa: MvO, 81, Japara-Rembang, 1936.

¹⁷¹ Burger, *Sociologisch-economische geschiedenis van Indonesia, Vol. 2*, 113–116; Booth, 'The burden of taxation in colonial Indonesia in the twentieth century', 99–100; J.W. Meijer Ranneft, and W. Huender, *Onderzoek naar den belastingdruk op de inlandsche bevolking* (Weltevreden: Landsdrukkerij, 1926) 17; Polak, *The national income of the Netherlands Indies, 1921–1939*, 37, government revenue included, besides tax revenue, non-tax revenues such as profits from state-owned companies, interest on loans and fees for licenses or concessions.

¹⁷² Lindblad, *Between Dayak and Dutch*, 153.

century, more expenditures were intended for public works under the banner of the Ethical Policy, aided by the simultaneous increase in GDP. Investment in irrigation increased in particular. Government expenditure reached its peak around 1920, but dropped significantly in the first half of the 1920s. It then recovered somewhat in the second half of the decade, only to fall again during the economic depression of the 1930s. Developments of revenue and expenditure were quite similar. Revenue from taxes reached its peak around the 1920s as well. However, expenditures were then 25% larger than total tax revenue. As a result, a policy of cut-backs was introduced.

Interestingly, during the first quarter of the twentieth century, at a time of a booming economy, expenditure on education remained small, not exceeding 10% of the total budget. The share of public works was more than twice the figure for education, but it dropped during the 1930s, too. Defence and civil service were two other large sources of expenditure, with a combined share of around 30% of total expenditures of the colonial state.¹⁷³ Most expenditures were realized in Java, which took around 70% of the budget. It can be argued that more could have been spent on education, industrialisation, infrastructure and welfare, especially when taking into account that proceeds from the tax on smallholder rubber in Sumatra were spent on cars for Dutch officials and only a small part went to Indonesian education. Roads, bridges and other infrastructure in particular, were constructed near production sites dominated by Western estates.¹⁷⁴ However, even if more than 10% of the total tax revenue originated from foreign private companies and the corporate income tax can be considered high compared to other countries, it is questionable whether much of these proceeds would have benefitted the indigenous population rather than the colonial bureaucracy.

4.6 Conclusion

In this chapter, I have discussed various linkages and showed which types operated in selected regions and industries. Backward linkages were most

¹⁷³ Lindblad, 'The late colonial state and economic expansion, 1900–1930', 119; Anne Booth, 'The evolution of fiscal policy and the role of government in the colonial economy', in: Anne Booth, William Joseph O'Malley and Anna Weidemann (eds), *Indonesian economic history in the Dutch colonial era* (New Haven, CT: Yale Center for International Studies, 1990) 210–243, in particular 221–225; Booth, *The Indonesian economy in the nineteenth and twentieth centuries*, 135, 141, 145, 158; Van Zanden and Marks, *An economic history of Indonesia 1800–2010*, 77, 99; H.J. van Oorschot, *De ontwikkeling van de nijverheid in Indonesië* ('s-Gravenhage: Uitgeverij W. van Hoeve, 1956) 26–27.

¹⁷⁴ Purwanto, 'The economy of Indonesian smallholder rubber, 1890s–1940', 190; Touwen, *Extremes in the archipelago*, 260, 302.

Impact on the domestic economy

prominent. They were present in a variety of industries. Irrigation and infrastructure in Java are good examples, but backward linkages were not restricted to Java alone. Many foreign companies constructed roads, but there are no statistics available that allow us to estimate how much of the infrastructure was created by foreign companies and how much by the colonial government. Although roads were primarily constructed in the interest of the company, the indigenous population clearly benefitted from the improved infrastructure as well. Even during the economic depression and after independence, the effects of infrastructure were still present in Indonesia.

Foreign firms across the archipelago required materials and labour, which was provided by the indigenous population. This was a prerequisite for the construction of factories and facilities. The output of these companies, however, consisted of primary export commodities, and even though local processing took place, forward linkages were rare and the beneficial effects were more pronounced in the Netherlands than in the Netherlands Indies. This was especially the case for the processing of tin, for which specialized equipment was manufactured in the Western world as well.

Regarding the compensation for land use, wages and other final demand linkages, it is debatable whether the firms did enough for their workers. Did the advantages of working for a foreign company weigh up against the disadvantages for indigenous workers and were compensations fair considering supply and demand in the domestic labour market? Estates did pay for the use of land, but landowners were not always convinced that they were better off when leasing out their land.

In total, less than one-tenth of the indigenous population worked for foreign firms. Most wages, therefore, were earned in the indigenous economy and it would be misleading to argue that indigenous Indonesians were excessively dependent on employment in foreign firms. Estimates of the proportion of wages paid by foreign firms in aggregate income of indigenous Indonesians in Java vary from 5.5% in 1924 to 7.7% in 1939. In the Outer Islands this proportion was in the range of 8–10%. Van der Mandere, however, claims that during the peak years in the 1920s the sugar industry alone was responsible for up to 11.5% of all indigenous income in Java. Even though wages on certain plantations in Java could have been higher than for similar work in the indigenous industries, in the Outer Islands foreign companies found it difficult to recruit local workers and, therefore, resorted to importing cheaper labour. Wages earned by the Indonesian population employed by foreign companies did on average not differ much from what Indonesians were able to earn in other businesses. Nevertheless, the foreign companies did provide a wage income to a considerable number of

Impact on the domestic economy

impoverished landless Indonesians. Around 7% of the total workforce of the indigenous population was employed by foreign companies, excluding seasonal workers. Including seasonal workers it is plausible that around 10% of indigenous income originated from foreign companies and that 10% of the indigenous workforce was employed by these companies during peak years.

Additional indirect benefits for workers existed, and they benefitted the company as well. But like infrastructure, it was possible that the surrounding population could also gain from these services. Taxes were another aspect. Fiscal linkages appeared due to payment of company tax paid by foreign firms. Foreigners also contributed significantly to other taxes, including import and export duties, excise taxes and personal income tax. Although it cannot be established exactly which share of these residents worked for foreign companies and which share was paid by foreigners, it is arguable that more than 10% of the total tax income for the colonial state, or more than 5% of total government revenue, originated from operations by foreign firms. This can be seen as a low estimate, considering that indigenous Indonesians paid less than half of all taxes from the 1920s onward. The rate of the company tax was increased in the long run, but instead of a progressive rate the tax system was regressive. In relation to its ability to pay, Western big business was not heavily taxed. Moreover, it is difficult to gauge how much of these proceeds were directly used to benefit the indigenous population.

Governmental expenditure for education was quite low, and while investment in irrigation and infrastructure was higher, arguably foreign firms benefitted from this before anyone else. In the previous chapter, we saw that there was colonial drain and profits were high, but it is questionable whether higher taxes would have improved the lot of local people. In the next chapter, I will continue analysing linkages, as well as profit and investment, but this will be done with the help of case studies, which will cast a new light on these topics and help discover the influence of foreign firms on the economic development of the Netherlands Indies.