

Foreign capital and indigenous economic development in Indonesia

Spillovers and linkages in a colonial setting

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Paper presented at the international workshop on ‘Colonial Business in Indonesia: The impact of foreign investment on economy and society’, Yogyakarta, 12 August 2016.

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Introduction

‘Is it too much to say that because of all this, the last decade has been one of extraordinary growth and progress in every field?’

With these words, Governor of S. van der Plas in his Report of succession (*Memorie van Overgave*)¹ of 1917 celebrated the economic development of North Sumatra² in the past decade. He mentions the expansion of the road and railway network, the establishment of rubber and tea estates next to the existing order of tobacco plantations, cosmopolitanism in thriving Medan. He also notes the spectacular population growth from half a million people in 1905 to almost one million in 1917, primarily due to the influx of plantation labourers from China and Java.³

These developments took place in North Sumatra largely as a result of European and American investment in estate agriculture. Yet, by ascribing this progress to ‘every field’ Van der Plas in his enthusiasm glanced over one issue that further on in his report is referred to as ‘lamentable’: the position of the local indigenous population, which did not seem to be partaking in the booming development of the region. In his eyes their condition contrasted sharply with the prosperity of the estates and the Chinese tradesmen.⁴

The observation of Van der Plas fits in with the perception that indigenous society in Indonesia gained little from foreign colonial business, being that the sole aim of these enterprises was to exploit the land

¹ Reports of succession were composed by parting Governors or Residents to inform their successors about geographic, economic, social and political matters in their residency.

² Or East Coast of Sumatra as it was then labeled.

³ S. van der Plas (Governor), ‘Memorie van Overgave van het gouvernement Oostkust van Sumatra’, 1917, pp. 4-7, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 184.

⁴ S. van der Plas (Governor), ‘Memorie van Overgave van het gouvernement Oostkust van Sumatra’, 1917, pp. 117-119, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 184.

and people of Indonesia for the extraction of maximum benefits. Contrary viewpoints are also easily found in the literature: on the other side of the spectrum we find a certain type of colonial triumphalism that evaluates colonial business from a more romantic-nostalgic point of view.⁵ Stereotypes are easily conjectured in this way, which calls for a more nuanced approach to the assessment of the relationship between foreign investment and indigenous society in colonial Indonesia.

In this paper I will analyze the impact of colonial business on indigenous economic development in colonial Indonesia through spillovers and linkages. In order to come to an assessment, I will use several case studies from different parts of the archipelago in which colonial business left its imprint on indigenous society. Starting with the concept of technological spillovers, we now turn to a discussion of tea cultivation in West Java and rubber production in Southeast Kalimantan. The concept of linkages is then analyzed on the basis of infrastructural developments and demand linkages from estates.

Spillovers

For the purpose of this chapter I interpret technology as ‘the perishable resource comprising knowledge, skills, and the means for using and controlling factors of production for producing... delivering... and maintaining goods and services’.⁶ This definition includes product, process, and distribution technologies, as well as management skills. Since foreign firms are not able to extract the full value of the productivity gains accruing to technology transfer or diffusion, these effects are commonly referred to as ‘spillover effects’.⁷

Firms that establish overseas subsidiaries normally have a technological advantage that enables them to compete with local firms. This then creates an opportunity for local firms to learn from the foreign firm. In this respect we need to distinguish between transfer and diffusion of technology. Technology transfer is the deliberate dissemination of technology from foreign firms to host country firms, whereas technology diffusion refers to the involuntary dissemination of technological know-how, for example through observation.⁸

⁵ J. Breman, *Koloniaal profijt van onvrije arbeid; het Preanger stelsel van gedwongen koffieteelt op Java, 1720-1870* (Amsterdam: Amsterdam University Press, 2010); J. Van der Zwaag, *Verloren tropische zaken; De opkomst en ondergang van de Nederlandse handel- en cultuurmaatschappijen in het voormalige Nederlands-Indië* (Meppel: Feniks Press, 1991).

⁶ S.H. Robock, *The international technology transfer process* (Washington, D.C.: National Academy of Sciences, 1980) 2.

⁷ R.E. Caves, ‘Multinational firms, competition, and productivity in host-country markets’, *Economica*, 41-162 (1974) 176.

⁸ A. Kokko, *Foreign direct investment, host country characteristics, and spillovers* (Stockholm: Economic Research Institute, Stockholm School of Economics, 1992) 20.

In the literature the spillover of technology from foreign companies to indigenous entrepreneurs in colonial Indonesia is often dismissed as insignificant.⁹ Nevertheless, there is evidence from primary and secondary sources that on occasion such spillovers took place and had far reaching consequences for Indonesians. For example, in his report of succession of 1932, the Resident of Kudus notes that:

‘In the districts of Tenggeles and Cendono the local population plants quite some sugar cane, thereby copying the cultivation methods of the European sugar estates. In the desa Klaling one can even find a small indigenous sugar factory, driven by steam power. The cane fields of this factory look particularly well maintained and are indistinguishable from the European ones.’¹⁰

Anecdotal evidence such as this suggests that on occasion members of indigenous society were able to profit from the example that was given by colonial business. In the case of Priangan, it was a combination of a deliberate transfer of knowledge and cultivation technique from estates to Indonesian peasants and a subsequent demonstration effect that laid the foundation of the extensive indigenous tea farming in the area.

Tea cultivation in West Java

In the early 1870s, planters around Sukabumi started to provide their mandur and house servants with tea seeds which they used to grow tea on their premises, at first only for private consumption. However, as the indigenous gardens grew and demand for Java tea increased, indigenous tea leaves became an important input for the European estates. When the European planters discovered that the ‘kampong tea’ was of sufficient quality to be mixed with estate tea, they provided the indigenous population around their estates with seeds, young plants and advice on cultivation techniques with the purpose of buying the produce.¹¹

Crone was the first tea planter who delivered tea seeds to farmers in Cicuruk and Cibadak, two districts in the Sukabumi regency, on the condition that they would sell the produce to him. In the Garut regency it was Holle, administrator of the Waspada tea estate, who provided the people around his estate with seeds

⁹ Thee Kian Wie, *Plantation agriculture and export growth: An economic history of East Sumatra, 1863-1942* (Jakarta: Indonesian Institute of Sciences (LIPI), 1977) 17-18; A. Booth, *Agricultural development in Indonesia* (Sydney: Allen and Unwin, 1988) 17, 221; J. Touwen, *Extremes in the archipelago: Trade and economic development in the outer islands of Indonesia, 1900-1942* (Leiden: KITLV press, 2001) 159.

¹⁰ Ilgen, W.A.C. (resident), ‘Memorie van Overgave van de residentie Koedoes’, 1932, 33, in: Nationaal Archief, Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 72.

¹¹ *Gedenkboek der Nederlandsch Indische theecultuur, 1824-1924* (Weltevreden: G. Kolff & Co., 1924), 53.

and information on how to cultivate and process the leaves into green tea.¹² Contrary to the general image of the harsh and profit driven colonial planter, Holle actively sought to improve the welfare of the indigenous population of Priangan, the Sundanese. He developed new farming methods for Sundanese peasants and strived for European education for the Sundanese elite in order to bridge the divide between them and the colonial officials.¹³

Not only were Indonesians outside the Western tea estates instructed with cultivation techniques by the tea estates, the practice of tea cultivation was also learned at the estates by Indonesian employees and put to practice at home. Soon these indigenous tea gardens were being copied by other members of indigenous society when they witnessed the profitable business first hand.¹⁴ According to the Inquiry into the diminished welfare (*Onderzoek naar de mindere welvaart*) from 1905:

‘the private tea estates on the leasehold parcels have a great influence on the economic state of the population in this department; primarily because they provide the opportunity to earn money by working on the estates, but also because most tea factories buy wet tea leaf from the population and because they have initiated the cultivation of tea by the indigenous population through the provision of seeds and young plants at no costs.’¹⁵

Increasingly Indonesians asked estates for seed and young plants, which at first were provided free of charge and without conditions. However, with rising tea prices the competition for indigenous produce increased. Now also estates and tea factories that did not provide seeds and instruction started to buy up indigenous tea, which led the estates to attach as a condition to their handouts that the produced tea could not be sold to other parties.¹⁶

Around 1900, witnessing the rapid expansion of indigenous tea gardens, the government came to regard tea cultivation as a means of providing a steady income to the indigenous population of Priangan. After all, tea shrubs, once planted and productive, could be harvested all year round for several years without the need to replant. Furthermore, it was hoped that the cultivation of tea gardens would bind the peregrinating population of the mountainous area of South Priangan to a permanent settlement, precluding the practice

¹² C.J.J. van Hall, ‘Bevolkingsthee’, in: C.J.J. van Hall en C. van de Koppel (eds), *De landbouw in de Indische archipel* IIb (W. van Hoeve: 's-Gravenhage, 1949) 246-47.

¹³ T. Van den Berge, *Karel Frederik Holle; theeplanter in Indië, 1829-1896* (Amsterdam: Uitgeverij Bert Bakker, 1998) 21.

¹⁴ *De theecultuur in de Preanger regentschappen. Inzonderheid die van de inlandsche bevolking* (Buitenzorg: Drukkerij Departement van Landbouw, 1910) 11.

¹⁵ *Onderzoek naar de mindere welvaart der inlandsche bevolking op Java en Madoera. Samentrekking van de afdelingsverslagen over de uitkomsten der onderzoekingen naar handel en nijverheid in de residentie Preanger-regentschappen* (Batavia: H.M. van Dorp & Co., 1906) 51.

¹⁶ *Gedenkboek der Nederlandsch Indische theecultuur*, 53.

of slash-and-burn agriculture and facilitating the collection of taxes.¹⁷ Pleased with these opportunities, the authorities decided to promote the cultivation of tea among the indigenous population of Priangan. Measures to stimulate indigenous tea production included the dissemination of seeds, the establishment of demonstration gardens and the exemption from taxes of land that was destined to be planted with tea.¹⁸

The estates however remained the main source of tea seeds: in 1933, 90 per cent of the seeds that were used in the indigenous tea gardens were supplied by the estates. The dependency of indigenous tea cultivators on the estates was made all the more stringent because fresh tea leafs could only be stored for one day before processing, and had to be transported in airy sacks or basket to maintain their quality, making transport voluminous and expensive. A precondition for the successful exploitation of an indigenous tea garden was therefore that it was situated in the immediate vicinity of a tea factory.¹⁹

Although the indigenous cultivation of tea became a considerable source of production for the tea industry in Indonesia (table 1), it could not develop into an independent industry producing for the world market. An important reason is that the export industry for tea leafs required considerable amounts of invested capital. Although tea was sold on international markets as a primary good, a good amount of local processing was required. In large industrial factories specialized machinery controlled the optimal temperature, humidity and ventilation for the withering, rolling, fermentation and drying of the tea leafs, producing a product of constant quality. The large investment in installations that had to be operated by technically schooled personnel made tea processing on an industrial scale unreachable for the indigenous cultivators, making them dependent on the capital-rich owners of processing facilities for the sale of their crop.²⁰ An attempt by a cooperation of indigenous tea farmers to run a modern tea factory met with little success. Bad management caused the factory to fail: despite the limited capacity of the factory and its outdated machinery, large quantities of tea leaf were bought up. Consequently, the factory was not able to process the leafs in a timely fashion. This, combined with inefficient working methods led the cooperation to produce an end product that was costly and of low quality. The tea was unsalable on both export markets and the national market, and within a year the cooperation had to file for bankruptcy.²¹

¹⁷ L.J. Vroon, *De bevolkingstheecultuur in de residentie West-Priangan* (H. Veenman & zonen: Wageningen, 1928) 18.

¹⁸ *De theecultuur in de Preanger regentschappen. Inzonderheid die van de inlandsche bevolking* (Buitenzorg: Drukkerij Departement van Landbouw, 1910) 3-8.

¹⁹ Van Hall, 'Bevolkingsthee', 248-50.

²⁰ W.B. Deijns, 'De theebereiding', in: C.J.J. van Hall en C. van de Koppel (eds), *De landbouw in de Indische archipel* IIb (W. van Hoeve: 's-Gravenhage, 1949) 227-45.

²¹ L.J. Vroon, *De bevolkingstheecultuur in de residentie West-Priangan* (H. Veenman & zonen: Wageningen, 1928), 134-35.

Table 1 *Tea production in colonial Indonesia, 1900-1940*
(10 year averages, production and exports in metric tons, area in hectares)

	1900-09	1910-19	1920-29	1930-39
Prod. summary				
Total	10,507	33,803	55,837	84,965
Estates	9,891	28,469	41,139	70,917
Smallholders	689	5,335	10,701	12,928
Area				
Estates	x	70,127	85,519	113,678
Smallholders	x	16,416	26,778	63,933
Exports				
Indonesia	11,401	33,983	54,735	78,543

Source: Changing economy in Indonesia pt. 1: Indonesia's export crops 1816-1940.

Despite the lack of development of an indigenous processing industry, the indigenous tea cultivation of West Java is nevertheless an example of technology transfer in a colonial setting, followed by technology diffusion through the demonstration effect. Although the technique of planting and cultivating tea is in itself not overly complex, it was a body of productive know-how that was deliberately introduced to the indigenous population by foreign entrepreneurs. While at first the donation of seeds to employees was of a philanthropical nature, it soon developed into an important part of the production base of the large-scale estate industry, driven by business interest.

Rubber cultivation in Southeast Kalimantan

After the demise of the sub district Hulu Sungai²² in Southeast Kalimantan in the beginning of the twentieth century as a center of tobacco cultivation due to competition from the Deli tobacco industry, rubber was introduced as a potentially profitable substitute. The oldest rubber garden in Southeast Kalimantan was started in the first years after 1900 in the kampong of Pagat, sub-district Barabai. The perennial crop was introduced there by hadjis that brought rubber seeds from the Straits Settlements on the way home from their pilgrimage. A few years later in 1906 it was the administrator of the languishing tobacco estate Mahé in Northern Hulu Sungai who imported seeds from the same source. Two business

²² An administrative unit in the Residency of South- and Southeast Borneo (nowadays known as Southeast Kalimantan).

relations of the estate administrator experimented with the *Hevea Brasiliensis* and the *Ficus Elasticus* and decided on the superior quality of the former. Consequently they established the Hajoep plantation near Tanjung, which was to play an important role in the initial phase of smallholder expansion. Meanwhile, another European entrepreneur established two rubber plantations in Martapura, named Tanah Indah and Danau Salak, which together counted more than 100,000 young trees in 1907.²³

Despite the establishment of several European plantations in the beginning of the twentieth century, they were soon to be outstripped by indigenous smallholders. This is shown by the share in total export of the estates, which dropped from 44 per cent on average in 1915-18 to 15 per cent in 1919-21.²⁴ Great expansion of indigenous rubber planting in Hulu Sungai erupted in the periods 1910-13, 1919-20, 1924-25 and 1929-30. Not coincidentally these waves of expansion coincided with rapidly rising rubber prices in international markets.²⁵

When around 1910 the indigenous population in Tanjung, which was to become the hotbed of indigenous rubber expansion in the first wave of planting, learned of the profitability of rubber cultivation and saw how easy it was to plant and tap the trees and prepare the rubber they started to follow the example of the European plantations. Other perennial crops such as coffee and pepper were uprooted to make space for rubber trees, and also the cultivation of food crops in higher situated grounds was combined with the growing of rubber trees. In 1911 and 1912 shiploads of seeds and saplings were brought in from Singapore, while planting material was also obtained from the Hajoep and Tanah Intan plantations. Soon other administrative subunits of Southeast Kalimantan such as Kandangan, Rantau, Barabai and Amuntai caught the 'rubber fever'. In these areas it was a combination of the example of the estates and the knowledge and seeds brought by returning hadjis that initiated the planting of rubber.²⁶

In the early years of the twentieth century the European rubber companies invested heavily in research related to the cultivation of rubber, and although the European rubber companies were of minor importance for the economic development of Southeast Kalimantan in terms of production, their planting and tapping techniques set an example for the indigenous rubber cultivators in the area.²⁷ In Amuntai knowledge about the planting tapping and processing of rubber was spread by ex-coolies of the Hajoep

²³ J. Th. Lindblad, *Between Dayak and Dutch; The economic history of Southeast Kalimantan 1880-1942* (Dordrecht: Foris publications, 1988) 58.

²⁴ *Idem*, 63

²⁵ A. Luytjes, *De bevolkingsrubbercultuur in Nederlandsch-Indië; Zuider- en Oosterafdeeling van Borneo* (Weltevreden: Landsdrukkerij, 1925) 27.

²⁶ M.T. Velsing, 'De bevolkingsrubbercultuur in de afdeeling Oeloe-Soengei residentie Zuider en Oosterafdeeling van Borneo', *Koloniale Studiën*, 9-1 (1925) 200-3.

²⁷ J. Ozinga, *De economische ontwikkeling der Westerafdeeling van Borneo en de bevolkingsrubbercultuur* (Zomer en Keuning: Wageningen, 1940) 248, 292.

estate. After they had worked on the estate for a period to learn these skills, they would provide instructions to aspiring planters: as a fee, they charged 2.5 guilders per person for a relatively simple tapping lesson, and 25 guilders for a 'secret' instruction in the more complicated technique of coagulation. Soon however the knowledge of this technique, which essentially entailed mixing of the latex with alum and then pouring off the water, disseminated outside the paid circuit.²⁸

The spread of rubber cultivation and tapping knowledge by ex-estate workers in Southeast Kalimantan is nevertheless an example of technology diffusion in a colonial setting. Here it was not a deliberate transfer of knowledge from foreign estate companies to other entrepreneurs in order to improve down- or upstream industries that caused the diffusion of technology. Rather, it was the training of personnel by the estates for the benefit of their own rubber production that led to the spillover of knowledge to rival entrepreneurs. Furthermore, as a factor in the rapid development of smallholder rubber production for the export market the importance technological spillover was limited compared to the role of the intermediary trade network that connected smallholders to international markets. Middlemen transmitted market information to smallholders, offered advance payments and generally stimulated the cultivation of rubber by the indigenous population of Southeast Kalimantan. In this way they were both an essential precondition and a strong incentive to the growth of indigenous rubber production for the export market.²⁹

Linkages

In a seminal work, Hirschman argued that certain 'leading sectors' could pull along the rest of the economy.³⁰ Through forward linkages, investment by a company can motivate investment by another company that uses the first company's output as an input. Similarly, through backward linkages, one company's investment can stimulate investment by another company supplying inputs to the first company.

The export industries in Indonesia created only few forward linkages, mostly in the oil refining industry. Backward linkages, specifically infrastructure, were much more important in their impact on indigenous economic development. More indirect linkages include fiscal linkages, in particular the taxation of foreign companies, and also final demand or consumption linkages, emerging when local spending of profits and wages stimulates import substitution by domestic industries.³¹ We now first turn to two case studies to

²⁸ Velsing, 'De bevolkingsrubbercultuur', 203.

²⁹ Touwen, *Extremes in the archipelago*, 195.

³⁰ A.O. Hirschman, *The strategy of economic development* (New Haven: Yale University Press, 1958).

³¹ A.O. Hirschman, *Essays in trespassing; Economics to politics and beyond* (Cambridge: Cambridge University Press, 1981) 65.

illustrate the impact of infrastructural backward linkages on indigenous society in North Sumatra and Central Java.

Deli Railway Company

Development of North Sumatra in the pioneering days of the reclamation of the area's jungle for agricultural enterprise was largely left to private capital. The cultivation of tobacco in the Deli plantation belt was set up in thinly inhabited area with a poorly developed infrastructure. When the Deli Company started out in 1870, North Sumatra's rivers formed the main entrance to its fertile interior. Outrigger canoes, ox carts or carriers transported the tobacco to ports on the coast from where it was shipped to Penang in British Malaya for export. In the absence of investment by the colonial authorities, the chief responsibility for developing the region's infrastructure rested with the estate companies.³² In a report from 1910 the resident of North Sumatra mentioned that the residency distinguished itself from other areas in the Netherlands-Indies by the 'firmness and *schwung* with which all things are handled here. Here not always that yearning for the public purse (...) If something has to be done they do it themselves.'³³

While this is confirmed by Resident Schaap for a large part of the residency of North Sumatra, mentioning that the sultans rarely invest in the development of people and land, he makes an exception for the sultans of Deli and Serdang. He notes that the Sultan of Deli provided some 'important sums of money' for the construction of a road to the Karo Highlands and a water pipe for the Sibolangit plain. The sultan of Serdang had provided funds for the irrigation of rice fields in the vicinity of Simpang Tiga.³⁴

Despite the contributions of the Sultan, a very important part of infrastructural development in North Sumatra was indeed privately funded. An example of such private initiative is the Deli Railway Company (*Deli Spoorweg-Maatschappij*, DSM). Commensurate with its status as largest estate company in the region, the Deli Company took the initiative to erect a railway network. After the government had granted the necessary concession, the DSM was established in 1883. The first railway lines connected Medan with Belawan, Deli Tua and Timbang Langkat (now Binjai). These lines were opened for transport of goods and people in 1886. Meanwhile, several other estate companies established 'feeder lines' to connect their estates with the DSM network. By 1890 the total length of railway track amounted to 103 kilometers. This was followed by a slowdown. Expansion was resumed after 1902 and within five years another 160

³² T. Volker, *Van oerbosch tot cultuurgebied. Een schets van de beteekenis van de tabak, de andere cultures en de industrie ter Oostkust van Sumatra* (Medan: DPV, 1928) 7, 21.

³³ J. Ballot (resident), 'Memorie van Overgave van de residentie Oostkust van Sumatra', 1910, p. 68, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 182.

³⁴ G. Schaap (resident), 'Memorie van Overgave van het bestuur over de residentie Oostkust van Sumatra', 1905, p. 61, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 181.

kilometers of railway track were constructed. From the mid-1910s, the rapid expansion of rubber cultivation in the Asahan district spurred construction of another 177 kilometers of tracks running southwards to Telok Nibung and Pematang Siantar. The final stretch of the Asahan line was completed when in the 1930s the track was extended to Rantau Prapat. In the same year the DSM moved 6 million passengers and 925 million KG of freight. 1937 the total length of track added up to 553 kilometers, with railway lines fanning out from Medan in all directions.³⁵

The next example of an infrastructural backward linkage portrays a similar effect on mobility of persons and goods.

Serajoedal Steam Tram Company

In 1889 the sugar factory Klampok was established in the valley of the Serayu river in the residency of Banyumas, Central Java. Soon after its establishment, the administrator of the factory urged the government to grant a concession for the construction of a railway that would connect the Serayu valley with the State Railway running from the seaport from Yogyakarta to the seaport of Cilacap. Without such a railway the transport of sugar from his factory to Cilacap was difficult and costly. The concession was granted in 1893 and the next year the Serajoedal Steam Tram Company (*Serajoedal Stoomtram Maatschappij*, SDS) was established by royal decree. Soon construction commenced and consecutively the lines Maos-Purwokerto (July 1896), Purwokerto-Sukaraja (December 1896), Sukaraja-Purworejo (July 1897) and Purworejo-Banjarnegara (May 1898) were opened for passenger transport. Previously the lines had already had been opened for cargo transport.³⁶

The tramline increased mobility in the area immensely. The number of transported passengers per year increased from 537 thousand in 1903 to more than 1.5 million in 1930 (table 2). Furthermore, the Serajoedal line had a stimulating effect on the production of copra by the indigenous population of Banyumas (table 3). In 1908 the management of the Serajoedal Steam Tram Company noted that the establishment of the tramline had caused an expansion of smallholder coconut tree cultivation. The increased income of the indigenous population from the sale of copra in turn led to a growth in the transport of persons and consumables by the SDS.³⁷ Other indigenous production was also stimulated and

³⁵ J. Weisfelt, *De Deli Spoorweg Maatschappij als factor in de economische ontwikkeling van de Oostkust van Sumatra* (Rotterdam: Bronder-Offset, 1972) 44-62.

³⁶ S.A. Reitsma, 'Eenige bladzijden Indische spoorwegpolitiek (de lijn in het Serajoedal)', *Indisch tijdschrift voor spoor- en tramwegwezen* (1915) 3-4: 75-79.

³⁷ Serajoedal Stoomtrammaatschappij (SDS), Annual Report 1908, p. 7-8, in: Nationaal Archief (NA), The Hague: Serajoedal Stoomtrammaatschappij, 2.20.19, no. 5.

increasingly transported using the SDS (table 3).

Table 2 *Transport of persons by the Serajoedal Steam Tram Company, 1903-37 (thousands)*

	<i>1st class</i>	<i>2nd class</i>	<i>2nd class</i>	<i>Total</i>
			<i>Indigenous</i>	
1903	2.5	51.5	537	618
1904	3	54.5	609	667
1915	9	98.5	1,397	1,505
1920	6	130	2,690	2,827*
1925	1	75	1,461	1,537
1930	-	32	1,554	1,585
1935	-	16	732	749

* In the annual report of 1921 it was noted that the glut in crops of the previous year had caused the abnormal high number of transported persons.

Source: Serajoedal Steam Tram Company Annual Reports.

Table 3 *Indigenous produce transported by the SSM, 1901-35 (tons, 5 year averages)*

	<i>Earthen-ware (rooftiles)</i>	<i>Copra</i>	<i>Vegetables and fruits</i>	<i>Manufactures</i>
1901-1905	30	6,778	692	202
1906-1910	199	12,392	1,940	363
1911-1915	292	9,915	5,853	553

1916- 1920	216	8,764	16,097	726
1921- 1925	746	15,841	4,921	1,160
1926- 1930	318	16,486	4,366	1,007
1931- 1935	226	401	1,691	628

Source: Serajoedal Steam Tram Company Annual Reports.

The SDS' annual report of 1915 describes the influence of the SDS line on the development of Purwokerto. As a result of the improved connectivity with the surrounding region the city grew and a school for indigenous teachers and an indigenous agricultural school were established, an ice factory was constructed, car rental agencies and a cinema were opened and even an indigenous hotel 'exploited and equipped in a European way'.³⁸ In 1920 the total length of the SDS' lines was 125.7 kilometers.³⁹

The Deli Railway Company and the Serajoedal Steam Tram Company are clear examples of backward linkage generated by the estate industry that had unintended benefits for the local populations of North Sumatra and Central Java. Although both companies were initially established for the transport of tobacco and sugar, they quickly earned half of their revenues by transporting other goods and passengers.

Besides infrastructural backward linkages, another important effect of large-scale agriculture on the surrounding economy was the demand for construction material, foodstuffs and consumer products that the estates and their workers created in the surrounding region, as we will now see in the case of North Sumatra.

Final demand linkages in North Sumatra

With the rise of foreign investment in the Netherlands Indies came an increase in the demand of private entrepreneurs for labour. Most investment went into labour-intensive estate agriculture producing for the world market, which required a great deal of manpower to 'open up the land'. The most obvious example

³⁸ 'Als eigenaardig teeken des tijds valt nog te vermelden de opening van een Inlandsch hôtel op Europeesche wijze geëxploiteerd en ingericht.', in: Serajoedal Stoomtrammaatschappij, Annual Report 1915, p. 5, in: Nationaal Archief (NA), The Hague: Serajoedal Stoomtrammaatschappij, 2.20.19, no. 5.

³⁹ Serajoedal Stoomtrammaatschappij, Annual Report 1920, Appendix A, in: Nationaal Archief (NA), The Hague: Serajoedal Stoomtrammaatschappij, 2.20.19, no. 5.

of private capital transforming wild, virgin land into highly rentable plantations with the help of thousands of indigenous labourers was in Deli, North Sumatra, where the tobacco industry was established 'practically in and out of the uninhabited primeval forest'.⁴⁰ In 1929, on the eve of the Great Depression, the coolie population in North Sumatra reached its peak at a total of 302,703 persons.⁴¹

Considering the spending of this large group of people and the demand of the plantations for foodstuffs and construction materials, one would expect 'final demand linkages'⁴² generated by the estates to be substantial. Although wages were generally low and remained roughly the same from 1930 to 1940 due to the 'cheap labour policy' pursued by the two large employers' organizations the Deli Planters Association (*Deli Planters Vereniging*, DPV) and the General Association of Rubber Planters on the East Coast of Sumatra (*Algemene Vereniging van Rubberplanters ter Oostkust van Sumatra*, AVROS), the total amount of money paid to labourers in North Sumatra formed a considerable sum. Over the period 1927-1936 labour wages paid by DPV members on average constituted 61 per cent of their total operation costs with an average total of 18.5 million guilders per year. The average share of wages in total operation costs of AVROS members over the period 1928-1937 was even higher still at 74 per cent with an annual average total of 24 million guilders.⁴³ That there was indeed a significant demand for foodstuffs and simple consumption goods as a result of the distribution of the substantial flow of income from the estates is shown by the relatively high per capita import figures of East Sumatra.⁴⁴

Imports in North Sumatra were initially mostly foreign in origin, with imports from Java averaging less than 20 per cent until 1934; after that year the proportion rose to almost 30 per cent (table 4). The expansion of exports of primary products from North Sumatra thus spurred the growth of final demand linkage industries not locally but in Java and abroad.⁴⁵ So why was the food shortage and demand for consumer goods in North Sumatra after the influx of large numbers of Chinese and Javanese labourers met by imports instead of local production?

⁴⁰ T. Volker, *Van oerbosch tot cultuurgebied: Een schets van de beteekenis van de tabak, de andere cultures en de industrie ter Oostkust van Sumatra* (Medan: Varekamp & Co, 1928) 7.

⁴¹ J. Th. Lindblad, Coolies in Deli: Labour conditions in Western enterprises in East Sumatra, 1910-1938, in: V.J.H. Houben, J. Th. Lindblad and others, *Coolie labour in colonial Indonesia: A study of labour relations in the Outer Islands, c. 1900-1940* (Wiesbaden: Harrassowitz Verlag, 1999) 72.

⁴² Thee describes these linkages as 'effects in income distribution and consumer demand, due to input by an industry of primary production factors', in: Thee, *Plantation agriculture*, 50.

⁴³ DPV and AVROS annual reports. It has to be noted that the wage figures of the AVROS members include wages and bonuses of European personnel that was more likely to be spent on imported luxury products or to be remised overseas.

⁴⁴ Thee, *Plantation agriculture*, 107.

⁴⁵ *Idem*, 133.

In the case of rice shortage the unfettered granting of land concessions to plantations by local rulers created a land deficit for the local population of the plantation area.⁴⁶ Governor Van der Plas wrote in 1917 that ‘the oldest plantation areas now experience the drawback of the granting of land concessions on too large a scale’, forming ‘an almost unbroken complex of plantations’.⁴⁷ Although the land shortage partially may explain the high per capita import of rice, it does not offer a full explanation for the failure of North Sumatra to develop industries to meet local demand for simple consumer goods.

Table 4 *Imports of North Sumatra by region, 1924-1938*
(percentage of total imports and millions of guilders)

1924/28			1929/33			1934/38		
<i>Interreg. imports</i>	<i>Foreign imports</i>	<i>Total imports</i>	<i>Interreg. imports</i>	<i>Foreign imports</i>	<i>Total imports</i>	<i>Interreg. imports</i>	<i>Foreign imports</i>	<i>Total import</i>
(%)	(%)	(mill.)	(%)	(%)	(mill.)	(%)	(%)	(mill.)
13.9	86.1	105	19.1	80.9	89	30.8	69.2	61

Note: Interregional imports are imports from Java.

Source: Trade statistics.

An important reason for the failure of import substitution materialize in North Sumatra was the free trade regime. It was much cheaper to import technology from other regions than to produce it locally. Moreover, the government did not pursue protective policies to stimulate the development of import-substituting industries.⁴⁸

Furthermore, opportunities arising from final demand linkages from the plantations in North Sumatra were mostly seized by immigrants. Governor Van der Plas gives an illuminating overview of economic activities of different immigrant groups: imports and trade in consumer goods was dominated by the Chinese, construction work at the plantations was the domain of Banjarese from Southeast Kalimantan, Indians and Bengalis traded in livestock and milk, Chettyars from India provided high interest loans, Arabs and Bombayites traded in artifacts and Japanese were active as dentists, photographers, pharmacists and hotelkeepers. Japanese women ‘everywhere found their way as prostitutes or as housekeeper at

⁴⁶ *Idem*, 111.

⁴⁷ S. van der Plas (Governor), ‘Memorie van Overgave van het gouvernement Oostkust van Sumatra’, 1917, p. 253, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 184.

⁴⁸ Touwen, *Extremes in the archipelago*, 159.

European households'.⁴⁹ Other than through the provision of transport services, deliveries of construction materials and agricultural and forest products to the plantations and nearby markets the local population of North Sumatra did not seize upon final demand linkages generated by the estates.

Colonial drain

A more controversial explanation for the relative lack of economic impact of the plantations on the local economy in North Sumatra is the disproportionate remittance of profits overseas by companies, also known as the 'colonial drain'. Furthermore, a large proportion of the workers at the plantations was foreign and therefore a 'good proportion' of their earnings were remitted abroad, also known as the 'double drain'.⁵⁰

However, if we look at the remittances of Chinese and Javanese labourers working at member companies of the DPV, we see that in the period 1927-1934 they constituted only 0.8 per cent of total coolie wages on average (table 5). Unfortunately, we lack data on remittances by European plantation staff. Nevertheless, it is likely that the largest part of plantation wages was spent in North Sumatra.

Table 5 *Remittances of DPV members' plantation labourers as a percentage of total wages, 1927-36 (thousands of guilders)*

	<i>Remittances</i>	<i>Total wages</i>	<i>Percentage of total wages</i>
1927	229	26.444	0.9
1928	218	28.052	0.8
1929	234	29.376	0.8
1930	161	26.657	0.6
1932	111	13.850	0.8
1933	73	10.359	0.7
1934	67	10.026	0.7

Source: DPV Annual Reports.

⁴⁹ S. van der Plas (Governor), 'Memorie van Overgave van het gouvernement Oostkust van Sumatra', 1917, p. 60-65, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 184.

⁵⁰ Touwen, *Extremes in the archipelago*, 126.

Governor Van der Plas also mentioned the drain of revenues in his report of succession, stating that ‘it is regrettable that profits largely leave the land’.⁵¹ But how substantial was this drain of profits compared to the millions that stayed in North Sumatra? We are able to roughly calculate the profits of the tobacco plantations in the period 1927-1936 and the rubber plantations in the period 1928-1937 in North Sumatra by subtracting operation costs from the total yields of annual harvests.

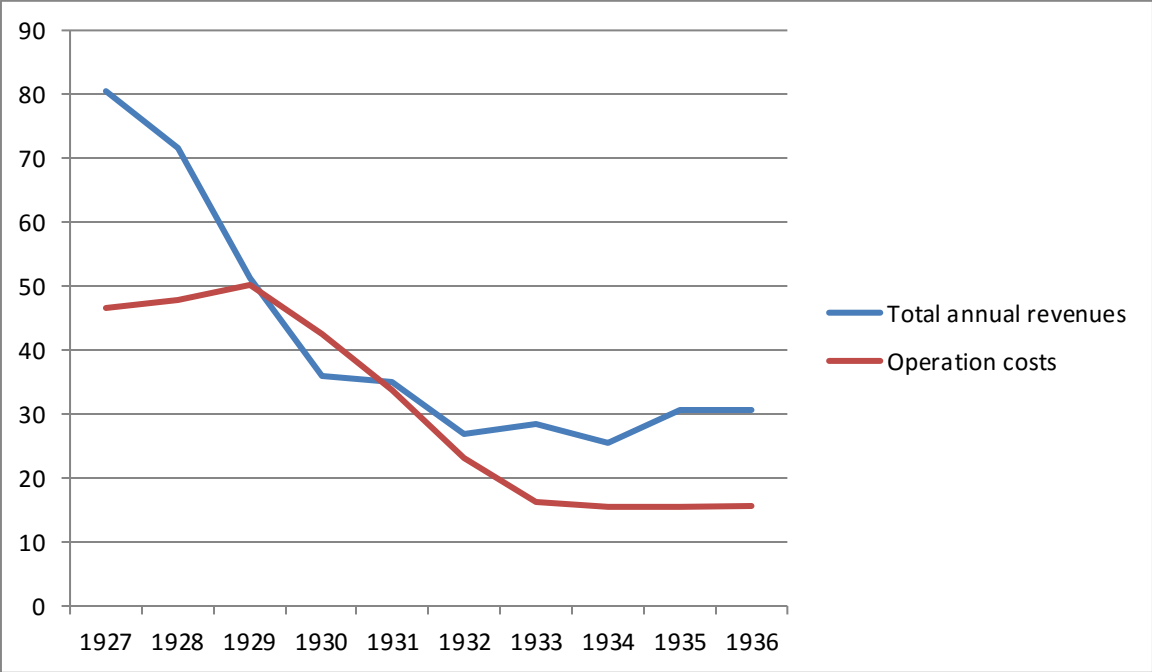
During the period 1927-1936 total revenues from DPV members’ tobacco harvests were 488,9 million guilders, while total operation costs amounted to 307 million guilders. Total profits amounted to 182 million guilders while 63 per cent of total revenues was spent within North Sumatra. During the years 1928, 1930, 1932, 1934, 1936 and 1938 total revenues of AVROS members’ rubber harvests was 253 million guilders. Total profits amounted to 61 million guilders while 76 per cent of total revenues was spent within North Sumatra.⁵²

Unfortunately the time periods over which we can calculate total profits and the share of operation costs of total tobacco and rubber harvest yields are for the greater part situated in the immediate post-crisis years and are thus not unambiguously representable for the pre-crisis years. Nevertheless, in the years 1927 and 1928 total operation costs of DPV members amounted to 62 per cent of total harvest yields and in the year 1928 total operation costs of AVROS members amounted to 60 per cent of total harvest yields.

⁵¹ S. van der Plas (Governor), ‘Memorie van Overgave van het gouvernement Oostkust van Sumatra’, 1917, p. 89-90, in: Nationaal Archief (NA) Den Haag, Ministerie van Koloniën: Memories van Overgave, 2.10.39, no. 184.

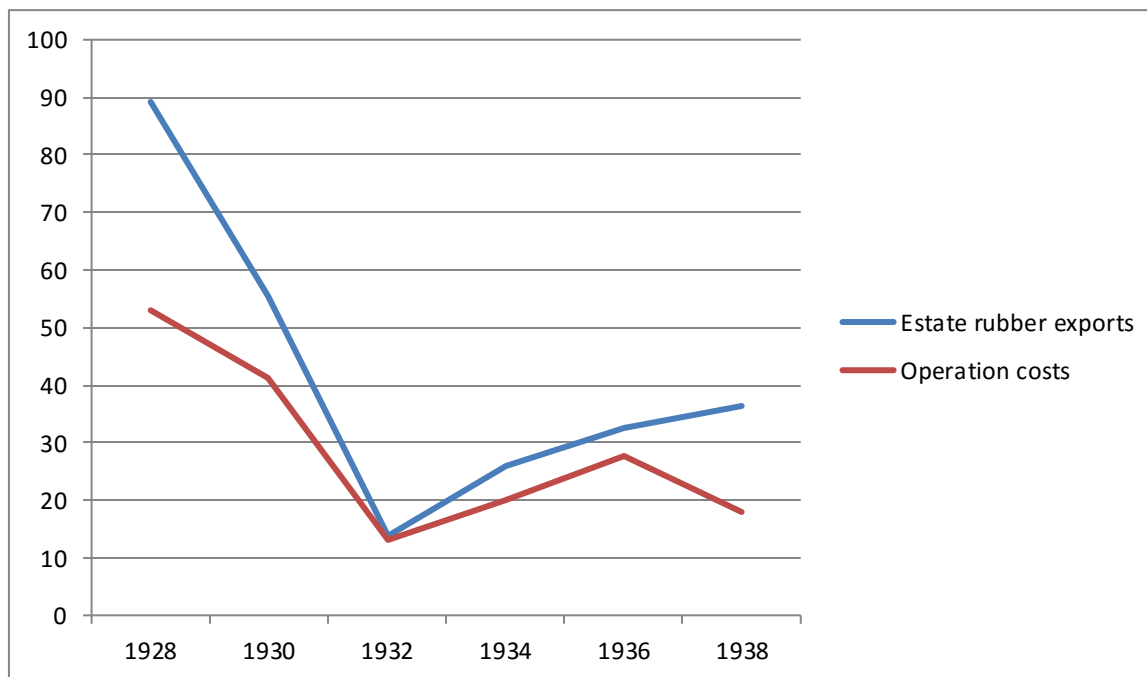
⁵² DPV and AVROS annualreports.

Figure 1 *Total annual revenues DPV members and their operation costs, 1927-36 (in millions of guilders)*



Source: DPV Annual Reports.

Figure 2 *Total value estate rubber exports and AVROS members' operation costs, 1928-38 (in millions of guilders)*



Sources: AVROS Annual Reports.

Considering the labour-intensive nature of both the tobacco and rubber plantations it is likely that also in pre-crisis years substantial parts of total harvest yields commonly remained in North Sumatra. Profits were indeed partly remitted overseas, but without such returns to investors there would not be any foreign capital invested in North Sumatra to begin with.

Although we lack quantitative data on profits that were reinvested in the colony, there are qualitative sources such as the report of succession of Governor Van Kempen that indicate that such reinvestment was common. He notes that part of the profits was kept as reserves for the expansion and improvement of the plantations while a substantial part ‘positively returned to the Indies as investment in other companies’, noting the example of the fibre plantation Soemoet of the Kota Pinang Plantation Company, in which 3 million guilders of predominantly tobacco profits were invested.⁵³

Conclusion

In this paper I analyzed technological spillovers and linkages between foreign business and indigenous society in colonial Indonesia and how these impacted on economic development of the latter.

⁵³ C.J. van Kempen (Resident), ‘Memorie van Overgave van het gouvernement Oostkust van Sumatra’, 111.

In West Java the tea estates provided peasants in the estate surrounding with the material and knowledge to produce tea. Although the indigenous side of tea production did not develop into a processing industry, it develop into an important source of additional income for a large part of the population of the Priangan region in West Java next to more traditional forms of agriculture. Contrary to this spillover in the tea industry, in Southeast Kalimantan the technological spillover from the rubber estates to smallholders was less defining in its impact. Incentives from the demand for rubber on world markets, accompanying high prices and the role of intermediate traders were the most important drivers for the development of smallholder export production.

An important way in which estate industries facilitated economic growth was by stimulating the development of infrastructure. Although originally intended to serve estate interests, these backward linkages stimulated indigenous production of a variety of goods through improved market access. The more indirect backward linkages that were generated by demand from the estate industry in North Sumatra did not spark the development of local indigenous industries for consumer products, which was precluded by the availability of cheap imports and the competition from immigrants. The remittance of profits and wages does not seem to have been an important factor: the largest part of revenues were spent locally as operation costs and remittances by immigrant workers constituted only a fraction of total wages.

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