

# THE DEVELOPMENT OF AGROINDUSTRY AND TRANSPORTATIONAL NETWORK IN THE CENTRAL JAVA DURING DUTCH COLONIZATION

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## ABSTRACT

*The Java Land has been developed into a big plantation area, especially a sugar cane and coffee plantation. Those plantation was carried out since the seventeenth century by VOC, and then it is developed rapidly in nineteenth century, especially in the cultivation system period. The development of plantation company needs supporting vehicles and facilities. As a result of this, there are a development of land transportation, especially a train since the middle of the nineteenth century and the water transportation includes a big ships which enliven some harbours in Java, such as Semarang, Jakarta, Cirebon and Surabaya.*

*Keywords: agroindustry, transportation network, Dutch colonization*

## ABSTRAK

*Tanah Jawa pernah berkembang menjadi wilayah perkebunan yang besar, terutama perkebunan tebu dan kopi. Usaha perkebunan itu mulai dilakukan sejak abad ke-17 oleh VOC, dan berkembang pesat pada abad ke-19, terutama sejak masa Tanam Paksa. Perkembangan perusahaan perkebunan memerlukan sarana pendukung transportasi. Akibatnya berkembanglah transportasi darat, terutama kereta api sejak pertengahan abad ke -19 dan transportasi laut berupa kapal-kapal besar yang meramaikan sejumlah pelabuhan laut di Jawa, seperti Semarang, Jakarta, Cirebon, dan Surabaya.*

*Kata kunci: agroindustry, jaringan transportasi, kolonial Belanda*

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## INTRODUCTION

Economic activity theoretically is divided into three sections of activity, namely production, distribution, and consumption. The three economy sections are associated each other. In the first level of the subsistence society, the three economic activities only happen both in a community and among this community. However, for the more advanced society, the three sections of economic activity are carried out by the different social groups, in different communities, and in the adequate space. In the such condition, the position of transportation becomes very important connecting the producer with the consumer.

In short, the distribution of products requires an adequate transportation.

In Java island in particular and Indonesia (*nusantara*) in general, the relation between transportation (routes and modes of transportation) and the producer and the consumer have changes. In classic period until the XVII century, the main route of transportation used river as the main aspect that connecting one region to other regions. The hinterland river net was then closely related (*network*) with the harbor cities located in coastal areas. From the harbor cities, then the river net was connected with the marine network and also connected with the other islands (*inter insular*), and also international (Hall, 1985: 13-

20). The good producing yielding the hinterland areas, such as rice were transported through big rivers such as Bengawan Solo, Lusi, etc to the harbor in the trading cities located in the northern coast of Java like Lasem, Juana, Semarang, Jepara, Demak, Kendal, Pekalongan, Tegal, and etc. On the contrary, goods from overseas and other islands were stored in warehouses at the harbor and then brought through the rivers to the consumers in the hinterland (Lombard, 2000: 52).

In the early of nineteenth century, the transportation network in Java had quite fundamental changes. Besides the river transportation network was still in progress, the land transportation grew rapidly. Beginning with the construction of the entry post (De Groote Post) by Herman Daendels in 1808-1811, the land transportation was starting to be an important alternative linking between inter cities on the northern coast of Java. The important change that was sufficient to determine was the construction of railroad lines since the cultivation system (*cultuurstelsel*) period to carry plantation products in the hinterland of Java to the major harbors such as Semarang, Cirebon, Surabaya, Batavia, including Cilacap. This article tries to map the land and sea transportation networks, and their relation in the production of plantations in Java since cultivation system period, and Liberal Colonial Politics to Ethical Colonial Politics in the twentieth century.

## THE CULTIVATION SYSTEM AND HIGHWAY TRANSPORTATION

### Government Plantation Plants

Up till now, memories of the nationalists and liberalist concerning Cultivation system are always dark, that is

the suppression by the Dutch colonization against Indonesian inhabitants. Regardless of those memories, from the perspective of transportation and economic growth, cultivation system had produced an adequate economic growth and extraordinary land transportation network. Economic growth was associated with a favorable export crop expansion by the Dutch colonial government (Booth, 1988: 1-13).

During cultivation system, sugar cane and coffee remained the mainstay for the Dutch East Indies State although other varieties of industry plants were developed. Sugar cane was planted in the lowlands combined with the main crop of the majority of the Javanese, namely rice. Meanwhile, coffee was grown in the highlands far from the inhabitants.

To support the agro-industry went on, the Dutch government was fully supporting starting from provision of land and labor, capital, infrastructure, until marketing. Land and labor were performed by using compulsion through the heads of the natives. Capital was provided by the government through a loan from The Java Bank (*De Javasche Bank*). Infrastructure was built starting from the road horses, railroads, ports, and warehouses. Meanwhile, for the marketing interest, The Colonial government formed a committee called *Nederkands Handels Matschappij* (Dutch Trading Company) (Booth, 1988: 52).

Agro-industry expansion efforts undertaken by the Dutch invader during the Cultivation system had brought amazing results. The production of sugar and coffee was continuing to rise, and easily sold in the international markets. The value of Indonesian coffee and sugar exports to overseas showed an increasing trend resulting in a large foreign exchange for Dutch East Indies government (Table 1). As a result the

Table 1. Indonesian Coffee Export Growth Value 1835-1870

Year	Coffee (f)	Sugar (f)
1835	10.353	4.760
1840	18.571	6.975
1845	15.610	10.428
1850	16.955	11.756
1855	26.896	12.825
1860	27.239	13.260
1865	31.554	12.923
1870	25.965	8.416

Source: Anne Booth, 1988

Dutch State Treasury which was originally drained to the war costs (especially the Diponegoro War) could be returned even tremendous surplus. Money flows in million guilders to Holland and it is used for developing the Netherlands, especially Amsterdam.

Coffee and sugar cane crops were not always available for every prefecture in the central Java. The highland areas, such as Kedu residency generally produced coffee plants. While in lowland areas, in which irrigation was enough, it produced sugar cane crops. Some areas in Java, which was in the Cultivation system period, not only follow the cultivation system, but also produced plantation crops, namely the Kingdom of Jogjakarta and Solo (*Vorstenlanden*), including the Kedu residency (Houben, 1994; Suhartono, 1991; Wasino, 2008).

The area which is now becoming the Central Java Province consisted of several residencies. In the cultivation system Period, there were eight residencies, namely: Tegal, Pekalongan, Semarang, Jepara, Rembang, Banyumas, Bagelen, and Kedu. Beyond that residencies was an area of *Vorstenlanden* (Departement van Landbouw, 1926).

Crops of sugar cane which became the basic ingredient of sugar industry

are the largest expansion plant in the Central Java at the cultivation system period. Table 2 shows changes in the development of sugar cane crop areas and the development of the distribution for each prefecture in central Java.

Based on table 2, it is showed that the preferred area of sugar cane since the beginning of the cultivation system period was the northern coastal area in western part of Central Java. It was seen from the number of sugar cane area that was so wide for residencies of Tegal, Pekalongan, Semarang and Jepara. The hinterland or the inland regions like Banyumas, Bagelen, and Kedu residencies only had few sugar cane crop areas. Similarly, the northern coast of eastern part of Java, the Residency Rembang, also had a relative small area.

Outside the sugar mills mentioned above, there are still many other sugar mills, that is in the area of Surakarta resident. The development of private sugar industry was recently widely developed in Surakarta after 1859. Liberalization or licensing of the Europeans to invest in that region and favorable prospects in reap profits encouraged the development of this industry. In 1860, in Surakarta, there are eight sugar mills powered by water, the nine other sugar mill driven by buffaloes. In 1862, 44 of 138 European businesses (31%) in Surakarta paid attention to the sugar cane plantations. There is detailed information regarding the name and location of sugar mills in Surakarta in 1863, as shown in Table 3 (Houben, 1994: 298).

Based on the table, it can be explained that the sugar plantation was concentrated in Klaten and Sragen region covering the South Mount Merapi and northeastern of Surakarta Resident. Although the total plantation area in Sragen was greater than in Klaten, the number of sugar cane plantations and sugar mills was less than Klaten, or only

Table 2. Area Sugar cane during Cultivation System Period

Residency	Year	
	1837 (area in bau)	1860 (area in hectare)
Tegal	1040	2286
Pekalongan	658	1064
Semarang	973	1306
Jepara	2349	2629
Rembang	n.a.	213
Banyumas	n.a.	227
Bagelen	n.a.	265
Kedu	n.a.	45

Source: *Kultuur Verslag 1837*; Elson, 1994:86; van Schaik, 1986:49

Note: n.a. = not available

concentrated on the relative large plantation areas. In addition, there were a number of sugar cane plantations in the Bayalali region located in the eastern of Merapi (Houben, 1994: 299).

The second important crop is coffee. Coffee is a plant that grows in the highlands. Unlike sugar cane crop that has cycle in a matter of months (18 months), the coffee plants require long time to obtain outcome. Table 4 shows the ratio of total area of coffee plants in each prefecture in the Central Java.

Based on table 4, shows that the coffee plants during the cultivation system period existed everywhere in the residency of the Central Java. Yet the widest their area is Kedu area. Another area which has a lot of coffee planted area is an area that has a suitable plateau or mountainous terrain for sugar cane. The

example of this suitable area is southern region of Tegal Resident in the northern slopes of Mount Slamet. In Pekalongan, coffee was planted in the southern mountainous region that mainly borders on Wonosobo. Meanwhile, in Semarang Residency, sugar cane was planted in the southern Kendal region such as Boja and Sukorejo (Suryo, 1994).

Kedu is a special area of coffee plants. Djuliaty Surojo argues that, although it was not exposed to the cultivation system of sugar cane, it did not mean that it was not subject of cultivation system. Kedu resident was also exposed to the cultivation system for planting coffee and indigo plant (*tarum*). Coffee is the crop in the highlands and has begun to be cultivated before cultivation system. Originally, coffee was planted freely (arbitrary) in the court-

Table 3. Sugar Companies Distribution Area in Surakarta in 1863

Area	Estates	Area (bau)	Labor Amount	Production (load)
Kartasura	3	2.591	1.575	11.860
Klaten	9	11.722	6.523	40.239
Boyolali	11	8.290	4.527	21.734
Sragen	18	13.710	3.661	13.039
Jumlah	41	36.313	16.286	86.872

Source: Vincent Houben, 1994: 299

Table 4. The Coffee Crop Area during Cultivation System

Residency	Year	
	1837 (Area in bau)	1844 (Area in bau)
Tegal	12.0	10.9
Pekalongan	9.5	10.2
Semarang	15.3	21.3
Jepara	7.2	5.4
Rembang	2.1	1.3
Banyumas	22.5	23.2
Bagelen	19.4	18.3
Kedu	26.0	30.4

Source: *Kultuur Verslag 1837*; Elson, 1994:86

yard houses known as *paggerkoffic* or in gardens around the village (*kampongekoffij*) (Soerojo, 2000).

Due to the god prospect of coffee, the government wants the improvement of coffee crop. Since 1820, the colonial of government had ordered people to grow coffee on large farms. Land that was used was an opened dry land or special land used for coffee plants. The manufacturing of land was done by all farmers in the village. Meanwhile, the maintenance was handed over to the dry land peasant ruler and rice field farmer ruler who were responsible over a number of coffee trees.

Together with the policy of the cultivation system, in 1833 the government introduced 2 million trees of coffee plant as fence coffee and forest coffee in Kedu. This policy was not implemented by the farmers. This farmers' action as a form of defense in order to make their coffee was not included in of government oversight network. One of the obligations is to sell all the coffee to the government. In other words, the government held the monopoly on coffee sales.

The government still obligated farmers to plant coffee for the government interest. As the consequence, farm-

ers had to accept this mandatory working as an inevitable burden. Even after seeing the coffee started to bear fruit since the age of 2-14 years, farmers began to accept the coffee cultivation system. This plant continued to expand extensively in the Kedu region.

Instead of the two plants, there are still some important crops that are developed during the cultivation system period. Those plants were indigo, tobacco and tea. The comparison of those areas the three plants for each residency can be seen in table 5.

In contrast to sugar and coffee crops that could be predicted the location and trend of growth, indigo, tobacco, and tea the cultivation system period were relatively could not be mapped out to their development. In a certain year, it was well recorded, but on the other following year, there was no data. This is related to the intensity of the colonial government's interest over the plants were not as big as sugar cane and coffee (Elson, 1994: 86).

### Transportation Mode

Before 1860, transportation routes

Table 5. The Comparison of Land Plants of Indigo, Tobacco, and Tea

Residency	Year/ Area (in bau)					
	Indigo		Tobacco		Tea	
	1837	1844	1837	1844	1837	1844
Tegal	1374	n.a.	n.a.	90	87	232
Pekalongan	4389	4235	n.a.	n.a.	49	155
Semarang	n.a.	n.a.	n.a.	250	36	180
Jebara	212	n.a.	n.a.	n.a.	37	n.a.
Rembang	n.a.	n.a.	259	1978	n.a.	n.a.
Banyumas	6542	6586	83	186	250	15
Bagelen	4389	4235	n.a.	n.a.	49	155
Kedu	n.a.	250	200	n.a.	n.a.	225

Source: *Kultuur Verslag* 1837; Elson, 1994:86

Note: n.a. = not available

that connected between the sugars estates with sugar mills and harbors by using land transportation. The biggest highway in the Central Java which is the main road on the northern coast is the road that was made since HW Dendels with called Postweg Groote (Nas & Pratiwo). Daendels' road is the first-class protocol road and then it was connected with smaller roads which connected the northern coast of Central Java with the hinterland. That is why the most crowded area in Central Java at that time is the area of the northern coast of Java. In addition, beside being artery land transportation, the Daendels road was also linking a distribution from hinterland plantation crops that would be brought to the harbor. At that time the largest port is Semarang harbor (Sulistiyono, 2003: 119-174).

Smaller road is the road that connected between the Solo and Semarang. The highway that connected Solo-Semarang had existed before 1860. This highway usually had been accustomed transported the goods of the land tenant who owned plantation in Surakarta, such as coffee, sugar, and indigo. This road was very important for being the interface with the marine transportation

at the Semarang harbor. Another road was Surakarta - Ngawi - Surabaya. The second route is though far, but it was too prominent because there was large port in Surabaya which transports plantation product to the outside of Java and of Netherlands East Indies. Data in 1860 gave a detailed description of the goods transported through the two land routes (Table 6).

Transportation vehicles from the sugar plantation to the sugar mills and from the sugar mills to the port generally used horse-drawn carriage. The kinds of land transportation that was used were horse, horse-drawn carriage (*delman*), two-wheeled bullock cart (*cikar*), two-wheeled carriage (*bendi*), and oxcart. Road as a means of land transportation was divided into two parts, namely a big way (*lurung big*) and small street (*lurung little*), and the connecting road to the village street. In some parts of the road, there were so often crossed the river, so it required a bridge. Big bridge called *kareteg* and small bridges called *ipeng*. Roads and bridges were constructed using compulsory labor without pay (Wasino, 2008: 258-269).

Another important highway is the highway that connects between Sema-

Table 6. Cargo Volume Through Land Roads from Surakarta to Semarang and Surabaya In 1860

Land Route	Transported Goods	Volume
Surakarta-Semarang	Kopi	46.608 pikul
	Gula	10.547 pikul
	Nila	102.422 A.p
Surakarta-Surabaya	Kopi	21.911 pikul
	Gula	7.008 pikul
	Nila	13.821 A.p

Source: Vincent J.H. Houben, 1994: 288

rang and Jogjakarta through Magelang. Based on the given data, early highway was built even from Jogjakarta to Magelang. In order to support the interests of the cultivation system, the road was added the width or the length. In 1833 Jogjakarta-Magelang road was extended up to Pringsurat. Nine years later, in 1842 it was followed by the building of entry road through Pingit to Ambarawa so it is now connected from Jogja-Magelang-Ambarawa-Semarang. Even at the same year, it was also built road Magelang -Salaman as a be big entry road. In 1843, there was built a big bridge on the post road Jogjakarta-Semarang and Magelang-Bagelen border. In 1851, a major posts road of Salaman-Purworejo was built. Finally, in 1862 all weight of vehicles in the Kedu had been set (Wasino, 2009).

#### PRIVATE SUGAR ESTATE DEVELOPMENT AND RAILROAD TRANSPORTATION LINE

##### From the Government Plantation to the Private Plantation

The development of plantation crops (agro-industry in Java) as a result of the cultivation system grew rapidly. The private investors began to play on this plantation business. A plantation business conducted by western private

entrepreneur which was originally only in Jogjakarta and Solo finally explored into other areas in the Central Java that had become the colonial government plantations through Cultivation system.

Since the private sector played an important role in the sugar estate industry, the development of agro-industry was growing rapidly. The sugar cane plantation is the most dominant product. Exports had continued to develop since 1870 (table 7).

Export of sugar from Java was produced by a number of sugar mills. Especially in the Central Java region there were many sugar mills. Table 8 shows the comparison of private sugar mills cooperated with the residency government in the Central Java in 1870-1900.

Based on table 8, it shows that almost all private sugar mills (which cooperate with the government) in the Central Java were concentrated on the northern coast of the Central Java. There is only one existing sugar mills in the hinterland which cooperates with the government, namely in Banyumas. It means that there still continued the tradition of sugar cane network during the cultivation system period which placed the northern coast of Java as sugar canes areas supported by sufficient sugar mills.

Outside those sugar mills, there

Table 7 Number of Sugar Export  
1870-1940

Year	Export amount (5 years in average) in thousand ton
1870	172
1875	217
1880	255
1885	384
1890	414
1895	547
1900	786
1905	1.063
1910	1.327
1915	1.528
1920	1.64
1925	2.112
1930	2.893
1935	913

Source: Anne Booth, 1988: 204.

were sugar mills that did not cooperate with the government, including the region of Surakarta. Those sugar mills were owned by the private western and the Mangkunegaran Kingdom. The private Western owned some sugar mills, namely Ceper, Gondang Baru, Bangak. Meanwhile, the sugar mills owned by Mangkunegarana were Colomadu and Tasik Madu.

A sugar production in this region was growing rapidly. Table 9 shows the

Table 8. Sugar mills in the Central Part of Java which Working with Government

Residency	Year / Amount				
	1870	1875	1880	1885	1890
Cirebon	10	10	10	10	10
Tegal	8	8	8	8	8
Pekalongan	3	3	3	3	3
Semarang	4	4	4	4	4
Jepara	9	9	9	9	9
Rembang	1	1	1	1	1
Banyumas	1	1	1	1	1

Source: Booth, O 'Malley, 1988: 206-207; R.Z. Leirissa, et al., 1996:71.

development of the sugar production in the late nineteenth century and the early twentieth century.

Apart from sugar crops, coffee still became a significant and superior crop since 1870. Coffee which was originally a government crop planted by private estate companies. The comparison of the coffee planted by government and the private estate companies was seen in table 10.

Based on Table 10, it can be seen that initially the percentage of coffee production produced by the private sector was smaller than the coffee planted by the government. However in the early twentieth century, the situation had been changed, the production of coffee owned by private company coffee.

Since the cultivation system period, to the Liberal Colonial Politics, up to the Ethical Colonial Politics, the variations of plantation crops indicated a sustainability. Beside sugar cane (sugar) and coffee, there were still other plants that liven up the plantation industry in Java in general and Central Java in particular, namely, tea, nila (*indigo*), and tobacco. In the early twentieth century, there was new commodities addition, namely rubber. Table 11 shows the development of plantation areas in Java as a whole over a century (1840-1940).



Table 9. European Plantation Area and Sugar Industry in Surakarta Residency

Year	European Plantation Area	Sugar Production (in thousand load)
1880	301.000	198
1890	259.000	332
1900	246.000	725
1910	235.000	1.215

Source: Koloniaal Verslag: 1881,1891,1901,1910; Siraishi, 1990:12

### Transportation Development

Together with the growth of plantation industry in Java (including Java), it was necessary to do transportation a revolution. It began to build the railroad on land. There were some proposal of this rail road construction. In 1841, the Dixon & Co. company, the owner of iron foundry industry "De Atlas" Amsterdam pleaded to the government to build a railroad from Semarang to Kedu and the kingdom in the hinterland. Road trains will be used to carry train carriages and ox, buffalo, and horses -drawn carts. Though the proposal had been ap-

proved, the establishment was never done.

Another proposal was to request the concessions of some development of railroads in Java. The railroad line would be passed Jakarta-Surabaya-Bogor; Jakarta Anyer; Surabaya-Ngawi; Jakarta-Semarang-Cilacap. The proposals lasted from the 1850s until the 1860s.

There was a different argumentation about the management plan for the railroad. There was a party who wants the railroad built and managed by the government, but another group wanted to be managed by private party. It is related to the political debate in the Netherlands between conservative politicians and liberal politicians.

To realize these railroad lines proposals as a new alternative transportation in Java, the colonial government sent TJ Stieltjes to give advice on technical issues to the Colonial Office. In 1860, he conducted research in order to transport improvements. He identified the possibility of a train route from Semarang to hinterland kingdom areas of Semarang - Surakarta and Jogjakarta (Koloniaal Verslag, 1861: 117; Houben, 1994: 288-289). He called it as a west

Tabel 10. Comparison between Government Coffee Production and Private Coffee Production 1870-1914

Year	Govt Coffee Prodctn (in average/year) in thousand load	Private Coffee Prodctn (in average/year) in thousand load	Percentage of Private Coffee Prodctn (%)
1870-74	986	158	11
1875-79	1.096	168	14
1880-1884	1.065	269	14
1885-1889	636	285	20
1890-1894	375	282	31
1895-1899	314	446	43
1900-1904	212	403	59
1905-1909	98	273	66
1910-1914	50	355	88

Source: Sartono Kartodirdjo, 1991: 90

Table 11. Plantation Areas in Java (ha)

Year	Sugar	Coffee	Tea	Rubber	Indigo	Tobacco
1840	22.701	n.a.	1.868	n.a.	n.a.	808
1850	29.204	n.a.	1.643	n.a.	n.a.	1.241
1860	27.976	n.a.	1.820	n.a.	n.a.	1.248
1870	32.347	n.a.	3.082	n.a.	n.a.	n.a.
1880	37.483	n.a.	5.776	n.a.	n.a.	76.553
1890	44.020	n.a.	7.747	n.a.	n.a.	73.048
1900	91.049	n.a.	n.a.	n.a.	n.a.	93.768
1910	126.525	51.231	49.439	63.943	n.a.	151.533
1920	153.366	105.886	78.247	157.299	n.a.	129.302
1930	198.007	97.520	98.589	228.933	n.a.	182.169
1940	90.765	83.081	104.967	240.956	n.a.	173.037

Source: Anne Booth, 1988: 221

Note: n.a. = not available

side of mountain route and east side of mountain route, although in reality both routes passed east complex of Mebabu-Merapi (Suryo, 1994: 108).

Originally, the construction of this railroad was tendered to the private sector, but it was declined. Finally in 1861, the construction of railroads was submitted by W. Poolman, the former director of the NHM, to the Dutch colonial government. Then, the railroad line from Semarang to Surakarta was built and successfully opened in February 1870. During the first year of their operation, 70,000 tons of goods transported through this railroad (Suryo, 1994: 289).

Till 1880, the reports submitted by the Resident of Surakarta told that the exploitation of the railroad ran routinely and regularly. The goods were transported from Surakarta to Semarang or on the other way were more increased.

A railroad line of Semarang-Surakarta was followed by Surakarta-Surabaya line through Madiun. A measurement of the new line was started in 1876 and was completed in 1880 (AVS 1880), but officially, the opening of this new railroad line was on 24 May 1884 (Wasino, 2008: 262). Surakarta-

Jogjakarta line was completed in 1873. It passed through irrigated rice fields and densely populated villages. In addition, it was also over valleys as long as 56.7km (Henket, 1886).

The impact of railroad construction linking Semarang-Surakarta and Jogjakarta had brought a tremendous changes to an economic growth in Surakarta. Takashi Siraishi mentioned those as capitalism century in the region (Siraishi, 1990). Suhartono (1986) identified these impacts in both positive and negative aspects. For the positive aspect, the estate industry had grown tremendously; on the other hand, it created marginal communities of the society resulting social pathologies, such as robber, robbery, social protest in line with the development of estate industrial in that area (Suhartono, 1986).

In addition, at the same period it was also built other railroad lines. Until the early twentieth century, almost all regions in the Central Java had bonded by railroad transport. That train paths were known as the north route and the south route. The north route was from Surabaya-Semarang-Cirebon. Then the south route was from Surabaya-Solo-

Jogjakarta-Cirebon. There was also a crossline of Jogja Cilacap.

According to Susan Zuhdi (2002) Jogja- Cilacap railroad line was the second line in Central Java after NISM. 187.283 km long railroad line started to build in 1879 and completed in 1887 at the cost of 14,709,074.75 guilders. The purpose of the opening of the railroad cross Jogja-Cilacap is to facilitate the transportation of sugar from the mills in *Vorstenlanden* areas, especially Jogjakarta.

According to Sartono Kartodirdjo (1987: 363-366) railroad line was made to make a link between the harbor city and hinterland. The main harbor city in Central Java is Semarang as the core port. In addition, there were small harbor, like Tegal, Pekalongan, and in the west of Cirebon, the north coast and on the southern coast of Cilacap.

#### **THE TRANSPORTATION NETWORK OF ROAD TRAINS AND PORTS ON LATE XIX CENTURY AND EARLY XX CENTURY**

The development of industrial plantations in the Central Java since the cultivation system to Ethical Colonial Politics had given birth to the transportation network. Transportation network connected between the producers of raw materials of plantation product with farm product processing industry. From the plantation product processing industry, then, it was distributed to a wider distributor through the available channels. If it was exported to overseas or outside Java, the last transportation network of the land transportation in Central Java is the harbor, especially the Semarang harbor on the north and Cilacap harbor on the south. If it was spread inside of country, it just used road routes, ranging from roads to the

village streets.

Semarang Port is an old harbor. Long before Demak developed into the Islam kingdom in Java, Semarang had become an important port. Sam Po Kong ship relics in *Gedong Batu* described as a former troop ship of Admiral Cheng Ho, proved that in this region there had been an important harbor. Harbor had grown rapidly since the VOC controlled Semarang in mid-18<sup>th</sup> century (Supriyono, 2008). In the twentieth century, Semarang was noted as a main harbor alike to the harbors of Surabaya, Batavia, Napier, Belawan, and Padang (Sulistiyono, 2003).

Agustinus Supriyono (2008) very clearly revealed that Semarang harbor became the main entrance and outside door to the transportation network in the Central Java. Semarang harbor had a transport links with *Hintherland*. Transportation links with hinterland closely related to economic development in that area. Since the late nineteenth century until early twentieth century, western private capital entry was invested heavily in plantations. The companies were generally the branch of a big capital in its their country. A result of this, then, there was an ease for exporting those products through Semarang harbor.

Land transportation network through the railroad line grew rapidly and it was a network with the Semarang harbor. Until the early twentieth century, there were several railroad companies that opened route across the regions of the Central Java. The establishment of NIS (*Nederlandsch-Indische Maatschappij Spoorweg*) in Semarang in 1867 allowed the transportation networks from the hinterland to the Semarang harbor. Railroad line construction of Semarang-Solo, Solo-Jogja, Semarang-Cirebon, Semarang, Temanggung and Jogjakarta had tied around the plantation producers surround the railroad

Table 12. Location of Sugar mill in Central Java and the Train Transportation Network at the End of the Century XIX and Early XX Century

Residency	Sugar Mills	Train line
Indramayu	Jatiwangi, kadipaten, parang jaya	
Cirebon	Niew Losari, Arjawinangun, Karangsuwung, Jati Piring, Luang Gajah, Niew Tersana, Gempol, Sendang laut, Surawinangun	SCS
Pekalongan	Adiwerna, Banjardawa, Kalimati, Patarukan, Balapulung, Banjaratma, Pagongan, Jati Barang, Duku waringin, Pangkah, Kemanglen, Kemantren, Gragi, Comal (Wonopringgo dan	SCS
Semarang	Besito, Kaliwungu, pakis, Cepiring, Gemu, langse, Rendeng, de Hoop (Mayong), Trangkil, Banyuputih, tanjung, Mojo	SCS, NIS, SJS.
Banyumas	Klampok (Bojong), Kalibagor, Kalirejo, Purwokwrto)	NIS
Kedu	Purwareja, Prembun	NIS
Yogyakarta	Bantul, Beran, Demak Ijo, Kedaton (Plered), Volharding, Barongan, Medari, Gondang Lipura, Sewugalur, Gesikan, Wonocatur, Pundung, Cebongan, Sendang Pitu, Rewulu,	NIS
Surakarta	Bangak, Ceper (Maja), Kartosura, Karang Anom, Prambanan, Dlanggu, Kedungbanteng, Gondang Winangun, Candi Sewu, Krajan Reja, Tasik Madu, Colomadu, Ponggok, Manis	NIS

Source: compiled from several literatures

line sent its products through the Semarang harbor. NIS had particularly transportation network that connected Semarang (including to the port) to Surakarta, Jogjakarta, Magelang (Kedu territory, including Temanggung), up to William Fortress in Ambarawa. Another railroad company that operated was the SJS (*Semarang-Joana Stroomtram Maatschappij*). The company was originally just ran a city tram which connects between the cities of Semarang with its center at Journatan. Meanwhile, in 1887, it was expanded outward according to its name, that is until Juana, Pati Residency. It also expanded to eastward through Demak,

Mayong, Juana, and finally Blora. This path allowed the transportation of local plantation products from Demak, Kudus, Jepara, Pati, and Rembang.

The western area was served by opening tram line by SCS (*Semarang-Chirebon Stroomtram Maatschappij*). This line enabled to transport farm products and people from the western part of northern coast to the Semarang harbor, which was originally only through Tegal and Cirebon harbor.

In the early twentieth century, in the Central Java, there were three groups of area which were reached out the network rail transport operations.

The western region consisted of In-dramayu, Cirebon, Pekalongan. The southern region was Banyumas, Kedu, Jogjakarta and Surakarta. The eastern region was the areas included the Semarang Residency.

The train lines could be associated with sugar mills development for each prefecture in the Central Java. The distribution of the sugar mills as shown in table 12.

Based on the table, it could be identified sugar transportation lines from the railroad companies in the Central Java. From the data it was seen that the NIS has the most area sugar transport area, which was 40 plantations, followed by SCS 28 estates, and SJS 11 estates (Supriyono, 2008). From those plantation areas, mostly they were exported through the Semarang harbor, and others through Cirebon, Tegal, and Cilacap (Zuhdi, 2002).

Trains carried people and goods. The goods were mostly as plantation products products, and from the results of the plantation, sugar cane and sugar ranked significantly. The percentage of

sugar transport in each railroad company could be seen in table 13.

Table 13 shows that the NIS was the biggest railroad company of freight tonnage of goods during that period. But the percentage of sugar estate products was not the highest; on average each year, sugar was transported 25% of goods transported. The second rank in the amount of freight was SCS, but the transportation percentage of sugar estate products was much higher than the NIS because it exceeds 40%. Meanwhile, SJS only transported goods relatively less. The percentage of goods transported from sugar estate was only about 15%.

Except transporting goods, trains also carried passengers. Passenger transportation was divided into three classes, namely class 1, class 2 and class 3. All train companies either the NIS, SJS, or SCS were carried passengers. As an illustration of transporting people, it could be illustrated in table 14.

Table 14 provides an interesting picture. If transporting goods, NIS was the pioneer, then transporting passen-

Table 13. Railroad Company and The Products of the Transported Sugar Cane Plantation

Year	Goods and Output Products of Sugar Mill (sugar, seed, sugar cane and mollases) transported in 1000 ton					
	NIS		SCS		SJS	
	Total goods	Sugar	Total goods	Sugar	Total goods	Sugar
1918	1.949.419	480.587	n.a.	n.a.	n.a.	n.a.
1919	2.073.819	454.784	n.a.	n.a.	n.a.	n.a.
1920	2.190.069	411.757	1.020.711	394.969	643.517	101.420
1921	2.377.454	475.990	1.115.869	408.447	663.599	109.631
1922	2.098.000	506.700	1.041.379	448.269	494.003	99.467
1923	2.040.000	491.000	1.015.075	466.780	489.344	91.848
1924	2.354.000	599.300	974.422	456.574	507.438	95.009
1925	2.412.000	657.100	1.098.333	545.728	574.080	112.949
1926	2.519.000	623.300	1.025.664	498.196	525.133	92.704

Source: H.CH. G.J. van der Mander, 1928: 106.

Note: n.a. = not available

Table 14 Passenger Transported by Railroad Company from Semarang (Departure from Semarang)

Year	Train Company /The amount of passenger transported		
	NIS	SJS	SCS
1910	148785	351014	n.a.
1915	262023	603810	241343
1918	487299	824855	307615
1925	281438	763472	157399
1929	381065	801092	275412

Source: Verslag de Handels Vereeniging te Semarang: 1910,1915,1918,1925,1929.

Note: n.a. = not available

gers was identified by SJS. If it was examined from the long line of operation, the NIS and the SCS were much longer compared with SJS. It seems related to the location that SJS was passed through the city lines, especially Semarang.

Besides to the three railroad companies, there was still another company operating in the southern part of Central Java. This firm was called SDS (*Serayudal Stoommatschappij*). This railroad company was built in 1884. This tram connected the lush hinterland Banyumas along the River Serayu to the Port of Cilacap.

The presence of this tram was economically very important. This tram line as the Dutch colonial government's strategy to break the flow of farm goods (especially tobacco in the north Bagelen and Wonosobo) in order to the fact that not all those would be sent to the port of Semarang, which previously passed the Dieng mountain.

## CONCLUSION

In the socio-economic history of Java, there is a link (linkage) between the economic growth and the development of transportation routes. Economic growth generated from the plantation sector has encouraged the emergence of

investment and policy in transportation world. On the other hand, the development of the transport links are also accelerate economic growth.

In the early nineteenth century, it appears a highway network, known as *de Grootte Postweg*. Although the purpose of the highway is for the sake of war, but in the subsequent period, the presence of highway has stimulated economic growth in surrounding areas and areas that are connected with a smaller road heading to hinterland. It was more noticeable when the Dutch colonial government introduced the cultivation system in 1830-1870.

Fundamental changes have occurred since the 1870's when the railroad network was built in several areas in Java. Railroad line forms "a bounded belt" of Java, including Central part of Java that connects the hinterland with the port areas. The presence of railroad driven by the NIS, SJS, and SJS has pushed very fast economic growth of the Central Java. This was due to the development of interest in private entrepreneur to invest their money in the plantation in Java land.

The presence of land transportation network, trains, and ships has opened Java into an open area. Java has been integrated with the international economically for plantation commodity

goods sold in national and international markets.

For the negative side, the economic openness of Java has created an economic dualism. On the one hand, there is developing a modern economy which is the capital-intensive with export crops produced by the plantation industry that was owned by foreigner. On the other hand, it still existed (although it was started to be ufged), traditional economy which had solid labor in the form of food crops that was cultivated by the Indonesian local inhabitants. Although several things are related, but the economic position of the Javanese people was marginalized. In other words, it has spawned economic segregation that was born due to the economic growth of plantations and road transportation.

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