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Not A Sugar Line: The Operation of Gundih–Surabaya Tramline 1900–1942

Muhammad Rizky Pradana[1] and Purnawan Basundoro[2]

[1]*Institute for Research and Community Services, Universitas Airlangga, Indonesia.*
[2]*Department of History, Faculty of Humanities, Universitas Airlangga, Indonesia.*

Correspondent Authors: mrizky.pradana26@gmail.com

Abstract Tram once became prima donna in early 20th century in Dutch-Indies. The effectivity and speed make it more interesting than using two-wheeled bullock cart and horse-drawn buggy at the time. The rail-based transportation had experienced up-down in the management. One of the causes was many train and tram management company lean on other industries, such as sugar industry. Fragment of train history in Dutch-Indies has not been written completely yet. This writing would be discussing concession application, construction, and management of tram service provided by *Nederlandsch-Indisch Spoorweg-Maatschappij* (NIS) on Gundih–Surabaya line in 1900–1942. The aim of this writing is completing history of train in Dutch Indies and as consideration for responsible institution for reactivating dead rail on Gresik and Tuban completely. This research used research of history methods consist of several steps, topic selection, heuristic, verification, interpretation, and historiography. Source of history used are accessed by online and offline via several institution and archive sites. The source which is used are old books, *Verslag van den Raad van Beheer der Nederlandsch-Indisch Spoorweg-Maatschaapij*, old newspaper, and the others. This research concluded that during tram service by NIS in North Java Coast rely on transportation of forest and mine commodity, as well as passenger transportation. Gundih–Surabaya tramline do not lean on sugar transportation as well as other tramline.

Keywords Tram line; passenger transportation; freight train; and changes.
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Trem pernah menjadi primadona pada awal abad ke-20 di Hindia Belanda. Efektivitas dan kecepatan membuatnya lebih menarik daripada menggunakan gerobak sapi roda dua dan kereta kuda pada saat itu. Transportasi berbasis kereta api ini telah mengalami perubahan dalam manajemen. Salah satu penyebabnya adalah banyak perusahaan manajemen kereta api dan trem yang bergantung pada industri lain, seperti industri gula. Fragmen sejarah kereta api di Hindia Belanda belum ditulis sepenuhnya. Tulisan ini membahas permohonan konsesi, konstruksi, dan pengelolaan layanan trem yang disediakan oleh Nederlandsch-Indisch Spoorweg-Maatschappij (NIS) di jalur Gundih-Surabaya pada tahun 1900–1942. Tujuan dari tulisan ini adalah melengkapi sejarah kereta api di Hindia Belanda dan sebagai pertimbangan untuk lembaga yang bertanggung jawab untuk mengaktifkan kembali rel mati di Gresik dan Tuban sepenuhnya. Penelitian ini menggunakan metode penelitian sejarah yang terdiri dari beberapa langkah, pemilihan topik, heuristik, verifikasi, interpretasi, dan historiografi. Sumber sejarah yang digunakan diakses secara online dan luring melalui beberapa lembaga dan situs arsip. Sumber yang digunakan adalah buku-buku lama, Verslag van den Raad van Beheer der Nederlandsch-Indisch Spoorweg-Maatschaapij, surat kabar tua, dan lainnya. Penelitian ini menyimpulkan bahwa selama pelayanan trem oleh NIS di Pantai Utara Jawa mengandalkan pengangkutan komoditas hutan dan tambang, serta transportasi penumpang. Jalur trem Gundih–Surabaya tidak tergantung pada transportasi gula seperti halnya jalur trem lainnya.

1. Introduction

The construction of the railway in the Dutch East Indies (so on Dutch Indies) became one of the indirect effects of Cultuurstelsel (Cultivation System). In the Era of the Cultivation System, necessities on efficient and fast transportation were much needed. Particularly in the plantation industry, such as the sugar industry often crowded by the traffic of raw material and sugar product transportation. Therefore, effective and efficient transportation is needed. Before the railway was introduced, they were using cikar, dokar, prau, and even lifted by men on their shoulders (panggul) for commodities transportation.

The debate on railway construction in the Indies always became a hot topic while the Cultivation System lost its prestige. Approximately eight years before the Liberalisation of the Economy in the Dutch Indies became official, the right or concession to construct the railways in the Dutch Indies came into the hands of the private company. Nederlandsch-Indische Spoorweg-Maatschappij (NIS) proposed a concession and was accepted by the Dutch East Indies colonial government. NIS was the first company that constructed and inaugurated the first railway in the Dutch Indies. The very first construction of NIS' railway from Semarang to Tanggung was in 1864 led by JP de Bordes (Trirahmi & Elandis, 2014, pp. 46–47). The 25 km railway was inaugurated on 10 August 1867 (Reitsma, 1928, p. 119).

On the other side, the colonial government also constructed its railway under the management of the Dutch Indies government. Staatsspoorwegen (SS) was founded on 6 April 1875. It was a state company for managing the railways in the Dutch Indies (Reitsma, 1925). The SS' first railway from Surabaya to Pasuruan 63 km long was inaugurated on 16 May 1878 (Reitsma, 1928, p. 115). The success path of the two companies—NIS and SS—triggered other companies to grow the railway business in the other region. Emerged numerous tram companies that focused locally such as Kediri, Malang, Pasuruan, and Serayu Valley. That was stimulated by the Liberalisation of the Economy that became legal by the colonial rules, particularly the Agraria Act and the Sugar Act in 1870 (Furnivall, 2010, p. 165).

2. Method

This writing using Kunowijoyo's (2013, p. 13) method on historical steps consisted from the topic selection, heuristic, verification (source critique), interpretation, and historiography. The historical sources which are annual report, newspaper, technician magazine, and photographs, are obtained and accessed from the various places. The annual report of NIS company obtained and accessed in the National Library in Jakarta. The newspaper and technician magazine accessed via Delpher provided by Koninlijke Bibliotheek, while the photographs are accessed via Koninklijk Instituut voor Taal-, Land- en Volkenkunde (KITLV).

3. The Surrounding Area of the Gundih–Surabaya Tramline

Grote Postweg or Great Post Road is the main connector to the big municipalities on the coastline of Java constructed by the government of Herman Willem Daendels. In the beginning, Great Post Road purposed to make the soldier movement swifter because Daendels was given the order to protect Java from the British invasion and blockade in the Java Sea by strengthening the defence in Java (Nas & Pratiwo, 2002, p. 709). Not only did the transportation flow matter for military necessities but eventually, this road was also purposed for swift mail delivery and commodities transportation. Besides that, military troops were more flexible by using that road to easily control colony regions, particularly regions suspected by the colonial government (Hartatik, 2016, p. 160). NIS as a private company had business in the transportation sector—especially as a pioneer in the train business—and constructed the Gundih–Surabaya tramline after successfully operating the Semarang–Vorstenlanden tramline.

Gundih—Surabaya tramline was chosen due to the slope contour makes it construction well and relatively cheap, even though must be face-to-face with Bengawan Solo River and convoluted land acquisition.

Semarang and Surabaya have records as trading cities and harbours since the 15th century (Pires & Rodrigues, 1944; Pradana et al., 2022, p. 213). That history continued to the period of the Netherlands Indies. After the Cultivation System ended, the Indies began the period of economic liberation. Big municipalities in the Indies such as Semarang and Surabaya were barraged by private capital, such as the sugar industry, bankery, and transportation. The region between Semarang and Surabaya was divided into three residences in 1871, which were Semarang, Rembang, and Surabaya (Nederlandsch-Indië, 1871, p. 14).

From a geography perspective, the region between Gundih and Surabaya is located north of the Kendeng Mountain and south of the North Lime Mountain. The position of two mountains aligned together (Knol & Moereels, 1936; Oudraad, 1925, p. 42). The region between two mountains formed a valley with a sloping topography. The topography of the slope soil was good for cultivation due to its location near the flow of the Bengawan Solo River (Knol & Moereels, 1936, p. 35; Mahmudah, 2016, p. 335). There are several branches of the Bengawan Solo River flow, Kali Batokan in Cepu, Kali Kening flow from Bojonegoro to Jatirogo, and Kali Luis in Blora (Veth, 1912, p. 8). The census report of 1930 showed Bumiputra (Indigenous) became the majority in the regencies of Grobogan, Blora, Bojonegoro, Tuban, Lamongan, Gresik, and Surabaya. By percentage Indigenous in Grobogan were 98,98%; Blora 98,42%; Bojonegoro 99,11%; Tuban 99,27%; Lamongan 99,63%; Gresik 98,97%; and Surabaya 87,56%. The mean of the residents in the seven regencies was approximately 497.887 residents per regency (Departement van Economische Zaken, 1934a, 1934b).

The oil industry in Cepu became primadonna between Gundih and Surabaya. Crude oil production in Cepu was located in Tinawun and Panolan. From 1913 to 1924, crude oil production in those two locations was always on top of the production with the other sites (Rutten, 1927, p. 517; Vuuren, n.d., p. 20). The economic condition in Surabaya could described by the property of land. The mean of the Surabaya-owned land was 1 bau in the city, Jabakota approximately 1,5 bau, and Gunung Kendeng varied between 1 to 3 bau. The district of Gunung Kendeng became an unwealthy region due to being located outside or far from Surabaya City and had bad condition of soil, and also a lack of water. The other two districts could be said strategic due to being close to the centre of the city (*Onderzoek Naar de Mindere Welvaart Der Inlandsche Bevolking Op Java En Madoera: Samentrekking van de Afdeelingsverslagen over de Uitkomsten Der Onderzoekingen Naar De Economie van de Desa in de Residentie Soerabaja*, 1909, p. 7).

The economic condition of the Gresik residences could be seen by the ownership of land. The region with rich area or in other words has an area to develop could be said as the region with better economic conditions than the region that has less area to develop. Nevertheless, the communal condition also encircles this region, with numerous residents of Lamongan positioned in the middle (neither rich nor poor). There was no exceeding poor or rich condition, in other words, the prosperities in this region spread evenly in Lamongan. The unwell condition experienced by the Tengahan area due to the flood problems, lack of water, pathology, to endemic. These conditions got better after the repairment of the water supply and drainage in the dam (*Onderzoek Naar de Mindere Welvaart Der Inlandsche Bevolking Op Java En Madoera: Samentrekking van de Afdeelingsverslagen over de Uitkomsten Der Onderzoekingen Naar De Economie van de Desa in de Residentie Soerabaja*, 1909, p. 8).

4. The Construction and Operational of the Gundih–Surabaya Tramway

The region of Gundih–Surabaya is not "given" by the sugarcane plantation or the spread of the sugar factory like the majority of the other railways and tramways in the Dutch Indies. Nevertheless, this line is rich in forest products and mine products. Not only depending on forest and mine transportation, NIS also focused on passenger transportation.

The construction of the Gundih–Surabaya Tramway through the important regions, Surabaya, Lamongan, Babat, Bojonegoro, Cepu, and Gundih. Het Nieuws van den Dag voor Nederlandsch-Indië wrote connection by the tramway to Tuban. The tramway construction from Babat to Tuban would be far more profitable in the future. Thus the construction of the Babat–Tuban branch line was anticipated. Many profits were connecting the Gundih–Surabaya tramway to the Tuban. There was a special reason why the connection between Semarang and Surabaya could not pass through the Northern Java Coast, even though there was a region profitable such as Tuban. Because the majority of the residents on the coastline had unwealthy conditions, such as the regions of Sedayu, Lawas, Kranji, and, Rembes. Those regions have the same characteristics: there was no plantation, low trade level, and almost no industry ("Een Tram Naar Toeban," 1911).

The Gundih–Surabaya tramline was constructed not while after the possession of the concession by the NIS in 1896. The concession of construction and exploitation over the tramline based on the colonial government in the Gouvernement Besluit van 24 September 1896 No. 1. The very first point in the Gundih would be connected with the NIS railway Semarang–Vorstenlanden–Ambarawa that already built there (Departement der Burgerlijke Openbare Werken, 1902, p. 174). The concession gave the NIS the right to exploit and manage the tramline for 75 years and would expire on 31 December 1971 (Nederlandsch-Indië, 1900, p. 355).

The construction began in 1896 with the *f* 8.000.000 construction money. The tramline as long as 230 km passes through several regions such as Randublatung, Bojonegoro, Lamongan, and Cerme ("No Title," 1896). The preparation of the construction project began from Gundih under supervisor of FB Lijphart ("No Title," 1897). NIS was not only given a concession by the government but also the deadline for construction completion time and inauguration. If the NIS could not complete the construction on time, then the project of the Gundih–Surabaya tramline would be taken over by the SS construction project as the management of that line (Departement der Burgerlijke Openbare Werken, 1902, p. 177).

In 1900, three tramline segments inaugurated such as Lamongan–Surabaya on 1 April, Babat–Lamongan on 15 August, and Gundih–Kradenan on 15 October ("No Title," 1901; Reitsma, 1928, p. 119). In the next year, NIS constructed a special line for freight from Cepu to Ngareng. That line served as oil transportation from Dordtsche Petroleum Maatschappij (DPM), so the construction cost was not charged to the NIS, but to the DPM (Raad van Beheer der N.I.S., 1902, p. 37). Another line opened in 1902 was Kradenan–Cepu and Bojonegoro–Babat occurred on the same day on 1 March, then Sumari–Gresik on 1 June. The completion of the Gundih–Surabaya tramline by the opening of the Cepu–Bojonegoro segment on 1 February 1903. On the same day with the segment opening also inauguration occurred for the segment of Gresik to the Gresik Harbour (Raad van Beheer der N.I.S., 1904, p. 33; Reitsma, 1928, p. 119).

NIS also planned to construct a branch line to Tuban via Jatirogo and Jenu. And yet, the company report of 1926 said that branch line construction from Babat to Tuban does not match if the terminus ended in the coastline near Jenu. The matchest location for the terminus was located at the Merakurak Village. The shifting of the terminus from Jenu to Merakurak was mentioned in the Gouvernement Besluit van 22 Augustus 1923 No. 4. Besides the NIS plan to connect Babat with Tuban, they also planned branch line from Bojonegoro to Jatirogo and

Ponco–Rengel–Ngidon, and the new line of Semarang–Brumbung–Gambringan which does not counted as Gundih–Surabaya tramline. The three branch lines were accepted and mentioned in the Gouvernement Besluit van 28 October 1913 No. 13. The concession for Kandangan–Gresik in the beginning was mentioned as Gresik–Surabaya, then changed to Kandangan-Gresik by the Gouvernement Besluit van 16 Juni 1916 No. 53 (Reitsma, 1928, p. 110).

The tram operated simultaneously with the timetable arranged for the high efficiency to serve the passengers. Moreover, the tramline was not only for passenger transportation but also freight train and mixed transportation. In 1900, only the Lamongan–Surabaya segment was ready for operation. After the inauguration on 1 April 1900, this route served passengers with three vice versa trips. The Lamongan–Surabaya route took 1 hour 55 minutes to travel (Van Dorp's, 1900). For the passenger services improvement, the NIS proposed the notion of the increasing tramline class from third class to second class. That proposal was accepted in 1912. Before 1912, trams in this line were only permitted to run as fast as a maximum of 25 km/hour according to the Algemeen Tramwegreglement (General Rules for the Tramline). NIS could not get the licence to operate the line at the maximum speed of 45 km/hour. Nevertheless could increase their speed up to 30 km/hour. After the proposal is accepted, the traction could run until a maximum of 45 km/hour (Jellema, 1929, p. 143; von Faber, 1934, pp. 268–271).

There was a partial route for Semarang Tawang–Surabaya Pasar Turi and vice versa in 1931. This partial route was announced as the feeder from Weltevreden (Gambir) to Surabaya. This connection started from a partial route Weltevreden–Semarang West which was operated by the SS and SCS. The train line operated by the SS was from Weltevreden to Cirebon SS and SCS management started from Cirebon SCS to the Semarang West. Passengers must change stations from Cirebon SS to the Cirebon SCS which are close to each other (Sie Dhian Ho, 1931).

The baggage of the passenger is included in the passenger services on the Gundih–Surabaya tramline. The passengers with the baggage of 30 kg were charged for free. If the baggage had more than 30 kg, then would be charged for the baggage fee. Besides that, the services of the freight transportation in this tram line heavily relied upon the natural production in the surrounding area of the Gundih–Surabaya tramline. NIS opened business on this line based on several commodities considered as profitable such as teak wood, crude oil, and limestone. Even though there were not many sugarcane plantations and sugar factories in the surrounding area of the Gundih–Surabaya tramline. NIS in fact, still operated and exploited that line..

The Gundih–Surabaya tramline was categorised as sugar "poor" line rather than another line, moreover, the tramline under the management of NIS which connects Semarang and Vorstenlanden was connected to the numerous sugarcane plantations and sugar factories. The amount of sugarcane and sugar transported by NIS in this line is not so much compared to the amount of transported sugarcane and sugar on the Semarang–Vorstenlanden line. And yet, in fact, the Gundih–Surabaya line also served sugar product transportation. That fact was stated in a memorial book published by the Semarang-Joana Stoomtram Maatschappij (SJS) that mentioned the Gundih–Surabaya tramline also transported sugar products in 1905 (Couveé, 1907, p. bijlage 5).

Het Nieuws van den Dag voor Nederlandsch-Indië newspaper reported the sugar transportation activities on the Gundih–Surabaya tramline, from Babat to Surabaya, then transported via ship in the harbour. The sugar product transported to Babat came from the Ponen Sugar Factory in Jombang. The transportation from the factory to Babat was using the Babat–Djombang tramline which was owned and managed by the Babat-Djombang Stoomtram Maatschappij (BDSM) ("Activiteit Der N.I.S.," 1913). On the segment of Babat–Surabaya, farm food (dedak), leather, tobacco, rice, work tools from iron, manufactured products, roof tiles, charcoal, limestone, ice, and salt were transported. In 1900 rice became the commodity

with the biggest amount on the transportation of freight, rice as weight as 1.2009 tonne was loaded into the freight wagons and 133 was unloaded on the segment of the Babat–Surabaya line (Raad van Beheer der N.I.S., 1901).

Those commodities could be considered minor commodities transported by the NIS, even though the profit gained was not as high as the teak wood, oil, and limestone & secondary products. Such as crude oil that also produced residue and petrol, also the limestone mine that mined limestone and some of it was processed into cement. The oil did not come from the refineries owned by the company and big industry, was distilled by the small industries of the Natives, which also became commodities transported by the NIS on this line. The other mine product that was also transported was natural stone (Raad van Beheer der N.I.S., 1902).

The establishment of the tariff in Java was much complicated. It was because of too many administrations and forms of the tariff itself, particularly for the tariff of freight transportation. On the other side, the tariff for the passenger was relatively similar, the majority of the tariff was directly proportional to the distance travelled. The passenger tariff is also different to the different classes and the distance travelled (Heel, 1927, p. 28). A year later, the NIS yearly report of 1901 reported that the new tariff in the Gundih–Surabaya tramline started effectively from 1 April 1902. The detail of that new tariff was *ƒ* 0,2 for the first class, *ƒ* 0,1 for the second class, and *ƒ* 0,5 for the Native's second class. While the baggage tariffed *ƒ* 0,05 per 30kg per 30 km distance travelled, if the baggage capacity was over the limitation (Raad van Beheer der N.I.S., 1902). The full tariff from Gundih to Surabaya in 1911 was *ƒ* 9,2 for the first class, *ƒ* 3,3 for the second class, and *ƒ* 2,3 for the Native class. In total the tram tariff for this line was simultaneously increased, the same thing happened to the baggage tariff which increased to *ƒ* 1,15 (Kolff's, 1911, pp. 148–149).

In the travel guide book for train and tram of 1922 published by Kolff, the tram operational of the Gundih–Surabaya tramline only mentions the tariff for second class, third class, and Native class. The full tariff from Gundih to Surabaya for the second class was *ƒ* 9,6; the third class was *ƒ* 4,8; and the Native's class was only *ƒ* 3,36. There were also stated tariffs for the mature and infant passengers, the infant was charged cheaper, the second class at the *ƒ* 4,8 and the third class at the *ƒ* 0,36 (Kolff's, 1922, pp. 192–193).

There was also a special tariff for the freight transportation on the short route of the Mesigit–Kalimas owned by the SS was valid for the connection with the Gundih–Surabaya tramline owned by the NIS (Reitsma, 1927, p. bijlage XXXVIII). This special tariff was agreed by the NIS and the SS as a part of the compromise due to the NIS could not got the concession for the tramline construction from Gresik to Mesigit that would be connected to the harbour in the Surabaya. The transported goods per packet with 5 kg or less would be charged as much as *ƒ* 0,3. The tariff for transportation per wagon was *ƒ* 0,5; if using the closed wagon per tonne would be charged the same as before; while using an open wagon would be charged less at *ƒ* 0,3. For the common cargo per 50 kg charged *ƒ* 0,05. For animal transportation such as horses and livestock charged *ƒ* 0,75; while for the small livestock such as chickens and ducks charged *ƒ* 0,15. If the tariff was calculated per wagon, it would charged differently, for the medium tonnage wagon between 8–10 tonnes charged by *ƒ* 3,5; while for the big tonnage which was 20 tonnes charged by *ƒ* 7 (Reitsma, 1927, p. bijlage XXXVIII).

For the remittance and precious goods charged much higher than the regular goods. It was because the tariff charged for the transportation also had it as insurance. For the goods with the value under *ƒ* 25.000; would be charged for insurance by 2 cents per *ƒ* 100. The goods with a value between *ƒ* 25.000 and *ƒ* 100.000 would be charged as much as 3 cents per *ƒ*100. While the goods with a value of more than *ƒ*100.000 would be charged 3,5 cents per *ƒ*100 (Reitsma, 1927, p. bijlage XXXVIII).

5. Management of the Gundih–Surabaya Tramline

The Central NIS Company consisted of a Governor-Commissioner, Commissioner Council, Direction Council, Secretary of Direction Council, Head of Engineering as a Head of the Bureau of Technicians, and a Local Committee in office in Semarang. In 1913 Governor-Commisioner was seated by E.B. Kielstra, a retired military officer with Lieutenant-Colonel rank, The Commissioner Council was led by WC Gerlach, represented by JH Bergsma, and the secretary position was filled by AHG Fokker, and the members were AW van Eeghen Jr., AD de Marez Oyens, and J Kraus. While the Direction Council was led by JL Cluijsenaer, the secretary was A Snethlage, and its only member was GF Lucardie. The Head of the Technician Bureau was filled by Head Engineer BM Gratama. The committee located in Semarang was led by Th. WL Steinmetz has only two members, R Birckenhauer and W Corver (Raad van Beheer der N.I.S., 1914).

The management of trains and trams was handed over to the responsible people who watched over the exploitation region. The exploitation regions were divided by the line. The line managed by the NIS such as Semarang–Vorstenlanden train line (S/V), Yogyakarta–Brosot tramline (D/B), Yogyakarta–Ambarawa tramline (D/W I), Gundih–Surabaya tramline (G/S), Solo–Boyolali tramline (S/B), and Semarang–Gambringan tramline (S/G) (Raad van Beheer der N.I.S., 1925, pp. 11–14).

Tramline managed by the tram company certainly had to mutate its workers or transfer from one position to another position. Therefore the implementation of the right man in the right position principle (Satrio, 2021, p. 97). Worker's mutation became normal things in the railway services such as BW Colenbrader an engineer in the Section of the Traffic and Commercial was mutated from Semarang to Surabaya on 30 September 1937 ("Mutatie Bij de N.I.S.," 1937). Before that Colenbrader was a vice inspector in 1930 mutated from Surabaya to Semarang and effectively since 1 May, his position in Surabaya would be filled by Verhoeven who was active in Cepu before ("N.I.S.-Mutatie," 1930).

There were many problems struggled by the NIS in the Gundih–Surabaya tramline. The problems could be an incident, destroyed properties due to flood, sabotage, and strikes that could delay tram operation. The incident happened is not just related to the usage of single or double track. Several newspapers mentioned that incidents happened during the operation of trains and trams affected by human error (eg. crashed or grazed), technical error (eg. derailed or rubber wheels slipped in the tramrail), or human matters (eg. sabotage on the railtrack or bridge). The incident and flood often made railtrack structure damaged so that needed to be repaired and insisted the temporary closing. For example the incident of the derailed tram in 1919. Tram on the Cepu–Surabaya route derailed in Halte Tobo. That incident caused several injured victims. Because of that incident, the tramline closed for a temporary time ("Spoorweg-Ongeluk Nabij Tjepoe," 1919).

All of the rollingstock used by the NIS was divided into two types of rail gauge: European standard of 1.435 mm and kaapspoor or narrow gauge of 1.067 mm. Most of the lines managed by the NIS operated on the 1.067 mm, except for Semarang–Vorstenlanden–Ambarawa and Yogyakarta–Brossot which used 1.435 mm. That disparity of the rail gauge caused difficulty in operating tram and rollingstock (including particularly locomotives, coaches, and wagons on the other track). In other words, locomotives with kaapspoor gauge could not run on the European standard gauge, which was Semarang–Vorstenlanden–Ambarawa and Yogyakarta–Brosot.

Locomotives used by the NIS mostly came from manufacturers in Germany, the Netherlands, and England. NIS was a loyal customer to the Hartman and Hohenzollern from Germany, Werkspoor from the Netherlands, and Beyer & Peacock from England (Prayogo et al., 2017, pp. 8–11). NIS did not use the standard notation of Whyte, UIC, or AAR for the

locomotive numbering. The locomotives numbering on almost all of the train and tram companies in the Dutch Indies was so simple. It just used the company name and locomotive number.

Figure 1. A NIS 353 locomotive with 0-6-2T wheel configuration manufactured by Hartman.

Source: *Lokomotieven Sächische Maschinenfabrik vorm Rich Hartmann Actien-Gesellschaft A.G. Chemnitz*.

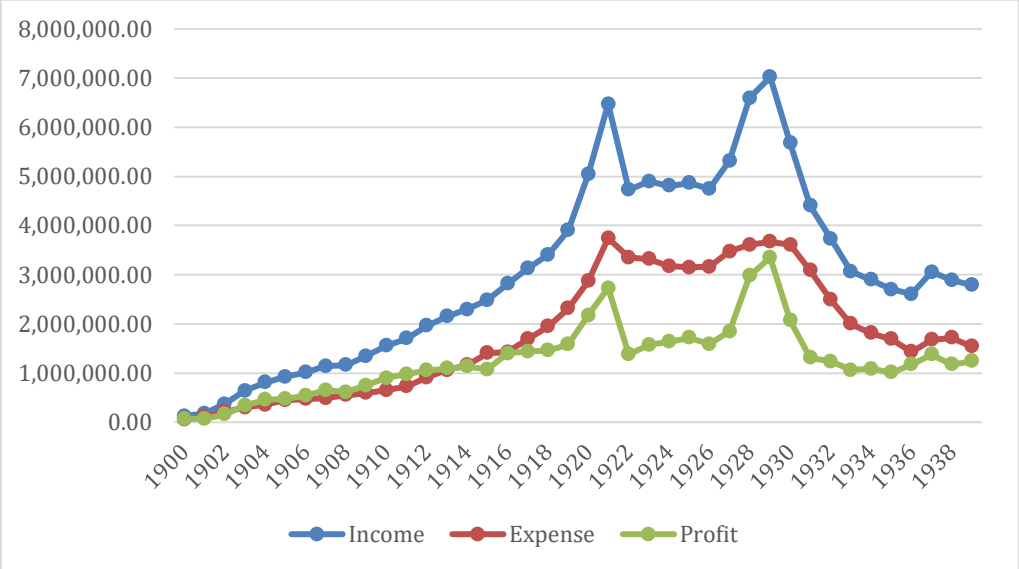
NIS' locomotive number 353 operated on the Gundih–Surabaya tramline using coal and teakwood as the fuel. In the beginning, coal as a fuel for its burner, then replaced by teakwood due to the difficulties of getting the coal also teakwood was the main commodity transported on the Gundih–Surabaya tram line. Therefore made the fuel quantity more guaranteed. The locomotive series 353 has an empty weight of 33,42 tonnes and a capacity of water tank only at 3.200 m^3. Those specifications made this locomotive run on water frequently and often refilled its water tank (Prayogo et al., 2017, p. 70).

The Japanese military occupation came to the Dutch Indies and made some changes to the Dutch Indies railways. All of the train and tram companies blended to the only one government office and made all of the locomotives renumbered. The Japanese numbering of locomotives mentioned moving axle configuration, locomotive code, locomotive series, and locomotive's registration number (Prayogo et al., 2017, p. 27).

The construction of the train line and tramline in Java was almost caused by the necessity of plantation commodities for fast and efficient transportation. The transportation of passenger, forest, and mine commodities became the main focus of the NIS, and also the profit on this line is the successful indicator of NIS exploitation in the surrounding area. The NIS' expenses consist of numerous office served and noted in the *exploitatie-kosten* or exploitation cost. The total expenses came from different account, which was eerste afdeeling (first part), tweede afdeeling A (second part of A), and tweede afdeeling B (second part of B). First part expenses detailed about councils and high-ranking officers expenses located in the Netherlands and the Dutch Indies. Second part expenses detailed about expenses in the Office of Road and General Work, the Office of Traction and Material, and the Office of Traffic and Trade Business. The difference about part A and B is the exploitation region. Part A was for the office operated in the West Java, while the Part B was for the Middle and East Java. (Raad van Beheer der N.I.S., 1914, p. bijlage no. 3).

The NIS' income came from passenger, bagage, freight transportation, livingstock transportation, and "great" income that accounted in the *bruto-opbrengst* or bruto income (Raad van Beheer der N.I.S., 1914, p. bijlage no. 4). The NIS' income was the bruto income minus exploitation cost (Raad van Beheer der N.I.S., 1914, p. bijlage no. 7).

Graph 1. Income, Expense, and Profit on the Gundih–Surabaya Tramline 1900–1939.



Source: *Verslag van den Raad van Beheer der Nederlandsch-Indische Spoorweg-Maatschappij over het jaar 1900–1939*.

At the graphic above, there is the increasing and decreasing income, expenses, and profit on the particular period. The increasing of the income occurred more than two decade long since 1900 to 1921. The NIS' income on Gundih–Surabaya tramline in the beginning dominated by income in the passenger sector by the *ƒ* 61.864,25 in 1900 (Raad van Beheer der N.I.S., 1901). That condition was changed by the income on the freight transportation replace its domination in 1902 by the *ƒ* 193.968,44 (Raad van Beheer der N.I.S., 1903). According to Furnivall, since 1900 the most of the Dutch Indies' economy held by the export activities in Java. The investation of private company capital categorised as a small number. Nevertheless still gained profit surplus (Furnivall, 2010, p. 303). The increasing of the economy level in the Dutch Indies became common and also occurred in the scale of the NIS company, particularly in the operation of the Gundih–Surabaya tramline.

On the period of 1914 to 1918 occurred the Great War which causing the decreasing import quantity. The decreasing production of the wood for the fuel also occurred in the Dutch Indies, and yet that decreasing could not affect the NIS' income on the Gundih–Surabaya tramline (Vereeniging van Hoogere Ambtenaren bij het Boschwezen in Nederlandsch Oost Indië, 1928, p. 9). In other words, the wars occurred in the Europe could not affect directly and significantly to the NIS. And yet, the crisis impact very felt by the labour worked in several sectors, including railways business. They have experienced most pitiful impact due to the unbalanced wage increasing with the living cost increasing drastically (Ingleson, 2004, p. 13). The Great War impact felt by the Dutch Indies in 1921 to 1922. The economy recession started attack Dutch Indies in the same year (Ingleson, 2004, pp. 54–55). This decreasing trend marked the transition from escalation period to the next.

Decreased trend of income occurred between 1929 and 1939 for one-decade long. The income in the freight transportation sector had the bigger number than passenger transportation. In 1929, the freight transportation income accounted by *ƒ* 5.486.263,48; while the passenger it was only *ƒ* 1.254.917,59 (Raad van Beheer der N.I.S., 1930, p. bijlage no. 4). The income tended to decrease to the 1932, *ƒ* 2.788.651,54 for the freight transportation and *ƒ* 765.148,76 for the passenger sector (Raad van Beheer der N.I.S., 1933, p. bijlage no. 4). From the graphic 1 could divided into periodisation of the tram management on the Gundih–Surabaya line as

three periods, escalation period, stagnancy, and degradation, and also transition periode between those three periods.

6. Conclusion

The baggage of the passenger is included in the passenger services on the Gundih–Surabaya tramline. The passengers with the baggage of 30 kg were charged for free. If the baggage had more than 30 kg, then would be charged for the baggage fee. Besides that, the services of the freight transportation in this tram line heavily relied upon the natural production in the surrounding area of the Gundih–Surabaya tramline. NIS opened business on this line based on several commodities considered as profitable such as teak wood, crude oil, and limestone. Even though there were not many sugarcane plantations and sugar factories in the surrounding area of the Gundih–Surabaya tramline. NIS in fact, still operated and exploited that line.

What is the interesting fact? The fact that the line did not depend on the plantation, especially sugar products. Far different from the other tramlines spread in Middle Java and East Java which are often associated with sugar factories. Even SCS, the tramline between Semarang and Cirebon gained suikerlijn or sugar line predicate (Raap, 2017, p. 239). Gundih–Surabaya tramline is different from the other tramlines which are heavily tied to mining and forest commodities, and also passenger between Semarang and Surabaya and vice versa. Commodity transportation on this line focused on forest products (e.g. teakwood) and mine products (e.g. limestone).

I was looking at the timetable and tariff set by NIS on the Gundih–Surabaya line including the branch tramline of Sumari–Gresik–Kandangan, Babat–Tuban–Merakurak, and Bojonegoro–Jatirogo, not so special. Nevertheless, that does not mean not interesting. As the only operator operated tram transportation from Surabaya to Semarang and vice versa through the north line close to the coastline. That would be one of the more interesting options than choosing SS that roundabout through Vorstenlanden. In addition, it could save up some expenses, distance travelled shorter, and consume short time for travelling.

For the freight train, not many plantation products particularly sugar products became its freight. This was because the region passed through by the tramrail had no sugarcane plantation area and there were no sugar factories. Nevertheless, this tramline still transported sugar products transferred from the BDSM on the Babat–Jombang tramline. The majority of freight transportation relied on the baggage of the passenger, delivery goods, postal packages, forest sector, and mine sector.

The income and profit of the NIS had tendencies to increase altogether. While there were situations when the income decreased, the expenses were not decreased either, they had tendencies to stagnate or even increase. The NIS' profit record tends to be good. Even though malaise crushed the world since the end of 1929, the NIS' income decreased several years later. NIS as a private company endeavours to keep the profit margins stable above the expenses and even avoid making a loss. Two of the options to cut the expenses were to increase the official housing rent and dismissal of the workers. The income gained by the NIS could be divided into three periods: escalation, stagnancy, and degradation, and also a transition period between those three periodisations.

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Footnotes:

[1] The footnote only for short interpretation or explanation of the data or initial.