

Geographical Factors and Their Impacts on Railway Construction

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Abstract. Indonesian railway development in the Dutch colonial period is a form of new technology use, especially in the field of transportation. Between the end of the nineteenth and early twentieth, the Dutch East Indies government needed a means of transportation to move a large amount of plantation products quickly to ports. The requirement aimed to maintain the quality of the plantation products from being stored in the warehouse too long because they might rot. For the transportation need, the railway was built. In general, plantations were located in rural areas with difficult geographic conditions. The distance between the plantations and the port was very far away. The railroad was built through areas with specific geographical condition like steep hilly, streams, rice fields, flat lands, and so on. The geography condition was very influential on the construction of railroads. The aspects that it influenced were budget, length of work, lane direction, and so on. This article presents the results of geographic factors impact research on the construction of railway conducted by the Dutch East Indies Government in Priangan Residency. The writing of this article is based on historical studies by using historical sources.

1. Introduction

The construction of railroads in the Dutch East Indies began in the third decade of the late nineteenth century. It was part of the introduction of Western technology [1] and was the largest infrastructure project in the mid-19th century [2]. Since railroad construction was a part of the application of Western technology in the Dutch East Indies, its development process required high technological capabilities at that time. In addition to technological capabilities, massive labor deployment was also needed. Massive labor requirements were needed due to very long distances and regions with geographical conditions that were full of challenges.

Economic factors, especially the growth of plantations, became one of the main factors behind the construction of railroads. Plantation opening was a part of colonial exploitations. The colonial exploitation in the mid-19th century required a more advanced means of transportation. Roads that already existed were not able to meet the needs of transportation, especially to move plantation products. In the mid-19th century, the colonial government built a major project, namely the implementation of the system of forced cultivation. Until 1850s, there was a considerable increase in exports compared to the previous period. The increase in exports also had an impact on the need for transportation facilities. Existing road facilities could not meet the transportation need. In fact, there were difficulties in relation to the increase of plantation yields.



Priangan is one of the residences that had a large plantation area. The Bandung plateau constitutes the core area of the Priangan region today made up of seven *kabupatens*: Tasikmalaya, Ciamis, Garut, Bandung, Sumedang, Cianjur and Sukabumi [3]. The existence of plantations in the Priangan area has a long history. The opening of the plantation in the form of mandatory planting in Priangan had been done since the era of the VOC, known as Preanger Stelsel. The plant product known at that time was coffee. This plant was planted in Sukapura, Limbangan, Galuh, Sukabumi, and Cianjur [4]. The growth of plantations in Priangan had grown rapidly since the period, and subsequent, of the forced cultivation system.

The railroads built in Priangan were unique. The uniqueness can be seen from the geographical aspects and its way of development. Geographically, the Priangan area is largely mountainous or hilly. Construction of railroads in mountainous areas has a high degree of difficulty compared to development in flat areas.

Like any large city it was a transportation center: running next to each other through the center of the city were one of the two main east-west railroad lines on Java and an important trunk road, while a net of smaller roads radiated out from the city to every corner of the bowl [5]. The railway should be built with a flat road or rail position, because if the road is uphill it will burden the train speed. Making the condition of the ground flat in the mountains is not an easy thing. Various ways had to be done, ranging from excavation to bury in the landfill.

2. Methods

This study used historical method that includes the process of examining and analyzing critical records and past relics critically. The result is imaginative reconstruction or historiography [4]. The steps taken in this study are as follows. Heuristics is the stage of searching for sources [6]. At this stage, researcher searches for sources related to the construction of railroads in Priangan. The historical sources used were mostly colonial archives stored in the National Archives of the Republic of Indonesia.

At the critical stage, researcher verifies, validates, or assesses the sources obtained. Criticism is done primarily on primary sources. There are two forms of criticism: internal criticism and external criticism. At the stage of internal criticism, an assessment of the content of the source or archive is done. It is to test whether the contents of the archives, documents, or reports obtained are really related to the research. In this case, this study categorized the sources obtained. The categorization was done based on the research problem proposed. On the other hand, external criticism was made of the outer form or source material used. For example, whether the paper used indicates conformity with the time when the archive was published.

At this stage, researcher interprets facts in sources. Interpretation is done by doing analysis and synthesis to sources. The analysis was done by sorting or categorizing the facts of the sources, while the synthesis was done by giving some conclusions to the results of the analysis. Analysis and synthesis was performed based on the research problem proposed. In conducting analysis and synthesis, this research has tried to explain the sources by using social science theories. It mainly covers theories relating to social structure and political science.

At this stage, researchers do the writing of data that exist in the source based on the results of analysis and synthesis. The writing in question means that researcher performs imaginative reconstruction based on empirical data and uses theory relating to research problems. Meanwhile ideas about history and historiography have again undergone a profound change [7]. Historiography is the result of research and historiography is expected to present new findings in this study. These new findings can be new data and new theories that are casuistic, especially the theories that can be the role of the press and politics.

3. Results and Discussion

The construction of railway in Priangan area is determined by geographical factor of the Priangan. In general, the geographical character of the Priangan region is the wide hills, in addition to the terrains. The geographical conditions of such areas greatly affect the difficulty of development. The extent to which this is done has a cost that varies greatly according to factors such as the distance involved and

the nature of what is being transported. There would be no transportation without geography and there would be no geography without transportation [8]. Here are some factors caused by the influence of geographical conditions.

3.1. Developer and Labor

In the construction of railroads in the Dutch East Indies, there are two parties involved as implementers of development. They are the government, represented by the state railway company or Staatspoor (SS), and the private sector that consisted of a considerable amount of private companies. The private sector that first built the railroad in Java is Nederlandsch Indisch Spoorweg Maatschappij (NISM). NISM built the Buitenzorg-Batavia railway line (Bogor-Jakarta) in 1869-1873 [5].

The geographical conditions of the hilly area of Priangan caused cost of development to be expensive. Initially, many private parties had proposed railroad construction on Priangan lanes such as the Tasikmalaya-Singaparna lane, which was built from 1910 to 1911. Banjar-Kalipucang-Cijulang was built in 1911 until 1921 [6]. Bandung-Banjaran-Ciwidey was built from 1916 to 1924 [4]. Before building the railway, the private sector applied for a development permit. Many private companies had received permit but they were unable to do development. This was due to the expensive construction cost, so the party building the railway in Priangan was mostly the government, or Staatspoor. Even the government bought and took over the management of the Buitenzorg-Batavia lane from NISM [2]. The government (SS) has a strong capital fund compared to the private sector.

The construction of the railroad required massive number of labors, ranging from rough to skillfulness labors. Rough labor included workers who performed physical jobs such as coolies. Physical labor was generally filled by natives. Geographical factors affected indigenous labor. The needs of the laborers were very high. In general, there were indigenous laborers who were imported from outside and there were indigenous workers who came from the local area.

Difficulties occurred usually in areas where the geographical location was very steep. In such areas, labors were usually difficult to be imported because they did not want to work as coolies in areas that endanger them. Such incidents happened in the construction of the Banjar-Kalipucang-Cijulang railway. The construction of railroads in this lane ran through a swampy area that was a malaria mosquito area. Many coolies were malarial. As a result, the construction of the railway was delayed due to the number of workers who returned home and some did not return to work [2].

3.2. Work period and Cost

The geographical condition was very influential also on the work period. The areas with hard geographical condition had a high difficulty level that affected the length of construction work. These kinds of difficulty, among others, were found in hilly areas. Such areas make the roads had to be made to turn in order to avoid the hills and look for a flat piece of land. Alternatively, tunnels were made in the hill. An example is the construction of the Padalarang-Karawang railroad. There is a tunnel known as Sasaksaat tunnel [5]. A very significant degree of difficulty can be found in the construction of the Banjar-Kalipucang-Cijulang railway line.

The area affecting the difficulties in the construction of Banjar-Kalipucang-Cijulang was a very wide swamp, namely Rawa Lakbok. The development of this lane had been changed many times in order to avoid difficult areas. The construction of this strip took almost 10 years, from 1911 to 1921 [6].

The geographical conditions of Priangan greatly affected the cost of construction. Railway development involved many people and used a lot of materials and high technology. Materials used were sand, cement, wood, and iron. Iron, in particular, must be imported from Europe. Some materials were available on construction site and some others had to be transported from outside to the area where the railway was built. Areas that were difficult to reach transport caused transportation costs and the price of goods to be expensive.

One of the most expensive lanes in the construction of a railroad in Priangan is the Banjar-Kalipucang-Parigi lane. The cost required in the construction of this lane was f9.583.421. The amount of budget spent exceeds the budget that had originally been planned, namely f4.846.000.00. If it was

divided by the length of the entire lane being built, the budget amount spent per kilometer was f117.000.00 [6]. The amount of budget incurred in the development of this lane due to severe natural conditions. The soil generally consisted of swamps so that several times there was a change of plan, even the delay of development.

4. Conclusions

The construction of railroads in Priangan was heavily influenced by its geographical conditions. The pattern of railroad direction generally grew from inland to harbor. The railroad covers the straight, twisting, even penetrating mountains by building tunnels. Priangan Residency was an area that mostly consist of hills and mountainous areas, triggering the emergence of various factors and variables in the construction of the railroads. These factors include, among others, developer, labor, length of construction, and costs.

References

- [1] Dienst der Staatsspoor en tramwegen Mededelingen administrative dienst generaal kantoor, no. 1, Indische Spoorweg Politiek, deel 1e de tarieven der SS en traam op Java van 1878 tot en met 1910, door S.A. Reitsma, Hoodambtenaar ter beschikking SS en Tr, Tekst en Aanghangsel, (Weltevreden: H. Brecht, 1920).
- [2] Afschrift De Aanleg Van Een Spoorweg Van Banjar Naar Parigi (dibuat oleh anggota Majelis Rendah Parlemen Lambert de Ram), dalam lampiran, Besluit 15 September 1915 No. 4, a collection of Algemeen Secretarie, (Arsip Nasional Republik Indonesia, Jakarta).
- [3] Svensson T, 1991, State Bureaucracy and Capitalism in Rural West Java: Local Gentry versus Peasant Entrepreneurs in Priangan in the 19th and 20th Century, Nordic Institute of Asian Studies Report p. 9
- [4] Dienst der Staatsspoorwegen En Tramwegen "Mededellingen Opname No. 9 Voorontwerpen 1. Bandoeng-Bandjaran-Kopo II. Toeloengagoeng-Trenggalek-Toegoe Nota Toelichting van Het Voorontwerp Bandoeng-Bandjaran-Kopo, (Batavia: De Verwachting, 1918), pp. 14–16.
- [5] Smail J, Bandung in The Early Revolution 1945-1946: A Study in the Social History of the Indonesian Revolution, Cornell University, New York.
- [6] Abbott A, 2004, Methods of Discovery: Heuristics for the Social Sciences, Contemporary Societies Series
- [7] Iggers G, 1997, Historiography in the Twentieth Century: From Scientific Objectivity to the Postmodern Challenge with a New Epilogue, Wesleyan University Press of New England, Hanover
- [8] Claude C and Slack B, 1939, The Geography of Transportat Systems, New York
- [9] Verslag van de Staatsspoorwegen In Ned. Indie over Het Jaar 1902, ('s-Gravenhage: Hollandsche Boek en Handels Drukkerij, 1904).
- [10] Reitsma, S.A, Dienst der Staatsspoor en Tramwegen Mededelingen Adminstrative Dienst General Kantoor no. 1 Indische Spoorweg Politiek, deel VIIIe, (Weltevreden: Landsdrukkerij, 1925).