

After The Darkness Comes The Light: Electricity and Modernity in Singaraja Town on The Dutch Colonial Period XX Century

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Abstract. This research discusses modernization in Singaraja city in the early 20th century which was initiated by the presence of the electric substations. The Dutch not only built government offices, revitalized residential areas, built bridges and irrigation canals, but also electrical substations scattered in several corners of the city. This research uses historical method. The heuristic stage is carried out by searching for sources in the form of colonial archives, newspapers and articles. Critical stages are used to map sources into primary or secondary types. The interpretation stage is useful for producing a rough draft of this paper. The last is the stage of writing or historiography. The findings from this study prove that the presence of electricity in the joints of people's lives has had an important impact on social change in this city. Electricity produces light, and light becomes a new spirit that leads to an accelerated modern lifestyle.

Keywords : electricity, modernity, dutch colonial

1. Introduction

After being controlled by the Dutch after Puputan Jagaraga 1848-1849, Singaraja City was made the center of government, economy and socio-culture (Pageh, 1998) To support this need, the Dutch Colonial Government equipped public facilities such as government offices, officials houses, bridges, schools, ports etc. Currently, this sites of memory identified as Dutch Colonial heritage, for example *Meer Uitgebreed Lager Onderwijs* (SMAN 1 Singaraja), Tweede Klasse School (SD N 1 Paket Agung 1), Custom Bridges, Ports and Electrical Substations which are the forerunners of the first electricity service in the City Singaraja and Bali. This facility was a support for regional development according to the Dutch East Indies Colonial Government [1]

In order to carry out its function as a trading city and to become a trade link from the north coast of Java to Makassar and Celebes, Singaraja City requires large energy capital. Therefore, several electrical substations were established by NIEM (*Nederlandche Indische Electriciteit Maatschappij*) or the Dutch East Indies electricity company in 1897. ANIEM was part of the Dutch East Indies Gas company, *Nederlandsch-Indische Gasmaatschappij* (NIGM), which was founded in 1864. Previously, this company was source of gas supply for the lights in the city [2].

There were 2 electricity companies in the Dutch East Indies era, NIEM and ANIEM. NIEM is a supplier of electricity needs in Batavia, and ANIEM is a supplier of electricity in Surabaya. ANIEM has many relationships with other electricity agencies such as Banyumas (EMB), Rembang (EMR), Sumatra (EMS), East Java (OJEM) and Bali and Lombok (EBALOM). During the reign of the Dutch East Indies, arrangements regarding the energy sector other than the mining sector were the electric power sector which was regulated on September 13, 1890, namely "*Bepalingen omtrent den aanleg en het gebruik van geleidingen voor elektrische verlichting en het overbrengen van kracht door middle van electriciteit in Nederlandsch -Indie*" contained in the *staatsblad* of 1809 number 190 [3]

ANIEM then split the company into subsidiaries which are one command. Bali is an area that has benefited from ANIEM's electricity. NV Electriciteits Maatschappij Bali en Lombok (EBALOM) is the name of a company located in Singaraja, Denpasar, Gianyar, Tabanan, Klungkung, Ampenan, Gorontalo and Ternate. The Singaraja region in the 20th century was an important area for the Netherlands, then the Dutch East Indies government implemented ethical politics [4]. As a result, the Kingdom of Buleleng was managed by the Dutch colonial government and in that year the construction of public facilities such as electricity was carried out.

[5] stated that the presence of electricity was considered to be able to beat the gas business in the Dutch East Indies. This statement can be understood that the existence of electricity is starting to be needed rather than gas lamps which are limited and require a lot of energy. Eventually, NIEM rose to prominence because it was considered renewable and sustainable energy rather than gas energy to power lights.

In 1869, the center of south Bali (Kuta) was transferred to Buleleng customs which became a liaison for local ports in the Dutch East Indies, especially with the eastern Dutch East Indies (Makassar) and the western Dutch East Indies (Tanjung Perak, Tanjung Priuk, Tanjung Mas to Singapore). This area is hereinafter referred to as the location of the Golden Triangle. The entry of electricity into the Dutch East Indies had strong reasons, such as its use for the industrialization of factories that required electricity for their operations. ANIEM was founded in 1909 and built its first factory in 1910-1911. This ANIEM then built a diesel power plant and a hydroelectric power plant. In 1925 ANIEM collaborated or partnered with the Dutch East Indies Hydro-Exploitation Company (NIWEN) which had the goal of making a hydroelectric power plant in the Konto river, East Java [6]

Due to the increasing bustle of trade at that time, the status of Singaraja City rose from the status of afdeling to the Residency of Bali and Lombok which was then perfected by recruiting government employees or *ambtenaar*. As a result, public facilities are massively built and electricity is of course needed as the main energy source for lighting. The electricity system at that time was considered to be a very efficient renewable energy, the large number of requests for electricity forced EBALOM at that time to build electrical distribution equipment such as electrical substations in the 19th century. There are 3 electrical substations in the area of Jalan Surapati, Jalan Diponegoro and Jalan Gajah Mada and still functioned until now [7]

At that time, electricity was a luxury item that not everyone in an area could reach. Areas with electricity were said to be developed and developing areas such as the city of Singaraja. The distribution of electrical substations from the colonial era shows that these areas are important areas for economic support such as markets and social services.

2. Methods

This study uses historical research methods. Here are the steps. First, heuristics, namely the stage of collecting data related to the research topic. Heuristics carried out by observation, interviews and literature review. Observation is an activity of direct or indirect observation [8]. Researchers made direct observations at 3 electrical substations in Singaraja to observe environmental conditions and locations. The results of the observations were then documented by taking pictures with the help of a digital camera or the researcher's cell phone camera, and also recording the data that had been found. Interview is an activity to obtain information and certain individual data for information purposes. Interviews were conducted with several informants who were considered to have an understanding of the history of former colonial electricity in Singaraja. A literature review is carried out to re-check the data with written sources in the form of books, notes, newspapers, and others. Activities in the study of documents are not only to find data, but researchers also conduct a study of the sources obtained in order to get more accurate references.

Second, source criticism, namely data codification activities. In this activity two types of data will be generated, namely primary and secondary [9]. To achieve this, it is carried out in two stages. First, internal criticism to prove the certainty or authenticity of the historical sources that have been obtained. The second external criticism is the act of research that seeks to find the authenticity of research data.

Third, interpretation, which is an attempt to interpret data into facts so as to produce a series that is complete and makes sense, so that later it can become the basis of a comprehensive historical story (Pageh, 2010). After going through a process of historical criticism, all the data obtained in the field will be combined into one so that a conclusion will be obtained regarding the history of the colonial heritage electrical substation building in the city of Singaraja.

Fourth, Historiography, namely the stage of writing history. What the writer needs to do is describe the results of the analysis in the form of a reconstruction of past events, provide an accurate general description related to the 5W+1H principle. In this case 5W+1H can be described by what, who, when, where, why, and how.

3. Results and Discussion

The Genealogy of Electricity in Netherland Indie

The plan from the Dutch Colonial Government to build electricity facilities for the Java line under the *Staatsspoorwegen* had been discussed for a long time. This is because it is influenced by the successful construction of electric facilities for trains in mainland Europe and

North America. This had good results in the Netherlands, namely the Province of Rotterdam close to Gravenhage in 1910, which was spearheaded by Ir. van Stipriaan Luisius. On the initiative of the Dutch government, the *Staatsspoorwegen* decided Ir. Damme to conduct studies on electrification pathways in England, France and others. This policy provided benefits to the *Staatsspoorwegen* because with this investigation, reports were obtained that electrification in Java was very possible [10].

But plans to electrify the Java line have been hampered by licensing issues. According to the railroad engineers who served in 1910 stated that the transportation of passengers and goods using steam trains must be maintained. It would be very difficult if the *Staatsspoorwegen* had to electrify the Java route, especially if there were differences of opinion. There are those who want to maintain the steam train and there are those who want the steam train to be replaced with another fast train to the destination of the stop [11].

Pertentangan lainnya muncul mengenai biaya dengan pelaksanaan elektrifikasi menjadi berita yang hangat pada kurun waktu 1911. Akhirnya dengan pertimbangan yang matang *Staatsspoorwegen* dan pemerintah Belanda mendirikan Badan Keuangan Elektrifikasi Kereta Api Hindia (*Indische Finance de Electrificatie van de Spoorwegen*) tahun 1911. Rencana elektrifikasi ditunda sampai waktu yang akan datang.

Follow-up research was carried out again by *Staatsspoorwegen* by sending various technicians to conduct research again in the Chicago area to Milwaukee. As it turned out, *Staatsspoorwegen* received very favorable reports and it was reported that the electrification of railway lines in mountainous areas is very possible. Moreover, it is known that the construction of electric piles in mountainous areas is very possible. Apart from that, it turns out that the data shows that electrification in remote areas will benefit the area in terms of the economy.

Plans for electification were initiated in 1915 and work began to build and open a hydroelectric power plant (*waterkracht-bureau*). For this reason, a figure named Ir. P.A Roelofsen who gave many of the concepts and principles he had discovered about hydroelectric power. Since then the electrification initiated by *Staatsspoorwegen* in Java cannot be separated from the construction of power plants (*waterkrachtcentrales*).

Considerations for reconsideration are coming, *Staatsspoorwegen* must reiterate, is it true that electrification in Java will be profitable or detrimental ?. Profit or loss is the guarantee for *Staatsspoorwegen* to continue building electricity facility projects. These two things became a consideration for the creation of a project called electrification of the train. According to experts, electrification provides a sense of comfort for passengers and has a positive impact on the economic aspect.

In Roelofsen's report, from 1916 to 1917, the full electrification plan for the railway would connect Batavia as a whole (Batavia complex) with the Buitenzorg line. If possible, it will be forwarded to the Sukabumi route. According to the plan, electrification will also be carried out on Tjikampek line. In line with that, the construction of the building (*gebouwd*) for the hydroelectric power plant in the form of electric voltage transmission is also being completed all the way to Tandjoeng Priok.

This plan is very reasonable and profitable in the economic aspect, until all policies related to electrification must be dealt with by the Dutch Government. This warm news was

heard domestically and abroad as a change to make the Dutch East Indies government's colony in a better direction. The news also reached the Minister of Parliament in Netherlands. In 1918 this policy was successfully approved by a Parliament session in Netherlands but the project had not yet been implemented and in 1919, the *Staatsspoorwegen* began working on a hydroelectric power plant.

Electric and Urban Modernity

In 1920, the construction of a water dam was paid in installments and became a progress by *Staatsspoorwegen* with its workers. *Staatsspoorwegen* appointed an engineer namely Dr. Ir. G. de Gelder from Netherlands to prepare and lead workers on the project. In 1921, all tools and equipment were provided and ready to start the construction project [12]. The *Oebroeg* hydroelectric power plant (Oebroeg-rsp) with the Kratjak center (*Kratjak-centrale*), was generated from Tjitjatih and Tjianten rivers. The electric current generates an alternating current (draaistroom) of 70,000 volts and this flow is channeled to *Staatsspoorwegen* lower station (onderstation) to Buitenzorg, Depok, Meester Cornelis and Antcol.

In 1921, planning had begun and its implementation was carried out in stages. However, when the construction was underway there was a malaise. This made the central government of the Dutch Parliament unable to provide sufficient capital and announced a policy that development would continue but in a slow time. The construction of electrification lines and hydroelectric power plants was affected by the malaise. The Kratjak-centrale building stops at certain times and electrified trains can only connect the Batavia circle.

In January 1925, the railroad electrification project was completed. An electric train is ready to come on Meester Cornelis-Tandjoeng Prioek line on a single electrification line (*engkelspoor*) 67.7 KM long. Then proceed with connecting all the electrification lines of the Batavia circle along 120 KM to Buitenzorg (Passing Meester Cornelis, Manggarai, Pasar Minggu, Lenteng Agung, Pondok Cina, Depok, Citayam, Bojong Gedeh, Tjilebut and Buitenzorg stations).

Traffic in the city of Batavia is more complete with the presence of electric trains. Previously, Batavia also had an electric tram. At the traffic junction, the coolies had started working again early in the morning to perfect the Batavia-Buitenzorg route and only returned home in the late afternoon. *Staatsspoorwegen* pointed to the Batavia Station route to Weltevreden to connect Batavia–Buitenzorg. In May 1930, the Batavia–Buitenzorg crossing was successfully completed.

To meet the demand for electric power for the railroads around Batavia, electric power centers were built in Tjitjatih and Tjiantan which were later called Ubrug and Kracak Electricity Centers which generated rotating electric currents of 70,000 volts. The electric current was then channeled to the Buitenzorg, Depok, Meester Cornelis and Antcol train stations. Upon arrival at the station, the electric power is converted into 6,000 volts via a rotating current transformer. Then the electric power is channeled to an electric train locomotive with a capacity of 1500 volts.

When the construction of hydroelectric power center in 1920 was almost complete, *Staatsspoorwegen* was ready to start with the construction for the infrastructure needs of electric railroad locomotives. For this purpose, *Staatsspoorwegen* brought in Dr. Ir. D. De Gelder from the Netherlands to the Dutch East Indies. It turns out that the electric traction system used is direct current with a voltage of 1,500 volts. Therefore, the rotating current from the outside with a voltage of 6,000 volts, through the unification of the electric direction must be converted into direct current with a voltage of 1,500 volts to be used directly by the electric locomotive.

Until 1928 there were 13 active electric locomotives. Electric power for electric motorized passenger trains comes from the state electricity company *Staatsspoorwegen*. From 6,000 volts of rotating current to 1,500 volts of direct current. Electric power centers were built in Antcol, Meester Cornelis, Depok and Kedungbadak (Buitenzorg). Electric power centers were built to be able to run electric locomotives and electric trains to be able to run electric locomotives and electric trains operating around the Batavia line and Manggarai-Buitenzorg line.

The Impact of Electricity in Singaraja

The Dutch had the plan to bring electricity to the Dutch East Indies in 1897. Then electricity developed in the Dutch East Indies areas such as Sumatra, Java, Kalimantan and Bali. The area of Bali became an area that could enjoy the flow of electricity, when the Dutch succeeded in conquering the Netherlands in 1849 by the war of Puputan Jagaraga, at that time Bali was still a trading city that only relied on torch lighting and oil. The Dutch began to build several public facilities around Buleleng Customs, such as docks, warehouses, customs office terminals and bridges that crossed rivers and made ports grow rapidly. Stated that in colonial settlements there is often an important thing when discussing settlements in cities, namely the relationship between power, capital and urbanization. Buleleng before being controlled by the Dutch in 1849, its people were classified as rural communities. According to Paul Landis in Leibo (1995) states that in rural communities the center of interest is agriculture.

In this case it is true that it was proven during the Buleleng kingdom, people lived with the concept of rural or rural communities so that most of the Buleleng people worked as farmers. In terms of energy use, before the arrival of the Dutch, the people of the city of Singaraja actively used fire, according to Pageh (2021), stating the high demand for matches. This fire is usually used for cooking, lighting cigarettes, lighting oil lamps, and so on. It is also said that the people at that time lived far from each other from house to house. However, in this case when the Dutch came and occupied the Singaraja city area, it began to change, the division of labor in society became more complex, such as; Most of them are divided into several jobs such as agriculture, labor, employees and others. Society is more into the urban system or urban society. The Dutch made Singaraja City modern in terms of a modern city layout equipped with several public and regular facilities in terms of the economy, social and government.

After the construction of various public facilities in Singaraja City, they must be supported by effective and efficient energy such as electricity so that they can provide comfort. Besides that, the Dutch realized that using lighting such as oil was more wasteful and could not last long and could suppress the high import of matches in Buleleng. The construction of schools, warehouses, entertainment venues, housing and offices was required by the

Netherlands to use electrical energy so that they were built in several potential areas in the economic sector. As shown in the figure below, there are 3 power substations and a diesel power plant in Singaraja City area. At present, this colonial legacy is not only used as a memory, but there are 2 substations that are still active today, namely the substation on Jalan Gajah Mada and on Jalan Surapati.

Traces of this colonial legacy in the form of an electrical substation became the object of a study related to Dutch colonial remains in Singaraja City, based on BPCB Bali's records regarding the Dutch colonial heritage substation in Singaraja City, which has been included in the list of investors with no. investaris 2/14-08/BNG/17 and 2/14-08/BNG/21 with a total of 3 substations spread across Jalan Surapati, Jalan Diponegoro, and Jalan Gajah Mada. The note also states the dimensions of the 3 substations, which are 310 cm long and 290 cm wide. This building is made of brick, cement and iron with a white building color. In the physical form of the substation, there are also window ornaments and small rectangular ventilation on the body. There is also an iron window to the west of the substation and uses two leaves, while the door to the south is made of iron on only one door.

4. Conclusion

The construction of electricity facilities in the Dutch East Indies and spread in the city of Singaraja has resulted in a social shift in society. From previously a society that was synonymous with agriculture and rural areas, it became a commercial and urban society. This was also supported by various factors such as geographical factors which positioned the city of Singaraja as the center of Dutch colonial administration on the island since it was fully controlled in 1908. In addition, the existence of the Buleleng port which became the entrance to international trade and was also supported by other natural ports in around the north coast of Bali makes the construction of electricity facilities in the city quite urgent to be carried out. At the point where interests and needs cause the construction of electricity facilities in the city of Singaraja to be carried out. The city that used to be dim and relied on manual lighting, has turned into a brightly lit electric city. The city, which is associated with silence at night, soon turns into a bustling center due to commercial activity. No doubt, this phenomenon has contributed to the modern behavior of the urban urban community in Singaraja, which is represented by the crowds of means of transportation and bright lights.

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