

The Kali Samin Hydroelectric Power Plant as an instrument of social change and an arena of power contestation in Vorstenlanden, 1933–1938

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Abstract

Studies on colonial electrification have been widely conducted. However, the relationship between the Kali Samin Hydroelectric Power Plant, social change, and power contestation in Vorstenlanden has received limited integrated historical analysis. This study aims to examine the Kali Samin Hydroelectric Power Plant as an instrument of social change and an arena of power contestation during the reign of Mangkunegara VII. The research employed the historical method, consisting of heuristics, source criticism, interpretation, and historiography, using colonial newspapers as primary sources and books, journal articles, and a thesis as secondary sources. The findings reveal that the Kali Samin Hydroelectric Power Plant not only expanded electricity supply but also stimulated economic modernization, tourism, and bureaucratic development through collaboration among the Mangkunegaran Principality, the colonial government, electricity companies, and technical experts. This study highlights energy infrastructure as both an instrument of social transformation and a medium of negotiated power in the modernization of *Vorstenlanden*.

Keywords: Kali Samin Hydroelectric Power Plant; Social change; Power contestation; Mangkunegara VII; Vorstenlanden.

Abstrak

Pembangunan infrastruktur ketenagalistrikan pada masa kolonial telah banyak dikaji. Namun, hubungan antara pembangunan Pembangkit Listrik Tenaga Air (PLTA) Kali Samin, perubahan sosial, dan kontestasi kekuasaan di *Vorstenlanden* masih belum dianalisis secara terpadu. Penelitian ini bertujuan menganalisis pembangunan PLTA Kali Samin sebagai instrumen perubahan sosial sekaligus arena kontestasi kekuasaan pada masa pemerintahan Mangkunegara VII. Penelitian menggunakan metode sejarah yang meliputi tahapan heuristik, kritik sumber, interpretasi, dan historiografi dengan memanfaatkan surat kabar kolonial sebagai sumber primer serta buku, artikel jurnal, dan tesis sebagai sumber sekunder. Hasil penelitian menunjukkan bahwa PLTA Kali Samin tidak hanya meningkatkan penyediaan energi, tetapi juga mendorong modernisasi ekonomi, pariwisata, dan birokrasi melalui kolaborasi antara Praja Mangkunegaran, pemerintah kolonial, perusahaan listrik, dan tenaga ahli. Penelitian ini menegaskan bahwa infrastruktur energi berfungsi sebagai instrumen perubahan sosial sekaligus medium negosiasi kekuasaan dalam proses modernisasi *Vorstenlanden*.

Kata Kunci: PLTA Kali Samin; Perubahan sosial; Kontestasi kekuasaan; Mangkunegara VII; Vorstenlanden.

Introduction

Technological development during the Dutch East Indies colonial period not only transformed the production and distribution of energy but also reshaped social dynamics and power relations across different regions (Tilley, 2021). One manifestation of this modernization was the construction of hydroelectric power plants (HPPs), which began to be developed in the early twentieth century to meet the growing energy demands of industry, transportation, and public services (Rospriandana et al., 2023).

Since the early twentieth century, some HPPs have been built in Java and outside Java. The Rasak Bungo Hydroelectric Power Plant in Indarung, Lubuk Kilangan District, Padang City, West Sumatra, was built in 1909. This hydroelectric power plant is an essential facility for the operational electricity needs of the cement company *NV Padang Portland Cement Maatschappij (PPCM)* (now *PT Semen Padang*) (Novelia, 2023). In addition, two more HPPs, i.e., the Tes Hydroelectric Power Plant in Bengkulu and the Tonsea Lama Hydroelectric Power Plant in Minahasa, North Sulawesi, were built several years later, around 1912 (Sulistyo, 2021).

Meanwhile, most of the oldest HPPs in Java are located in West Java. The Pakar Hydroelectric Power Plant (*PLTA Pakar aan de Tjikapoendoeng Nabij Dago*) in the Pakar Dago area was later renamed the Centrale Bengkok Hydroelectric Power Plant (*PLTA Bengkok*) and began operating around 1923 (Hermawan, 2012). Subsequently, between 1920 and 1926, several other HPPs were also operated, such as the Lamajan Hydroelectric Power Plant, the Ubrug Hydroelectric Power Plant, and the Kracak Hydroelectric Power Plant, which featured the modern *Nieuwe Bouwe* architectural style, popular in the 1920s (Kholis & Ajid, 2020).

In *Vorstenlanden*, however, the electrification process exhibited distinctive characteristics because it involved indigenous principalities that retained authority over certain aspects of their governance. Within this context, the construction of the Kali Samin Hydroelectric Power Plant by the Mangkunegaran Principality emerged as one of the region's most significant infrastructure projects during the 1930s. Its establishment not only supplied electricity but also reflected a transformation in development policy that integrated modern technology with local governance under colonial supervision.

The construction of the Kali Samin Hydroelectric Power Plant was particularly significant because it coincided with the rapid increase in energy demand in Surakarta, driven by the expansion of industry, commerce, tourism, and public services (Albastomiroji & Umar, 2018). Hydropower was selected as a strategic alternative to reduce dependence on oil-fired power generation while improving the efficiency of electricity supply. Nevertheless, the project cannot be understood merely as a technical achievement. Energy infrastructure also served as a catalyst for

changing patterns of social life by expanding access to electricity, fostering the emergence of indigenous technical professionals, and stimulating economic activity as well as the development of public spaces. At the same time, the construction of the power plant revealed complex interactions among the colonial government, the Mangkunegaran Principality, electricity companies, and local communities, giving rise to power dynamics that extended well beyond the physical construction of infrastructure.

These developments indicate that the construction of the Kali Samin Hydroelectric Power Plant formed part of a broader modernization process characterized by the negotiation of interests among multiple actors. *Mangkunegara VII* employed infrastructure development as a strategy to strengthen governmental capacity while improving public welfare, whereas the colonial government maintained its influence through regulatory frameworks, concession systems, and technological control (Saffana & Marwoto, 2025). This interaction produced a form of modernization that was neither entirely dominated by the colonial administration nor fully controlled by the local government. Consequently, the Kali Samin Hydroelectric Power Plant provides a compelling case for understanding how energy infrastructure functioned both as an instrument of social change and as an arena of power contestation. This perspective offers a broader analytical framework than studies that interpret electrification solely as a process of technological advancement.

Research on electricity infrastructure development during the colonial period has been widely conducted. Strielkowski et al. (2021) demonstrated that power plant development played a crucial role in supporting industrialization, accelerating economic growth, and expanding public service networks. Zhao et al. (2020) found that hydroelectric power development also influenced the growth of residential areas and the social activities of surrounding communities. Meanwhile, Setiasih et al. (2024) showed that modernization under the reign of *Mangkunegara VII* encompassed reforms in education, culture, and public administration. Nevertheless, most existing studies have examined these issues separately, leaving the relationship between the construction of the Kali Samin Hydroelectric Power Plant, social change, and power contestation in *Vorstenlanden* insufficiently explored within an integrated framework of social history.

Against this background, this study aims to examine the construction of the Kali Samin Hydroelectric Power Plant as both an instrument of social change and an arena of power contestation in *Vorstenlanden* during the period 1930s. The study not only reconstructs the planning, construction, and inauguration of the power plant but also explains how energy infrastructure was utilized to strengthen governmental legitimacy, advance modernization, and reshape relationships among the colonial government, the Mangkunegaran Principality, electricity companies, and local

communities. This study is expected to contribute to the historiography of infrastructure in Indonesia by positioning electrification as an integral component of socio-political dynamics rather than merely a technological development. In doing so, it offers a more comprehensive perspective on the interconnected relationship between energy, modernization, and power relations during the colonial period.

Method

This study employed the historical method to reconstruct the development of the Kali Samin Hydroelectric Power Plant as part of the processes of social change and power contestation in *Vorstenlanden* during the period 1930s (Tosh, 2015). The research followed four stages: heuristics, source criticism, interpretation, and historiography (Kartodirdjo, 1992; Kuntowijoyo, 2003). Primary sources consisted of colonial newspapers published in the Dutch East Indies, namely *Algemeen Handelsblad voor Nederlandsch-Indië*, *De Locomotief*, *Het Nieuws van den Dag voor Nederlandsch-Indië*, *Soerabaijasch Handelsblad*, and *Deli Courant*. These sources were selected because they provide contemporary accounts of the planning, construction, and inauguration of the Kali Samin Hydroelectric Power Plant. Secondary sources included books, journal articles, and a master's thesis addressing the modernization of Mangkunegaran, the history of electrification, and socio-political dynamics during the colonial period.

The collected data were first subjected to external criticism to assess the authenticity of the sources and internal criticism to evaluate the credibility of the information they contained (Gottschalk, 1985). The validated sources were then interpreted using processual analysis to explain the development of the Kali Samin Hydroelectric Power Plant from its initial planning to its operational stage, while structural analysis was employed to examine the relationship between energy infrastructure development, social change, and the evolving power relations between the colonial government and the Mangkunegaran Principality (Bidart et al., 2013). Finally, the interpreted findings were synthesized through historiographical writing to produce a systematic historical reconstruction of the role of the Kali Samin Hydroelectric Power Plant as both an instrument of modernization and an arena of power contestation in *Vorstenlanden*.

Results and Discussion

Mangkunegara VII's modernization as the foundation of social change

Kanjeng Gusti Pangeran Adipati Arya (KGPAA) Mangkunegara VII was one of the prominent local rulers in *Vorstenlanden* whose vision of modernization was far ahead of his time. Born as *Bendara Raden Mas Soerjo Soeparto* on November 12, 1885, he received his early education at the *Europeesche Lagere School (ELS)* before pursuing Eastern Literature at Leiden University in the Netherlands (Setiasih, 2009). This

educational background shaped his perspective on the importance of knowledge, effective governance, and the application of technology as instruments of societal development. According to Setiasih (2009), his academic experience in the Netherlands profoundly influenced the reform-oriented vision that he later implemented during his reign over the Mangkunegaran Principality. After succeeding *Mangkunegara VI* in 1916, he directed his administration not only toward strengthening the royal bureaucracy but also toward advancing social reform through education, culture, and various institutional innovations aimed at improving public welfare (Sulistyo, 2021).

Mangkunegara VII's commitment to modernization was reflected in a wide range of cultural initiatives that remained firmly rooted in local identity. In 1919, he established the *Cultuur-Wijsgeerige Studiekring* and the *Java Instituut* as institutions dedicated to the advancement of knowledge while preserving Javanese, Madurese, and Balinese cultural heritage (Setiasih, 2009). In architecture, the construction of the *Societeit Mangkoenegaran*, which combined colonial architectural styles with traditional Javanese elements, demonstrated an effort to integrate Western modernity without compromising local cultural identity (Trisnaningsih, 2018). These initiatives indicate that Mangkunegara VII's modernization agenda was not merely a process of Westernization but rather an adaptive strategy that selectively incorporated modern elements to strengthen the social capacity of society. As Mrázek (2006) argued, modernity in colonial settings often evolved through negotiations among technology, power, and local identity. Within this context, Mangkunegara VII's cultural policies laid a crucial foundation for the emergence of social change in *Vorstenlanden*.



Figure 1. KGPAA Mangkunegara VII

Source: puromangkunegaran.com

As shown in Figure 1, Mangkunegara VII embodied a model of local leadership that combined a Western educational outlook with a strong commitment to preserving Javanese culture. This orientation was subsequently translated into more inclusive educational policies. He promoted broader access to education, including increased attention to women's education (Setiasih, 2009), and supported the development of the *Hollandsch-Inlandsche School (HIS)* Muhammadiyah Mangkunegaran, where Dutch served as the language of instruction (Musyafa, 2021). This educational model expanded local communities' access to modern knowledge without severing their ties to Islamic identity and indigenous cultural traditions. Musyafa (2021) explained that Mangkunegara VII's educational policies successfully reconciled educational modernization with the strengthening of Islamic values, allowing education to function as both an instrument of social mobility and a means of fostering a society that was more adaptive to change.

Mangkunegara VII's modernization agenda extended beyond education and culture. He also introduced a range of innovations in communication and public infrastructure as part of his broader effort to strengthen the socio-economic capacity of *Vorstenlanden*. One of his most significant initiatives was the establishment of the *Solosche Radio Vereeniging (SRV)*, which later became recognized as the forerunner of *Radio Republik Indonesia* in Surakarta (Trisnaningsih, 2018). The introduction of radio served as a medium for disseminating information, promoting education, and expanding communication among communities. At the same time, his emphasis on technological advancement and infrastructure development reflected a comprehensive understanding of modernization as a process linking scientific progress, public services, and improvements in the quality of life (Sulistyo, 2021). From the perspective of the history of colonial technology, the development of communication infrastructure and public services also transformed the relationships among the state, society, and the public sphere, as discussed by Mrázek (2006).

Taken together, these policies demonstrate that Mangkunegara VII's modernization strategy represented a comprehensive program of social transformation integrating education, culture, communication, and infrastructure development within a unified framework of societal advancement. This approach illustrates that social change was achieved not only through institutional reform but also through the provision of infrastructure capable of enhancing productivity, expanding access to information, and improving public welfare. Kartodirdjo (1992) argued that historical social change emerges through the interaction of political policies, social institutions, and technological development. In this context, the construction of the Kali Samin Hydroelectric Power Plant constituted a logical continuation of the modernization agenda initiated during Mangkunegara VII's reign (Sulistyo, 2021). Rather than representing merely the construction of an energy facility, the project formed part of

a broader vision to build an independent, modern, and competitive *Vorstenlanden* society amid the realities of colonial domination.

The Kali Samin Hydroelectric Power Plant as an instrument of social change

The increasing demand for electricity in *Vorstenlanden* during the early 1930s prompted the Mangkunegaran Principality to seek a more reliable energy source to support regional development. Prior to the construction of the Kali Samin Hydroelectric Power Plant, Surakarta's electricity supply was largely provided by the *Solosche Electriciteits Maatschappij* (SEM), an electricity company established in 1901 through the initiative of *Mangkunegara VI* and *Sunan Pakubuwana X* (*Algemeen Handelsblad voor Nederlandsch-Indië*, 1936). Although SEM successfully introduced a modern electricity system, the generating capacity of its Tuntang Power Plant became increasingly insufficient to meet the growing demand driven by industrial expansion, urban development, and the increasing provision of public facilities. Sulisty (2021) explained that this rising demand for electricity became one of the principal development challenges facing Surakarta during the 1930s. In addition, the high operating costs of oil-fired power plants resulted in relatively expensive electricity tariffs, limiting public access to modern energy. Under these circumstances, *Mangkunegara VII* regarded hydropower as a strategic alternative for establishing a more self-reliant energy system while simultaneously advancing the region's modernization agenda.

The idea of constructing a hydroelectric power plant emerged after *Mangkunegara VII* recognized the considerable hydropower potential of the Tawangmangu area. To realize this plan, a series of field surveys and technical assessments were undertaken to identify the most suitable location. According to the report *Grootsche Waterkracht-plannen op Lawoe in Studie*, the project's initial funding was provided by the *het Fonds van Mangkoenegorosche Eigendommen*, a fund financed through the profits of enterprises owned by the Mangkunegaran Principality (*Het Nieuws van den Dag voor Nederlandsch-Indië*, 1933). Several alternative sites, including the Beji Waterfall area, were evaluated before the Kali Samin River was ultimately selected because of its stable water discharge and favorable topography for the construction of a dam and water conveyance system. Sulisty (2021) noted that this site selection was based not only on technical considerations but also on its potential to support the development of Tawangmangu as a tourist destination. Accordingly, from its inception the hydropower project was conceived as an integrated regional development strategy linking the energy, economic, and tourism sectors.

The technical planning stage involved experts from both within and outside the Mangkunegaran Principality. Prof. Ir. van der Ley and Ir. Zorn of the *Dienst voor Waterkracht en Electriciteit Wezen* in Bandung conducted assessments of the area's hydropower potential and prepared the design of the generating facility (*De*

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Locomotief, 1933). Meanwhile, the geologist Mr. Grondijs investigated the geological conditions and slope stability surrounding the construction site, while Ir. Sarsito, Head of the Mangkunegaran Irrigation Service, completed a four-month technical training program in Bandung to enable him to supervise the project directly (Sulistyo, 2021). Based on these studies, the Kali Samin Hydroelectric Power Plant was projected to generate approximately 10,000 horsepower, with an estimated investment of around f1,100,000 (*Soerabaijasch Handelsblad*, 1933). Construction was subsequently entrusted to SEM with equipment supplied by *Lindeteves-Stokvis*, illustrating the collaboration between indigenous technical professionals and the modern technologies introduced during the colonial period.



Figure 2. Ir. Sarsito explaining the construction process of the Kali Samin Hydroelectric Power Plant to government officials during the inauguration ceremony.

Source: *Soerabaijasch Handelsblad*, June 28, 1938.

As illustrated in Figure 2, Ir. Sarsito symbolized the emergence of indigenous professionals who increasingly assumed important roles in the development of modern infrastructure. His contribution extended beyond supervising construction, as he also served as a bridge between the development policies of the Mangkunegaran Principality and the application of contemporary electrical technologies (*Soerabaijasch Handelsblad*, 1938). According to Sulistyo (2021), the involvement of indigenous experts demonstrates that modernization in Surakarta was no longer entirely dependent on European specialists but increasingly supported by technically skilled local professionals. From the perspective of social change, the emergence of this professional class represented an important indicator of the growing bureaucratic and institutional capacity of local government to manage technology-based development.

The impact of the Kali Samin Hydroelectric Power Plant extended well beyond expanding electricity generation capacity, influencing multiple aspects of social and

economic life. A more reliable electricity supply created opportunities for the expansion of the sugar industry and agave fiber factories, which formed the backbone of the Mangkunegaran economy. The availability of electrical infrastructure also supported the development of Tawangmangu as a tourist destination by improving public facilities and enhancing visitor comfort (*Het Nieuws van den Dag voor Nederlandsch-Indië*, 1933). Hermawan (2012) and Kholis and Hakim (2020) demonstrated that hydroelectric development during the colonial period generally generated impacts extending beyond the energy sector by stimulating economic growth and transforming community life in surrounding areas. In the Mangkunegaran context, electrification extended social activities into the evening, improved the quality of public services, and accelerated the emergence of new economic activities. Consequently, the construction of the Kali Samin Hydroelectric Power Plant can be understood as an instrument of social change that linked technological advancement with the transformation of economic and social life.

Table 1. Dimensions of social change resulting from the construction of the Kali Samin Hydroelectric Power Plant

Dimension	Contribution of the Kali Samin Hydroelectric Power Plant
Energy	Expanded electricity generation capacity through the utilization of local hydropower resources.
Economy	Supported the development of the sugar industry, agave production, and regional economic activities.
Tourism	Strengthened the development of Tawangmangu as a mountain tourism destination.
Social	Expanded access to electricity and increased community activities within public spaces.
Modernization	Promoted the adoption of modern technology and facilitated the emergence of indigenous technical professionals.

Source: Author's analysis (2026).

The inauguration of the Kali Samin Hydroelectric Power Plant on June 25, 1938, marked the culmination of a development process that had been underway for several years. The ceremony was officially opened by *Ratu Timur* and attended by *Mangkunegara VII*, colonial government officials, Mangkunegaran aristocrats, and thousands of visitors from across the region (*Deli Courant*, 1938). Following the commissioning of the turbines and the successful transmission of electricity, the celebration continued with *ketoprak* performances, screenings of Mickey Mouse films, fireworks displays, and various forms of public entertainment (*De Locomotief*, 1938). The large public attendance demonstrated that the inauguration of the power plant had become a social event extending far beyond its technical significance. According to *Soerabaijasch Handelsblad* (1938), the public enthusiasm surrounding the inauguration indicated that electrification had come to be perceived as both a symbol

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of progress and a source of pride for the Mangkunegaran Principality. Below is a news passage from the Deli Courant newspaper entitled "Nieuwe Waterkracht Centrale" published on June 13, 1938, which reported the inauguration of the hydroelectric power plant by *Mangkunegara VII* and his wife, *Ratu Timur*:

"De officieele in gebruikstelling van de nieuwe waterkracht centrale in Tawangmangoe, voor de electriciteitsvoorziening van dit bergoord, zal op 25 Juni aanstaande plaats hebben in tegenwoordigheid van den Mangkoe Nagoro en de Ratoe Timoer als mede genoodigden."

"The inauguration of the new hydroelectric power plant in Tawangmangoe, to supply electricity to the mountain resort, will be held on June 25th, attended by *Mangkoe Nagoro* and *Ratoe Timoer* along with other guests."



Figure 3. Inauguration of the Tawangmangu Hydroelectric Power Plant, 25 June 1938.

Source: "Officieele inbedrijfstelling elektrische centrale Tawangmangoe," Soerabaijasch Handelsblad, June 28, 1938.

As shown in Figure 3, the inauguration of the Kali Samin Hydroelectric Power Plant demonstrates that electrification was understood not merely as the successful completion of an infrastructure project but also as a symbol of social transformation in *Vorstenlanden*. The gathering of colonial officials, the Mangkunegaran elite, technical experts, and local communities within a single public celebration illustrates how technology became a visible representation of governmental progress. The combination of modern and traditional performances reflected an effort to integrate local cultural values with the symbols of modernity. Consequently, the Kali Samin Hydroelectric Power Plant not only generated electricity but also created a new social space that reinforced the political legitimacy of *Mangkunegara VII* while accelerating the modernization of society in the final years of the colonial period (Sulistyo, 2021).

Energy infrastructure as an arena of power contestation in Vorstenlanden

The construction of the Kali Samin Hydroelectric Power Plant demonstrates that energy infrastructure during the colonial period cannot be understood merely as a means of electricity generation but also as an instrument closely associated with the distribution of power. Within the colonial system of the Dutch East Indies, control over technology and infrastructure networks was directly linked to economic interests, administrative authority, and territorial governance. Mrázek (2006) argued that the development of colonial technology was fundamentally part of a political project intended to strengthen governmental administration and expand the influence of the colonial state. Consequently, every strategic infrastructure project involved negotiations among the colonial government, private enterprises, and local elites. In the context of *Vorstenlanden*, the construction of the Kali Samin Hydroelectric Power Plant illustrates how the Mangkunegaran Principality employed modern technology to strengthen its governing capacity, while the colonial government sought to maintain regional economic stability through a more reliable energy supply (Sulistyo, 2021).

One manifestation of this power contestation can be observed in the issue of electricity supply concessions in Surakarta. Before the construction of the Kali Samin Hydroelectric Power Plant, electricity distribution was dominated by the *Solosche Electriciteits Maatschappij* (SEM), a company that had held a central position in regional electricity provision since the early twentieth century (*Algemeen Handelsblad voor Nederlandsch-Indië*, 1936). However, the Mangkunegaran Principality's plan to construct a hydroelectric power plant initiated discussions concerning the allocation of regional electricity concessions and the distribution of authority over electricity management. Reports published in *De Locomotief*, including *De Regionale Electriciteitsconcessie* (1936) and *A.N.I.E.M. en Midden Java* (1936), demonstrate that this process involved multiple competing interests, ranging from the colonial government and electricity companies to the local administration. Consequently, the construction of the hydropower plant not only created a new source of energy but also reshaped the governance structure of infrastructure management, which had previously been concentrated in the hands of electricity providers.

Nevertheless, the construction of the Kali Samin Hydroelectric Power Plant did not constitute an act of open resistance against the colonial government. Rather, the project exemplified a collaborative model characterized by a negotiated division of responsibilities and supervisory mechanisms. The planning stage involved Dutch specialists, including Prof. Ir. van der Ley, Ir. Zorn, and the geologist Mr. Grondijs (*De Locomotief*, 1933), while construction was entrusted to SEM with technological support from the Lindeteves-Stokvis Company (*Soerabaijasch Handelsblad*, 1933). At the same time, project financing was provided through the economic resources of the

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Mangkunegaran Principality, whereas on-site technical supervision was carried out by the indigenous engineer Ir. Sarsito (Sulistyo, 2021). These arrangements demonstrate that infrastructure modernization proceeded through negotiated interests, whereby the colonial government provided access to technology and technical expertise, while the Mangkunegaran Principality retained authority over development decisions within its own territory. The configuration of stakeholder relationships in the construction of the Kali Samin Hydroelectric Power Plant is summarized in Table 2.

Table 2. Actors and interests in the construction of the Kali Samin Hydroelectric Power Plant

Actor	Primary interest	Role in the construction of the Kali Samin Hydroelectric Power Plant
Dutch colonial government	Maintaining regional economic stability, supervising infrastructure development, and preserving administrative control	Provided oversight, technical support, and the regulatory framework through the electricity concession system.
Mangkunegaran Principality	Achieving energy self-sufficiency, accelerating modernization, and improving public welfare	Financed the project, determined development policies, and managed the utilization of energy for regional interests.
<i>Solosche Electriciteits Maatschappij</i> (SEM)	Maintaining its role in electricity generation and distribution	Served as the construction contractor and supported the expansion of the electricity distribution network.
Technical experts (Dutch and indigenous)	Ensuring infrastructure development according to modern engineering standards	Prepared technical plans, conducted geological investigations, and supervised project implementation.
Communities of Vorstenlanden	Gaining access to energy, public services, and economic opportunities	Became the primary beneficiaries while simultaneously reinforcing the social legitimacy of the development project.

Source: Author's analysis (2026).

As summarized in Table 2, the construction of the Kali Samin Hydroelectric Power Plant demonstrates that although each stakeholder pursued distinct interests, they remained mutually dependent in realizing this modernization project. The successful operation of the power plant subsequently became a symbol of the growing political legitimacy of *Mangkunegara VII* as a leader capable of advancing modernization without abandoning local identity. The inauguration ceremony on June 25, 1938, was attended by colonial government officials, Mangkunegaran aristocrats, technical experts, and members of the public from various regions (*Deli Courant*, 1938). The sequence of events, which combined the ceremonial activation of the turbines with *ketoprak* performances, screenings of Mickey Mouse films, and fireworks displays

(*Soerabaijasch Handelsblad*, 1938; *De Locomotief*, 1938), illustrates that technology was employed not only as a public utility but also as a representation of governmental achievement. From the perspective of social history, such public events functioned to strengthen political legitimacy by publicly demonstrating the success of development, thereby transforming infrastructure from a purely technical object into a symbol of the relationship among government, society, and modernity (Kartodirdjo, 1992).

Based on the foregoing discussion, the construction of the Kali Samin Hydroelectric Power Plant demonstrates that energy infrastructure served as an arena of power contestation shaped through collaboration, negotiation, and the division of responsibilities between the colonial government and the Mangkunegaran Principality. Control over energy resources was not merely associated with the capacity to generate electricity but also determined a government's ability to direct development, expand public services, and consolidate political legitimacy. As Mrázek (2006) argued, technology in the colonial period consistently occupied the intersection of political interests and modernization projects. In the context of *Vorstenlanden*, the Kali Samin Hydroelectric Power Plant provides compelling evidence that modernization was not imposed unilaterally but emerged through a process of negotiation that produced a new configuration of relationships among technology, power, and society during the final years of colonial rule.

Conclusion

This study demonstrates that the construction of the Kali Samin Hydroelectric Power Plant was not merely an energy infrastructure project but also functioned as an instrument of social change and an arena of power contestation in *Vorstenlanden* during the 1930s. Mangkunegara VII's modernization agenda was realized through infrastructure development that integrated education, culture, communication, and energy into a comprehensive strategy for societal development. The establishment of the Kali Samin Hydroelectric Power Plant expanded access to electricity, stimulated the growth of industry and tourism, and fostered the emergence of indigenous technical professionals involved in the management of modern technology. At the same time, the project demonstrates that modernization did not result from the dominance of a single actor but rather evolved through continuous negotiation among the Mangkunegaran Principality, the colonial government, electricity companies, and technical experts. Consequently, the Kali Samin Hydroelectric Power Plant provides compelling evidence that colonial energy infrastructure functioned not only as a technical facility but also as a medium through which social, economic, and political relationships were constructed, shaping the broader dynamics of *Vorstenlanden* society.

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This study contributes to the historiography of the social history of energy infrastructure by positioning the Kali Samin Hydroelectric Power Plant as part of a locally driven modernization process characterized by collaboration and power contestation rather than merely as an achievement of colonial technology. By integrating primary sources from colonial newspapers with scholarship on the history of modernization, this study offers a more comprehensive perspective on the relationship between technology, governance, and social change in the Mangkunegaran Principality. Nevertheless, the study has certain limitations because it relies primarily on written sources, particularly colonial newspaper archives and secondary literature, without making extensive use of administrative archives or technical documentation related to the construction project. Future research could therefore broaden this line of inquiry through the examination of colonial archival records, institutional documents of the Mangkunegaran Principality, and approaches drawn from environmental history and the history of technology, thereby providing a more comprehensive understanding of the development of the Kali Samin Hydroelectric Power Plant within the broader context of Indonesia's energy infrastructure history.

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