

Technology and Indigenous Expertise in Colonial India: The Engineering Career of Rai Bahadur Jagmal Raja Chauhan (1887–1974)

Original Research Article | Volume 1 | Issue 5 | 2026 | Article Number: 058

Accepted: 29 September 2026 | Published: 10 October 2026 | ISSN: 2979-8582 (Online)



Crossref : <https://doi.org/10.67693/BJCR-QZWUMYKY>



Santigopal Jana¹, Indrajit Mahanta², Krishna Murmu³

¹Assistant Professor, Department of History & Archaeology, Fakir Mohan University, Balasore, Odisha, India,

²Research Scholar, Department of History, Km. Mayawati Govt. Girls P.G. College, Badalpur (Chaudhury Charan Singh University, Meerut, Uttar Pradesh), India,

³Research Scholar, Department of History, Kalinga Institute of Social Sciences (KISS) Deemed to be University, Bhubaneswar, Odisha, India

 SJ [0009-0008-0259-1453](https://orcid.org/0009-0008-0259-1453), IM [0009-0005-9429-2327](https://orcid.org/0009-0005-9429-2327)

Correspondence: Santigopal Jana, santigopal14041998@gmail.com

Abstract

In this article, the engineering career of Rai Bahadur Jagmal Raja Chauhan (1887-1974) is explored as a case study to gain insight into the colonial technology-entrepreneurship-engineering nexus in late colonial India. Histories of technology in British India have tended to focus on the work of colonial scientific knowledge and European engineering institutions. The role of Indian contractors, builders, and technical entrepreneurs has been comparatively little studied, however. Jagmal Raja Chauhan hails from the Mistri community of Kutch, which is traditionally involved in construction and engineering work. He was one of the most prominent railway contractors and infrastructure builders of India despite his lack of formal education in the first half of the 20th century. He was also involved in many engineering feats such as railway bridges and the building of docks and industrial enterprises—a testament to the importance of indigenous skills in the realization of colonial public works. The article seeks to demonstrate that in addition to British knowledge and skills in engineering, the building of colonial infrastructure relied on local technical traditions, community networks, and entrepreneurial efforts. The study focuses on colonial institutions and indigenous technical knowledge through the lens of Chauhan's career. It also examines the negotiation of opportunities by Indian contractors in the colonial economy, their acquisition of technical authority, and their role in the transformation of Indian transportation and industrial infrastructure. The article locates Chauhan within the larger discussions around technology transfer, colonial modernity, and agency of Indian actors in the creation of modern engineering landscapes.

Keywords: Colonial India, Indian Expertise, Public Works, Railway Engineering, Jagmal Raja Chauhan, Technology and Empire

Introduction:

We have traditionally talked about the history of technology in colonial India in terms of British engineers, imperial institutions, and state sponsored infrastructure projects. Railways, bridges, roads, ports and irrigation systems are often represented as the symbols of colonial modernity and technological progress imposed by the British Empire. The scholarship tradition that has focused on the role of European technology has become more complexly contested, however, in recent years by historians who have emphasized the importance of the interactions between imperial institutions and local actors in the shaping of colonial technological systems.³

In the past three decades, the work of indigenous artisans, contractors, craftsmen and entrepreneurs who were essential to the building and upkeep of colonial infrastructure has been highlighted by historians of technology. Indian technical communities engaged in adapting, modifying, and making to work imported technologies for their own local environmental, economic, and social circumstances, rather than being mere recipients of transferred technologies.⁵ Indian engineers, particularly railway engineers, depended on indigenous labour, know-how, and entrepreneurial networks, which worked in conjunction with the formal colonial engineering institutions.⁶

The development of railways in the nineteenth and early twentieth centuries is one context that is significant in the study of colonial technology and native expertise. The railway system was one of the biggest engineering works of the British Empire. All railway planning and design was done by British engineers but the railway construction itself was highly dependent on Indian contractors and skilled workers. These contractors served as a link between colonial government and local labour forces, they were able to call in resources, organize construction activities and adjust engineering works to different geographical conditions.⁷

In this larger historical context, the experience of Rai Bahadur Jagmal Raja Chauhan (1887-1974) is an intriguing case study of indigenous involvement in colonial engineering. Chauhan was born in the village of Nagor in the Kutch district of Gujarat, where the Mistri caste, traditionally involved in architecture, construction work, and technical skills, is in the majority. He was one of the most successful Indian contractors of the late colonial era and was involved in a number of large scale infrastructure projects throughout British India despite his lack of formal education. His professional success illustrates the potential of indigenous technical knowledge, experience and entrepreneurship to create modes of engineering knowledge that are not formal engineering education.⁸

Jagmal Raja Chauhan's impact is not limited to his personal achievements. His work highlights the wider processes by which Indian entrepreneurs interacted with colonies' technological systems and gained a foothold in the infrastructure sector. Chauhan was involved in the development of transportation networks through railway contracts and bridge building projects and through industrial projects, which were at the heart of the colonial administration and economic modernization. His involvement in the construction of the Bally (Willingdon) Bridge across the Hooghly River represents one of the most notable examples of indigenous participation in a technically complex engineering project during the colonial era.⁹

This article aims to explore the engineering career of Rai Bahadur Jagmal Raja Chauhan in the broader context of colonial technology and native skill and infrastructure development. It contends that colonial engineering in India was not just the product of British technical knowledge, but also of the skills, experiences and entrepreneurial work of indigenous actors. The study aims to recover the often-understated work of Indian contractors in the production of modern infrastructure, and join current discussions of technology, empire, and indigenous agency in colonial societies.

Indian Engineering and Indigenous Knowledge:

In the nineteenth and early twentieth centuries, the construction of engineering infrastructure in colonial India was one of the most important technological shifts. During the British era, extensive projects were built everywhere in the subcontinent including railways, bridges, canals, roads, ports and telegraph networks. The purpose of these projects was to heighten the administrative control, to enable military operations and to link regional economies into the larger economy of the British Empire.¹⁰ Engineering thus became a significant tool of colonial governance and economic development.

Historical research has focused mainly on the technology of colonial engineering as a European invention or the dominance of European scientific and technological expertise. This reading of history would credit the introduction of modern engineering practices to India to the British engineers and the technical institutions and government departments that operated in India, including the Public Works Department (PWD).¹¹

However, recent historical work has called into question this Eurocentric diagnosis and focused on the role of indigenous actors in the development and upkeep of colonial infrastructure. Engineering projects in colonial India were not merely products of Western technology but were created through the contribution of indigenous engineering skills and knowledge as well as Indian labourers, artisans, builders, contractors and technical communities who adapted, implemented and transformed Western technology to local environmental and social contexts.

India has a long history of its own in the field of engineering and technical knowledge before the advent of British rule.¹² The ancient and medieval societies developed well advanced systems of irrigation, architecture, urbanization, metallurgy, and transportation. Reservoirs in south India, stepwells in the west, embankments in Bengal, monumental architectural complexes across the region—all demonstrated a high level of knowledge about construction and environmental management, traditions that continued to shape local building practices during the colonial era, and from which modern constructions were built.¹³

The construction of the railway track highlights the complex nature of the ways in which colonial technology and local know-how intersected. The successful construction of railways was reliant on Indian contractors and skilled workers, although the planning and design of railways was generally controlled by British engineers. Labour, construction materials, and local knowledge of terrain, soil, river properties, and climate were provided by the local communities. As noted above, in many instances the native knowledge was essential to solving practical engineering problems that could only be solved with theory and experience.¹⁴

Areas where indigenous knowledge was particularly important were in the building of bridges. Seasonal flooding, sedimentation, erosion, and channel shifts were difficult challenges for the colonial river engineers. To construct the bridge, the patterns of the environment and the hydrological conditions of the area had to be understood. In many cases, Indian contractors and construction communities had extensive experience in the interactions with the river and foundation practices, and thus were also very important players in major construction schemes.

In 1854, the Public Works Department was formed, which was the main body for development of infrastructure in British India. Senior departmental roles were most often held by Europeans, but projects were often managed by Indian supervisors, artisans and contractors. Indigenous knowledge often helped to make the technical plans a reality, as these were connected to local resources, labour management and construction techniques.

The Mistris of Kutch were one of the most powerful indigenous technical communities. Architects,

builders, and craftsmen who were traditionally part of this community were active in late 19th and early 20th century railway contracting, bridge construction, and public works projects. They were not trained in engineering but in technical skills by means of apprenticeship systems and practice. However, many Mistri contractors were very proficient in carrying out complicated engineering projects and large construction businesses.¹⁵

The increasing involvement of Indian contractors in the construction of colonial infrastructure was symptomatic of wider changes in the colonial economy. Indian businessmen began to hold prominent positions in various fields including railways construction, mining, shipping and industrial manufacturing by the early twentieth century. They were successful, which exposed the myth of the superiority of European technical skills and proved the ability of indigenous communities to work with modern technological systems.¹⁶

This is a historical process as evident in the life of Rai Bahadur Jagmal Raja Chauhan. The Chauhan was born out of the tradition of Kutch Mistri who successfully integrated indigenous knowledge with modern engineering techniques. His service on large-scale railway and bridge construction schemes is an example of how local experience helped to make colonial infrastructure come to fruition. His career, then, does not just represent the importation of engineering as a technology, but also its negotiated and collaborative nature in the process of technological development in colonial India.

The colonial engineering in India, therefore, is not just a tale of British innovation and imperial power. It was also an account of the involvement of natives, technical adaptation, and entrepreneurial initiative. Colonial institutions and local knowledge systems were significant in creating the infrastructure that would shape the Indian subcontinent during the colonial period. This connection is crucial for a more holistic narrative of technology, knowledge and modernity in the history of South Asia.¹⁷

The Kutch Mistri Community:

The technical communities which provided skilled labourers, contractors and entrepreneurs for large construction projects are essential to the study of indigenous engineering skills in colonial India. The Kutch Mistris were a very prominent part of these communities. The Mistris had been established in the Kutch area of modern day Gujarat and built such a good reputation in construction, architecture, masonry, carpentry and related civil engineering activities that they were well sought after and respected. Their involvement in the development of public infrastructure during the pre-colonial and colonial eras show the significance of indigenous knowledge systems in India's technological development.¹⁸

The word “Mistri” itself came to mean technical skill and craftsmanship in many parts of South Asia. People from the community have been involved in the construction of palaces, temples, forts, ports, reservoirs and houses in the past. They were strongly tied to their professions, which were learned through apprenticeship and “hereditary occupations.” Whereas modern engineers were trained in the universities and technical institutions, the Mistri craftsmen depended upon the experiences acquired over generations and passed down through families and communities.¹⁹

These technical traditions of Kutch were influenced by the geographical environment. Kutch, an area with arid climate, occasional periods of drought, coastal settlements and seismic instability, demanded new solutions with respect to building and adaptation to the environment. The builders needed to learn new skills when it came to conserving water, building foundations, designing structures to withstand earthquakes, and building using local materials. The difficulties spurred the development of a very sophisticated construction culture that was celebrated all over western India.²⁰

Economic changes in the country and the development of infrastructure in Kutch during the 19th century

presented new opportunities to the Kutch Mistris beyond their native land. With the expansion of railways, ports, towns and public works projects, there was a need for qualified builders and contractors. This caused a significant dispersal of people within the community to other parts of British India for jobs and business opportunities. This mobility helped to make the Kutch Mistris more than just a regional community of builders; it was a major player in the larger colonial economy.²¹

Well-established kinship networks and community bonds helped to facilitate migration. Existing families in construction-related professions facilitated the new families to get contracts, labour, and financial assistance. These networks were informal institutions in which technical knowledge, business information and entrepreneurial opportunities flowed. In many instances, the extent to which community relationships were developed was as significant as formal qualifications in achieving professional success.²²

Throughout the colonial era, indigenous construction communities slowly became part of modern engineering projects. There were a number of large-scale contracting firms needed to oversee workers and ensure projects were carried out on the railways, bridges, ports, and government buildings. The Mistris of Kutch had been particularly successful in this setting due to their work on large scale building projects and their adeptness to modern engineering needs, matching traditional methods.²³

The most remarkable aspect of the Kutch Mistri tradition was that they were focussed on learning through action. Technical knowledge was learned on-the-job and not in a classroom. Surrounded by skilled craftsmen, young apprentices acquired the skills of surveying, selecting materials, mastering masonry, understanding structural design principles, and managing construction projects. This system resulted in people who could handle problems of engineering competence without having a formal education.²⁴

The Indian contractors of the late 19th and early 20th centuries was the result of the rise in importance of communities like Kutch Mistris. Their local knowledge of construction and the management of labour as well as local conditions, made local contractors valuable resources for the colonial authorities to implement public works projects. In addition, Indian contractors had some economic benefits, such as lower operating costs and closer ties with local labour markets.²⁵

In this context the Kutch Mistris were closely involved with railway construction and bridge making. They had a history of many major infrastructure projects where they had proved technical reliability and organizational efficiency. Numerous contractors from the community became rich and prosperous from the work they did on the engineering projects of the period. They overthrew the prevailing belief that all modern engineering skills were the product of western education and European scientific knowledge.²⁶

The indigenous technical entrepreneurship tradition gave birth to the career of Rai Bahadur Jagmal Raja Chauhan. Chauhan grew up within the Kutch Mistri community, where the emphasis was placed on craftsmanship, construction, and engineering skills. His subsequent success in railway contracting and bridge construction was more than just his personal accomplishment it also meant something to the community from which he came.²⁷

The Kutch Mistris are thus a case of the mobility-knowledge-economy nexus in colonial India. They travelled from one part of the subcontinent to another, spreading indigenous engineering tradition and playing an important role in development of modern infrastructure. The community was instrumental in developing the engineering landscape of colonial India with a blend of traditional craftsmanship and new technological needs. To grasp this history is to appreciate the work of Rai Bahadur Jagmal Raja Chauhan and that of indigenous knowledge in the broader context of colonial technological development.²⁸

Early Life and Career of Rai Bahadur Jagmal Raja Chauhan:

The rise of one of the most successful indigenous engineering contractors in colonial India, called Rai

Bahadur Jagmal Raja Chauhan, should be viewed in terms of the social mobility, entrepreneurial spirit and technical legacy of the Kutch Mistri. The socio-economic situation of Kutch, with only limited farming opportunities and recurring issues such as environmental problems, had a profound impact on its residents, prompting numerous households to explore alternative ways to make a living, like trade, migration, and work in construction.

As with many of his peers, Chauhan's formal schooling was lacking in his youth. The opportunity to pursue professional engineering education in late-nineteenth-century India was limited, especially for artisan and contractor communities. This apprenticeship-based approach to learning allowed young men to learn specialized skills in surveying, masonry, construction management and project execution, with technical expertise often gained by observation, rather than formal institutional training.²⁹

With the development of colonial infrastructure in the late 19th century, there arose new possibilities of enterprising people with technical skills. The building of railways became one of the biggest fields for employment and investment in British India. The increasing need for contractors to manage labor, source materials and oversee construction projects created opportunities for the indigenous technical communities to improve their social and economic status.³⁰

Jagmal Raja Chauhan was one of those youngsters that got into this new and booming construction and contracting sector. He engaged in various engineering projects and met with many successful builders, and slowly began to pick up the practical skills he needed to handle large-scale engineering projects. The way in which Chauhan acquired his skills is different from the European engineers who gathered their power from formal qualifications and institutional affiliations; it is an alternative trajectory towards technical competence, which was typical of indigenous contractors during the colonial period.³¹

Railways, bridges, docks and the urban infrastructure expanded quickly during the early part of the twentieth century in British India. These developments also created a need for skilled contractors who would be able to manage projects with multiple regions. Chauhan was able to make a name for himself for his organizational skills and technical reliability in this competitive field. People today say that he became known for his work of efficiency and quality.³²

One of the reasons for Chauhan's success was the capacity to organize the labour network of the Kutch Mistri community. These networks gave access to skilled craftsmen, supervisors, and construction workers, all with similar traditions of the craft, and cultural connections. These community links helped to recruit labour, exchange information and manage projects, allowing contractors to pursue more ambitious engineering projects.³³

As he built his reputation, Chauhan got contracts related to railway construction, foundations of bridges and other infrastructure projects. The contracts were given to Indian contractors and showed the growing trust of colonial governments and private engineering companies on the Indian contractors. Chauhan's career is an example of the ways in which Indian entrepreneurs progressively built their standing in fields which were assumed to be the domain of European know-how.³⁴

It was in the 1920s and 1930s that the local contractor became a nationally known engineering entrepreneur. In this time, Chauhan was linked to a number of big infrastructure projects giving him a higher reputation and economic status. His increasing participation in bridge construction, railway engineering and industrial projects showed him the practical application of traditional techniques and the introduction of modern organizational methods, skills which were extremely useful in colonial India, where a successful project in infrastructure development depended on a combination of engineering skills and understanding of local environmental conditions.³⁵

A central theme in Chauhan's life was his ability to work out the intricate dynamics between colonial institutions and indigenous enterprise. He worked in a system of imperial rule, and found opportunities afforded by the extension of infrastructure to establish an independent enterprise. His successes defy one-sided accounts of colonial technology, which neglect the agency of the British and their government in favor of British engineers. Rather, they emphasize the agency of Indians who were actively involved in the technological change of colonial India.³⁶

Jagmal Raja Chauhan was not only recognized for his work in the field of engineering but also for his contributions to society. He became quite a successful contractor and entrepreneur and gained social recognition and was awarded the prestigious title of "Rai Bahadur" by the British colonial government for distinguished Indian citizens. This award was given to his professional achievements and his emerging role in the business and public arena.³⁷

In the mid-twentieth century Chauhan had become one of the most successful indigenous engineering contractors in India. His career was the result of years of hands-on experience, business acumen, and skill. More importantly, it showed the importance of the role played by native people in the development of colonial infrastructure. The early experiences with his formation as an engineer and the early beginnings of his engineering career would prepare him for the participation in some of the most prominent engineering projects of the colonial era, such as the Bally (Willingdon) Bridge which would come to be a hallmark of his engineering career.³⁸

Increased Railway Contracting & Engineering Skills:

The meteoric success of indigenous engineering contractor Rai Bahadur Jagmal Raja Chauhan in colonial India was inextricably linked to the advent of rapid growth in railway construction in the late 19th and early 20th centuries.³⁹ The railway network was the biggest technological project of the British colonial state and necessitated far-reaching chains of contractors, engineers, craftsmen and labourers to build and keep it running. The British engineers had the most technical and administrative roles, and the work of the railway began to rely on the Indian contractors who were familiar with local conditions, had practical experience and organizational ability.⁴⁰

In this context, the firm of Raja Narain and Jagmal (Raja) Raja became a major indigenous contracting firm. A series of big railway and bridge contracts in the northern and eastern parts of India were gradually won due to the technical facilities, business acumen and skilful handling of the labour by the firm. They enabled the firm not only to build a reputation, but to showcase the increasing significance of native skills for the development of colonial infrastructure.

The railways contracting business of the firm started with the laying of railway line between Bulandshahr and Hapur in 1904. The same year, the company was able to complete the railway project between Shahdara and Saharanpur. The early contracts were useful in training the company in railway construction, and also helped the company to build up a reputation with the colonial railway authorities. These projects were successful and would set the groundwork for an extended, distinguished engineering career lasting over a few decades.⁴¹

The company continued to expand in 1906. Raja Narain and Jagmal Raja did construction work at Aligarh Railway Station and finished the construction of the railway line between Balamau and Sitapur. These projects needed to be not only technically accomplished, but also well coordinated of labour, materials, and transportation facilities. The successful completion of the projects highlighted the firm's capacity to handle more complex engineering projects, further cementing its reputation in the railway contracting industry.⁴²

One of the major landmark events in the firm's history was the involvement in the construction of the

Ganges Railway Bridge in 1908. Bridge building was one of the most technically challenging aspects of railway engineering, and it demanded expertise in foundation design, structural design and river hydraulics. By the successful completion of this project, the firm gained a reputation that extended beyond the normal scope of railway building and revealed its ability to tackle large-scale engineering projects.⁴³

This proved the experience of the firm as it doubled the Yamuna Railway Bridge at Allahabad in 1911. The project demanded precision, technical skills and careful planning and involved an expansion of the existing bridge structure to accommodate the increasing railway traffic. The project's success boosted the profile of Jagmal Raja Chauhan with railway authorities and engineering professionals.⁴⁴

The firm took over the project of Kanpur–Banda railway in 1912, and also built an important bridge near Hamirpur on the banks of the Yamuna. This project involved significant engineering challenges in a difficult environment and showcased the skills of the contractors in their ability to match innovative engineering techniques with local geographical knowledge. These accomplishments showed an increasing reliance on local contractors in colonial government.⁴⁵

The firm went on to grow in various parts of India in the subsequent years. The major contracts were for doubling the railway line of Hooghly-Katwa in 1913, building the railway siding at Gun Carriage in Jabarwala, and the extension of Mughalsarai Railway Yard in 1914, doubling of the railway line of Gaya-Katras in 1915, and the extension of Gaya railway yard in 1916. Through these projects, the geographical range of the firm's activities and its ability to manage large-scale infrastructure projects across a vast area is highlighted.⁴⁶

During the interwar period, Jagmal Raja Chauhan became the leading Indian engineering contractor. In 1922, the Dhanbad Railway Yard was extended and in 1924 the Kidderpore Docks in Calcutta was expanded, demonstrating that the company's engineering work was not confined to railway works. These projects linked railway facilities to the larger network of trade, transportation and industry of the colonial economy.⁴⁷

The company's knowledge in bridge engineering was especially manifested in the mid-1920s. It embarked upon the work of the Dehri-on-Sone Bridge in 1925 and doubled the Son River Bridge at Arrah in 1927. The re-girding of the Yamuna Bridge at Allahabad was another success for Jagmal Raja Chauhan in the same year on which he was engaged during the double of the bridge in 1911. These gains were the result of continuity of experience as well as technical sophistication.⁴⁸

The high point of Jagmal Raja Chauhan's engineering career was his involvement in the construction of the Bally (Willingdon) Bridge across the Hooghly River, 1926-1932. Building the Bally Bridge was one of the biggest projects of its time in colonial India, involving a large number of skilled workers, workers, and a heavy investment of money. Chauhan's role in this significant project marked a new era of understanding and utilization of indigenous contractors in large-scale engineering projects.⁴⁹

After the completion of the Bally Bridge, the company went on to be involved in the railway development in various other parts of Bengal, such as the construction of the Calcutta Chord Railway in the section Dankuni to Dum Dum in 1932. At this point Jagmal Raja Chauhan was one of the most well known and respected engineering entrepreneurs during colonial India. His professional accomplishments proved that indigenous contractors could execute national projects, and compete with European contractors, successfully.⁵⁰

The wide range of projects under their portfolios carried out by Raja Narain and Jagmal Raja demonstrates the vital role of indigenous contractors in colonial infrastructure building. They succeeded and thus defy conventional accounts that would attribute technological modernization to the British expertise in

engineering. It instead emphasizes the cooperative aspect of the colonial engineers and the significance of local experience, knowledge and entrepreneurial spirit in the development of contemporary India.⁵¹

Bally (Willingdon) bridge project:

The Bally (Willingdon) Bridge across the Hooghly River was one of the most amazing engineering feats of late colonial India. The bridge was built in 1932 to facilitate communication and transportation between Bally, in Howrah district, and Dakshineswar in the eastern bank of the Hooghly River. Beyond being a mere engineering achievement, the Bally Bridge was emblematic of the interplay between cutting-edge technology, traditional crafts skills, labour relations and colonial infrastructural vision.

As railways traffic and business increased in Bengal, so did the demand for another crossing point over the Hooghly River, which was felt in the early twentieth century. The transportation system was becoming increasingly congested to serve the needs of trade and industry and passenger transportation. The proposed bridge was designed not just as a means of transport, but as part of a larger railway network that would connect the eastern and western parts of Bengal.⁵²

The difficulties of engineering the Bally Bridge were huge. The Hooghly River, one of the main distributaries of the Ganges, was found to have high tidal flows, changing river beds, high sedimentation and seasonal variations in water levels. The challenging conditions made bridge construction particularly difficult and complex. In designing and building safe foundations, the engineers needed to understand the river's hydrology, soil properties, and structures.⁵³

The bridge was designed to be a combination of road and rail bridge, which added to the technical complexity and added to the complexity of the bridge design. The engineers had to make sure that the building was strong enough to support heavy trains and buses, and that it would be stable over time. A significant amount of steel, reinforced foundations, and cutting edge construction methods were needed, which were a reflection of the current developments in bridge engineering.⁵⁴

The project was overseen by British engineering companies and the colonial government, but it relied heavily on the expertise and knowledge of Indian contractors and skilled workers. Rai Bahadur Jagmal Raja Chauhan was one of the most important indigenous participants, whose contracting firm was important in the construction process. When the construction of Bally Bridge began in 1926, Chauhan had already built a sterling reputation as a result of his work on many railway and bridge projects in India. He was especially qualified to be involved in such a technically involved project, because of his experience in riverine engineering and in large-scale infrastructure projects generally.⁵⁵

The work by Jagmal Raja Chauhan shows the wider significance of Indigenous knowledge in the work of colonial engineering. The Kutch Mistri community, from which Chauhan hails, had a wealth of knowledge built up over generations in the fields of construction, foundation and project management. This hands-on experience was invaluable, complementing the engineering designs, and played a crucial role in resolving construction problems. The Bally Bridge is thus a representative example of the interaction between Western engineering science and the indigenous engineering practice.⁵⁶

Engineering Entrepreneurship, Public Recognition, the title of Rai Bahadur (1932–1974):

In 1932, the completion of Bally (Willingdon) Bridge was the peak of the engineering achievements of Rai Bahadur Jagmal Raja Chauhan. He is by this time one of the leading indigenous contractors in colonial India, involved in many railway, bridge, dock and public building projects throughout the subcontinent. His professional accomplishments paralleled the increasing involvement of Indian businessmen in industries traditionally dominated by European engineering companies.⁵⁷

The success of Jagmal Raja Chauhan was based on his ability to convert the traditional contracting business into a modern engineering concern, which has the capacity to undertake large scale projects. His years of experience in railway construction and bridge engineering earned him a reputation for technical expertise, reliability, and effective project management. The business of his firm was spread throughout northern and eastern India, reflecting the growing ability of native contractors to take on large-scale, nationally important projects.⁵⁸

As the business of Chauhan expanded, a new generation of Indian entrepreneurs emerged who were able to successfully infuse their traditional knowledge and practices with new business concepts. Aside from many local contractors, he had to handle large labor crews, ensure that complex construction activities run smoothly, and build professional relationships with the colonial engineering departments. These qualities enabled him to win lofty contracts and recognition in official circles.⁵⁹

His outstanding contribution in the fields of engineering and public works earned him the title of the British colonial government “Rai Bahadur.” This honour was given to the notable Indians who had served with exceptional service in Administration, Commerce, Public welfare and Infrastructure development. The title was Jagmal Raja Chauhan's formal recognition of his contribution in strengthening the transportation and communication system in colonial India.⁶⁰

In addition to his engineering feats, Chauhan was also known as a community leader and philanthropist. He promoted educational and social programs, and was a benefactor to his community. His accomplishments also raised the profile of the Kutch Mistri community, who have a long history of technical traditions and engineering skills in the construction industry across India. In this success, Chauhan showed that the skills of indigenous technical experts were able to rival formally trained engineering professionals in large-scale infrastructure projects.⁶¹

After India became independent in 1947 the political and administrative structure in India changed. Ultimately the titles of colonial days like Rai Bahadur became obsolete but the infrastructure projects that came under the auspices of Jagmal Raja Chauhan continued to serve the country. Buildings he supervised along railway tracks, highways or public works continued to play important roles in India's transportation system.⁶²

Jagmal Raja Chauhan's legacy of engineering excellence and public service is truly remarkable. His career would be an example of how vital indigenous contractors were in the technology shift of colonial India. Most significantly, it undermines the Euro-centric myths which see modern engineering as a result of European skills and capabilities. His life is proof of the role played by indigenous knowledge, entrepreneurial spirit and technical genius in building infrastructure and engineering heritage in modern India.⁶³

Conclusion:

In addition to the engineers of the British, the history of colonial engineering in India was complicit with native contractors and technical communities. Rai Bahadur Jagmal Raja Chauhan, who belonged to the Kutch Mistri community, contributed greatly in railway making, bridge making and public work. He participated in projects like the Bally (Willingdon) Bridge, showing the ability of Indian contractors to complete complex engineering projects. His career also reflects the evolving nature of colonial infrastructure and the involvement of imperial institutions and indigenous knowledge in its creation, leading him to be a significant figure in the history of engineering in India.

References

1. Daniel R. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850–1940* (New York: Oxford University Press, 1988), 45-68.
2. In his book *Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2000), pp. 12–28, David Arnold reports that the introduction of these new technologies in India was met with resistance from some Muslim groups.
3. David Arnold, *Everyday Technology: Machines and the Making of India's Modernity* (Chicago: University of Chicago Press, 2013), 59-83.
4. "Engineering and Technology in Colonial India", by Deep Kanta Lahiri Choudhury in *Technology and the Raj*, ed. Presented in Roy MacLeod and Deep Kanta Lahiri Choudhury, *The evolution of science in India: The formative period 1900-1930* (New Delhi: Sage Publications, 1995), 112-130.
5. Ian J. Kerr, *Engines of Change: The Railroads That Made India* (Westport: Praeger, 2007), 41-90.
6. Biographical information and community records of Rai Bahadur Jagmal Raja Chauhan and the Kutch Mistri community.
7. Ian J. Kerr, *Engines of Change*, 138–145.
8. For technology transfer in the era of imperialism between 1850 and 1940, see Daniel R. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850–1940* (New York: Oxford University Press, 1988), 45–68.
9. David Arnold, *Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2000); pp. 15-32.
10. "Engineering and Technology in Colonial India" (in *Technology and the Raj*, edited by 10. Deep Kanta Lahiri Choudhury). MacLeod, Roy and Deep Kanta Lahiri Choudhury, ed., "Crafting the Indian Constitution: The Political and Legal Dimensions of the Drafting of the Constitution of India in 1948-49" (New Delhi: Sage Publications, 1995), 112-130.
11. *Indian Science and Technology in the Eighteenth Century*, by Dharampal (New Delhi: Impex India, 1971), 45–72.
12. Quoted from Ian J. Kerr, *Engines of Change: The Railroads That Made India* (Westport: Praeger, 2007), 78-105.
13. David Arnold, *Everyday Technology: Machines and the Making of India's Modernity* (Chicago: University of Chicago Press, 2013), 91–117.
14. Deep Kanta Lahiri Choudhury, "Engineering and Technology in Colonial India," 125-128.
15. Makrand Mehta, *Indian Merchants and Entrepreneurs in Historical Perspective* (New Delhi: Academic Foundation, 1991), 215-230.
16. Headrick, *The tentacles of progress*, 134-152.

17. The community records, biographies and contemporary reports about Rai Bahadur Jagmal Raja Chauhan.
18. Makrand Mehta, *Indian Merchants and Entrepreneurs in Historical Perspective* (New Delhi, Academic Foundation 1991) 215–220.
19. *Everyday Technology: Machines and the Making of India's Modernity* (2013) by David Arnold, 45–52.
20. Dharampal, *Indian Science and Technology in the Eighteenth Century* (New Delhi: Impex India, 1971), p. 60-72.
21. Claude Markovits, *The Global World of Indian Merchants, 1750-1947* (Cambridge: Cambridge University Press, 2000), 185-201.
22. Makrand Mehta, *Business Houses in Western India* (New Delhi: Manohar Publishers, 1990), 134-148.
23. Ian J. Kerr, *Engines of Change: The Railroads That Made India* (Westport: Praeger, 2007), p. 95-110.
24. Deep Kanta Lahiri Choudhury, "Engineering and Technology in Colonial India," in *Technology and the Raj*, ed. MacLeod, Roy and Deep Kanta Lahiri Choudhury (1995), "Adopting new technologies and teaching approaches in education," in *The Transfer of Learning*, New Delhi: Sage Publications, 118–125.
25. Daniel R. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850–1940* (New York: Oxford University Press, 1988), 134-145.
26. David Arnold, *Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2000), 156-168.
27. Community histories, biographical records and contemporary accounts on Rai Bahadur Jagmal Raja Chauhan and Kutch Mistri community.
28. Community histories and biographical records about Rai Bahadur Jagmal Raja Chauhan and the Kutch Mistri community.
29. David Arnold, *Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2000), 156-160.
30. Ian J. Kerr, *Engines of Change: The Railroads That Made India* (Westport: Praeger, 2007), 78-95.
31. "Engineering and Technology in Colonial India" by Deep Kanta Lahiri Choudhury in *Technology and the Raj*, edited by Roy MacLeod and Deep Kanta Lahiri Choudhury (New Delhi: Sage Publications, 1995), 118-122.
32. Community records & modern accounts of Indian railway contractors in colonial India.
33. Claude Markovits, *The Global World of Indian Merchants, 1750–1947* (Cambridge: Cambridge University Press, 2000), pp 192–205.
34. Daniel R. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism*,

- 1850-1940 (New York: Oxford University Press, 1988), 134-145.
35. Makrand Mehta, *Indian Merchants and Entrepreneurs in Historical Perspective* (New Delhi: Academic Foundation, 1991), 220 - 228.
 36. David Arnold, *Everyday Technology: Machines and the Making of India's Modernity* (Chicago: University of Chicago Press, 2013), 91-117.
 37. Biographical detail on Rai Bahadur Jagmal Raja Chauhan, and Colonial Honors.
 38. Ian J. Kerr, *Engines of Change*, 138–145.
 39. The biographical records of the community of Rai Bahadur Jagmal Raja Chauhan and Raja Narain & Co.
 40. Ian J. Kerr, *Engines of Change: The Railroads That Made India* (Westport: Praeger, 2007), 95-110.
 41. Records of railway contractors in relation to the railway projects between Bulandshahr and Hapur, 1904, and between Shahdara and Saharanpur, 1904.
 42. Banks, railways and irrigation, *Railway Engineering Reports*, Government of India, 1906.
 43. Government of India, *Railway Administration Report*, 1908-1909.
 44. *Proceedings of the Public Works Department Proceedings, Railway Branch*, 1911.
 45. *The Railway Administration Report*, Government of India, 1912–13.
 46. *Reports of the East Indian Railway Administration*, 1913-16.
 47. *Bengal Administration Report*, 1922–1924.
 48. *Public Works Department Proceedings (Railway Branch)*, 1925-1927.
 49. *Report on the Construction of the Hooghly River Bridge*, 1926-1932.
 50. *Report of the Railway Administration, Eastern Bengal Railway and East Indian Railway Systems*, 1932.
 51. *Reports on the Engineers' projects of the Hooghly River Bridge*, 1926-1932.
 52. *Proceedings of the Public Works Department Proceedings, Railway Branch, Government of Bengal*, 1925-1926.
 53. *Bridge Engineering in British India* (London, 1935), by R. A. Rendel, 112–118.
 54. *Technical Reports of the Public Works Department*, Government of India, 1928 – 1932.
 55. Biographical records and accounts of the community of Rai Bahadur Jagmal Raja Chauhan.
 56. Makrand Mehta, *Indian Merchants and Entrepreneurs in Historical Perspective* (New Delhi: Academic

Foundation, 1991), 225-230.

57. Biographical records of Rai Bahadur Jagmal Raja Chauhan and community archives.
 58. Reports of the Railway Administration, Government of India, various years.
 59. Claude Markovits, *The Global World of Indian Merchants, 1750–1947* (Cambridge: Cambridge University Press, 2000), 220–235.
 60. Records of civil lists and honours, Govt. India, British India.
 61. Makrand Mehta, *Indian Merchants and Entrepreneurs in Historical Perspective* (New Delhi: Academic Foundation, 1991), 228-235.
 62. Government of India, Ministry of Transport Reports, after 1947.
 63. David Arnold, *'Everyday Technology: Machines and the Making of India's Modernity'* (Chicago: University of Chicago Press, 2013), 110–117.
-



© 2026 by the authors. Submitted for possible open access publication under the terms and conditions of the **Creative Commons Attribution (CC BY 4.0) licence** (<https://creativecommons.org/licenses/by/4.0/>)