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An Assessment of Operational Challenges in Udayapur Cement Industry

Gopi Krishna Neupane[1], Sushil Kumar Pant[2]
[1]PhD Scholar, Department of Management, Sikkim Professional University
[2]Associate Professor, Faculty of Management, Tribhuvan University, Kathmandu, Nepal
Corresponding Author: Gopi Krishna Neupane | neupanegopi777@gmail.com | https://orcid.org/0009-0000-6710-8153
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ABSTRACT

The research discusses the poor performance of Udayapur Cement Industries Ltd. (UCIL), the largest state owned cement factory in Nepal and discusses ways through which it can be restored to its previous glory. Having been a dominating unit initially in the domestic market, UCIL is now functioning at a meager 30 to 35 out of the 100 percent installed capacity, compared to the worldwide standards of 80 to 90 and even the rivals of the company, which operate at 70 to 80 percent. The study is devoted to the areas of production, logistics, and workforce management in order to determine which problems are hurting performance. The qualitative case study approach was adopted with two sources of evidence firsthand managerial reflections of thirty months experience working at UCIL and secondary data of the industry reports, government statistics and comparison with competitors. These have been examined at a thematic level in order to identify structural inefficiencies as well as contextual constraints. The results point to various difficulties. Old machines, high breakdown rates and inappropriate matching spare parts have greatly lowered the efficiency on production. A weak input quality that comprises poor quality of coal contribute to a weakened cement strength. The inefficiencies in workforce are severe, as the interference of unions, lack of discipline and excessive labor costs stand at an average of NPR 100,000 per employee every month; this is five times the averages in the private sector. It, therefore, results in an average of NPR 650 per 50-kg bag as the cost of production, which is usually higher than the selling price causing losses of more than NPR 360 million by FY 2020. The weak marketing and malpractice by dealers have also cut the sales down to 23,000 bags a day. The research suggests the short-term solutions to be taken in the nearest future, such as the rehabilitation of the machine, the control over raw materials gained more strictly, the accountability of the working staff, and the marketing changes. To be long-term sustainable, the company should implement such strategies as public-private partnerships, the creation of 10,000 TPD plant to exploit the limestone reserves in Sindhali, the use of renewable energy, and the modernization of logistics. The combination of these measures will be able to bring back the competitiveness, decrease the reliance on imports of clinker, and make the cement industry of Nepal more robust.

KEYWORDS

Capacity utilization, Operational challenges, Public-private partnerships, Udayapur Cement Industry, Workforce management

INTRODUCTION

Cement industry is generally established as an infrastructure development backbone and an economic growth crucial factor. Udayapur Cement Industries Ltd. (UCIL) is a former giant in

the local market, which is why in Nepal, this state-owned cement industrial complex is of utmost importance in the country (Shrestha et al., 2016). Its flagship brand, the Gaida Chhap, has been associated with power, quality, and longevity in the years that it has acquired reasonable credibility in the building industry (Singh and Shakya, 2016).

Simultaneously, within the recent decades, the competitiveness of UCIL has been deteriorating significantly. The plant is currently functioning at 30 to 35 percent of its capacity as compared to 80 to 90 percent in the international standards and 70 to 80 percent in the trends of the rivals of the plant in Nepal (Mishra and Chaudhary, 2018; Ratopati, 2024). The factors include aging equipment, constant downtimes, and high operation expenses, unreliable logistics and excessive reliance on imported coal and gypsum that exposes the company to global price fluctuations (Banstola et al., 2021). These problems have escalated the cost of production to the estimated NPR 650 per bag of 50kg probably more than the average selling price leading to incurring chronic losses of over NPR 360 million by FY 2020 (Shrestha et al., 2016). Meanwhile, UCIL has reduced its market share to only 1.64% in the face of intense competition of more than 65 producers of cement privately.

Nonetheless, UCIL has a lot of potential. It has estimated limestone reserves of 74 million metric tons, which can be used over a period of over 200 years, and a well-known brand, which can be readily regenerated (Singh & Shakya, 2016). The development of this potential will involve modernizing the equipment, increasing the energy efficiency of its operation, making workforce more responsible, and reforming the government. Another important force that scholars point to in impacting the lives of the failing state-owned businesses is the aspect of the public-private partnerships (PPP) where the government injects capital and technical skills in the ailing companies (Kharel and Dahal, 2020; Barbhuiya et al., 2024). It is on this background that this research aims to evaluate the business issues at Udayapur Cement Industry in three key areas namely production, logistics and managing the workforce. The study of these interdependent regions will help to identify the underlying causes of the inefficiencies, assessment of the acquired effects, and suggestions on how to handle them sustainably. By this, the study also fits into the current debates on the sustainability of UCIL in the future and the policy debate on the performance of Nepal cement industry as a whole.

METHODOLOGY

This paper utilizes the case study research methodology based on qualitative studies to analyze the operational issues at Udayapur Cement Industry (UCI). Case study design was chosen due to its ability to dive deeply into an organization and dimension where researchers can see all the structural inefficiency as well as contextual forces that influence performance.

Two primary sources were used to draw data to use to study data. The primary sources were first hand information based on the reflections and hands-on experiences of the former General Manager of UCI, who had a tenure of thirty months of his life. At this tenure, operational, logistical and workforce related challenges have been detailed providing first hand accounts on the internal dynamics of the plant. The second source comprised secondary data, which comprised industry reports, government statistics, and comparative data of other firms that competed with the company like Maruti Cement. These resources had a wider background in assessing the performance of UCI in the industry of cement in the country.

The analysis of collected data was done thematically. The focus was given to three interrelated dimensions production, logistics, and workforce management that are combined to assume the operational problems of UCI. Such a methodological approach is able to

provide a systemic view as a result of which technical failures, disruptions of the supply chain, and low-productivity of the labor force are aggregated to dominate the competitiveness of the industry, in general.

CASE DESCRIPTION

Background

Udayapur Cement Industry (UCI) had started in 1987 in Nepal, as the largest state-owned cement industry benefiting by the Japanese financial and technical assistance. Japan provided ¥18.77 billion in the shape of Overseas Economic Cooperation Fund (OECF), and the Government of Nepal provided NRs. 450 million as an equity (Shrestha et al., 2016; Pandey and Banskota, 2008). Having sophisticated technologies of Vertical Roller Mills (VRMs), Programmable Logic Control (PLC) and the use of a 13.8 km aerial ropeway, UCI was initially beating the competitors (Singh and Shakya, 2016). Its main flagship production, cement -Gaida Chhap, was promptly accepted by the Nepalese construction industry as a reliable brand (Shrestha et al., 2016).

Regarding this, UCI has been experiencing a continuous deterioration over the years, caused by outdated machinery, poor maintenance, political interference, union pressure and corruption (Singh & Shakya, 2016; Nepal, 2024). It is also running the plant at 30 35 percent capacity, compared to the global standard of 80 90 percent (Mishra & Chaudhary, 2018). In the comparison, the private competitors have been on a steady increase. An illustration of this is Maruti Cement, which grew initially to produce 300 tons per day (TPD) to 3,000 TPD, and UCI is producing less than 800 TPD of production, although it had a much larger installed capacity (Ratopati, 2024). This difference highlights the growing performance differences between state and privately owned cement plants in Nepal (Table 1), where the utilization rate and market standing of the plants with stronger results are higher in the category of the second type of facility (Banstola et al., 2021).

Table 1: Comparative Performance of UCI and Maruti Cement

Indicator	UCI	Maruti Cement	Global/Industry Benchmark	Source
Installed Capacity (TPD)	~800	3,000 (expanded from 300)	N/A	Ratopati (2024)
Capacity Utilization (%)	30–35%	~75–80%	80–90%	Shrestha et al. (2016); Mishra & Chaudhary (2018)
Daily Output (TPD)	<800	3,000	Benchmark ~80–90% capacity	Ratopati (2024)
Market Position	Declining, 1.64% share	Expanding	N/A	Singh & Shakya (2016)

Limestone Reserves

The biggest asset of UCI is the Sindhali limestone deposit that occupies an area of five square kilometers in the deposit and has an estimated 73.5 million metric tons (Singh & Shakya, 2016). It is preferably composed of cement since its mineral composition CaO is more than 52 percent and MgO is less than 2 percent. This has been estimated to have mined only 6 percent of the resource (3.8 million metric tons) so far. The deposit has the potential to last almost 400 years at the present rate of extraction (Ratopati, 2024).

This is a resource that can be strategically used nationally and regionally. Domestically, it can counter Nepal dependence on imports of clinker which is currently supplying almost 80 percent of clinker and only costs approximately NPR 10 billion a year (Nepal Rastra Bank, 2020). The excess is regional and can be dispersed to Indian states that are northwards like Bihar and Uttar Pradesh which have no sufficient limestone deposits (Janjirawatna et al., 2023). Nevertheless, to fulfill this potential, this will have to be invested in modernization, better governance, and perhaps public-private collaboration (Kharel and Dahal, 2020; Barbhuiya et al., 2024).

FINDINGS AND DISCUSSION

Operational Challenges

Most of the machinery of Udayapur Cement Industry (UCI) is currently aged more than 31 years old since the first set up of the cement industry was conducted through the aid of the Japanese in the late 1980s. The rotary kiln, secondary crushers, separators, and filters, the most important ones, are dysfunctional or in high deterioration. As one example, the second tire of the cooler had a serious place of crack, which had to be temporarily repaired to prevent the complete collapse in operation. Machines, such as gas analyzers, variable frequency drive (VFDs), and dust filters, do not operate, but the components with the cost of about NPR 1 billion do not work because of an inappropriate approach to procurement. These failures have dropped effective daily output to lower than 30% of installed ability, which is about 8,000 tons day by day, versus 3,000 tons day by day at Maruti Cement via modernization (Ratopati, 2024).

UCI has a high number of workers, but it has no adequate skilled operators and technical employees. There has been the increased downtime and expensive repairs due to union interference, indiscipline, and even sabotage through deliberate equipment tampering (Singh and Shakya, 2016). In the cement industry, labor costs are exceptionally high in Nepal and the average per worker is almost NPR 100,000 each, which is approximately five times higher than the current industry standards on the private sector (Mishra, 2019). Such an imbalance adds to the production costs being high and the output being low.

The quality of cement at UCI has also fallen prey of inconsistency in procuring raw materials. In the past, coal having a Gross Calorific Value (GCV) of only 5,700 has been supplied without getting the required specifications and its cement strength was weak (Banstola et al., 2021). The laboratory tests proved that coal with GCV of 5,4705,500 and a moisture level of 10 percent works better and once the specifications changed, the product quality improved. Still, tampering with the suppliers and contaminated deliveries remain the problem of disturbing the regularity, which justifies severe control in the stores and laboratories (Shrestha et al., 2016).

This means that the price of a 50 kg bag of cement is around NPR 650, which is usually higher than the average price of 640-645 that cement is usually selling in the market (Singh and Shakya, 2016). This loss imbalance has led to periodically incurred losses, where accumulated losses have surpassed NPR 360 million by the FY 2020 (Shrestha et al., 2016). Sales also have dropped drastically. Previously in UCI, the number of bags they sold per day was approximately 23,000, but due to mismanagement, as well as, misguided marketing policies, the figure has drastically dropped (Ratopati, 2024). NPR 160 million government grants and NPR 400 million concessional loan plans are also underway in order to fund modernization as well as to settle NPR 150 million outstanding debts (Nepal, 2024, Table 2)

Table 2: Comparative Performance of UCI and Private Competitors

Indicator	**UCI**	**Private Competitors (e.g., Maruti, Shivam, Sarbottam)**	**Benchmark / Notes**	**Source**
Installed Capacity (TPD)	~800	Maruti: 3,000 (expanded from 300)	UCI much larger, but underperforming	Ratopati (2024)
Capacity Utilization (%)	30–35%	70–80%	Global: 80–90%	Shrestha et al. (2016); Mishra & Chaudhary (2018)
Daily Output (TPD)	<800	Maruti: 3,000	UCI runs below one-third of potential	Ratopati (2024)
Production Cost (per 50 kg bag)	NPR 650	NPR 450–550	UCI cost exceeds market selling price (≈NPR 640–645)	Shrestha et al. (2016)
Average Daily Sales (bags)	Declined from 23,000 to much lower levels	Growing steadily	Reflects weak marketing at UCI	Ratopati (2024)
Labor Expenses (per employee, monthly)	≈ NPR 100,000	≈ NPR 20,000	UCI labor cost ~5x higher	Mishra (2019)
Accumulated Losses	> NPR 360 million (FY 2020)	Profitable operations	Financial stress unique to UCI	Shrestha et al. (2016)

Immediate Measures

The case study identified some of the short term strategies that are necessary to stabilize the activities of Udayapur Cement Industry (UCI). The rapidly needed intervention was identified as modernization of machinery. The rotary kilns, crushers and separators, which are critical equipment, were in bad performances and often interfered with the production. It has also been noted in previous studies that the refractory lining in the kiln needs replacement after every three months and not the usual twelve which contributes to inefficiencies (Shrestha et al., 2016). The results pointed out that the purchase and installations of new burners, Kiln Shell, and other important parts would be significant in minimizing downtime and returning the production to its normal level.

Another burning issue that came up was workforce accountability. Even with the huge number of the workforce at UCI, insufficient numbers of skillfully qualified technicians have been an issue. Inefficiencies have been worsened by union interference and negligence or sabotage (Singh & Shakya, 2016). The reinforcement of the supervisory system, limitation of union influence and engagement in process, mechanical, and electrical activities with external specialists were identified as key measures to improve the productivity. Raw material monitoring has also been pointed out as a very important region by the study. Substandard coal, compromising cement quality, had been supplied in the past due to poor procurement practices (Banstola et al., 2021). It was shown that the coal that had Gross Calorific Value (GCV) of approximately 5,500 and up to 10 percent moisture content contributed greatly to cement strength. Thus, there was a recommendation to have more stringent laboratory checks and supplier compliance audits to maintain quality consistency.

The results as far as sales were concerned indicated the need to expand the market. UCI has declined in sales of almost 23,000 bags to record a sale per day as a result of poor marketing campaigns and allegations of gypsum adulteration (Ratopati, 2024). The creation of direct-to-consumer outlets, the re-energization of advertising programs and punishing those found to be guilty of malpractice are some of the strategies to reestablish consumer confidence and recover the market share. Lastly, mobilization of finances was emphasized as one of the key recovery pillars. The unit price of making a 50 kg bag of cement estimated at NPR 650 is quite commonly higher than the selling price (Singh and Shakya, 2016). The resources that were found to be essential in the reconstruction of machinery, clearing of debts and regaining of capacity up to 1,100 tons per day (TPD) included government grants of NPR 160 million and concessional loans of up to NPR 400 million. When these measures are properly employed, they would enable UCI to be profitable in three years' time.

Long-term Vision

UCI has a maximum strategic advantage in Sindhali limestone which is estimated as 73.5 million metric tons comprising of CaO at a concentration greater than 52% and MgO less than 2%. In order to gain the maximum benefit of this resource, it is decided to open a 10,000 TPD cement plant in collaboration with local people. The deposit would be in a position to run operations of more than 30 years at such a scale. The project will bring the NPR 3 billion in yearly savings, hundreds of direct working positions, and enable the export of the project to Indian states that already do not have limestone deposits, including Bihar and Uttar Pradesh. The complement is a 10 MW solar power (researches are already finalized) to decrease energy dependency and NPR 70 million in road system to enhance logistics, however, the latter is deferred by administrative obstructions. These long-term objectives would help make UCI a cement manufacturing center in the region and make significant

contributions to the industrial development of Nepal and decrease dependence on clinker imports.

CONCLUSION

As can be seen in this case study, Udayapur Cement Industry (UCI) is a former flagship organization in the Nepal cement industry that has gotten into tremendous operational and financial trouble through old machinery, poor workforce management, and inefficient logistical systems. UCI had been set up using advanced Japanese technology and was once leading in the

market but has then worked with only a third of the installed capacity, cost of production greater than the selling price and a cumulative loss of over NPR 360 million. The juxtapositions with the private companies like Maruti, Shivam, and Sarbottam Cement show some dismal differences: the competition of private companies has been modernized and developed, and UCI is still within the boundaries of political influence, labour unions, and lack of investment in technology and management change. Simultaneously, the analysis shows that UCI still has valuable resources that can be used as a foundation to be revived. The Sindhali limestone deposits that contain large quantities of high-CaO limestone would provide a resource base, which, with centuries of production, would help Nepal stop its reliance on imports of clinker. The immediate solutions, such as the modernization of one of the machines, the higher accountability of the working staff, the enhanced oversight of the raw materials, and the new marketing campaigns, are not only possible and needed but also urgent. The long-term plans that include the setting of a 10,000 TPD plant in the form of a public-private partnership, the promotion of renewable energy, and the enhancement of transport infrastructure can turn UCI into a local industrial center and develop it into a large-scale revenue generator and the best place to obtain a job. The results highlight that the issues that UCI faces do not consist of detached technical breakdowns but network structural problems related to production, logistics, workforce administration, and governance. All these need to be dealt with in a combined fashion in order to achieve competitiveness. UCI once again can be changed to become a pillar of the industrial progress of Nepal as well as play a role in making the country self-sufficient in cement-making.

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