Available online at www.elixirpublishers.com (Elixir International Journal)

Social Studies

Elixir Social Studies 180 (2023) 56976 - 56982

ISSN: 2229-712X

Strategies to Manage Hydroelectricity Interruptions in Zambian Manufacturing Businesses

Mpafya Mutapa

ARTICLE INFO

Article history:
Received: 10 June 2023;
Received in revised form:
12 July 2022;
Accepted: 28 July 2022;

Keywords
Hydroelectric Energy,
Worker Productivity,
Hydroelectricity Interruptions.

ABSTRACT

The deleterious effects of interruptions of hydroelectric energy damage on equipment are profound, and the adverse effect is also on worker productivity. This exploratory study was on understanding the strategies of manufacturing leaders in Zambia strategies to manage hydroelectricity interruptions and thereby also mitigate risks and reduce financial losses. Grounded in the contingency theory, the purpose of this qualitative multiple case study was to explore strategies that some manufacturing leaders use to manage hydroelectricity interruptions. The study participants for this study were six managers from different manufacturing industries based in Lusaka, Zambia, who implemented strategies to manage hydropower interruptions. Data collection involved semistructured interviews and a review of secondary sources, from the company and externally, and these ranged from company websites, and publications from the Zambia Association of Manufacturers related to managing hydroelectricity power interruptions. The analysis of data was thematic from which Four themes emerged: managing stock gaps, use of generators (turn-time), managing cost of labor input, and investment in stabilizers and storage facilities. Key recommendations include investment in alternative power-generating equipment and upgrading plant transformers. The implication for positive social change includes the potential to create jobs and improve the local economy and subsequent tax base.

Introduction

The productivity of a nation and its industrial sector is heavily dependent on the availability of power. Hydropower consumption for instance, has positive and significant effects on the growth of the manufacturing industry. Power outages plague countries and many manufacturing businesses in Southern Africa face power supply deficits (Urban et al., 2015), which ostensibly has a detrimental effect on national economies. Hydroelectricity interruption critically impacts the value chain of small and medium enterprises (SMEs) and multinational business profits (Gaimon et al., 2017). Hydropower consumption affects processes that transform manufacturing operations and ultimately diffuse into the economy.

The growing power supply shortages are a cause of great consternation, and disruptions slow manufacturing and adversely create manufacturing losses, which retards competitiveness and causes the erosion of competition and profitability (Kumar et al., 2018). The erraticism of power and the associated consequences are more pronounced in the struggling industrial sector of countries in the southern part of Africa. The manufacturing industry is possibly one of the greatest sufferers of hydropower interruptions and disruptions.

According to *Programme for Infrastructure Development in Africa* (2019), the increase of energy demand is projected to increase significantly from 590 TWh to 3,100TWh, whereas the installed capacity is expected to grow from 120 GW to 700 GW. The increase implies that significant investment in both hydro and additional renewable energy supply initiatives is required to meet future demand. The investments may to some extent compensate, and to a limited extent, address the issues of low production in the manufacturing industry and serve to increase profitability (Gaimon et al., 2017). The solution would also necessitate changing the current practice of manufacturing leadership strategies and management of technological changes, in keeping abreast of hydropower innovations, while acuity and deftness in management may contribute to improved efficiency.

Understanding the Problem

Electricity plays an essential role in a nation's economic development, hydropower interruption causes concerns for household and commercial consumers overall, while losses in the production manufacturing industry are of a vital concern. The manufacturing industry is managing hydropower interruptions mostly by running on alternative but expensive energy sources such as diesel-powered generators, which increase the cost of production (Phiri, 2017). To maintain effectiveness and competitive advantage, manufacturing leaders need to manage the increasing load-shedding hours in Zambia. This study entailed the exploration of strategies manufacturing leaders use to manage hydroelectricity interruptions using the lens of the contingency theory, The data collected included interviews of manufacturing leaders, to understand the strategies implemented to manage hydropower interruptions and remain competitive in the industry.

The interruptions of hydroelectricity negatively impact business operations and cause financial losses for the manufacturing sector (NamPower, 2018). A study of 12,452 small-scale enterprises in Zambia indicated that the average revenue loss per firm resulting from hydroelectric interruptions was K 19,251, with 22.8% of firms reporting cases of idle labor, 29.9% reporting equipment damage, and 7.6% reporting reduced working hours (Mwila et al., 2017). Overall, the disruptions and interruptions of the hydroelectric power supply cause operational interference and financial loss in the Zambian manufacturing sector. This qualitative study aimed to explore the strategies implemented by manufacturing to manage hydroelectricity interruptions. To undertake this study, the targeted population consisted of six manufacturing leaders in Zambia who have used strategies to successfully manage hydroelectricity interruptions. The findings of the study may be of significance since it is about a topic that is associated with the potential for economic growth, and job creation among the unemployed and has a bearing on the livelihoods of the people of Zambia.

Methodology and Design Rationale

A qualitative method was chosen for this study. Qualitative researchers explore human experiences using documentation, interviews, and observations (Ivankova et al, 2006; Yin, 2018). The aim was to the strategies of leaders to manage hydroelectricity interruptions using interviews, observations, documentation reviews, and interviews were appropriate. Quantitative researchers test hypotheses and analyze independent and dependent variables 'relationships or differences using statistical methods (Bogue et al., 1994). The mixed method includes both qualitative and quantitative methods to explore and explain phenomena (Klassen et al., 2012). Since there were no hypotheses to test and examine the relationships using numerical data, a quantitative, or mixed methods study was appropriate.

A multiple case study design was also suitable for this study. Researchers use a case study design to explore the *what*, *how*, and *who* query of a phenomenon over a period of time (Yin, 2018). A multiple case study was appropriate since the focus was to explore and compare and compare the strategies and efforts of multiple manufacturing organizations in managing hydroelectricity interruptions.

Principal Research Question

What strategies do manufacturing leaders use to manage hydroelectricity interruptions?

Under the umbrella of the overarching research question, the following were four important research questions:

Interview Questions

1. What strategies have you used to manage hydroelectricity interruption?
2. What strategies have been most effective to manage hydroelectricity interruption?

Theoretical Underpinning

The theoretical foundation for the study was using the postulations of the contingency theory (CT). Woodward (1981) developed the CT stating that there is no best way to lead, organize, and make decisions in a business. Fiedler (1964) built on the CT by elaborating on factors of leadership style and locational understanding. The fundamental propositions underlying the CT are: (a) there is no universal or one best way to manage a business, (b) organizations' systems should fit within the environment, (c) organizations should be concerned with accomplishing alignment and a good fit with management practices, systems, and technologies, and (d) adequately designed systems meet the needs of an organization (Woodward, 1981). The contingency theory served as a potential means to understand manufacturing leaders 'strategies to manage hydroelectricity interruptions, as research has shown that the contingency theory of leadership clarifies the desired style of leadership and the environmental characteristics, which aid leaders in decision-making fit the organizations 'business model (Heller, 2019).

Significance of the Study

The study findings could be valuable to business leaders, as may provide insights into the development of strategies needed to introduce effective mitigation practices to manage hydroelectricity interruptions. Hydroelectric power interruptions reduce operational hours and increase operational costs. Manufacturing leaders may find the research results of value to improve industries' practices to reduce the cost of production and manage unproductive working hours or production downtime, and therefore potentially find improved productivity and profitability

A Review of the Professional and Academic Literature

The conceptual framework for this study was contingency theory(CT). Fiedler (1964) developed the CT by elaborating on factors of leadership style and locational supportiveness. The main concepts of contingency theory are: (a) no universal or one best way to manage a business, (b) organizational systems should fit with the environment, (c) organizations should reasonably fit among their subsystems and (d) adequately designed systems met the needs of an organization. CT has been an essential part of management writing for the past many years. Leaders' effectiveness is contingent upon how their management style balances with the job or task. Successful leaders must find out what kind of leadership style and setting they succeed in (Csaszar & Ostler, 2020). The leadership style is therefore scaled based on the situation or problem faced by the organization and those in leadership. Invoking the lens of the contingency theory may serve leaders, to possibly consider a business process and determine that a highly coordinated organization configuration may best fit and interrelate with the environment.

Falkenhausen et al., (2019), suggested that the CT attempts to convey studies using several variables, allowing researchers to analyze different situations and make an informed decision concerning variables that may influence the right decision to overcome a particular situation. Consequently, leadership may be expressed systematically as the process in which a team member of an organization endures, motivates, and encourages the mindsets, performances, and activities of team members, and directs their activities so that the team members work voluntarily and fervently toward the completion of task assignments (Tifferet, 2020). Team members and team leaders are therefore concerned with the systematic and consistent process of identifying essential team members with attributes to achieve the objectives of the organization, and balance leaders 'attentiveness to the assignment.

Leadership Styles

Organizational leadership styles are likely to be driven by their vision and mission. Fielder (1964) identified four types of leadership styles connected to behavior that proved to be effective in successful organizations: (a) consideration leader behavior and (b) initiating structure leader behaviors. The consideration leader strategies build a good rapport and interpersonal relationships and exhibit support and concern for subordinates and the entire organization workforce. The

theory uses autocratic leadership, consultative leadership, and collaborative leadership. On the other hand, the second leadership behavior, which is the initiating structure of CT, is essential to my study because of the need for adequate structures such as locational understanding, role/task assignment, scheduling the production lines, planning, task completion, and objectives attainment. Also essential to the study regarding CT is contingency forecasting and planning (Tsolka, 2020). Forecasting and planning are essential skills for strategic foresight and leadership because of the need for adequate facilities to achieve organizational objectives and understand the operational environment.

CT may be used to predict the suitability of employees in serving different circumstances (Csaszar & Ostler, 2020). Having such knowledge would determine and position the employees in clusters that indicate how well-rounded they are regarding assignments and be of value adding to the organization's reward systems for employees. Likewise, a contingency system is expended to evaluate the efficiency of team members in line with specific organizational roles and tasks (Csaszar & Ostler, 2020). Fiedler (1964) stated that an individual's leadership style is fixed. This may be interpreted as If a situation requires a task-oriented leader and the individual in the leadership position is relationship-oriented, then four options may emerge. The situation must be amended or the leader must be substituted.

The CT explains leadership results through a lens of external and internal practices (Negrão, 2019) to *contextualize the group atmosphere*. Internal practices relate to total productivity, continuous flow, and maintenance and process controls (Csaszar & Ostler, 2020; Negrão, 2019) within the organization's control. The external processes critically analyze the involvement of customers and suppliers' feedback (Csaszar & Ostler, 2020), which is external to the organization. Contextualizing the external and internal business practices elaborates on the complexity of the business markets. Bachrach and Mullins (2019), stated that complex markets use teams to capitalize on collective awareness and proficiency across the team members, calling it a transactive memory system (TMS). However, for businesses to benefit from the transactive memory approach organizations must have an assessment of the leadership style and external environment that influence the translation of the transactive memory approach to improve team performance (Bachrach & Mullins, 2019). Therefore, the importance of formal control mechanisms such as TMS not only strengthens the approach to market development but also increases the demand for management and leadership style. The results are services whose structure may be costly to the business and increase the cost of doing business.

The situational CT of evolutionary systems may be well adjusted to challenges where optimization is the fundamental standard. Hooi and Smyth (2014) elaborated on systems to promote hydroelectric power consumption, stating that systems may have everlasting positive effects on hydroelectric power utilization but may not be successful in addressing hydroelectric power interruption. The CT looks at organization initiatives using the lens of organization subsystems. The ideas on the consumption and use of such efforts have permanent positive effects on hydroelectric power consumers in particular the manufacturing sector.

The loss of productivity due to hydropower interruptions may require actions through the lens of *situational leadership*. Fielder, (1964), stated that the situational leadership of CT suggests that leaders that are in control of the situation are confident that their followers will carry out suggestions made and achieve desired success. Adopting a leadership style that suits the challenges manufacturing firms are facing due to load shedding may win the confidence of the team members and help develop skills for their members' confidence while focusing on the task.

Contingency Theory of Decision-Making, Leadership, and Team Engagement

The CT relates to decision-making and results in the type of leadership that shapes organizational objectives and direction. A decision is useful if it addresses the purpose of the challenges faced and the significance of the quality of the decisions (Csaszar & Ostler, 2020). To achieve the desired result(s) from an effective decision process and outcome, the normative model supports participation as an essential variable. In general theory, rational decision-making takes after economic reasoning and links the decisions to the leader—member's behavior regarding the optimization of their set goals (Robinson & Le Ber, 2019). Participatory leadership is essential for effective decision-making while taking into consideration economic reasoning and organization-set objectives.

The rational theory is founded on the premise, that systems methodology and decision makers want to derive the greatest productivity. However, contingency theorists suggest that the efficiency of decisions enforces the purpose of situational variables that incorporate appropriate information, and the probability of other players may acknowledge the decisions (Csaszar & Ostler, 2020; Robinson & Le Ber, 2019). An all-inclusive and fit-for-purpose decision is certainty and not a result of uncertainty in setting and planning organizational goals or objectives (Csaszar & Ostler, 2020). The challenge with formulating CT of decision-making is the political process aligned with what the leader controls concerning the decision(s) made. Therefore, navigating such control may necessitate a certain degree of influence, particularly when developing contingency rules regarding the nature of the decision(s) of (Csaszar & Ostler, 2020; Heller, 2019; Robinson & Le Ber, 2019). Organizational cultural norms are essential to consider when applying CT in decision-making to identify the perfect design (Heller, 2019). This is essential because contingency opinions rationalize the need for adaptiveness of business structures, team goals attainment, and fit among organizational corporate social implementation, tactics, and configurations. A mixture of simulation for decision-making has shown that explanatory power increases by operationalizing varied decision-making among personalities, even accounting for a greater level of independence (Embrey, 2019). In addition, substantial evidence shows that individual decision-makers do not consistently request the same result benchmark after a period or across a choice of circumstances (Embrey, 2019; Heller, 2019). Decisions are made in situations where one or more actors must decide on the available alternatives. Available alternatives include developments to be undertaken, purposes to possess, and costs to be incurred for them to actualize. The decision-making CT informs that of every outcome resulting from the choices made, there are also other preferences with different outcomes (Embrey, 2019). Besides, organization policies shape the decisions and their direction through conversational, interactive, and substantial work using social relationships (Weick, 2020). Organizational, decision is based on a mixture of simulations with substantial evidence that individual decision-making yields different results and cannot be benchmarked.

A necessary concept underlying an integral part of decision theory is based on relationship(s). Fiedler, (1964) proposed that team performance has a relationship between the personality of the leader and the situation. Performance gains are obtainable by moving managers into task situations where their leader's personality avails them of a comparative advantage (Yetton, & Crouch, 1983). In situations where leader-member relations are good performance will likely be good and where performance is good, but the leader-member relations are poor it is unlikely that the performance of management teams may not be long-lasting (Yetton, & Crouch, 1983). Therefore, leadership decisions may be affected by four situational individualities leader position power and task structure.

Team functionality is affected by the leadership style and the relationship of the leader with the team members. The functioning of a team ordinarily varies concerning the relationships of the members and their leaders (Delfgaauw et al., 2020; Yetton, & Crouch, 1983).The determination exercised by the team members and the separation of tasks among them is essential and calls for prudent rather transparent leadership if tasks are to be achieved among high-performing teams. Nonetheless, when leaders allocate responsibility to team members, performance may not only be a consideration because a leader's position power may influence the relationships (Delfgaauw et al., 2020). Leaders 'position power, preferentiality, employees' seniority, employees' inclinations over tasks, and fairness often play a role in managing a team's optimum functionality. Team encouragement has the potential to restrict the function of dynamics in support of performance (Yetton, & Crouch, 1983), in specific when the incentive plan includes both the leader and team members. Therefore, team effectiveness cannot be measured based on task performance without paying attention to the leaders 'position power which influences team members and organization objectives.

Leadership styles toward team member efficiency may have an essential role in regulating role assignment alienation. Competition among organizations largely depends on the degree of employee-leader engagement (Zhao & Sheng, 2019). To mobilize the eagerness of team members and recuperate the level of team members' engagement is a practical challenge faced by business managers. A substantial literature has consistently concluded that higher task involvement results in a positive influence on individual work and is positively associated with team member's job performance and satisfaction (Delfgaauw et al., 2020; Kumar, 2020; Yetton, & Crouch, 1983; Zhao & Sheng, 2019). The CT of leadership and decision-making theory discusses four main styles of leadership. The first one is the authoritarian leadership style which accentuates the influence and power of the leader (Busse & Regenberg, 2018; Zhao & Sheng, 2019). The second is the charismatic leadership style that encourages team members' attitudes and behavior by defining inspirational foresight and enthusiastically meeting team members' needs (Busse & Regenberg, 2018; Zhao & Sheng, 2019). Leadership is an imperative situational variable in team members' assignments and has a significant impact on the individual team member's mindset, attitude, and performance.

The adopters of an authoritarian leadership style often dismiss the views of subordinates and ignore their contributions and suggestions (Busse & Regenberg, 2018). Authoritative leaders have strict requirements in terms of employee expectations and performance, giving speeches and direct control to team members that are not meeting performance expectations. Busse and Regenberg, (2018), state that authoritarian leadership style and decision-making negatively impact team members. The result is task performance is poor, and if team members achieve positive results under authoritative leadership chances are it will not last long (Busse & Regenberg, 2018). Zhao and Sheng (2019) stated that authoritarian leadership negatively impacts team members' commitment because leaders show an authoritarian style, high attentiveness to power, unenthusiastic to inspire team members, and command team members to conform categorically. Such leadership style may result in team members becoming rebellious and not having the motivation to perform tasks and not engage in organizational activities because team members passively start believing that they are not suitable to carry out the assigned tasks by their leaders (Kwadade-Cudjoe, 2020). Authoritative leadership demands more from the team members who eventually end up losing faith in their leaders because the leader-and-follower relationship suggests that the team members are not suitable for the task.

The right leadership style enhances the success and quality of the desired output and there is no universally acceptable leadership style applicable to different situations. Fiedler (1964) leadership CT, states that there is no universally applicable leadership style. The helpfulness of leadership style is predictably moved by organizational context dynamics that include charismatic and authoritarian leadership (Kwadade-Cudjoe, 2020; Zhao & Sheng, 2019). Fiedler (1964) recommended the notion of organizational task structure and deliberated on its influence on the effectiveness of the leadership style. Task structure is the determination of the task, the technique to complete the assignment, the clarity of the assignment, and the implementation of assessment standards (Kumar, 2020).

The reality is that, when it comes to high task structures, chances are that the mission structure and objectives are clear to all the team members. Also, the organizational systems seemingly improve gradually, and the advantages of the charismatic leader are crowded out (Saiti, & Stefou, 2020; Shapira, 2019). At this point, the leaders need to consider ways to show the advantages of consultative management. Because what the organization requires is a system for the leader to find a way to realize its influence, rather than discover a new one. Business commands team members to complete their tasks according to known and established processes. Therefore, a charismatic leader desires to put in place new objectives, defined processes, and goals, (Kumar, 2020; Saiti, & Stefou, 2020). However, the challenge is that team members and their work goals become confusing, contradictory, and lose direction of the assignment, resulting in a reduction of team member engagement in the assignment and poor performance. In the case of a high task structure, authoritarian leadership is effective and may increase team member's engagement (Saiti, & Stefou, 2020). Charismatic leaders define team objectives but not clearly enough which sometimes results in team members confusing the objectives of the task and loss of commitment. Therefore, a high task structure is more defined regarding the set objectives and desires when the team assignment is complicated.

From the Analysis of the Interviews, the following four principal themes emerged:

Theme 1: Managing Stock Gaps

The first theme that emerged from the data analysis was managing stock gaps in the manufacturing sector. Eighty-three percent of target participants of leaders responded to:

What strategies have you used to manage hydroelectricity interruption? Participants reported that the primary and essential aspect was addressing the stock gaps in production as a strategy for managing hydropower interruptions. Pax01 stated, "The manufacturing industry must consider managing stock gaps to manage the effects of hydropower interruptions, and one quick option was to invest in generators."

Pax02 further indicated,

> Everything is based on production, and having a dormant plant is not beneficial to anybody since it must be operated; therefore, managing stock gaps is critical. We managed production in line with the peak periods and non-peak hours. Day production was subdivided because consumption was most during the peak periods. We opted to start off-peak production hours, i.e., during the night, and activities that do not need hydropower during the day to stock up.

Pax03 emphasized, "Our changing over system during power interruption has been fully automated to eliminate delays or interruptions on production when faced with hydropower interruptions." Pax04 mentioned, "Increasing production time to overnight when power is available is a successful strategy to manage stock and have the labor force resting during daytime when there is no power to avoid loss of production time and manhours." Pax06 further stated,

> An off-grid system would have required batteries to store the power generated during the day for use even at night to manage production. Whereas an on-grid system would have fed the Power utility's distribution lines with any excess power the solar plant would have generated significantly reducing the initial cost of the project and the cost of production.

Pax05 did not mention this theme but stated, "We invested in generators to power the plant, the only successful strategy. The company has not seen the need to modify its approach as it has good maintenance of the generators to have a powered plant."

Correlation to the Literature and Conceptual Framework

Managing stock gaps aligns with the literature review on situational contingency theory of evolutionary systems adjusting to challenges where optimization focuses on contingency forecasting (Fielder, 1964). The situational contingency theory focuses on topical foundations (i.e., organizational systems and their environment and opportunities).

Productivity systems increase the proportion of the business's size (Cissokho, 2019). The loss of productivity because of power interruptions may require leadership to consider situational leadership style. The situational leadership style of contingency theory advocates those leaders who focus on the challenges faced and control the situation. Leaders are confident that their team members will make suggestions and achieve desired success (Fielder, 1964). Manufacturing businesses consider initiatives by focusing on organizations' subsystems. This is indispensable because it expounds on the necessity for adaptiveness of business structures, team goals attainment, and fit among organizational corporate social implementation, tactics, and configurations.

The usefulness of leadership decisions is that they are used to address the purpose of circumstances the business faces and the quality of decisions (Csaszar & Ostler, 2020). Decision-makers follow the most significant productivity decision and managing stock gaps in the manufacturing sector ensures production scheduling is aligned to the organization's demand. The efficiency of decisions enforces the purpose of challenges that incorporate appropriate information for the right decision (Csaszar & Ostler, 2020; Robinson & Le Ber, 2019).

Fit-for-purpose decisions are all-inclusive (Csaszar & Ostler, 2020), and certainty is critical because the manufacturing sector may not afford uncertainties in setting and planning production if the business is to achieve its goals and objectives. Stock gaps in production are critical because the sector is multidimensional and primarily operates in open systems. Therefore, leaders avoid high ambiguity conditions by engaging in operative models and making all-around convectional organizational forecasts (Huang & Lee, 2020; Tsolka, 2020). In summary contingency forecasting, decision-making, and situational contingency theory provide manufacturing leaders the opportunity for a better foundation that may promote and cultivate leadership strategies and practices.

Theme 2: Use of Generators (Turn-Time)

The second theme that emerged from data analysis was the use of generators. Five out of the six target participants representing 83% of the target population when responded to the interview question on what strategies have been most effective to manage hydroelectricity interruption. Most agreed that investment in generators to manage hydropower interruptions was a successful strategy for maintaining production. Pax01 stated,

> To manage stock gaps, you need to handle interruptions in the supply chain, and the easiest option is implementing generators. The reason is that if power is disrupted, it may cause a stoppage to the production line. Therefore, the use of generators is essential because of the turn- time if power is interrupted from the primary source, the generator's supply kicks in more immediately than any other power supply substitute.

Pax03 mentioned that "the company invested in a 200kva diesel power generator to cushion the impact of downtime on production to manage the production line and stocks." Pax04 stated, "The organization purchased an industrial generator to be used during load shedding to manage production runs." In comparison, Pax05 mentioned that "the business invested in generator units. We have used one strategy we thought was effective from inception and stuck to it by investing in generator units." While Pax06 further stated "We employed electric generators to power the factory during load shading hours. Shuffled shifts around to ensure we had teams in place when power was scheduled to be on to ensure production of stock."

Pax02 did not cite this theme but stated,

> The time of tap time was reduced from 1 hr 30 min to 1 hr 00 min due to oxygen optimization. Sheading the labor instead of 24 hr 00 min was reduced to 12 hr 00 min. At the same time, 30% of labor staff were permanent, and the rest were put on a casual basis to avoid high unemployment.

Correlation to the Literature and Conceptual Framework

The use of generators (Turn-Time) is relevant to the literature review of CT of emerging trends and influence on the manufacturing sector link in managing hydropower interruptions. Fielder, (1964), argued that the business environment affects how businesses are managed and is the best aspect to understand how the organization may be shaped and used to achieve optimum results. The theory relates to a leader's decision-making, and the usefulness of a leader's decision to address the purpose of circumstances and the significance of the quality of decisions (Csaszar & Ostler, 2020).

A non-functioning plant may not be helpful and could demotivate the workforce. Decisions to invest in generators are essential and involve higher task involvement results. Higher task results positively influence individual work and are aligned with job performance and satisfaction (Delfgaauw et al., 2020; Kumar, 2020; Yetton & Crouch, 1983; Zhao & Sheng, 2019). The suitability of employees in serving different circumstances is essential (Csaszar & Ostler, 2020). Therefore, employees' knowledge to operate generators and reduce idle man-hours may be necessary for an operational plant to continue production. Also, considering the challenges of hydropower effects on a business' external and internal practices to contextualize the operational atmosphere is critical for the organization's success (Negrão, 2019). Internal procedures align themselves to total productivity and aim to eliminate production downtime, practices relate to continuous production flow, maintenance, and process controls within the business (Csaszar & Ostler, 2020; Negrão, 2019).

The external process analyzes the involvement of customers' and suppliers' feedback (Csaszar & Ostler, 2020). In summary, the complexity of running generators requires manufacturers to engage suppliers of services to maintain the generators and supply fuel needed for business operational efficiency. The organization must also supply manufactured goods to its customers. Managing hydropower interruptions by running on alternative power-generating equipment like diesel-powered generators increases production costs (Phiri, 2017). In conclusion, investment and maintenance of generators ensure no break in operations, secure production line, and efficiency concerning other internal practices for archiving organizational goals. However, it may negatively impact the margins of the manufacturing businesses because product prices cannot increase since customers may not afford high prices reflecting the actual cost of the investment.

Conclusion

Hydro energy demand is increasing significantly from 590 TWh to 3,100 TWh, whereas the installed capacity is expected to grow from 120 GW to 700 GW (Programme for Infrastructure Development in Africa, 2019). Implying that significant investment in hydropower and other renewable energy supply initiatives is required to meet future demand. In this qualitative multiple case study, the goal was to personally explore strategies of some manufacturing leaders used to manage hydroelectric power interruptions. The target population consisted of six leaders in the manufacturing sector who have demonstrated success in using strategies to manage hydroelectric power interruptions based in Lusaka, Zambia. The features of MaxQDA served to compile and analyze data efficiently. The study generated four critical themes that emerged during data collection, and these were reinforced during the analysis of the data emphasizing the leading research question and conceptual framework. The study elaborated on the following themes:

a) Managing stock gaps,
b) Investment in generators (turn-time),

The findings aligned with the existing literature and comprehension concerning the CT that there is no one best way of managing a business. Besides, organizations should align themselves to the evolutionary decision-making attributed to the challenges faced. The use of leadership style, decision-making, and locational understanding proved to be efficient management styles to achieve the organizational targets and objectives of the manufacturer. In addition, having an environment that aligns well with the demands of the organization and is task-oriented motivates employees and enhances job satisfaction.

Managing stock gaps was critical and this translated into managing scheduling man-hours and investment in generators to keep production running. At the very best, the industry should consider investing in renewable energy such as solar-powered sub-station grids, and supply any excess electricity generated to primary grids for domestic consumption, therefore, positively contributing to social change. Lastly, investment in power stabilizers and power storage facilities is an essential decision that manufacturing leaders must consider.

References

Bachrach, D. G., & Mullins, R. (2019). A dual-process contingency model of leadership, transactive memory systems and team performance. *Journal of Business Research*, *96*(3), 297–308. https://doi.org/10.1016/j.jbusres.2018.11.029

Bogue, A. G., Jarausch, K. H., & Hardy, K. A. (1994). Quantitative methods for historians: A guide to research, data, and statistics. *The Journal of American History*, *80*(4), 1569–1570. https://doi.org/10.2307/2080767

Busse, R., & Regenberg, S. (2018). Revisiting the "authoritarian versus participative" leadership style legacy: A new model of the impact of leadership inclusiveness on employee engagement. *Journal of Leadership & Organizational Studies, 26*(4), 510–525. https://doi./org10.1177/1548051818810135

Cissokho, L. (2019). The productivity cost of power outages for manufacturing small and medium enterprises in Senegal. *Journal of Industrial and Business Economics, 46*(4), 499–521. https//doi.org/10.1007/s40812-019-00128-8

Csaszar, F. A., & Ostler, J. (2020). A contingency theory of representational complexity in organizations. *Organization Science,31*(5),11981219.https://doi.org/10.1287/orsc.2019.1346

Delfgaauw, J., Dur, R., & Souverijn, M. (2020). Team incentives, task assignment, and performance: A field experiment. *The Leadership Quarterly*, *31*(3), 1858–2010. https://doi.org/10.1016/j.leaqua.2018.03.003

Embrey, I. P. (2019). States of nature and states of mind: A generalized theory of decision-making. *Theory and Decision, 88*(1), 5–35. https://doi.org/10.1007/s11238-019-09705-8

Falkenhausen, C., Fleischmann, M., & Bode, C. (2019). How to find the right supply chain strategy? An analysis of contingency variables. *Decision Sciences, 50*(4), 726–755. https://doi.org/10.1111/deci.12355

Fiedler, F. E. (1964). A contingency model of leadership effectiveness. In *Advances in experimental social psychology* (Vol. 1, pp. 149–190). Academic Press.

Gaimon, C., Lee, H., L, & Schmidit, G. (2017). Using value chains to enhance innovation. *Production & Operations Management*, *26*(4), 617–632. https://doi.org/10.1111/poms.12665

Heller, F. A. (2019). Leadership, decision making, and contingency theory. In F. A. Heller (Ed.) *Managing democratic organizations* (pp. 211–227). Routledge.

Hooi, H., & Smyth, R. (2014). Will initiatives to promote hydroelectricity consumption be effective? Evidence from univariate and panel LM unit root tests with structural breaks. *Energy Policy*, *68*(7), 102–115. https://doi.org/10.1016/j.enpol.2014.01.007

Huang, V. L., & Lee, S. K. (2020). Contingency plans: An introduction. *Women &Performance:A Journal of Feminist Theory*, *30*(1), 1–19. https://doi.org/10.1080/0740770x.2020.1801968

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, *18*(1), 3–20. https://doi.org/10.1177/1525822X05282260

Klassen, A. C., Creswell, J., Plano Clark, V. L., Smith, K. C., & Meissner, H. I. (2012). Best practices in mixed methods for quality-of-life research. *Quality of Life Research*, *21*(3), 377–378. https://doi.org/10.1007/s11136-012-0122-x

Kumar, A. (2020). Leadership and decision-making: Top management team age demographic and environmental strategy. *Journal of Management & Organization*, *26*(1), 1–17. https://doi.org/10.1017/jmo.2019.91

Kumar, M., Basu, P., & Avittathur, B. (2018). Pricing and sourcing strategies for competing retailers in supply chains under disruption risk. *European Journal of Operational Research*, *265* (2), 533–543. https://doi.org/10.1016/j.ejor.2017.08.019

Kwadade-Cudjoe, F. (2020). Leadership of change: Examination of transactional, transformational, and charismatic leadership, and evaluation of the concept of charismatic leadership in the current information-driven business environment. *Archives of Business Research*, *8*(8), 294–305. https://doi.org/10.14738/abr.88.8909

Mwila, A., Sinyenga, G., Buumba, S., Muyangwa, R., Mukelabai, N., Sikwanda, C., Chimbaka, B., Banda, G., Nkowani, C., & Bwalya, B. K. (2017). *Impact of load shedding on small scale enterprises. Working paper 1*. Energy Regulation Board. Lusaka, Zambia.https://www.erb.org.zm

NamPower. (2018). Annual report. https://www.nampower.com.na/public/docs/annualreports/Nampower%202018%20AR_web%203.pdf

Negrão, L. L. L., Godinho Filho, M., Ganga, G. M. D., Chopra, S., Thürer, M., Sacomano Neto, M., & Marodin, G. A. (2019). Lean manufacturing implementation in regions with scarce resources. *Management Decision*, *58*(2), 313–343. https://doi.org/10.1108/md-10-2018-1082

Phiri, J. (2017). Electricity demand and load shedding: Impact on Zambian business: A case study of selected Solwezi based businesses. *International Journal of Multidisciplinary Research and Development*, *4*(5), 146–157.https://doi.org/10.22271/ijmrd.v4.i5

Programme for Infrastructure Development in Africa. (2019). Icaafrica.Org. https://www.icafrica.org/fileadmin/documents/PIDA/PIDA%20Executive%20Su mmary%20-%20English_re.pdf

Robinson, T. A., & Le Ber, M. J. (2019). Collective leadership practices: Creating responsive, inclusive, participatory, and representative decision- making. *Journal of Leadership Studies*, *13*(3), 50–55. https://doi.org/10.1002/jls.21660

Saiti, A., & Stefou, T. (2020). Hierarchical organizational structure and leadership. *Oxford Research Encyclopedia of Education*. https://doi.org/10.1093/acrefore/9780190264093.013.709

Shapira, R. (2019). High-moral trusting transformational leaders, charismatic transformational leadership, and charismatic leadership. *SSRN Electronic Journal*, *5*(6), 1–38. https://doi.org/10.2139/ssrn.3418773

Tifferet, S. (2020). The effect of grade framing on task engagement, task completion, and anticipated regret. *Instructional Science*, *48*(4), 475–494. https://doi.org/10.1007/s11251-020-09516-3

Tsolka, A. (2020). Contingency and situational approaches to educational leadership. *Oxford Research Encyclopedia of Education*. https://doi.org/10.1093/acrefore/9780190264093.013.637.

Urban, F., Siciliano, G., Sour, K., Lonn, P, D., Tan-Mullins, M., & Mang, G. (2015). South-South technology transfer of low-carbon innovation: Large Chinese hydropower dams in Cambodia. *Journal ofSustainable Development, 23*(4), 232–244. https://doi.org/10.1002/sd.1590

Weick, K. E. (2020). Thomas B. Lawrence and Nelson Phillips: Constructing organizational life: How social-symbolic work shapes selves, organizations, and institutions. *Administrative Science Quarterly*, *65*(2), 16–19. https://doi.org/10.1177/0001839219896664

oodward, J. (1981). Industrial organization: *Organization Studies*, *2*(2), 202–203. https://doi.org/10.1177/017084068100200219

Yetton, P., & Crouch, A. (1983). Social influence and structure: Elements of a general theory ofleadership. *Australian Journal of Management*, *8*(2), 15–26. https://doi.org/10.1177/031289628300800202

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.) Sage.

Zhao, R., & Sheng, Y. (2019). The effect of leadership style on employee engagement: The moderating role of task structure. *Open Journal of Social Sciences*, *07*(07), 404–420. https://doi.org/10.4236/jss.2019.77033