

Contractor Management Post updating the Kariba Dam Rehabilitation Project ESIA

Abstract

This paper examines the post-ESIA phase of the Kariba Dam Rehabilitation Project (KDRP), focusing on successful contractor management strategies employed by the Zambezi River Authority (ZRA) to enhance value creation. The KDRP, aimed at improving the long-term safety and reliability of the dam, underwent a comprehensive update of its Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plans (ESMP) in response to changing project conditions and emerging challenges, including those arising from the COVID-19 pandemic. The paper explores the rationale behind the update, key changes incorporated, challenges encountered during implementation, and lessons learned for effective contractor management and value creation post-ESIA.

1 Introduction

The Zambezi River Authority (ZRA) is a collaborative entity jointly owned by the Governments of Zambia and Zimbabwe, established to oversee the management of the Zambezi River within their shared borders. With a focus on fostering economic, industrial, and social development in the region, the ZRA aims to leverage the natural resources provided by the Zambezi River. This includes facilitating electricity generation through hydroelectric power schemes and overseeing the construction and maintenance of dams and related infrastructure (Figure 1).

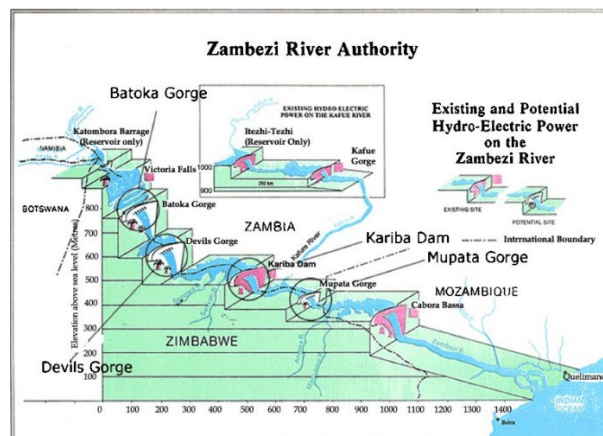


Figure 1: Existing and potential hydro-electric power schemes on the Zambezi River

Among its key assets is the Kariba Dam, a cornerstone of water storage and infrastructure. Built between 1956 and 1959, the dam serves as a vital source of energy, supporting the growth and prosperity of Zambia, Zimbabwe, and the broader Southern African region. With two underground hydropower stations located on the North and South Banks of the Zambezi River, the Kariba Dam (Figure 2) has a combined installed capacity of 2130MW, making a significant contribution to meeting the region's energy needs and advancing sustainable development goals.



Figure 2: Project site at the Kariba Dam

In 2017, ZRA initiated the Kariba Dam Rehabilitation Project (KDRP) (Figure 3) to enhance the long-term safety and reliability of the dam and its associated benefits. The project, slated for completion by 2025, encompasses critical components aimed at improving the dam's structural integrity and operational efficiency. One key aspect involves resizing the plunge pool to alleviate pressure from water spillage, thereby reducing the risk of erosion to the dam's foundation. Additionally, the project includes refurbishing the spillway, equipped with six sluice gates, and related infrastructure. These upgrades are designed to enhance the dam's ability to regulate reservoir levels, ensuring compliance with operational protocols and international safety standards for sustained safe and effective operation in the future.



Figure 3 View of the Plunge Pool and Spillway as of December 2023

2 KDRP ESIA/ESMP Update

The KDRP Environmental and Social Impact Assessment (ESIA) and the subsequent Environmental and Social Management Plan (ESMP) were approved in 2016 by the environmental regulators of Zambia and Zimbabwe before the commencement of the Project. During the implementation of the Project, the said documents were later updated in 2020 to incorporate emerging environmental, health and social issues among others. The decision to update the ESIA and ESMP of the KDRP was motivated by several key factors, including the need to align with prevailing conditions at the project site, incorporate changes to the project, and update and introduce environmental and social management plans to address evolving challenges.

The updated ESIA and ESMP incorporate a range of changes aimed at addressing additional identified impacts and measures related to health, safety, biodiversity, and social aspects. These include concerns such as the physical presence of disused infrastructure, deposition of debris into the Zambezi River, and loss of land due to unmanaged waste disposal. Notably, the outbreak of the COVID-19 pandemic introduced unprecedented challenges, ranging from health and safety concerns to socio-economic disruptions (such as loss of income and community tensions), necessitating the implementation of stringent health and safety protocols.

Furthermore, the new and updated plans aim at addressing emerging challenges and enhancing project resilience. These include the following:

- i. COVID-19 Management Plan
- ii. Gender-Based Violence Plan
- iii. Employee Welfare Plan
- iv. Employment and Skills Training Management Plan
- v. Communicable Diseases Management Plan
- vi. Social Values Management Plan
- vii. Community Engagement Management Plan.

By integrating these new plans into the project framework, the KDRP aims to proactively manage environmental and social risks, foster community resilience, and promote sustainable development outcomes.

To enhance accountability and streamline project management processes, the new and updated plans allocate clear roles and responsibilities between the Client and Contractor, ensuring effective coordination and collaboration throughout the project lifecycle. This includes delineating responsibilities for environmental monitoring, stakeholder engagement, and compliance with regulatory requirements, thereby facilitating transparent and accountable project governance.

3 Overcoming Challenges to implementing the new ESIA/ESMP

The implementation of the updated ESMPs for the Kariba Dam Rehabilitation Project encountered a multitude of challenges, each presenting unique obstacles to project success. These challenges encompassed a diverse array of issues, reflecting the complex nature of managing large-scale infrastructure projects in dynamic environments.

- i. One significant challenge arose from conflicting contractual documents, where the initial contract signed by the contractor stipulated adherence to the original ESMP. As a result, the contractor requested an addendum to the contract, leading to delays and complexities in aligning with the updated ESMP requirements.
- ii. Cost implications posed another significant challenge, particularly concerning the feasibility of certain suggestions outlined in the new ESMP. For example, implementing measures such as remote surveillance during the COVID-19 pandemic was deemed excessively costly and disproportionate to the perceived risk, creating tension between project stakeholders.
- iii. Prolonged engagement processes further exacerbated implementation challenges, as the contractor deliberately extended negotiations in an attempt to avoid compliance with the new ESMP. This deliberate delay tactic hindered progress and strained relationships among project participants.
- iv. Capacity limitations within the contractor's workforce emerged as a critical challenge, with staff members lacking the necessary competence and familiarity with the updated ESMP. This deficiency in expertise hindered effective implementation and necessitated additional training and support efforts.
- v. Language barriers compounded communication challenges, particularly as top management personnel were not fluent in English. As a result, deliberations and decision-making processes were protracted, impeding timely resolution of issues and complicating project management efforts.
- vi. Moreover, escalating pressure from financiers to adhere strictly to the new ESMP added further strain to project implementation. These demands placed additional burdens on project stakeholders and intensified the need for swift and effective resolution of implementation challenges.
- vii. Lastly, staff turnover within the Environmental, Health, and Safety (EHS) department introduced continuity disruptions and knowledge gaps, requiring repeated explanations and reorientation efforts to onboard new personnel effectively.

In response to these challenges, the ZRA undertook innovative approaches to contractor management aimed at ensuring project success and value creation. The ZRA implemented a series of successful contractor management strategies that were carefully designed to mitigate risks, foster collaboration, and promote

adherence to environmental and social standards throughout the project lifecycle. Key components of these strategies included:

- i. **Continuous Monitoring and Evaluation:** The ZRA implemented rigorous monitoring and evaluation protocols, including regular inspections and audits, to assess contractor performance and ensure compliance with ESMP requirements.
- ii. **Effective Communication:** Regular meetings and notices to correct were utilized to maintain open lines of communication between project stakeholders, facilitating prompt resolution of issues and alignment with project goals.
- iii. **Capacity Building:** The ZRA invested in capacity-building initiatives to enhance the skills and knowledge of contractors, particularly in areas related to EHS practices, thereby ensuring competent implementation of ESMPs.
- iv. **Recruitment of Competent Personnel:** Deliberate efforts were made to recruit personnel with expertise in EHS management at all levels of the project hierarchy, ensuring a strong foundation for effective contractor management.
- v. **Relationship Management:** The establishment and awareness of a project code of conduct fostered positive relationships between stakeholders, promoting mutual respect, accountability, and adherence to ethical standards throughout project implementation.
- vi. **Continuous Improvement:** External advice and review processes were leveraged to facilitate ongoing improvement and refinement of contractor management practices, enabling the project to adapt to changing circumstances and emerging challenges.

By adopting these proactive and comprehensive contractor management strategies, the ZRA successfully navigated the challenges associated with implementing the updated ESMP, thereby ensuring the continued success and sustainability of the Project.

4 What drives success: lessons learnt

The lessons learned regarding successful contractor management of ESIA/ESMP can be categorized into three key stages: Project Design, Project Implementation, and Post-Project phases. These lessons highlight the importance of proactive measures, clear communication, and continuous improvement throughout the project lifecycle.

Project Design Stage

- i. **Flexibility in Contracts:** ESIA/ESMPs and Contractual Documents should be designed to accommodate changes and updates as the project progresses, ensuring that evolving environmental and social factors are adequately addressed.
- ii. **Enforcement of Compliance:** Regulators should impose strict conditions for non-conformances or non-adherence to environmental and social standards, including imposing monetary penalties to incentivize compliance.
- iii. **Accountability:** Roles and responsibilities of the various parties should be integrated into the ESMP, providing clarity on implementation responsibilities from the outset.
- iv. **Contractor Selection:** Contractors should be selected during the design stage based on their expertise, experience, and available resources, ensuring that they are equipped to meet environmental and social requirements.
- v. **Performance-based Contracts:** Implementing performance-based or incentivized contracts can motivate contractors to adhere to environmental and social standards outlined in the ESIA and ESMPs.

Project Implementation Stage

- i. **Knowledge Transfer:** Ensure effective knowledge transfer and skills development among contractors and project stakeholders, facilitating better understanding and implementation of environmental and social management measures.
- ii. **Competent Personnel Recruitment:** Deliberate efforts should be made to recruit competent personnel, with a particular emphasis on EHS expertise at all levels of the organizational hierarchy.
- iii. **Establish Clear Expectations:** From the outset, clear expectations and performance metrics should be established to guide contractors in meeting environmental and social objectives throughout project implementation.
- iv. **Effective Communication:** Regular involvement and communication with contractors' top leadership foster a collaborative environment and ensure alignment with project goals and standards.
- v. **Staff Turnover Management:** Measures should be in place to manage staff turnover effectively, ensuring continuity in the implementation of environmental and social management measures.

Post-Project Phase

- i. **Information Dissemination:** Share project outcomes and lessons learned through professional groups and networks to facilitate knowledge exchange and promote best practices in contractor management for future projects.
- ii. **Project Review:** Conduct comprehensive post-project reviews to assess the effectiveness of environmental and social management measures, identify areas for improvement, and inform the planning and execution of future projects.
- iii. **Establish Monitoring and Evaluation Mechanisms:** Develop or refine robust monitoring and evaluation systems to track the implementation of ESMPs post-project. This may involve regular site visits, data collection, and performance assessments to ensure that environmental and social measures are being effectively implemented and maintained in other projects.
- iv. **Stakeholder Engagement:** Maintain ongoing engagement with relevant stakeholders, including local communities, regulatory bodies, and project contractors, to solicit feedback, address concerns, and garner support for ongoing ESMP implementation efforts in other projects.
- v. **Partnerships and Collaboration:** Collaborate with relevant organizations, NGOs, and government agencies to leverage resources, expertise, and best practices in ESMP implementation. Partnerships can facilitate knowledge exchange and collective action to address shared environmental and social challenges.
- vi. **Community Engagement and Empowerment:** Continuously engage with local communities and empower them to participate in the implementation of ESMPs. This could include initiatives such as community-based monitoring programs, environmental education, and capacity-building activities to strengthen local ownership and involvement in sustainability efforts.
- vii. **Capacity Building:** Provide training and capacity-building initiatives to relevant stakeholders, including project staff, contractors, and local community members, to ensure they have the necessary knowledge and skills to effectively implement and maintain ESMPs post-project.
- viii. **Documentation and Reporting:** Develop standardized documentation and reporting procedures to facilitate the recording of ESMP implementation activities, including any challenges encountered and lessons learned. Regular reporting ensures transparency and accountability in ESMP implementation efforts.
- ix. **Incentivize Compliance:** Consider implementing incentives for contractors and project stakeholders who demonstrate exemplary compliance with ESMP requirements. This could include recognition, awards, or financial incentives to motivate continued adherence to environmental and social standards.

By incorporating these lessons learned into future projects, stakeholders can enhance the effectiveness of contractor management in ensuring environmental and social sustainability throughout the project lifecycle.

5 Conclusion

The post-ESIA phase of the KDRP exemplifies the crucial role of effective contractor management in enhancing value creation and ensuring sustainable project outcomes. Through innovative strategies and lessons learned, the ZRA demonstrates its commitment to environmental and social excellence. This paper highlights the success of the KDRP and provides insights for future projects, stressing the importance of proactive and adaptive contractor management approaches. Collaboration, flexibility, and continuous improvement are emphasized as key elements for navigating complexities and driving positive impacts. By embracing these principles, stakeholders can foster resilience and promote sustainable infrastructure development, advancing environmental stewardship and social responsibility in future endeavors.

6 References

1. **Environmental Resources Management Southern Africa (Pty) Ltd. (ERM)**, Environmental and Social Impact Assessment Report for the Kariba Dam Rehabilitation Project (Zambia and Zimbabwe) on the Zambezi River, January 2016
2. **Zambezi River Authority**, Environmental and Social Impact Assessment, October 2020

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