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Report No: RES00630

RESTRUCTURING PAPER

ON A

PROPOSED PROJECT RESTRUCTURING

OF

Kariba Dam Rehabilitation Project (RI)

APPROVED ON 09-Dec-2014

TO

The Republic of Zambia

Water
Eastern And Southern Africa

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
CD	Country Director
DAB	Dispute Adjudication Board
EDF	European Development Fund
EHS	Environmental Health and Safety
EPP	Emergency Preparedness Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FM	Financial Management
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
HSS	Hydropower Sustainability Standards
IDA	International Development Association
KDRP	Kariba Dam Rehabilitation Project
PDO	Project Development Objective
PIU	Project Implementation Unit
PoE	Panel of Experts
RPF	Resettlement Policy Framework
SDR	Special Drawing Rights
SEA	Sexual Exploitation and Abuse
SIDA	Swedish International Development Cooperation Agency
STEM	Science, Technology, Engineering, and Mathematics
TS&S	Technical Services and Supervision
ZRA	Zambezi River Authority
ZVDF	Zambezi Valley Development Fund

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BASIC DATA

Product Information

Operation ID	Operation Name
P146515	Kariba Dam Rehabilitation Project (RI)
Product/Financing Instrument	**Geographical Identifier**
Investment Project Financing (IPF)	Eastern and Southern Africa
Approval Date	**Current Closing Date**
09-Dec-2014	28-Feb-2025

Original EA Category

Full Assessment (A) (PAD Approval Package-06 Nov 2023)

Organizations

Borrower	Responsible Agency
The Republic of Zambia	Zambezi River Authority

OPERATION STATUS

Project Development Objective (DO)

Original Development Objective

The Project Development Objective is to assist in improving the safety and reliability of the Kariba Dam.

Disbursement Summary (in USD million)

Source of Funds	Net Commitment	Disbursed	Undisbursed	% Disbursed
IBRD	--	--	--	0
IDA	66.34	28.75	38.64	42.66
Grants	20.00	18.24	1.76	91.20

Policy Waivers

Does this restructuring trigger the need for any policy waiver(s)?	No

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I. PROJECT STATUS AND RATIONALE FOR RESTRUCTURING

A. INTRODUCTION

1. The Kariba Dam Rehabilitation Project was approved by the World Bank Board of Directors on December 9, 2014, and declared effective on August 20, 2015. The mid-term review (MTR) for the project was held virtually in November 2020. The current closing date is February 28, 2025. The project development objective (PDO) is to assist in improving the safety and reliability of the Kariba Dam. The project is expected to benefit more than 3 million people through reduced risk of dam failure and associated downstream consequences. The total project cost at appraisal was estimated at US$294.2 million to be financed as follows: by International Development Association (IDA, Credit number 5563-ZM, US$75 million equivalent at appraisal) with co-financing from the Swedish International Development Cooperation (SIDA, Grant number TF019029, US$25 million), and the African Development Bank (AfDB, US$75 million equivalent) covering the institutional project support and the spillway rehabilitation activities, a parallel financing by the European Union – European Development Fund (EU-EDF, US$100 million equivalent) for the plunge pool reshaping, and a counterpart financing from the Zambezi River Authority (ZRA) US$19.2 million.

2. The Project was restructured only once in June 2022 to: (i) reallocate IDA resources between components to finance part of the plunge pool refurbishment costs based on the updated technical analysis of the project; (ii) incorporate Project Implementation Unit (PIU) staff costs and salaries in the project operating costs to enhance project management efficiency; (iii) provide a 32-month extension of the SIDA grant co-financing to align with the current project closing date, February 28, 2025; (iv) add new intermediate indicators; (v) revise the repayment terms of the Subsidiary Agreement between the Ministry of Finance and National Planning of Zambia and the ZRA and update the Economic and Financial Analysis of the project; (vi) trigger safeguards policy OP 4.04 Natural Habitats and update the ISDS, with disclosure of the Environmental and Social analysis; and, (vii) update risk ratings. The restructuring revised the component costs as follows: Component 1: Institutional and Project Management (US$ 55.1 million); Component 2: Plunge Pool Reshaping (US$120 million); and Component 3: Spillway Refurbishment ($US 100 million). The total project cost stood at US$273.1 million at the time of restructuring as follows.

Revised Project Financing

Component	Total Cost (US$ million)	Financing (US$ million equivalent) *				
		ZRA	IDA	EDF	AfDB	SIDA
1. Institutional Support	53.1	9.1	18	0	16	10
2. Plunge Pool Reshaping	120	0	10	100	10	0
3. Spillway Refurbishment	100	0	43.5	0	43.5	13
Total	273.1	9.1	71.5*	100	69.5*	23*

*Considering exchange rate losses

B. PROJECT STATUS

3. Overall progress towards the achievement of the PDO as well as implementation progress are rated Moderately Satisfactory. Overall project implementation remains behind schedule, with delays primarily driven by initial procurement and mobilization delays, unforeseen geotechnical conditions, which necessitated additional assessments and remedial

works of cracks and structural faults inside the spillway, the COVID-19 pandemic, and project management capacity limitations at the ZRA. Additionally, the schedule for the spillway refurbishment was extended to accommodate additional maintenance works that were originally envisaged to be addressed separately prior to the commencement of the spillway refurbishment works contractor but later included as additional services under the project. Overall, an estimated additional 22 months are required for project completion. This restructuring is expected to allow completion of the project (see Action Plan in Annex 1).

4. Component 1: Institutional Support (as per the restructuring that took place in 2022, US$53.1 million, of which IDA US$18 million, SIDA US$10.0 million, AfDB US$16.0 million, and ZRA US$9.1 million). This component aims to provide technical support to ZRA in securing the long-term safety and reliability of Kariba Dam. For the remaining duration of the project, two separate (for each phase of spillway refurbishment works) Technical Support and Supervision (TS&S) Consultancies are dimensioned to support ZRA project management and enhance their operational capacity. The contract for supervision of remaining Phase I works was signed on December 28, 2024, while ZRA has confirmed that negotiation for Phase II and the contract is expected to be signed by February 21, 2025**.** ZRA must ensure adequate close-out of the original TS&S contract that ended on December 30, 2024, including closing reports documenting lessons learned, cataloguing and transfer of collected data and information and handover of pertinent tools to ZRA for implementation (e.g. instrumentation, Emergency Preparedness Plan (EPP), Standard Operating Procedures (SOP), etc.).

5. Component 2: Plunge Pool Reshaping (US$ 120.0 million, of which IDA US$10.0 million, EDF US$100.0 million EDF, and AfDB US$ 10.0 million). This component aims to stabilize the plunge pool of Kariba Dam and prevent further scouring, particularly along the weak fault/seam zone towards the dam foundations. Works for this component were completed following the fault treatment and other concreting works that were completed on July 22, 2024, with a total of 5,241m^3 of concrete placed within the plunge pool. The safety netting in the plunge pool was removed on a surface of approx. 5,000 m^2 and anchored on an agreed area of approx. 12,000 m^2. The refilling of the plunge pool was carried out during August 7-31, 2024. Because of low reservoir levels and low power generation, the Contractor's originally planned method of refilling by removing the stoplogs was not viable, and instead, refilling was done with a combination of natural seepage and pumping water from the tailrace downstream. The last stoplogs were finally removed on September 17, 2024, by a pontoon-mounted crane, with the cofferdam piers, temporary access road and dock area remaining as previously agreed. The total duration of the work from contract signing to demobilization was 7 years and 6 months. TS&S contractor must still submit a completion report detailing the lessons learned, experiences gained, issues faced and resolved, and the dam's behavior and performance compared to expectations according to the bespoke model that was developed to monitor the dam behavior.

6. Component 3: Spillway Refurbishment (US$100.0 million, of which IDA US$43.5 million, SIDA US$13.0 million, and AfDB US$43.5 million). This component aims at improving the Kariba Dam operation and preventing the potential failure of the spillway control facility by replacing some of the built-in structures that are significantly deteriorated, as well as the concrete that has been affected by an alkali-aggregate reaction. Works on the spillway (Phase I) commenced in November 2019. Additional maintenance works, which were originally envisaged to be carried out separately and prior to the spillway refurbishment works, were introduced as additional services. Some of these maintenance works (civil works) are being carried out concurrently with the main spillway works, and the electromechanical maintenance works, which could not be executed in parallel with the ongoing main works, were packaged separately as Phase II refurbishment.

7. Spillway refurbishment - **Progress on the spillway (Phase I) stands at 82% as of October 2024**. The refurbishment works in sluices 2, 3, 5, and 6 are substantially complete. Works in sluices 1 and 4 are underway with sluice 4 on the critical path. The replacement of built-in parts in Sluice 5 is completed, and new concrete beams installation works in Sluice 2 is in progress. Hydro demolition in Sluice 1 was completed on schedule, and sill installation is currently ongoing, along with the rebar installation on the groove tracks. The Cofferdam transfer from sluice 5 to Sluice 4 was completed. The contractor

has optimized the program of works to accelerate the refurbishment of the sluices. Notwithstanding, the contractor's latest schedule has completion of the works on October 28, 2025, which is after the current contractual end date of July 3, 2025 (a deviation of 117 days from the revised Time for Completion (CCD). ZRA is aware that the testing of the emergency gates, commissioning procedure and demobilization plan needs to be agreed with clarity as soon as possible to avoid further delays and potential claims from Spillway phase 2 contractors.

8. The permanent office in Zimbabwe was completed and handed over in November 2023. Works on the office in Zambia is ongoing with expected completion by April 2025. The Zimbabwe permanent offices are currently in use by ZRA officials and STEM interns.

9. Spillway Phase2 II refurbishment –The contract for the Phase II spillway works was signed on June 3, 2024, and the contractor has commenced design and manufacturing of hoists and hydromechanical equipment. The contract end date is September 2026, and works are ahead of schedule. The Contractor has established offices on site and envisages being able to commence non-sluice related works in April 2025. The contractor foresees commencement of sluice-related works in sluices 5 and 6 from September 2025, which would require access to the site. ZRA has a comprehensive plan to ensure interface, management of schedule and both Phase I and Phase II contractors working concurrently on site.

10. The STEM (Science, Technology, Engineering, and Mathematics) program for women – ZRA has recruited 20 female trainees (10 Zambian and 10 Zimbabwean) who came on board in February 2024. The trainees have completed their first rotation and were re-assigned to different department to expand their exposure to ZRA. ZRA highlighted and appreciated the additional technical support afforded by the trainees and the program in turn is providing the young graduates with valuable work experience. ZRA is considering retaining several of the trainees, should budget allow, while some have already been offered opportunities with other entities in the sector.

11. Hydropower Sustainability Standard (HSS) Assessment – A HSS Assessment was included as an activity during the June 2022 project restructuring as part of the update to the environmental and social assessment. The **HSS assessment** is certification framework for hydropower projects against good international practices on environmental, social and governance dimensions. The HSS assessment is currently underway. A Certified User Training for the HSS was carried out in November 2024, and the site inspection by an independent team of accredited assessors is planned for February 2025. The assessment will be based on the operation-stage criteria. After the assessment, the assessors will produce a report with the findings, which will be discussed in a post-assessment workshop.

12. Procurement and Contracts Management. The Procurement and Contracts Management Risk of this project is substantial. ZRA has significantly delayed initiation of procurement of TS&S consultancy despite discussions and advice provided and documented in the previous two implementation support missions. ZRA has opted to split the supervision consultancies for the remaining Phase I and Phase II. Accordingly, two new CQS method procurement for supervision were launched in October 2024. The contract for supervision of Phase I works was signed on December 28, 2024, and the contract for Phase II works supervision is under negotiation by ZRA as of early February 2025. The **World Bank** highlighted its concern regarding these delays and stressed that the risks and additional costs (because of claims) for further delays need to be thoroughly assessed by ZRA as project financing is limited and additional costs may need to be sourced from ZRA's own financing.

13. Updated Spillway Refurbishment contract costs. The current contract was amended in January 2024, which increased contract cost to $60m. Additional variation orders, price adjustments and Dispute Board (DB) Decision have increased the contract amount to $77m, a 43 percent increase from the original contract value. ZRA has shared the cost breakdown of the additional costs and is preparing a formal contract amendment for World Bank No Objection through

STEP. ZRA was reminded that cost exceeding the contract cost approved by financiers requires a World Bank No Objection. ZRA shall ensure to closely monitor and document subsequent cost escalations from variations, finalized claims etc., and ensure that once amounts are agreed between parties, prior World Bank clearance is obtained.

14. Additionally, ZRA has concluded two consultancy contracts for: (i) Early warning system (EWS) design consultancy was signed on May 31, 2024 with two phases - Phase I (Lumpsum): Design phase of a Flood EWS, including hydraulic modelling and flood mapping; and Phase II (Time-based): Supervision of the supply, customization, installation, training, and commissioning of the EWS equipment; and (ii) Hydropower Sustainability Assessment. Early Warning System Phase II procurement commencement is pending Phase I EWS design. Action Plan will be required by February 2025 to ensure supply and installation aligns with project closure.

15. ZRA has reduced the composition of the Dam Safety Panel of Experts from seven to four experts to align with reduced scope and completion of the plunge pool reshaping.

16. **Status of Disputes (Spillway rehabilitation) –** to date, 68 claims have been received and determined out of 80 notices. The Dispute Board (DB) provided its decision on Referral No. 3 (CLM-KAR 48) on August 31, 2024, which awarded $3.37m to the contractor out of a $26m claim. Overall claims and DB decisions have resulted in certification of payments worth US$7,443,686. The Employer received the Contractor's Notice of Dissatisfaction on 27/09/2024. ZRA accepted to initiate a dialogue within the Contract's provided timeframes (56 days). CLM-KAR77 – Rejection of Mobile Crane: The mobile crane remains rejected, and reasons have been communicated. The Contractor has referred this claim for a decision to the DB.

17. **Financial Management (FM) performance is Satisfactory, and FM risk rated as Moderate.** The PIU continues to comply with financial covenants and has been consistent in submitting the Interim Financial Reports (IFRs) in an acceptable content and format.

18. The disbursement rate of 54% (as of January 31, 2025) of IDA funds is notably low, considering the elapsed implementation period of over nine (9) years or 97%. As of September 30, 2024, only US$25.501 million has been disbursed out of the original financing of US$75 million. In addition, the project has lost approximately US$7 million due to exchange rate movements between the SDR and USD, implying that only US$68 million was available for disbursement as of January 31, 2025. AfDB grants have slightly higher disbursement rates ranging from 43-63%. Further, the Project was urged to ensure that FY2023 outstanding audit issues are resolved and that the auditors should issue an updated audit status report. The PIU has been consistent in sharing internal audit reports and has yet to share the latest FY 2024 report with the World Bank. The Finance and Procedures manual is yet to be approved by the ZRA Board, which requested additional edits prior to approval.

19. **The project's environmental and social safeguards performance is rated Satisfactory, and the environmental risk remains High**. An environmental and social impact assessment (ESIA), an environmental and social management plan (ESMP), and a Resettlement Policy Framework (RPF) were prepared for the project, approved, and disclosed. Over recent years, ZRA and its service providers have improved the structure and capacity for environmental health and safety (EHS) management. The project has continued to: (i) prepare regular reporting on ESMP implementation and continued monitoring of contractor compliance, (ii) maintain labor statistics across all contracts and sub-contracts, (iii) implement the gender action by conducting 4 awareness-raising sessions on GBV/SEA/SH risks and available support services, (iv) monitor GRM functionality, update information package on the GRM, relocate complaint boxes to enhance visibility and ease access for the community, induct new GRM committee members, and (v) engage with downstream communities promoting public safety as part of the early warning system.

20. Zambezi Valley Development Fund (ZVDF) - Implementation of the ZVDF recommendations is ongoing, albeit slowly. Funding of activities remains a challenge as increased contributions from the utilities is yet to be actualized. In addition, the staffing structure has not been expanded though the process has commenced. In mitigation, staff from the operations side (Dam Management Services) have been engaged to support the supervision arrangements when required. This is in addition to the staff from local authorities who are the supervisors of the respective projects in their localities. Further, graduate trainees have been mapped to the ZVDF as a temporary measure to support implementation. A long-term solution beyond the existing STEM program is required for sustained and efficient operation of the department.

21. Dam Safety. The project triggered OP4.37 on Dam Safety. A panel of experts (PoE) providing expertise in hydrology, concrete, geotechnical engineering, environmental and social safeguards is in place, and has held 12 meetings, providing valuable engineering, environmental, and social inputs to enhance project implementation and safety of the dam.

22. Dam behavior and performance – The dam monitoring system has not detected any abnormal behavior of the dam. The controlled refilling of the plunge pool was executed satisfactorily according to the agreed procedure and schedule, and the dam monitoring system did not indicate any unusual response from the dam. All key instruments have been checked and replaced if needed before starting the plunge pool refilling. Not all monitoring instruments installed in the plunge pool to observe the behavior of the dam and the plunge pool during the rehabilitation works are needed for the dam's normal operation after the completion of the project. The final instrumentation plan for the new configuration of the dam after the completion of the rehabilitation works will be reviewed and approved by the PoE and the World Bank by end February 2025. It is crucial to ensure a smooth and comprehensive transfer of knowledge, lessons learned, and tools to facilitate optimal monitoring of the dam's behavior and performance in its new configuration. The five-year periodic dam safety review is scheduled for August 2026, following the completion of Phase II of the spillway rehabilitation work.

23. Dam safety plans – The review and update of the dam safety plans are in progress. A first draft version of the instrumentation plan and the O&M plan, which are part of the Kariba Standing Operations Procedures (SOP), were reviewed and commented on by the World Bank and still needs some improvement. The documents are under revision and final versions are expected before the upcoming supervision mission in April 2025. ZRA submitted an implementation action plan, which the Bank reviewed in August 2024. This plan covers a period of two years, ending in August 2026 and includes the design, supply, installation and commissioning of the Early Warning System (EWS). The EWS design contract was signed in May 2024 but only became effective in July 2024. The first phase of the assignment, which includes the inundation (flood) mapping and design of the EWS, is expected to be completed by March 2025. The EPP will then be reviewed and improved by ZRA to integrate the results of the hydraulic modelling and the design of the EWS.

C. RATIONALE FOR ROJECT RESTRUCTURING

24. The project design and the project restructuring carried out in June 2022 envisaged that the second phase of spillway refurbishment cannot be executed in parallel with the ongoing first phase refurbishment works, thus requiring the tendering to be completed afterward. The restructuring further envisaged that because of this, it was likely that the work on the spillway would be extended by at least 18 months beyond the current closing date and an assessment would be necessary at the time of current project closing date. The proposed extension of the closing date will allow for the completion of all the remaining rehabilitation works on the project, specifically the remaining works on Component 3 Spillway refurbishment.

II. DESCRIPTION OF PROPOSED CHANGES

25. The proposed restructuring seeks to extend the Project end date by 22 months, from February 28, 2025, to December 31, 2026. This is the first extension of the project closing date and will allow for the completion of all the remaining rehabilitation works on the project. The full project amount is committed in ongoing activities. No other changes to the project are envisioned through this restructuring. Furthermore, the Project's Development Objective remains achievable, the performance of the Borrower remains moderately satisfactory, and the World Bank and the Borrower agreed on actions that will be undertaken by the Borrower to complete the project.

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III. PROPOSED CHANGES

Operation Information	Proposed Changes	Operation Information	Proposed Changes
Disbursements Estimates	Yes	Loan Closing Date Extension	Yes
Development Objective	No	Implementation Schedule	Yes
Safeguard Policies Triggered	No	Loan Cancellations	No
ISDS	No	Reallocations	No
MFD/PCE	No	Financial Management	No
Results	No	Procurement	No
Risks	No	Institutional Arrangement	No
Legal Covenants	No		
Conditions	No		
Implementation Modalities	No		
Disbursements Arrangements	No		
DDO	No		
Clients	No		
Appraisal Summary	No		
Components	No		

IV. DETAILED CHANGE(S)

COSTS & FINANCING

Private Capital Facilitation

Is this an MFD-Enabling Project (MFD-EP)?

Is this project Private Capital Enabling (PCE)?

LOANS

Loan Closing

Loan/Credit/Trust Fund	Status	Original Closing	Revised Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IDA-55630-001	Effective	28-Feb-2025	28-Feb-2025	31-Dec-2026	30-Apr-2027
TF-19029-001	Effective	30-Sep-2019	28-Feb-2025	31-Dec-2026	30-Apr-2027

DISBURSEMENTS

Operation Dates & Projection Details

Reasons to change the full Disbursement date and/or the projection

Restructuring

Implementation Start Date	Operation Closing Date
09-Dec-2014	28-Feb-2025

Projected Date for Full Disbursement

01-Jan-2027

Expected Disbursements (in US $) (Absolute)

Year	Original Estimation at Preparation (Approval Package – 06 Nov 2023)	Revised Estimation	Actual
FY2015	0.00	0.00	0.00
FY2016	0.00	1,000,158.16	832,039.87
FY2017	0.00	1,306,594.76	1,306,594.76

FY2018	0.00	2,185,081.18	2,185,081.18
FY2019	0.00	3,838,650.15	3,941,350.11
FY2020	0.00	4,938,807.69	7,742,228.11
FY2021	0.00	3,423,427.72	5,143,518.57
FY2022	0.00	8,096,000.04	9,259,309.11
FY2023	0.00	0.00	4,142,524.34
FY2024	0.00	0.00	6,752,728.99
FY2025	0.00	0.00	5,682,515.04
FY2026	0.00	0.00	0.00
FY2027	0.00	0.00	0.00