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Report No: PAD5131

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT  
ON A  
PROPOSED CREDIT

IN THE AMOUNT OF US\$200 MILLION

TO THE

UNITED REPUBLIC OF TANZANIA

FOR A

SECOND TANZANIA INTERMODAL AND RAIL DEVELOPMENT PROJECT

MARCH 6, 2024

Transport Global Practice  
Eastern and Southern Africa Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective {February 29, 2024})

Currency Unit = **Tanzania Shillings  
(TZS)**

**US\$1 = TZS 2,525**

**FISCAL YEAR  
July 1 – June 30**

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## ABBREVIATIONS AND ACRONYMS

AWPB	Annual Work Plan and Budget
BoT	Bank of Tanzania
BRN	Big Results Now
CBA	Cost-Benefit Analysis
CCDR	Country Climate and Development Report
CERC	Contingent Emergency Response Component
CGR	Cape Gauge Railway
CPA	Certified Public Accountant
CPF	Country Partnership Framework
CPCS	Canadian Pacific Consulting Services
CWR	Continuous Welded Rails
EHS	Environmental Health and Safety
EIRR	Economic Internal Rate of Return
ERMS	Enterprise Resource Management System
ESCP	Environmental and Social Commitment Plan
ESHS	Environmental, Social, Health, and Safety
ESIA	Environment and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
ESS	Environmental and Social Standards
FIRR	Financial Internal Rate of Return
FM	Financial Management
FYDP	Five-Year Development Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoT	Government of Tanzania
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
ICR	Implementation Completion and Results Report
IFR	Interim Financial Report
IPF	Investment Project Financing
JICA	Japan International Cooperation Agency
LATRA	Land Transport Regulatory Authority
LSMS	Living Standards Measurement Survey
M&E	Monitoring and Evaluation
MGR	Meter Gauge Railway
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoW	Ministry of Water
MoT	Ministry of Transport
NDC	Nationally Determined Contribution
NeST	National e-Procurement System

NIRC	National Irrigation Commission
NOCP	National Open Competitive Procedure
NPV	Net Present Value
NTP	National Transport Policy
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
PDO	Project Development Objective
PIT	Project Implementation Team
PMU	Procurement Management Unit
PPP	Public-Private Partnership
PPRA	Public Procurement Regulatory Authority
PPSD	Project Procurement Strategy for Development
PS	Permanent Secretary
RAP	Resettlement Action Plan
REGROW	Resilient Natural Resource Management for Tourism and Growth
RPF	Resettlement Policy Framework
SEA-SH	Sexual Exploitation and Abuse-Sexual Harassment
SEP	Stakeholder Engagement Plan
SGR	Standard Gauge Railway
SMS	Safety Management System
SPC	Shadow Price of Carbon
SPD	Standard Procurement Document
STEM	Science, Technology, Engineering, and Math
STEP	Systematic Tracking of Exchanges in Procurement
TANePS	Tanzania National e-Procurement System
TAZARA	Tanzania Zambia Railway Authority
TEU	Twenty-foot Equivalent Unit
TIRP	Tanzania Intermodal and Rail Development Project
TIRP-2	Second Tanzania Intermodal and Rail Development Project
TPA	Tanzania Ports Authority
TRC	Tanzania Railways Corporation
TSIP	Transport Sector Investment Program
TZS	Tanzanian Shilling
UNDB	United Nations Development Business
UNFCCC	United Nations Framework Convention on Climate Change
US\$	United States Dollar
VfM	Value for Money
VGPF	Vulnerable Groups Planning Framework
WBG	World Bank Group
WRBWB	Wami/Ruvu Basin Water Board

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**DATASHEET****BASIC INFORMATION**

Project Beneficiary(ies) Tanzania	Operation Name Second Tanzania Intermodal and Rail Development Project		
Operation ID P176682	Financing Instrument Investment Project Financing (IPF)	Environmental and Social Risk Classification Substantial	

**Financing & Implementation Modalities**

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternative Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Expanded Implementation Support (HEIS)

Expected Approval Date 28-Mar-2024	Expected Closing Date 31-Dec-2029
Bank/IFC Collaboration No	

**Proposed Development Objective(s)**

To improve safety, climate resilience and operational efficiency of the railway along the Dar es Salaam to Isaka segment in Tanzania.

**Components**

# The World Bank

Second Tanzania Intermodal and Rail Development Project (P176682)

Component Name	Cost (US\$)
Component A: Strengthening of Railway Infrastructure and Support of Transport Studies	129,170,000.00
Component B: Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu Section	55,300,000.00
Component C: Operational and Institutional Support	15,530,000.00
Component D: Contingent Emergency Response	0.00

## Organizations

Borrower: The United Republic of Tanzania  
Implementing Agency: National Irrigation Commission (NIRC), Tanzania Railways Corporation (TRC)

## PROJECT FINANCING DATA (US\$, Millions)

### Maximizing Finance for Development

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

**Is this project Private Capital Enabling (PCE)?** Yes

### SUMMARY

Total Operation Cost	200.00
Total Financing	200.00
of which IBRD/IDA	200.00
Financing Gap	0.00

### DETAILS

#### World Bank Group Financing

International Development Association (IDA)	200.00
IDA Credit	200.00

#### IDA Resources (US\$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
National Performance-Based Allocations (PBA)	200.00	0.00	0.00	0.00	200.00
<b>Total</b>	<b>200.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>200.00</b>

#### Expected Disbursements (US\$, Millions)

WB Fiscal Year	2024	2025	2026	2027	2028	2029	2030
Annual	5.40	20.70	73.50	50.40	20.60	18.60	9.26
Cumulative	5.40	26.10	99.60	150.00	170.60	189.20	198.46

#### PRACTICE AREA(S)

##### Practice Area (Lead)

Transport

##### Contributing Practice Areas

Agriculture and Food; Water

#### CLIMATE

##### Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Appraisal Document

#### SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Moderate
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate

4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Moderate
6. Fiduciary	● Low
7. Environment and Social	● Substantial
8. Stakeholders	● Substantial
9. Overall	● Substantial

## POLICY COMPLIANCE

### Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes    [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes    [✓] No

## ENVIRONMENTAL AND SOCIAL

### Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

**LEGAL****Legal Covenants****Sections and Description**

Section I.A.2 of Schedule 2 to the Financing Agreement: GoT to establish by not later than three (3) months after effectiveness, and thereafter maintain throughout the period of Project, a Project Steering Committee ("PSC") co-chaired by the Permanent Secretaries of MoT and MoA, to meet periodically and to provide policy guidance and high-level oversight to TRC and NIRC.

Section I.C.1 of Schedule to TRC Project Agreement TRC to develop, by not later than two (2) years after effectiveness, a business plan satisfactory to the Association.

Section I.C.2 of the Schedule to TRC Project Agreement TRC to enter into a Track Access Agreement, by not later than forty (40) months after effectiveness, with one or more private operators granting them trackage rights, on a non-discriminatory basis.

Sections I.D.1 of the Schedule to TRC and NIRC Project Agreement NIRC and TRC to prepare and furnish to Bank, by no later than March 15th and March 31st of each year(respectively), during the implementation of their Respective Parts of the Project, their annual work plan and budget containing all activities proposed to be carried out under their Respective Parts of the Project during the following Fiscal Year.

Section I.D.2(d) of the Schedule to the Project Agreement: NIRC to furnish to the Bank for review and comments, by not later than March 31, 2028 or the date on which at least ninety percent (90%) of the Credit has been disbursed, whichever occurs earlier: (i) the operational procedures with respect to the Moderate/Low Risk Dam(s) constructed, rehabilitated, and/or otherwise affected/impacted by the activities under Component B of the Project, including retention of written instructions for flood operations and emergency preparedness at such dams at all times; and (ii) the (updated) detailed dam Operations and Maintenance Plans and Emergency Preparedness Plans for the said dams.

Section I.E.1 of Schedule to NIRC Financing Agreement NIRC to prepare, by no later than December 30, 2026, and furnish to the PSC and the Bank, a time-bound medium term maintenance program and budgetary plan (the "Reservoir MP&BP") for NIRC to secure the necessary funding to ensure the medium to long-term sustainability of maintenance activities with respect to the reservoirs refurbished/rehabilitated in the Kinyasungwe Catchment Area under the NIRC's Respective Parts of the Project, and in conformity with the requirements set forth in the ESSs and the ESCP, the Dam Safety Plans, the Dam Construction Supervision and Quality Assurance Plan, the Dam Instrumentation Plan and the Dam Emergency Preparedness Plan to be prepared under the Project.

**Conditions**

Type	Citation	Description	Financing Source
Effectiveness	ARTICLE IV - 4.01 (a)	GoT and TRC and NIRC have entered into their	IBRD/IDA

		respective Subsidiary Agreements.	
Effectiveness	ARTICLE IV - 4.01 (b)	TRC has established the TRC-PIT.	IBRD/IDA
Effectiveness	ARTICLE IV - 4.01 (c)	NIRC has established the NIRC-PIT.	IBRD/IDA
Effectiveness	ARTICLE IV - 4.01 (d)	TRC and NIRC have prepared and adopted the Project Operations Manual.	IBRD/IDA
Effectiveness	ARTICLE IV - 4.01 (e)	TRC and NIRC have established, and fully operationalized, the Project grievance redressed mechanisms.	IBRD/IDA

### I. STRATEGIC CONTEXT

#### A. Country Context

1. **Tanzania's economy has steadily grown over the past two decades.** The graduation from lower-income status in 2020 to lower-middle-income status reflects sustained macroeconomic stability coupled with rich natural resource endowment and Tanzania's strategic geographic position. Inflation rates have been low—below 5 percent since 2018—and sustainable fiscal and current account deficits have been financed by a combination of domestic and external sources. Over the past two decades, investment has been a key driver of economic growth. The rise in overall investment translated into a sustained accumulation of capital stock and has consistently accounted for roughly two-thirds of real gross domestic product (GDP) growth.

2. **Despite steady growth, poverty reduction has been modest in the recent decade due to less inclusive growth concentrated in less labor-intensive sectors.** Between 2012 and 2018, poverty reduction slowed, growth became less inclusive, and inequality rose while the international poverty headcount (US\$1.90 per day in 2011 purchasing power parity) remained high and unchanged during this period, at 49 percent. In 2023, the poverty rate for mainland Tanzania was projected to have dropped from 27.0 percent in 2021 to 26.8 percent in 2022 whereas for Zanzibar it dropped from 34.9 percent in 2009 to 25.7 percent in 2019 with the fastest dropping rates observed in the urban areas. However, the number of people living in poverty increased given population growth.<sup>1</sup> Tanzania's economic growth has been driven by sectors such as construction, information and communication technology, and real estate, which employ less than 3 percent of the population. Additionally, low levels of education and inadequate labor skills have constrained poor households' access to productive employment opportunities in fast-growing sectors.

3. **Tanzania faces severe climate change challenges that endanger its natural resources and the well-being of its population.** The impacts of climate change encompass various aspects, including coastal zones, public health, energy supply, infrastructure, agriculture, and goods and services availability. Around one-quarter of Tanzania's population resides along the vulnerable mainland coast, exposed to rising sea levels and a high flood risk, while water scarcity and extreme heat threats are of medium concern. Climate-related disasters, particularly droughts and floods, have disrupted rural and urban communities and posed significant economic costs which contributed to overall climate insecurity. Tanzania's adaptation cost to current climate impacts is estimated at US\$500 million annually and projected to double if no action is taken, with individual events causing economic losses exceeding 1 percent of GDP<sup>2</sup>. Despite the Government's adoption of a National Climate Change Strategy in 2012, inadequate implementation of climate-resilient measures, including in the transport sector, has led to problems like railway closures and substantial economic losses.<sup>[3]</sup>

4. **Gender inequality is limiting Tanzania's ability to increase human capital and overall wealth per capita.** In 2014, women accounted for 35.5 percent of Tanzania's human capital wealth, while men accounted for 64.5 percent.<sup>[4]</sup> Losses in human capital wealth due to gender inequality in Tanzania are estimated at up to US\$111 billion. The gender gap in

<sup>1</sup> Tanzania Economic Update. Issue 18. The World Bank Group, 2023.

<sup>2</sup> Nationally Determined Contribution, July 2021, Vice President's Office, United Republic of Tanzania,

[https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA\\_NDC\\_SUBMISSION\\_30%20JULY%202021.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA_NDC_SUBMISSION_30%20JULY%202021.pdf) accessed on March 1, 2024

<sup>3</sup> GFDRR. (n.d.). Tanzania—River flood. Thinkhazard.Org. Retrieved December 12, 2023, from <https://thinkhazard.org/en/report/257-united-republic-of-tanzania/FL>

Multisectoral Kilosa-Gulwe-Igandu technical committee. (2022). *Preliminary Investigation Report for Integrated and Sustainable Flood Management affecting Kilosa-Gulwe-Igandu railway line*. Ministry of Works and Transport.

Nationally Determined Contribution (NDC) of Tanzania to the United Nations Framework Convention on Climate Change (UNFCCC), July 2021.

[https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA\\_NDC\\_SUBMISSION\\_30%20JULY%202021.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA_NDC_SUBMISSION_30%20JULY%202021.pdf).

World Bank Group. 2015. "Financing Climate-Resilient Growth in Tanzania." Environment and Natural Resources Global Practice Policy Note, Washington, DC: World Bank.

<sup>4</sup> Tanzania Economic Update, 12th Edition, July 2019.

agricultural productivity is estimated at 20–30 percent. Men and women control different assets and have different decision-making roles and responsibilities, generally resulting in an unequal situation that is disadvantageous to women.<sup>5</sup> The transport sector is traditionally male-dominated in terms of employment and related values.<sup>6</sup> The preliminary gender assessment of the railway sector in Tanzania identified that women are significantly underrepresented in both the public and private sector.<sup>7</sup> For instance, they make up 10 percent of Tanzania Railways Corporation (TRC) staff, 12 percent of TRC management, and 10 percent of the Tanzania Railway Workers Union. Women make up only 18 percent of TRC engineers, 12.9 percent of the station masters, zero percent of the more than 130 locomotive drivers, and only 2.4 percent of the over 1,400 skilled workers. In the private sector, women make up 12 percent of the 33,899 registered engineers. Gender gaps in the railway sector are due to gender stereotypes, lack of work-family balance policies, and limited opportunities for school-to-work transition. A gender survey of TRC conducted in 2022 confirmed that unequal access to education, particularly in science, technology, engineering, and math (STEM) between girls/women and boys/men is a key entry-level barrier in formal employment and is reported by 72.4 percent of the respondents. Women face specific barriers as locomotive drivers due to the relatively high cost of training and the requirements for obtaining a certificate.<sup>8</sup> The latest Living Standards Measurement Survey (LSMS) data for Tanzania show that only 22 percent of women versus 48 percent of men were in wage employment in the last 12 months.<sup>[9]</sup> In addition, women wage workers earn about 88 cents for each dollar earned by men.<sup>[10]</sup> Adding to this, the COVID-19 pandemic limited women's access to formal employment.<sup>[11]</sup>

## B. Sectoral and Institutional Context

5. **Tanzania is an important gateway serving its vast hinterland and six landlocked countries<sup>12</sup> but its transport network is not well integrated across road, rail, air, lake, and maritime routes.** While the network is relatively expansive, significant bottlenecks remain both in terms of capacity and condition of many of these links, restricting a seamless movement of people and goods and thus limiting the potential contribution of the sector to development. The country has a total road network of 181,189.77 km, of which 8.05 percent (14,602.24 km) is paved, and the rest is unpaved gravel and earth.<sup>13</sup> The roads are being managed by the Tanzania National Roads Agency (TANROADS) and the Tanzania Rural and Urban Roads Agency (TARURA). There are two existing railway systems with a total of 3,682 km: the Tanzania railway (2,707 km), a meter gauge railway (MGR) under TRC, and the Tanzania-Zambia railway line (975 km), a cape gauge railway (CGR) under the Tanzania Zambia Railway Authority (TAZARA). A third system of a standard gauge railway (SGR) along the Central Corridor<sup>14</sup> is being built in phases. The first phase from Dar es Salaam to Mwanza has five lots, with the first two lots between Dar es Salaam and Makutupora (in Manyoni, Singida) (541 route-km) almost completed and the remaining three lots between Makutupora and Mwanza (673 route-km) under construction. Implementation of the first lot of the second phase from Tabora to Kigoma (411 route-km) is also ongoing. The new line runs parallel to the MGR line. The maritime transport system comprises the coastal seaports of Dar es Salaam, Tanga, and Mtwara as well as lake ports at

<sup>5</sup> IFAD (International Fund for Agricultural Development). 2011. *Investing in Rural People*. Accessed May 2, 2020. <http://www.ifad.org/sf/index.htm>.

<sup>6</sup> UNECE (United Nations Economic Commission for Europe). "Gender and Transport." Accessed July 21, 2023. <https://unece.org/transport/gender-and-transport>.

<sup>7</sup> Based on an internal survey in TRC which was conducted during project preparation.

<sup>8</sup> The requirements to be certified as a locomotive driver include: (a) a certified copy of a basic training in locomotive driving from a recognized railway institute, and (b) a proof of completion of at least two years of practical and internship training in railway operations. See Land Transport Regulatory Authority (Registration and Certification of Crew) Regulations, 2020.

<sup>9</sup> The World Bank, Forthcoming. "LSMS+ Program in Sub-Saharan Africa: Findings on Individual-Level Data Collection on Labor and Asset Ownership and Rights." 2021.

<sup>10</sup> Global Wage Report (accessed September 5, 2021, <https://www.ilo.org/global/research/global-reports/global-wage-report/lang--en/index.htm>).

<sup>11</sup> Tanzania Economic Update. Issue 15. February 2021.

<sup>12</sup> Burundi, the Democratic Republic of Congo, Malawi, Rwanda, Uganda, and Zambia.

<sup>13</sup> TANROADS. (2023, December). *TANROADS performance review for FY2020/21-2022/23*. 16th Joint Transport Sector Review (JTSR), Arusha, Tanzania. TARURA. (2023, December). *Tanzania Rural and Urban Roads Agency*. 16th Joint Transport Sector Review (JTSR), Arusha, Tanzania.

<sup>14</sup> The Central Corridor in Tanzania is an economic corridor from the Dar es Salaam port westward to Kigoma, Tanzania's Northern hinterland (Mwanza and Kagera), and to the landlocked Democratic Republic of Congo, Burundi, Rwanda, and Uganda.

Lake Victoria, Tanganyika, and Nyasa under the Tanzania Ports Authority (TPA). The country also has 59 airports under the Tanzania Airports Authority and about 200 airfields operated by other agencies including the private sector. Surface transport (road and railway) is being regulated by the Land Transport Regulatory Authority (LATRA), maritime transport operations by the Tanzania Shipping Agencies Corporation, and aviation operations by the Tanzania Civil Aviation Authority.

**6. The SGR was one of the strategic projects for implementation under the National Five-Year Development Plan (FYDP-II) for 2016/17–2020/21 that was also included under FYDP-III for 2021/22–2025/26.<sup>15</sup>** One of the objectives of FYDP-III is to enhance the scope of Tanzania's benefits from strategic geographical opportunities through enabling improved business environment and strengthening the country's regional position as a hub for production, trade, supply, and transportation. The objective of the SGR—under FYDP-II—was to facilitate enhanced trade through better connectivity of the neighboring countries of Burundi, Rwanda, the Democratic Republic of Congo, and Uganda to and from the Port of Dar es Salaam. The 2,561 km SGR project was estimated to cost about US\$7.6 billion and increase train speed from the current 30–56 kilometers per hour (kph) on the existing line to 160 kph for coaches and 120 kph for wagons; and increase axle load from 13–20 tons to 35 tons and throughput volume from 214,987 tons to 17 million tons per year.

**7. The SGR and existing MGR are expected to complement the roads in transporting goods along the Central Corridor.** The FYDP also prioritized rehabilitation of the existing MGR that is planned to coexist with the SGR when completed, with the MGR primarily serving the Tanzanian hinterland with multiple stops. The coexistence of the two railway systems is expected to provide adequate capacity, in line with the increasing throughput. The participation of the private sector in the train operations—after the June 2023 parliamentary approval of the amendment to the Tanzania Railways Act Cap 170 to allow for open access train operations—is expected to facilitate higher utilization of the public tracks on both lines. The total throughput along the Central Corridor in 2021<sup>16</sup> was 17 million tons, which was predominantly (about 98 percent) carried by roads. The operations of both railways are expected to facilitate modal shift for freight toward railways, given the ongoing and planned expansion of the Dar es Salaam port.<sup>17</sup>

**8. The coexistence of the SGR and MGR in Tanzania is similar to the approach used in Kenya and in line with the 2009 East Africa Railway Master Plan.<sup>18</sup>** To facilitate modal shift toward rail and feed traffic to the SGR, in August 2019, the Government of Kenya required shippers with goods destined for the Nairobi area and beyond to transport their goods by rail rather than by road. The decision enabled nearly all containers to be moved by the SGR to the multimodal transfer facilities in Nairobi while general cargo (concentrate bulk) traffic remained with the MGR due to its direct connectivity through the available sidings to the industry premises. While the decision was reversed by the new government in September 2022, volumes, and type of freight on both SGR and MGR have remained stable since then.

**9. The transport sector is vulnerable to the impacts of climate change and natural hazards.** The natural hazard that presents the highest risk to the transport sector is flooding. Flooding damages transport infrastructure and disrupts the transport network, leading to delays and negative social and economic impacts. These risks are expected to increase in the future, with climate change increasing the frequency and intensity of catastrophic natural hazard events. A systematic climate vulnerability assessment of multimodal transport networks was conducted for Tanzania in 2018, which showed that with climate change, greater lengths of the transport network will be exposed to extreme fluvial flooding. The analysis estimated that the worst-case transport network disruption in Tanzania has the potential to cause a negative economic

<sup>15</sup> The National Five-Year Development Plan 20/21–2025/26 “Realizing Competitiveness and Industrialization for Human Development.” United Republic of Tanzania, June 2021.

<sup>16</sup> *Central Corridor Transport Observatory, 2021 Annual Report.* <https://centralcorridor-ttfa.org/>

<sup>17</sup> The rehabilitation of Berths 0 to 7 and deepening of the entrance channel at the Dar es Salaam port through Dar Maritime Gateway Development Project (Report No: PAD1462) was expected to increase port throughput from 15 m tons in 2016 to 25 m tons in 2025. At the same time, the Government plan of building four additional new berths (Berths 12–15) will likely increase the throughput to 40 m tons in 10 years.

<sup>18</sup> The East Africa Railway Master Plan of 2009 was developed by Canadian Pacific Consulting Services (CPCS) of Canada for the East African Community (EAC).

impact of US\$1.4 million per day at present and this would potentially increase to US\$2.5 million per day by 2030, due to disruptions caused by future fluvial flooding. The Central Corridor Railway Network is exposed to floods, erosion, and sand deposition. Risks are particularly high along the Kilosa-Gulwe-Igandu railway section. People in the section have been suffering from floods for more than 25 years but the impacts have worsened over the last few years.

**10. The existing Tanzania railway systems have been declining due to infrastructure and operational challenges.** The design annual freight capacity for both the central MGR and the TAZARA CGR lines is about 5 million tons each. However, the historical annual peak freight volume carried by the 100-year-old MGR and the TAZARA railways was 1.2 million tons and 1.5 million tons, respectively, in 2002 and 2005. Thereafter, the freight volumes have been declining and shifting to the roads running in parallel to the lines, mainly due to deteriorated infrastructure and inadequate investment for repairs and/or replacement of rolling stock that led to unreliable services. The freight carried in 2021/2022 by the MGR and TAZARA lines was 416,866 tons and 322,000 tons, respectively. Rail modal share is significantly lower than in other regions such as Asia and North America with active railways for freight services. For example, the freight shipments by rail in the United States in 2019 accounted for nearly 28 percent of all ton-miles, and the rail freight shipments in South Africa in 2013 accounted for 10.4 percent of all modes.

**11. The Tanzania Intermodal and Rail Development Project (TIRP, P127241) supported the Government to improve the MGR railway section between Dar es Salaam and Isaka (970 km).** The TIRP supported the Government of Tanzania (GoT) strategy ‘Big Results Now’<sup>19</sup> of 2012, to address transport bottlenecks. It was closed on September 30, 2022, and resulted in: (a) the rehabilitated infrastructure (track and bridges) increasing the axle load capacity from 13.9 tons to 18.5 tons for the section between Dar es Salaam and Tabora (840 km); (b) completed designs to rehabilitate the intermodal terminals of the Dar es Salaam port, Ilala, and Isaka; (c) additional rolling stock for TRC for their block train<sup>20</sup> (3 locomotives and 44 wagons); and (d) the drafting of economic and safety regulations for open-access train operations, which was approved by parliament nine months after its closure.

**12. Safety incidents along Tanzania's railway network have escalated despite improvements in tracks, due to increased train frequency, resulting in 123 fatalities over five years, averaging 24 per year.** Half of the serious injuries were caused by train-vehicle collisions or pedestrians being struck by trains. Notably, the Dar es Salaam to Isaka section, upgraded by TIRP, witnessed 25 fatalities, while 98 occurred elsewhere within the central railway network.<sup>21</sup> Root cause analyses of nine incidents identified encroachment by pedestrians, driver negligence, noncompliance with safety regulations, and inadequate safety measures at crossings as primary factors. Tanzania's railway system exhibits relatively high fatality rates compared to other freight railways, with the average of 20 yearly fatalities translating to about 125 per billion ton-km, contrasting sharply with lower rates in the United States and South Africa. The most problematic areas include railway crossings and urban zones with high incidents of trespassing.

#### C. Relevance to Higher Level Objectives

**13. Under its Vision 2025, Tanzania plans to achieve middle-income country status through attaining sustained growth.** Under FYDP-III, the focus is on “Realizing Competitiveness and Industrialization for Human Development.” This plan emphasizes “economic reform, industrial development, and the knowledge and ability to participate fully in international trade.” The GoT has made significant investments in infrastructure, particularly in roads, under FYDP I and II, including connecting most regional capitals with paved roads. Despite this progress on Tanzania’s transport infrastructure development, more investment is needed to maintain and improve the transport links, including improving the condition of trunk routes while expanding the share of the population with an all-season road network, the capacity

<sup>19</sup> The Big Results Now (BRN) initiative by the GoT proposed major reforms and investment proposition of about US\$2.3 billion along the central transport corridor between 2012 and 2015.

<sup>20</sup> The block train for TRC is a 40-container wagon freight train providing scheduled services between the Dar es Salaam port and Isaka intermodal terminals.

<sup>21</sup> TRC accidents database - data shared during project preparation. 2023.

and safety of regional airports and sea and lake ports, and upgrading of the rail network. While such infrastructure investments are individually impactful in their immediate surroundings, their wider coordination and integration offers the possibility of economies of scale, improved resilience resulting from the possibility for alternate routing, and reinforcing of impacts on growth.

**14. The project will address the existing central railway infrastructure bottlenecks that restrict links between the country's developing growth clusters and its role as a transit country for its neighbors.** Through these improvements, the project is expected to improve the incentives for the private sector to drive economic growth and generate wider economic benefits. In addition, by building human and institutional capacity, the project enhances productivity and contributes to sustainable growth as well as the modernization and greater efficiency of sector institutions. This effort is supported by both ongoing and planned World Bank-financed transport projects in Tanzania, as well as by investments made by the GoT and other development partners. It will also contribute to the realization of the mission of the National Transport Policy (NTP) of developing a safe, reliable, effective, and efficient transport network by addressing key infrastructure bottlenecks, which are limiting integration of the network, while supporting the relevant institutions to integrate aspects of sustainability more fully in the planning, implementation, operations, and maintenance of transport assets.

**15. The project aims to strengthen climate resilience of the transport sector and communities served and is aligned with Tanzania's climate and sectoral strategies.** The project is consistent with Tanzania's Nationally Determined Contribution (NDC) to the objectives of the Paris Agreement on Climate Change.<sup>22</sup> The NDC identifies, as a priority, climate-proofing of existing and new critical infrastructure for the transport and other sectors and promotion of integrated disaster risk management, enhancing emergency response capacities in line with climate risk profiles. The NDC also mentions the need to promote low-emission transport systems, including through investments in rail networks, as globally, the rail sector transports over 8 percent of the world's passengers and goods and accounts for only 3.6 percent of total transport emissions.<sup>23</sup> The project is also consistent with Tanzania's National Climate Change Response Strategy 2021–2026,<sup>24</sup> which mentions the impact of floods and overflowing rivers on railways and highlights the importance of ensuring that all infrastructure is climate resilient to reduce losses and disruptions. Existing infrastructure needs to be enhanced and retrofitted to be climate resilient. The country does not yet have a long-term low greenhouse gas emission development strategy<sup>25</sup> that can help strengthen and guide the NDC<sup>26</sup>, and the first Country Climate and Development Report (CCDR) is under preparation. The project is consistent with the objectives of the World Bank Group's Climate Change Action Plan 2021–2025,<sup>27</sup> the Next Generation Africa Climate Business Plan,<sup>28</sup> and the World Bank Africa Region Strategy (2019–

<sup>22</sup> NDC of Tanzania to the UNFCCC; July 2021. [https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA\\_NDC\\_SUBMISSION\\_30%20JULY%202021.pdf](https://unfccc.int/sites/default/files/NDC/2022-06/TANZANIA_NDC_SUBMISSION_30%20JULY%202021.pdf).

<sup>23</sup> IEA (International Energy Agency) and UIC (International Union of Railways). 2015. "Railway Handbook 2015: Energy Consumption and CO<sub>2</sub> Emissions." Organization for Economic Co-operation and Development International Energy Agency and International Union of Railways.

<sup>24</sup> National Climate Change Response Strategy 2021–2026; Vice President's Office; Division of Environment, Government Printer, Dodoma. Tanzania. [https://www.vpo.go.tz/uploads/publications/en-1640772745-NCCRS%202021-2026\\_%20Final\\_PK.pdf](https://www.vpo.go.tz/uploads/publications/en-1640772745-NCCRS%202021-2026_%20Final_PK.pdf).

<sup>25</sup> "Article 4, paragraph 19 of the Paris Agreement requires all Parties to strive to develop and communicate long-term low greenhouse gas emission development strategies - mindful of Article 2 and taking into account their common but differentiating responsibilities and respective capabilities, in light of different national circumstances. (UNFCCC. "Long-Term Strategies Portal." United Nations Climate Change. Accessed July 24, 2023. <https://unfccc.int/process/the-paris-agreement/long-term-strategies>).

<sup>26</sup> United Nations Development Programme. 2023. "What Are Long-Term Climate Strategies, and How Can They Help Us Tackle Climate Change?" *UNDP Climate Promise*, April 3, 2023. <https://climatepromise.undp.org/news-and-stories/long-term-climate-strategies-LTS-LTLEDS-climate-change>.

<sup>27</sup> World Bank Group. 2021. *World Bank Group Climate Change Action Plan 2021–2025: Supporting Green, Resilient, and Inclusive Development*. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/35799>.

<sup>28</sup> World Bank. 2020. *The Next Generation Africa Climate Business Plan: Ramping Up Development-Centered Climate Action*. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/34098>.

2023).<sup>29</sup> The Next Generation Africa Climate Business Plan highlights the urgency for countries to ramp up climate-smart development and emphasizes strengthening resilience and integrating climate adaptation in sectoral development plans and investments.

16. **In line with Tanzania's current FYDP-III, the project will support women's participation in the transport and agriculture sectors.** By expanding women's involvement in STEM fields, the GoT looks to strengthen the country's human capital to boost Tanzania's competitiveness and innovation. The project will support this objective while also contributing to the FYDP's social development goals to increase opportunities for women and girls in education and training. The project also supports the World Bank's vision for women and girls' empowerment and access to more and better jobs and leadership positions, as outlined in the current World Bank Group Gender Strategy (FY16–23) and envisioned in the upcoming Gender Strategy 2024–2030. Project activities will also be guided by one of the main principles under the Country Partnership Framework (CPF) which promotes gender inclusion to narrow economic and social gaps between women and men.

17. **The project is aligned with the World Bank Group (WBG) CPF for Tanzania (FY18–FY22) (Report No. 121790-TZ) discussed by the Board of Directors on February 14, 2018<sup>30</sup>.** The CPF supports the country's Vision 2025 and its ongoing FYDP-III, envisions a more spatially inclusive approach to development so that the benefits of growth are sustainable and quality services are widely shared. Unlocking the key transport infrastructure bottlenecks for the efficient movement of goods and people within the country, together with the institutional support, will help in the realization of the CPF's Focus Area 1 (Enhance Productivity and Accelerate Equitable and Sustainable Growth), especially Objective 1.7 (Capture Tanzania's potential as a maritime gateway and regional trade hub).

## II. PROJECT DESCRIPTION

### A. Project Development Objective

#### PDO Statement

18. To improve safety, climate resilience, and operational efficiency of the railway along the Dar es Salaam to Isaka segment in Tanzania.

#### PDO Level Indicators

19. Achievement of the PDO will be measured by the railway infrastructure being able to allow for train operations throughout the year, having at least one private open-access train operator and improved safety.

#### Project Outcome Indicators

- Operational efficiency: Average transit time from Dar es Salaam to Isaka (hours)
- Climate resilient infrastructure: Number of days of railway traffic disruption due to flooding in a year (days)
- Railway safety: Annual number of at-grade traffic incidents at the railway crossings per 100 train-km along the corridor (number).

<sup>29</sup> Supporting Africa's Transformation: World Bank Africa Strategy for 2019–2023. <http://pubdocs.worldbank.org/en/485321579731572916/AFREC-Strategy-Trifold-Brochure.pdf>.

<sup>30</sup> A new CPF is currently being developed and is expected to be completed before June 2024.

## B. Project Components

### Component A: Strengthening of Railway Infrastructure and Support of Transport Studies (US\$129.17 million)

20. This component combines railway infrastructure upgrading to allow more efficient and climate-resilient train operation with key studies to further improve the railway. It will comprise five subcomponents explained below.

21. **Safety strengthening of the Dar es Salaam to Tabora Railway Infrastructure.** This activity will include the refurbishment of selected track sections (257.4 km) and bridges in the Dar es Salaam to Tabora railway track section and strengthening the associated safety infrastructure. The project will support the strengthening of safety at the ‘rail and road’ at-grade level crossings and providing pedestrian safety at townships. The improvements will include the installation of automatic operated bars/booms at the rail-road crossing points and/or speed reduction measures (speed humps or rumble strips) to reduce the speed of approaching vehicles from the paved roads. The project will further support the installation of chain-link barriers to deter pedestrians from trespassing on the railway track in townships. The railway track refurbishment is planned to be conducted at Kikombo-Bahi (74.8 km), Makutupora-Manyoni (33.6 km), and Kitaraka-Igalula (149 km) and will include strengthening works that were not implemented under the TIRP due to cost overruns and resulting budget constraints. The works will include continuous welded rails (CWR) on 308.1 km of the rail track, complete track renewal on 33.6 km length, replenishment of ballast, and strengthening of the track formation.

22. **Rehabilitation of the Tabora-Isaka railway line (130 km).** This section is currently the weakest (15-ton axle load) link for the container block train operations and is to be rehabilitated to support consistent 18.5-ton axle load capacity from the Dar es Salaam port to Isaka railway terminal. The railway track and bridges are weak, and this is the only section with 56/60 pounds per yard rails compared to the rest of the section with 80 pounds per yard rails. As a result, the operation of the 3,000 hp container block train locomotive from Tabora to Isaka currently requires the train to be split at Tabora and continue with two 2,200 hp locomotives to Isaka. The double handling causes delays and affects the reliability and efficiency of services. The rehabilitation includes complete renewal of tracks, installation of CWR of 80 pounds per yard, and rehabilitation of bridges.

23. **Rehabilitation of the flood-prone section at Kilosa-Gulwe-Igandu (84 km).** This section is currently weak due to periodic flooding and will be rehabilitated by raising the embankment and providing flood protection infrastructure along the railway section. The rehabilitation works will be conducted after implementation of flood control measures within the Kinyasungwe catchment area, under Component B.

24. **Improvement of intermodal terminals and preparation for operations.** The two existing intermodal terminals of Ilala and Isaka will be rehabilitated under the project. They will be made compliant with national building codes and have energy performance standards equivalent to Level 1: EDGE<sup>31</sup> Certification. The third intermodal terminal at the Dar es Salaam port is being implemented through GoT funding. The completion of realignment of rail and loading platform at the three intermodal terminals will reduce train in-and-out maneuvers and address cargo loading and unloading delays at the intermodal terminals. The project will support the preparation of feasibility studies and regulatory and contractual documents for the implementation of public-private partnerships for the terminals at Ilala and Isaka and ensure seamless integration of operation with the Dar es Salaam port intermodal terminal.

25. **The infrastructure upgrading will benefit from ongoing and planned studies that will influence policy strategies and designs.** Key studies will include: (a) analysis of policy strategies for maximizing the usage of railway (modal shift), and (b) engineering design for the rehabilitation of additional MGR sections of Isaka-Mwanza, Tanga-Arusha (inclusive of the link line from Ruvu junction to Mruazi Junction), and Kilosa-Mikumi lines to climate resilient standards. In addition, the ongoing climate and disaster risk assessment study along the Dar es Salaam-Isaka line will inform the designs of the infrastructure activities under the component. The study is being supported by a Japan-funded Quality Infrastructure

<sup>31</sup> EDGE = Excellence in Design for Greater Efficiencies.

Investment Partnership World Bank-executed trust fund. Further, the Korea Green Growth Trust Fund is providing a World Bank-executed trust fund for conducting data collection and digitization of the Tanzania central railway network and catchment area for climate resilience and operational efficiency. Finally, the Global Center on Adaptation has agreed to provide technical assistance to deepen the climate risks assessment and provide an investment rationale with flexible planning under uncertainties for the implementation of nature-based-solutions and water reservoirs reinforcement to increase the railway's climate resilience.

**Component B: Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu Section (US\$55.30 million)**

26. The component will support the analytical studies for design of flood control systems along the catchment area of the Kilosa-Gulwe-Igandu section, detailed engineering designs and rehabilitation/restoration of six flood control reservoirs at the Kinyasungwe catchment area to reduce flooding of the section.

27. **The flooding of the Kilosa-Gulwe-Igandu railway section leads to railway closure for about three to four months annually.** The recurring flooding is mainly due to heavy rains and lack of adequate soil cover upstream of the basin catchment, especially in the Dodoma region. The heavy rains in areas such as Chenene and Makutupora result in high runoff, causing flash floods downstream including along the Kilosa-Gulwe-Igandu railway section. The environmental degradation and deforestation have resulted in a lack of soil cover, therefore facilitating the runoff speed and flash floods in all river streams from upstream to downstream. Apart from infrastructure washout and community displacement, the flooding also results in massive deposition of silt/sand, causing the ground level to rise by about 500 mm annually at Kilosa.

28. **The water levels were historically controlled by six reservoirs upstream of the section under review.** A 2016 Japan International Cooperation Agency (JICA) report identified six upstream reservoirs—Kidete, Kimagai, Buigiri, Ikowa, Hombolo, and Dabalo—that were developed in the 1950s and 1960s for irrigation and water supply and also served as flood control reservoirs. Most of the reservoirs have been either washed away or were significantly sedimented due to lack of maintenance, therefore no longer effectively supporting irrigation, water supply, and/or flood control in the areas. The Ministry of Agriculture (MoA), through the National Irrigation Commission (NIRC), is supporting the construction of two new reservoirs at Membe (immediately downstream of Dabalo reservoir) and Msagali (immediately upstream of Ikowa reservoir) within the Kinyasungwe catchment area for irrigation schemes.

29. **The project will support the rehabilitation of the six existing flood control reservoirs.** The project will support the feasibility study and detailed design of flood relief structures (ponds/reservoirs) at the Kinyasungwe catchment area that quantify the flooding (flood modeling) along the Kilosa-Gulwe-Igandu section and propose the design for rehabilitation/restoration for effective flood control of the railway segment. The restoration/rehabilitation of the selected flood control reservoirs will be supported by the project. NIRC will be responsible for operation and maintenance of the reservoirs and the project has included a legal covenant to ensure a maintenance program is developed and approved by the MoA, including a sustainable source of funding for maintenance of rehabilitated/restored reservoirs by December 30, 2026.

30. **The project will also provide institutional capacity strengthening and support the preparation of large-scale irrigation schemes for the six reservoirs.** NIRC will be provided with technical specialists for effective review of designs and monitoring of infrastructure implementation, as well as a consulting team for supervision of contracts. The Dam Safety Unit under the Water Resources Department in the Ministry of Water (MoW) will be supported with dam safety technical specialists to review the safety of designs, provide approval and construction certificate, and provide independent quality monitoring during implementation. The project will also support capacity strengthening for operations and maintenance of the flood control reservoirs. Finally, the project will support the feasibility study and detailed design for development of a multipurpose water utilization program for the six reservoirs that will include water supply to surrounding communities, fisheries, livestock, and irrigation schemes for both livelihood of surrounding communities and large commercial agricultural investors through public-private partnership (PPP).

**Component C: Operational and Institutional Support (US\$15.53 million)**

31. **Development of a safety culture in the railway network and the supporting regulatory agencies is critical for safe operations and reduction/elimination of safety incidents.** Institutional safety support will include updating of the Safety Management System (SMS); updating of the operational manual to reduce the likelihood of human errors; guiding planned improvements in level-crossing protection and the deployment of new electronic train control and warrant system; guiding of the Project Implementation Team (PIT); and training of TRC, LATRA, and Ministry of Transport (MoT) staff. In addition, the institutional capacity of TRC, LATRA, and MoT will be strengthened to carry out the project activities, including maintaining a PIT to ensure compliance with procurement, financial management, social and environmental, and technical and legal requirements of the project.

32. **The operationalization of open-access trains will increase infrastructure asset utilization and influence modal shift in favor of railways for freight cargo.** The amendment to the Tanzania Railways Act in June 2023 has formally allowed open-access train operations along the TRC network. The project will support the preparation of technical instruments (for example, network statement) and capacity strengthening to enable TRC to become an infrastructure manager. Further, the project will support updating the economic and safety regulations as well as providing technical assistance to enable LATRA to perform its regulatory function under open-access arrangements. The support will enable TRC to attract at least one private train operator by December 30, 2027.

33. **Development of an asset management system for railway tracks is key for the sustainability of operations.** The project will support operation of the ‘track recording car’ for effective network data collection, provide capacity strengthening for data analysis, and support preparation of maintenance strategies and programs. The support will enable TRC to switch to condition-based maintenance (from currently force account maintenance methods) as part of their enterprise-wide asset management transformation.

34. **The project will contribute to addressing the identified barriers to women’s participation in the railways sector to provide safe, decent, and equal employment opportunities in both technical and non-technical positions.** An analysis of the barriers that women face at different levels in the railway sector will be conducted to define specific activities. Based on preliminary analysis, activities will include: (a) building a pipeline of young experts by providing three-year financial support to graduate engineers, at least half of whom will be women, to participate in the existing Structured Engineers Apprenticeship Program to enable them to register as professional engineers and thus expand their employment opportunities in the sector and in the market (including TRC, TAZARA, and private sector consultants and contractors), and (b) supporting the training and certification<sup>32</sup> of women as locomotive drivers. The project will support developing and carrying out gender-inclusive capacity building programs, including trainings for women contractors, the implementation of a resource- and time-bound institutional gender equality policy and action plan, setting up a database to trace/monitor equitable gender participation in the sector, and designing and conducting tailor-made gender capacity building for TRC’s staff.

**Component D: Contingent Emergency Response (US\$0 million)**

35. **This zero-dollar component will allow for swift reallocation of credit proceeds from the other components to provide immediate emergency recovery support following an eligible crisis or emergency.** Following an eligible crisis or emergency, the government may request that the World Bank reallocate project funds to support emergency response and reconstruction. When triggered this component will draw uncommitted resources from other project components to cover emergency response. Activation of the CERC (and financing to be provided) will require the World Bank’s no-objection upon: (a) declaration of an emergency by the GoT; (b) a request letter for CERC activation and the evidence required to determine the eligibility of the emergency as defined in the CERC Manual; (c) an Emergency Action Plan,

<sup>32</sup> This would include the licensing and the two-year internship (similar to the apprenticeship program).

including the emergency expenditures to be financed; and (d) meeting the environmental and social requirements as agreed in the Environmental and Social Commitment Plan and CERC Manual. TRC will be responsible for the CERC, including preparing the CERC Manual to guide its activation and implementation arrangements (including but not limited to defining CERC activities, eligible expenditures, and arrangements for financial management, procurement, and compliance with ESF and Paris alignment), which will be approved by the World Bank.

36. The overall project financing structure is presented in Table 1.

**Table 1. Summary of Cost Estimates**

Project Components	Total (US\$, millions)
Component A: Strengthening of Railway Infrastructure and Support of Transport Studies	129.17
Component B: Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu Section	55.30
Component C: Operational and Institutional Support	15.53
Component D: Contingent Emergency Response	—
<b>TOTAL</b>	<b>200.00</b>

### C. Project Beneficiaries

37. **The direct beneficiaries of the project are the current and potential users of the railway services and rehabilitated reservoirs.** The railway infrastructure users include public and private train operators, port operators, freight-forwarding agencies, shippers, importers, and exporters who are expected to use rehabilitated freight facilities and rail services along the Dar es Salaam-Isaka rail segment and be able to operate their own trains with license. Other direct beneficiaries include small-scale farmers along the Kinyasungwe catchment area using the reservoirs for agricultural purposes. The project is also expected to indirectly benefit the broader public, residents along the railway line, tradable sectors of the economy, and, ultimately, customers and producers both inside and outside Tanzania. The estimated number of direct beneficiaries for the entire project is 857,519 and over 3.5 million indirect beneficiaries representing about 5 percent of the country's eligible population.

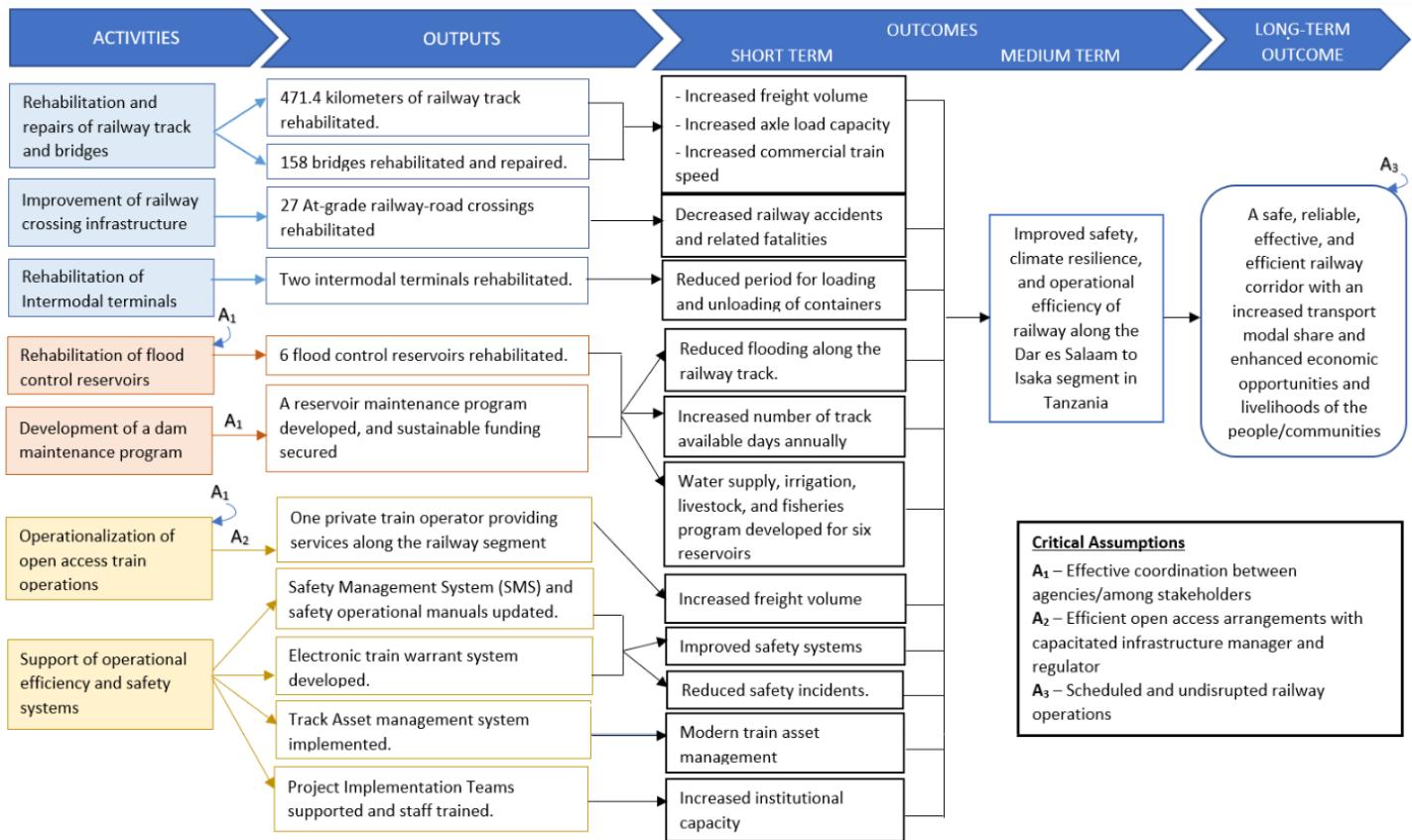
38. **Through the component that will strengthen the climate resilience of the Kilosa-Gulwe-Igandu section, the project will benefit communities around the Kinywasungwe catchment area which is expected to reach a population of 1.65 million<sup>33</sup> by 2025.** The project will support socioeconomic activities such as irrigation, livestock keeping, and fishery through rehabilitation of the flood control dams and hence support the Tanzania Development Vision 2025 target of high-quality livelihood through food self-sufficiency and food security goal.

### D. Results Chain

39. The assumption underpinning the project's Results Chain is that by investing in strengthening of railway infrastructure and climate resilience of Kilosa – Gulwe – Igandu section, and supporting institutions, the project will improve safety, climate resilience and operational efficiency of the railway and increase its modal share. The Results Chain is shown in Figure 1.

<sup>33</sup> About 26 percent of the eligible population of the Dodoma and Morogoro regions

**Figure 1: Results Chain**



### E. Rationale for Bank Involvement and Role of Partners

40. **The project will build on the existing strong partnership between the GoT and the World Bank in the transport sector.** The World Bank has a strong and sustained track record as a key partner across the sector, with previous and ongoing projects in the roads, aviation, ports, rail, rural, and urban transport. Recognizing the important contribution of this project for integration of the overarching transport network, this continued engagement is essential to achieve longer-term goals that extend beyond the scope of any specific operation. The project also builds on a long-standing partnership with Tanzania's transport sector institutions, including TRC that has experience as a lead implementing agency of previous railway projects. This partnership has built a level of cooperation and trust necessary to effectively execute such extensive civil works, as well as continue to institute reforms and build the capacity of railway institutions on technical issues, Environmental and Social Standards (ESS), project management, policy development, and planning.

41. **The World Bank is a key partner among donors in the sector.** The Transport Sector Development Partners Group has been functional for several years and is chaired by members of the group on a rotating basis. The development partners work within the framework of the transport sector investment program (TSIP)<sup>34</sup> and have all been supporting transport sector activities for years. While some donors have moved toward budget support, most of the sector funding is received by parallel financing. There is an annual Joint Transport Sector Review with the GoT where the status of the sector is discussed and implementation plans of TSIP are reviewed and updated. Members include the World Bank; African Development Bank (AfDB); Foreign, Commonwealth, and Development Office (FCDO), the European Union (EU); JICA; United States Agency for International Development; TradeMark Africa (formerly TradeMark East Africa; Korea Exim Bank;

<sup>34</sup> The third phase of the Transport Sector Investment Program (TSIP-3) ended in 2022 and the TSIP-4 is currently under preparation.

*Agence Française de Développement; Kreditanstalt für Wiederaufbau; and Arab Bank for Economic Development in Africa.* There are quarterly Joint Technical Committee meetings where progress made in implementing the annual plans is reviewed. Experience gained and challenges in the implementation of similar projects are shared, and issues are presented to the attention of the MoT for resolution.

42. **World Bank involvement adds value and complements previous efforts by other donors.** The World Bank support to the project will bring a range of expertise in the railway sector to enable the client to acquire international experience. Specifically, the World Bank will support the GoT in areas of designing, climate change and resilience, railway safety, and management of social and environmental risks, all of which will strengthen the railway agency's capability in managing projects more efficiently. The activities under the project will address the gaps that were not addressed under the TIRP.

#### **F. Lessons Learned and Reflected in the Project Design**

43. **The project draws on valuable lessons from TIRP.** The TIRP's objective was to deliver a reliable open-access infrastructure on the Dar es Salaam-Isaka rail segment. Lessons have also been drawn from other past Tanzanian railway projects such as the Railways Restructuring Project (P002757) and the Central Transport Corridor Project (P078387).

44. **Railway reforms take time and require interim targets and persistence beyond the lifespan of a single project.** For TIRP to be able to realize its objective of an open-access railway infrastructure along the corridor, the Railway Act of 2017 had to be amended in June 2023 to provide relevant statutes. However, the strong buy-in from the implementing agencies and their respective ministries was not enough to achieve this objective within the project's life cycle. To avoid a similar challenge, Component C under the TIRP-2 includes an activity to provide support to TRC and LATRA in implementation of open-access operations. In addition, three intermediate results indicators have been added to track progress on the open-access and container block train unit operations and the formation and operationalization of the Infrastructure Manager unit within TRC.

45. **Building on the experience from past railway projects in Tanzania where major changes in institutional arrangements negatively affected project implementation, a skills and knowledge retention component has been embedded.** The previous individual consultants who performed well in TIRP have been retained to carry on their duties in TIRP-2 together with a team of staff from TRC, most of whom were also involved in TIRP. Furthermore, all training given to TRC, LATRA, and MoT staff will consider the benefits of the whole sector and not be limited to this project or the Central Corridor.

46. **The monitoring and evaluation (M&E) capacity of the implementing agencies needs to be deepened.** This will be done through training to develop robust M&E designs and frameworks under Component C and/or the support of the transport studies element under Component A. An M&E specialist will be included as part of the PIT under the support to the PIT activity in Component C.

47. **A separate follow-on project was prepared rather than additional finance, to allow for significant change of project scope and scale-up.** TIRP-2 has been specifically designed and prepared to achieve a larger impact of improving safety, climate resilience, and operational efficiency of the Dar es Salaam to Isaka segment of the Central Corridor. Component A has been designed to support improvement of the railway infrastructure gaps not addressed under TIRP. Component B (Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu Section) was added to implement a permanent solution for addressing the flooding challenge. Component C includes activities for capacity strengthening of the railway institutions for effective open-access operations, implementation of the TRC business plan, and asset management.

### III. IMPLEMENTATION ARRANGEMENTS

#### A. Institutional and Implementation Arrangements

48. **TRC is the implementing agency for Components A, C, and D of the project and will be responsible for financial management (FM) and procurement activities.** TRC has gained experience in implementing World Bank-funded projects during implementation of TIRP through the PIT. For this project, TRC will prepare a project operational manual and set up the PIT for support, monitoring, and coordination of all aspects of the project before effectiveness. TRC will also coordinate and assist LATRA in setting up a timely, effective, and efficient legal and regulatory structure for open access in the rail segment to foster efficient cross-border transportation and trade (imports and exports) for the beneficiaries. **NIRC will be the implementing agency for Component B activities** and will likewise prepare a project operational manual and establish a dedicated PIT with technical, fiduciary, environment and social, and monitoring teams before effectiveness to ensure smooth implementation. The MoA, MoW, MoT, Wami/Ruvu Basin Water Board (WRBWB), TPA, and LATRA will be the project's supporting entities. TRC and MoT will, as appropriate, call on institutions' training to support the project in skills upgrading and in support of gender inclusion, career development, and capacity training in open-access operations.

49. **Overall oversight for the project will be the responsibility of the Steering Committee, with the Technical Committee providing technical guidance to the Steering Committee on cross-cutting technical issues.** The Steering Committee will be established not later than three months after effectiveness and will comprise the Permanent Secretary (PS) of Transport under the MoT and the PS MoA with representatives from Ministry of Finance (MoF), President's Office - Planning Commission, MoW, TRC, NIRC, WRBWB, LATRA, TPA, Regional Administrative Secretaries from Morogoro and Dodoma regions, Ministry of Land Housing and Human Settlement, Ministry of Livestock and Fisheries, and the Attorney General. The Steering Committee will meet biannually to review project progress toward the development objectives, approve the Annual Workplan and Budget (AWPB), and help resolve any interagency issues that may arise. The PITs will report on technical matters to the Technical Committee and provide an overall implementation progress report to the Steering Committee. The Technical Committee will comprise the Director Generals of TRC and NIRC, technical directors and technical assistants from TRC, NIRC, MoT, MoA and MoW, TRC and NIRC project coordinators and managers, and the Director of the Dam Safety Unit from the MoW. The implementation arrangements of the project and support plan are detailed in Annex 1.

#### B. Results Monitoring and Evaluation Arrangements

50. **The project design includes a set of monitoring indicators for effective measurement of the project's progress toward achieving its objectives and in advancing the components.** These indicators, together with the M&E arrangements, are detailed in the Results Framework under section VII. The indicators will be measured, monitored, reported, and disseminated by/with the support of TRC, NIRC, and the supporting agencies in accordance with the methodology established in the operations manuals.

51. **The overall responsibility for M&E of project outcomes will formally lie with the PITs.** Measurement of project progress will be documented in project progress reports. The PITs will be responsible for the preparation of these reports on a quarterly basis with TRC being responsible for consolidating the reports for submission to IDA within 45 days from the end of the reporting period. The progress reports will include contributions from TRC, NIRC, and supporting agencies. In addition to reporting on detailed physical progress of the various subcomponents and the project monitoring indicators according to the Results Framework, the reports will include information on disbursements, compliance with FM, procurement, social and environmental policies and guidelines, and an updated annual plan of works and activities. The challenges faced in implementing the project, as well as measures being undertaken or recommended to be undertaken to improve performance, will also be included.

### C. Sustainability

52. **The project design considers measures to help ensure sustainability of its physical, financial, and operational aspects.** All physical investments to be financed under the project will adopt technically sound design specifications that conform with local regulations, site conditions, and climate risks to ensure the durability and resilience of the assets built. The institutional strengthening and capacity-building activities of the project will provide training and technical assistance to the concerned stakeholders to manage and sustain the project activities. The project design considers social and environmental aspects. Most works relate to the rehabilitation of the existing rail system and improving its condition with minimal social and environmental negative impacts. The flood mitigation measures for strengthening climate resilience of the Kilosa-Gulwe-Igandu section under Component B will enhance climate resilience of the Central Corridor and help communities in the area which otherwise get affected by floods every year.

## IV. PROJECT APPRAISAL SUMMARY

### A. Technical, Economic and Financial Analysis

#### Technical Analysis

53. **The technical analysis of the project for the railway component has been largely conducted under TIRP (P127241).** The preparation of studies and estimation of works for the TIRP-2 have been guided by two essential parameters of TIRP: (a) optimizing track profiles to meet a maximum target journey time of 30 hours, and (b) ensuring bridges can accommodate a minimum permissible axle load of 18.5 tons. The final balance between axle weight, speed, and renewal costs will be determined following the completion of bridge assessments and operational modeling. The technical solutions for this project involve rehabilitation of weak railway tracks and bridges along the Tabora to Isaka section (130 km) by upgrading the overall capacity of the railway infrastructure to carry 18.5 tons axle load, and support spot improvement of tracks and bridges for selected sections of about 350 km between Dar es Salaam and Tabora.

54. **The Kilosa-Gulwe-Igandu railway section, spanning 84 kilometers, faces recurring flood risks.** Government-led studies, dating back to the post-colonial era and including the 1985 Integrated Development Plan for Dodoma Region, have explored the hydrology of the Kinyasungwe catchment area. This catchment, characterized by ephemeral Kinyasungwe River and leaf-shaped watersheds, witnesses' runoff only after intense rainfall surpasses infiltration capacity and potential evaporation. The 1985 plan proposed flood control dams along the catchment, aiming to mitigate flooding and provide water for various purposes. Recent studies, such as JICA's underscore the necessity of integrated short and medium-term measures to bolster climate resilience along the Kilosa-Igandu railway, safeguarding investments and preserving the Wami/Ruvu Basin ecosystem<sup>35</sup>.

55. **Protecting the central line corridor involves addressing the origin of floods beyond Kilosa-Gulwe, which begin in Manyara region and flow into the Kinyasungwe sub-basin, and rehabilitating the aging Ikowa, Buigiri, Dabalo, Hombolo, Kidete, and Kimagai dams.** Increased population, human activities, deforestation, land use changes, and climate change have contributed to high sedimentation levels, compromising the functionality of the dams. Lack of sand traps, check dams, and proper spillway designs exacerbate sedimentation issues, resulting in reduced reservoir capacity and structural deterioration. Rehabilitation and upgrades of these dams are deemed necessary, with some dams requiring minor interventions while others necessitate detailed feasibility studies to ensure effectiveness and suitability given current conditions and risks. Interventions to address the flooding issues include joint studies on a broader scale of the catchment, starting from Manyara, to develop runoff quantification models and sustainable water harvesting strategies while ensuring the integrity of the central railway corridor. Additionally, there's a call for joint prioritization of sectoral

<sup>35</sup> [https://openjicareport.jica.go.jp/pdf/12262887\\_01.pdf](https://openjicareport.jica.go.jp/pdf/12262887_01.pdf)

investments, guided by multisectoral criteria, to identify priority infrastructure for flood control, livelihood support, and environmental conservation throughout the Kinyasungwe catchment.

### Economic and Financial Analysis

56. **The analysis is based on the cost-benefit analysis (CBA) approach comparing the ‘with project’ and ‘without project’ scenarios.** The economic model analyzes the expected main economic benefits which result from: (a) the reduction of transport user costs; (b) a higher value of time expected because of increased operating rail speed and improved reliability in rail operations; (c) the emission reduction by diverting traffic from road to rail transport, which is induced by the lower cost; and (d) reduced casualties due to safety improvement in rail transport compared to road transport. Additionally, the focus is on the investment, operating and maintenance costs on the infrastructure side, and the project will also provide technical assistance to strengthen the institutional capacity to assure safety and environmental regulations. The analysis ignores potential benefits and costs associated with passenger services, which are minimal compared to the above costs and benefits on the freight side. Annex 4 presents a detailed explanation of the analysis.

57. **The project is expected to contribute to reducing GHG emissions, compared to road transport.** In addition, rail transport is safer than road transport with fewer fatal accidents. To balance expected benefits and required costs, the analysis considers the rolling stock (3 locomotives and 44 new flat wagons) that was delivered under TIRP between October to November 2021.

58. **The economic evaluation results indicate that the project provides sufficient economic returns to justify the investment.** Based on the shadow price of carbon (SPC) estimates, the net present value (NPV) is estimated at US\$84.3 million with an economic internal rate of return (EIRR) of 12 percent under the low carbon price scenario, while the application of high SPC yields an NPV of US\$93.9 million and an EIRR of 12.5 percent (at 6 percent discount rate). In addition, the financial assessment results indicate that the project provides sufficient financial returns to justify the investment under TIRP-2. The project is expected to provide an NPV of US\$39.8 million (at 3 percent discount rate) and yield a financial internal rate of return (FIRR) of 7.3 percent. Thus, the project is both economically and financially viable.

59. **A sensitivity analysis has been conducted based on three scenarios: 20 percent increase in investment cost, lower diverted traffic levels (demand) by 20 percent, and a combination of both scenarios.** The results show that TIRP-2 is largely robust to the 20 percent increase in investment cost and 20 percent less diverted traffic levels. As indicated in Annex 4, the application of both low SPC and high SPC yields positive NPV when investment cost is increased by 20 percent and diverted traffic is lowered by 20 percent distinctly. Conversely, when both case scenarios are considered, the application of low SPC and high SPC results in significantly lowered NPVs and EIRRs for the project.

60. **An analysis of GHG emissions indicates that the project is anticipated to lower GHG emissions by approximately 45 percent.** The GHG accounting assessment analyzed the impact of refurbishment of the Dar es Salaam to Tabora railway section (257.4 km), rehabilitation of the Tabora to Isaka section (130 km), and rehabilitation of the Kilosa-Gulwe-Igandu flood-prone section (84 km) of the Central Corridor railway network. It is estimated that these works, as well as the improvement in safety, climate resilience, and operational efficiency, will result in modal shift from freight transport by road to the Central Corridor line. Also, the analysis suggested that the project’s fuel and carbon intensity will be efficient. Over the 25-year evaluation period, the “with-project” carbon-dioxide (CO<sub>2</sub>) emissions are estimated at 403,597 tons and the “without-project” emissions are estimated at 728,256 tons. This corresponds to a total net CO<sub>2</sub> emissions reduction of 324,659 tons, or a 45 percent CO<sub>2</sub> emissions reduction, and an annual average net emissions reduction of 12,986 tons. The World Bank-approved GHG accounting tool (non-urban rail tool) was used to conduct GHG accounting of the project. The results are summarized in Annex 4.

61. **Due to lack of reliable data and complexity of the issue, it is difficult to assess economic benefits from improved transport safety.** However, the available national statistics were used in the analysis. According to Tanzania Transport and

Meteorology Sectors Statistics, 2012, there were 21 incidences of death in TRC operations, which translates to an incidence rate of 0.057 per millions of ton-km. On the other hand, based on the road safety statistics, Tanzania had 31 vehicle accident deaths per 100,000 population. Assuming that the modal split for freight is 95 percent for road and 5 percent for rail, the incidence rate for road transport is estimated at 1.50 deaths per millions of ton-km. Thus, by using rail more, a considerable number of lives could be saved. The value of people's life is complex but calculated simplistically based on current per capita GDP as well as the nation's median age and life expectancy.

## **B. Fiduciary**

62. The fiduciary assessments and arrangements are summarized below and detailed in Annex 1.

### **(i) Financial Management**

63. **The World Bank conducted an FM assessment of both TRC in Dar es Salaam and NIRC in Dodoma.** The assessment was carried out in accordance with the Bank Directive: Financial Management Manual for World Bank Investment Project Financing Operations issued on February 4, 2015, and effective March 1, 2010; and the Bank Guidance: Financial Management for World Bank Investment Project Financing Operations issued and effective November 10, 2017.

64. **TRC is well established, has systems and policies in place, and has experience in managing World Bank-financed projects through TIRP.** The FM arrangements are adequate to provide, with reasonable assurance, accurate and timely information on the status of the project as required by IDA. The project will use the report-based disbursement method. The project accounts will be audited by the Controller and Auditor General of the United Republic of Tanzania. Accounting and audits will be conducted in accordance with sound and internationally recognized accounting and auditing principles and practices satisfactory to IDA. Interim financial reports will be submitted to IDA within 45 days after the end of every quarter of the project implementation period. The audit reports and related project accounts will be submitted to IDA within six months after the end of the fiscal year. In conclusion, the risk rating for TIRP-2 is assessed as Moderate, which satisfies the World Bank minimum requirements for FM.

65. **NIRC does not have direct experience in managing World Bank-financed projects but has experience as a sub-recipient through the Tanzania Resilient Natural Resource Management for Tourism and Growth (REGROW) Project (P150523).** The organization is well-established and has systems and policies in place to be able to manage a World Bank-funded project. The FM arrangements are adequate to provide, with reasonable assurance, accurate and timely information on the status of the project as required by IDA. The project will use the report-based disbursement method. The project accounts will be audited by the Controller and Auditor General. Accounting and audits will be conducted in accordance with sound and internationally recognized accounting and auditing principles and practices satisfactory to IDA. Interim financial reports (IFRs) will be submitted to IDA within 45 days after the end of every quarter of the project implementation period. The audit reports and related project accounts will be submitted to IDA within six months after the end of the fiscal year. The risk rating for NIRC is assessed as Substantial, which satisfies the World Bank minimum requirements for FM.

### **(ii) Procurement**

66. **Procurements under the project will be carried out in accordance with the following World Bank procedures:** (a) the World Bank Procurement Regulations for IPF Borrowers, dated September 2023; (b) Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (dated October 15, 2006, and revised in January 2011 and as of July 1, 2016); and (c) other provisions stipulated in the Financing and Project Agreements. The World Bank's Standard Procurement Documents (SPDs) will be used for all contracts subject to international competitive procurement and those contracts as specified in the Procurement Plan in Systematic Tracking of Exchanges in Procurement (STEP). Based on Procurement Regulations 'Rated criteria' will be applied to procurement packages that are subject to international competition and the process will be conducted using two envelopes.

67. **Project Procurement Strategy for Development (PPSD) and Procurement Plan.** TRC and NIRC have prepared a consolidated PPSD and a Procurement Plan covering the next 18 months for the project and the World Bank has provided the consent. The Procurement Plan of TRC and NIRC will be updated biannually in agreement with the World Bank or as required to reflect the project's actual implementation needs. A procurement capacity assessment of NIRC were carried out. The assessment also covered the organizational structure for implementing the project, functions, staff skills and experiences, and adequacy for implementing the project. TRC has adequate experience and NIRC has gained some experience in implementing the World Bank-financed projects, that is, the REGROW Project for which NIRC is among the implementing agencies implementing a component of US\$15 million.

68. **Procurement key risks are:** (a) insufficient staff in the PMU to cope with the volume of procurement transactions—TRC staff who had acquired sound experience in implementing the World Bank-financed projects have been promoted to higher positions (directors, managers, and project managers for SGR); (b) inefficiencies in processing procurement activities such as preparation of bidding documents and request for proposals, evaluation of bids and proposals, and signing of contracts and approval of contracts; (c) delays in payment process, resettlement plan, and provision of full access to site; and (d) lack of awareness and low capacity of the ministry staff and local construction industry to comply with environmental, social, health, and safety (ESHS) requirements.

69. **Identified risks, mitigation measures, capacity building, and action plan agreed upon.** The overall project procurement risk was assessed to be Substantial. The residual risk after implementation of the mitigation measures is Moderate. Details of the mitigation measures to address the identified risks and action plan, as well as the procurement arrangements for the project, are presented in the procurement section of Annex 1.

70. **Advanced procurement.** The World Bank provided clearance for the GoT to proceed with the procurement process before signing of the Financing Agreement. Therefore, for the eventual contracts to be eligible for World Bank financing, the procurement procedures, including advertising, will be consistent with Sections I, II, and III of the Procurement Regulations.

### C. Legal Operational Policies

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

### D. Environmental and Social

71. **The project will support the refurbishment of the railway track and/or complete track renewal in some sections, rehabilitation and repairs of river crossing bridges, infrastructure safety improvements in level crossings and in townships, construction of flood control reservoirs, and improvement of intermodal terminals.** The implementation of some of these activities will improve safety during the operational stage of the project but may also pose health and safety risks during their construction.

72. **Based on the current assessment, the environmental and social risk rating of the project is Substantial.** Main risks are associated with planned construction and upgrading of the existing infrastructure which will be done on different rail sections along the 970 km rail segment. Planned civil works and activities will take place within the same footprint of existing railway infrastructure and will not extend beyond the track corridors except for sourcing materials such as gravel and sand. The construction phase of the project will involve several issues including: (a) labor and working conditions

covering occupational health and safety (OHS); (b) traffic impacts associated with level crossing upgrades; (c) community health and safety risks resulting from dust, noise, and vibration from construction and vehicle transit movements and communicable diseases associated with the influx of temporary construction labor; (d) waste generation and management (including hazardous waste); (e) air pollution and noise from construction machinery and quarries and operation phase noise and vibration impacts; (f) soil disturbance and loss during earthmoving; (g) tree cutting and loss of vegetation; (h) quarry sites' management; and (i) construction of camp for workers. The World Bank's general Environmental Health and Safety (EHS) Guidelines as well as EHS Guidelines for Railways will be followed and used particularly to address issues that will arise throughout project implementation. Most of the identified impacts are site-specific and short-term (that is, limited to construction), and mechanisms are available to prevent and mitigate those impacts; however, there is still medium probability of OHS risks due to accidents observed during the implementation of TIRP. During the implementation of TIRP, there were 11 fatal accidents; most of the accidents were due to negligence of train working norms and safety regulations as per the root cause analysis conducted by LATRA. The environmental and social assessments and related environmental and social instruments under consultancies, studies, and capacity building are carried out in accordance with terms of reference acceptable to the World Bank that incorporate the relevant requirements of the ESS. Based on the Environmental and Social Assessment study findings, the environmental risk rating was updated accordingly in the Project Appraisal Environmental and Social Review Summary (ESRS) and appropriate mitigation measures developed and included in the Environmental and Social Commitment Plan (ESCP) for implementation. Among others, the following aspects were discussed and considered in the revised risk classification: (a) capacity of the implementing agencies; (b) likely OHS risks; and (c) likely environmental and social risks relevant to technical assistance activities, including key transport studies and designs to be undertaken by the project.

73. **Project components will be implemented mainly within the existing government-owned land, which will minimize the need for land acquisition except for clearance of encroachments, which may result in physical and/or economic displacement.** Construction between Dar es Salaam and Dodoma will utilize existing camps acquired under TIRP. There is a possibility of temporary land acquisition for camp sites covering activities to be implemented between the Dodoma and Isaka sections of the railway line. The project will use the existing quarry in Tabora owned by TRC for ballast and also purchase from commercial producers who supplied the same for TIRP. The extent of potential ESS 5 risks, impacts, will be assessed prior to implementation of project activities and will be guided by existing resettlement policy framework (RPF). Other social impacts and risks may include, but not be limited to: (a) construction-related risks and OHS risks, (b) labor influx and associated risks of gender-based violence/sexual exploitation and abuse-sexual harassment (SEA-SH) which is rated as moderate risk, (c) pressure on local amenities and resources in the project area where civil works will be undertaken as a result of labor influx, (d) possible spread of communicable diseases, (e) possible increase in prevalence of HIV/AIDS and other sexually transmitted diseases, and (f) exclusion of people with disabilities and vulnerable groups described in ESS 7 and meet the criteria set out in paragraphs 8 and 9 of the standard due to limited access to information and project benefits.

74. The following ESS tools have been prepared for the project and disclosed both in-country through the TRC website and the World Bank website on October 19, 2023, and October 20, 2023, respectively:

- Labor Management Procedures (LMP),
- A Resettlement Policy Framework (RPF) to guide the preparation of Resettlement Action Plan (RAP) for sites not currently known as well as an RAP for already identified sites,
- Vulnerable Groups Planning Framework (VGPF) to guide the preparation of Vulnerable Groups Plan as required,
- Stakeholder Engagement Plan (SEP) with a grievance redress mechanism,
- SEA/SH Prevention and Response Action Plan including an Accountability and Response Framework,
- An ESCP has been agreed upon with the recipient to set out the substantive measures and actions for the project to meet environmental and social requirements.

**Climate Co-Benefits**

75. The project applied the transport sector's 'Avoid, Shift, Improve, and Resilient' Framework to identify and select measures for mitigation of greenhouse gas (GHG) emissions and to strengthen climate resilience and therefore generate climate co-benefits in all project components.

76. **Under Component A, the project enhances the climate resilience of the Central Corridor railway network through rehabilitation and strengthening of the Dar es Salaam to Tabora railway section and the Tabora to Isaka railway line.** The railway tracks, bridges, and intermodal terminals will be refurbished and implemented to climate-resilient standards. This will include measures to prevent and protect against floods and extreme heat through drainage system improvements, river flow improvements, riverbed protection, tracks designed considering minimum and maximum rail temperatures to avoid buckling, and electric and signaling equipment set to operate at appropriate local temperatures.

77. **The project interventions under Component A will improve the climate resilience, safety, efficiency, productivity, and therefore attractiveness of the Central Corridor railway network.** This is estimated to result in modal shift from freight road transport (trucking) and motorized private vehicles (such as cars and motorbikes) to railways, which is less carbon intensive, and will therefore reduce GHG emissions against the baseline. The intermodal terminals will be designed under the green building concept and to energy-efficient standards and using locally produced renewable materials, thus reducing the overall carbon footprint of construction and operations. Internationally recognized certification for energy-efficient buildings will be sought for the design, construction, and operations of the terminals.

78. **Under Component B, the project will make the Kilosa-Gulwe-Igandu railway section more climate resilient and reliable, thereby promoting modal shift from road to railway transport.** Component B will support analytical studies for the design of flood control systems in the Kinyasungwe catchment area, affecting the Kilosa-Gulwe-Igandu railway section; rehabilitate/restore six flood control reservoirs in the catchment area to reduce flooding of the Kilosa-Gulwe-Igandu railway section; and support institutional capacity strengthening and preparation of large-scale irrigation schemes for the six reservoirs.

79. **Under Component C, the project will build the capacity of TRC to establish and manage condition-based maintenance contracts that consider climate risks.** Improvements in railway safety and operations will enhance the railway attractiveness and induce modal shift from road freight and passenger transport to railway, thus reducing GHG emissions.

80. **Under Component D, the project will establish a CERC,** which facilitates the swift allocation of resources to emergency response and reconstruction in a climate or other emergency.

**Paris Alignment**

81. The operation is aligned with the goals of the Paris Agreement on both mitigation and adaptation, as detailed in the following paragraphs.

82. **Assessment and reduction of mitigation risks.** On mitigation, the project has a low risk of preventing the country's transition to low-carbon development pathways as the activities financed by the project support the railway transport sector which carries minimal amounts of fossil fuels (2.2 percent of the entire freight on average for 2017–2022). The project's investments support modal shift from road to more energy-efficient railway transport, actively contributing to decarbonization, consistent with the pathways aligned with the mitigation of the Paris Agreement. The railway infrastructure rehabilitated under the project is not dedicated for transportation of coal, peat, or other fossil fuels as part of the overall service, and there is no material risk of contributing to deforestation. The project's economic feasibility does not depend on external fossil fuel exploitation, processing, or transport activities; the project viability does not depend on fossil fuel subsidies; and the project does not rely significantly on the direct utilization of fossil fuels. The project does not finance railway rolling stock, while investments in rail signaling will ensure the signaling design and materials allow for later

electrification of the railway system. The project will finance two intermodal terminals compliant with national building codes and that have energy performance standards equivalent to Level 1 EDGE Certification, making this activity universally aligned. Activities financed by the CERC will be Paris aligned and this will be detailed in the CERC Manual. All activities financed by the project are assessed as universally aligned with the Paris Agreement from a mitigation perspective or representing a low risk from a mitigation perspective.<sup>36</sup>

**83. Assessment and reduction of adaptation risks.** On adaptation, the project adequately reduces the physical climate risks to the project outcomes, and the project's climate resilience and adaptation design considerations limit the exposure to moderate level of residual risk. The main climate and disaster risks likely to affect the project investments—the railway infrastructure and operations—are flooding, associated erosion, sand deposition, and extreme heat. Climate change risks and vulnerability to floods and extreme heat will be managed and reduced through targeted adaptation measures along the Central Corridor railway network that combine engineering, nature-based, and soft<sup>37</sup> adaptation solutions. Annex 2 provides an overview of activities to strengthen climate resilience of the Kilosa-Gulwe-Igandu section. A complete list of climate adaptation measures adopted by the project is provided in Annex 3 on climate change adaptation and mitigation.

## V. GRIEVANCE REDRESS SERVICES

**84. Grievance Redress.** Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank Management and after Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's Grievance Redress Service (GRS), visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank's Accountability Mechanism, visit <https://accountability.worldbank.org>.

## VI. KEY RISKS

**85.** The overall risk for the project is assessed as **Substantial**.

**86. The technical design of the project, environment and social, and stakeholders' risks are Substantial.** While the project benefits from the institutional arrangements and implementation experience of TIRP, the TIRP-2 project features may generate additional risks. The key risks and agreed mitigation measures are outlined below.

**87. Technical design of the project.** The project will support strengthening climate resilience of the Kilosa- Gulwe-Igandu section. This will require strong coordination of three ministries and agencies. The work involves rehabilitation of water reservoirs by NIRC - under MoA – under the oversight of MoW and TRC - that is under the MoT - as the flood control reservoirs will help support sustainable operations of the railway. The project will support feasibility studies and design as

<sup>36</sup> Transport Sector Note on Applying the World Bank Group Paris Alignment Assessment Methods. World Bank Group.

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099802104072399820/1du042c63ab700a4904fdb09fea073c99ff21977>.

<sup>37</sup> "Soft options include policy, legal, social, management and financial measures that can alter human behaviour and styles of governance, contributing to improve adaptation capacity and to increase awareness on climate change issues." Climate-ADAPT. n.d. *Adaptation Options*. [https://climate-adapt.eea.europa.eu/en/knowledge/adaptation-information/adaptation-options/index\\_html](https://climate-adapt.eea.europa.eu/en/knowledge/adaptation-information/adaptation-options/index_html).

well as implementation of flood control measures and requires strong inter-agency coordination which currently does not exist. To mitigate the risk, a multiagency Technical and Steering Committee will be formed to coordinate project activities.

88. **Environment and social.** This is related to: (a) capacity of the implementing agencies to manage environment and social issues, likely OHS risks, including those related to labor working conditions, (b) environmental and social risks relevant to technical assistance activities, and (c) risks related to Gender Based Violence (GBV)/ Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH). To mitigate the risk, the World Bank in collaboration with the borrower will implement specific capacity building activities for the environment and social teams of the implementing agencies' capacity. Furthermore, the implementing agencies have agreed to strengthen the existing Grievance Redress Mechanism (GRM) and ensure that it will be aligned with the mechanisms of existing local solution options including establishment of a specific channel on GBV, and use of national legislation to avoid the risk of stigmatization, exacerbation of the mental/psychological harm and potential reprisal. In addition, the implementing agencies have also agreed to make use of existing partnership with civil society organizations on management of GBV/SEA-/SH in this project.

89. **Stakeholders risk.** The project will require effective coordination among various agencies especially for operationalizing the open access to allow private sector train operations, flood control measures for the Kilosa-Gulwe-Igandu section, and intermodal terminals. Lack of understanding or ownership of these activities could lead to misalignment of stakeholders and delays in agreeing on solutions and implementation. To mitigate the risk, the GoT has engaged stakeholders throughout project preparation and will continue to engage stakeholders on the objectives, importance, and expected benefits of the project activities and consult them for feedback during project implementation. In addition, the formation of the Steering Committee, with participation of the stakeholders, will help mitigate this risk.

## VII. RESULTS FRAMEWORK AND MONITORING

### PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Closing Period
<b>Improved railway operational efficiency</b>			
<b>Operational efficiency: Average transit time from Dar es Salaam to Isaka (Hours)</b>			
Nov/2023			Dec/2029
50.00			30.00
<b>Improved resilience of the railway corridor</b>			
<b>Climate resilient infrastructure: Number of days of railway traffic disruption due to flooding events in a year (Days)</b>			
Nov/2023	Dec/2026	Dec/2027	Dec/2029
120.00	120.00	60.00	10.00
<b>Improved railway safety</b>			
<b>Railway safety: Annual number of at-grade traffic incidents at railway crossings per 100 train-km along the corridor (Number)</b>			
Nov/2023	Dec/2025	Dec/2027	Dec/2029
50.00	20.00	10.00	10.00

### Intermediate Indicators by Components

Baseline	Period 1	Period 2	Closing Period
<b>Component A: Strengthening of Railway Infrastructure and Support of Transport Studies</b>			
<b>Length of rail track-km rehabilitated to target capacity along the Dar es Salaam-Isaka railway section (Kilometers)</b>			
Nov/2023	Jun/2027	Dec/2028	Dec/2029
0.00	200.00	387.40	387.40
<b>Length of climate resilient rail track rehabilitated along the Kilosa and Igandu flood prone section (Kilometers)</b>			
Nov/2023	Dec/2026	Dec/2027	Dec/2029
0.00	0.00	40.00	84.00
<b>Number of bridges rehabilitated to target permissible capacity (Number)</b>			
Nov/2023	Dec/2026	Dec/2028	Dec/2029
0.00	70.00	158.00	158.00

<b>Average loading and unloading time per train in each terminal (Hours)</b>			
Nov/2023	Dec/2025	Dec/2027	Dec/2029
12.00	6.00	4.00	4.00
<b>Component B: Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu Section</b>			
<b>Number of flood control reservoirs rehabilitated within the Kinyasungwe catchment area (Number)</b>			
Jun/2023	Dec/2026	Dec/2028	Dec/2029
2.00	6.00	8.00	8.00
<b>Long-term maintenance program for the six reservoirs developed and sustainable funding secured (Yes/No)</b>			
Nov/2023	Dec/2025	Dec/2027	Dec/2028
No	No	Yes	Yes
<b>Water supply, irrigation schemes, livestock and fisheries program developed for project supported reservoirs (Number)</b>			
Nov/2023	Dec/2026	Dec/2028	Dec/2029
0.00	3.00	5.00	6.00
<b>Beneficiaries of job-focused interventions (Number) <sup>CRI</sup></b>			
Nov/2023			Dec/2029
40000.00			80000.00
➤ Beneficiaries of job-focused interventions - Female (Number) <sup>CRI</sup>			
18000.00			40000.00
<b>Millions of people with enhanced resilience to climate risks (Number)</b>			
Nov/2023			Dec/2029
0			1,650,000
<b>Component C: Operational and Institutional Support</b>			
<b>Open access operations: At least one private sector operator providing freight train services (Yes/No)</b>			
Nov/2023	Dec/2027		Dec/2029
No	Yes		Yes
<b>Infrastructure Manager Unit within TRC is created and operational (Yes/No)</b>			
Nov/2023	Dec/2026	Dec/2027	Dec/2029
No	No	Yes	Yes
<b>Asset management system for the railway track developed and becomes operational under TRC (Yes/No)</b>			
Nov/2023	Dec/2026	Dec/2027	Dec/2029
No	No	Yes	Yes
<b>Number of TEUs carried by the Container Block Train Unit of the TRC (Number)</b>			
Jun/2023	Dec/2027	Dec/2028	Dec/2029
366.00	2,000.00	4,000.00	6,000.00

<b>Beneficiaries of job-focused interventions (Number) <small>CRI</small></b>			
Jul/2023	Dec/2027	Dec/2028	Dec/2029
50.00	80.00	90.00	100.00
➤ Beneficiaries of job-focused interventions - Female (Number) <small>CRI</small>			
10.00	20.00	30.00	40.00
<b>Percentage of females trained and who will receive a licence as locomotive drivers (Percentage)</b>			
Nov/2023	Dec/2025	Dec/2027	Dec/2029
0.00	0	5.00	10.00

**Component D: Contingent Emergency Response**

### Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

<b>Improved railway operational efficiency</b>	
<b>Operational efficiency: Average transit time from Dar es Salaam to Isaka (Hours)</b>	
Description	Core indicator to measure the progress towards improved operational efficiency of the rail segment from Dar es Salaam to Isaka.
Frequency	Annual
Data source	TRC Business Department
Methodology for Data Collection	Data to be collected from the department's annual reports or figures and information to be reported in the quarterly project progress reports
Responsibility for Data Collection	TRC Project Implementation Team
<b>Improved resilience of the railway corridor</b>	
<b>Climate resilient infrastructure: Number of days of railway traffic disruption due to flooding events in a year (Days)</b>	
Description	Core indicator to measure the climate resilience of the built infrastructure along the flood-prone Kilosa-Gulwe-Igandu section that as an after-effect of heavy flooding, is damaged, causing a halt to operations to allow for infrastructural repairs.
Frequency	Annual
Data source	TRC's Infrastructure and Operations Departments
Methodology for Data Collection	Quarterly project progress reports
Responsibility for Data Collection	TRC Project Implementation Team
<b>Improved railway safety</b>	
<b>Railway safety: Annual number of at-grade traffic incidents at railway crossings per 100 train-km along the corridor (Number)</b>	
Description	Count of at-grade traffic crashes at railway crossing areas per 100 train-km along the corridor from Dar es Salaam – Tabora.
Frequency	Annual
Data source	TRC Safety Unit
Methodology for Data Collection	Data to be collected from the safety reports of TRC by the PIT and shared through the project progress quarterly reports
Responsibility for Data Collection	TRC Project Implementation Team

### Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

<b>Component A: Strengthening of Railway Infrastructure and Support of Transport Studies</b>	
<b>Length of rail track-km rehabilitated to target capacity along the Dar es Salaam-Isaka railway section (Kilometers)</b>	
Description	Core indicator to measure progress towards improved rail infrastructure conditions on the Dar es Salaam-Isaka rail segment.
Frequency	Annual
Data source	Project progress reports
Methodology for Data Collection	On commencement of the civil works, quarterly reports delivered by the contractor and/or supervision consultant
Responsibility for Data Collection	TRC Project Implementation Team
<b>Number of bridges rehabilitated to target permissible capacity (Number)</b>	
Description	The indicator will measure the progress towards improved railway bridges.
Frequency	Quarterly
Data source	Project progress reports

Methodology for Data Collection	On commencement of the civil works, quarterly reports delivered by the contractor and/or supervision consultant will provide the needed data
Responsibility for Data Collection	TRC Project Implementation Team
<b>Average loading and unloading time per train in each terminal (Hours)</b>	
Description	Hours per shift. Measurement of progress towards improved efficiency of the intermodal logistical operations.
Frequency	Quarterly
Data source	TRC
Methodology for Data Collection	The M&E expert will develop M&E frameworks to guide the data collection team in these intermodal terminals to correctly record and analyze the data that will monitor this indicator
Responsibility for Data Collection	TRC Project Implementation Team
<b>Length of climate resilient rail track rehabilitated along the Kilosa and Igandu flood prone section (Kilometers)</b>	
Description	The indicator will measure the progress towards improvement and resilience of the railway infrastructure to flash and/or annual floods in the Kilosa-Gulwe-Igandu flood prone section
Frequency	Quarterly
Data source	Project progress reports
Methodology for Data Collection	On commencement of civil works, quarterly reports delivered by the contractor and/or supervision consultant
Responsibility for Data Collection	TRC Project Implementation Team
<b>Component B: Strengthening Climate Resilience of Kilosa-Gulwe-Igandu Section</b>	
<b>Number of flood control reservoirs rehabilitated within the Kinyasungwe catchment area (Number)</b>	
Description	The indicator will monitor progress towards the achievement of the implementation of the flood control reservoirs for irrigation, water supply, livestock and fisheries. The implemented reservoirs are expected to reduce the flooding impacts on the railway and the catchment area, and also benefit people and communities.
Frequency	Quarterly
Data source	Project progress reports
Methodology for Data Collection	On commencement of the construction of the flood control ponds, quarterly reports delivered by the contractor and/or supervision consultant will provide the needed data
Responsibility for Data Collection	NIRC Project Implementation Team
<b>Long-term maintenance program for the six reservoirs developed and sustainable funding secured (Yes/No)</b>	
Description	Study for development of the maintenance program to be completed and a maintenance program developed by NIRC. MoA to approve and MoF to concur with budget allocation/sources.
Frequency	Annually
Data source	NIRC Progress reports
Methodology for Data Collection	Yes only when all actions are completed
Responsibility for Data Collection	NIRC Project Implementation Team
<b>Water supply, irrigation schemes, livestock and fisheries program developed for project supported reservoirs (Number)</b>	
Description	Study to be conducted for development of a program for the use of the multipurpose reservoirs for PPP irrigation schemes, water supply, livestock and fisheries. On study completion, a program is to be developed by NIRC and approved by MoA.
Frequency	Annually
Data source	NIRC Progress reports
Methodology for Data Collection	Yes only when all actions are completed
Responsibility for Data	NIRC Project Implementation Team

Collection	
<b>Beneficiaries of job-focused interventions (Number) CRI</b>	
Description	The indicator captures the cross-cutting nature of the jobs agenda, as beneficiaries (disaggregated by gender) may be individuals, workers, households, farmers, microenterprises, small and medium-sized enterprises (SMEs), and other target groups that benefit from World Bank-financed operations in different sectors and types of operations. The indicator is a composite indicator and in addition to being used as a standalone indicator it aggregates values from following Corporate Indicators (CRI) for corporate reporting: (i) farmers reached with agricultural assets and services; (ii) beneficiaries of labor market programs (iii) firms benefiting from private sector initiatives; (iv) teachers recruited or trained; (v) students benefiting from direct interventions to enhance learning (TVET & tertiary learning only); (vi) beneficiaries reached with financial services.
Frequency	Annually
Data source	NIRC, Wami Ruvu Basin Water Board, Kilosa, Mpwapwa and Chamwino District Councils
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	NIRC Project Implementation Team
<b>Beneficiaries of job-focused interventions - Female (Number) CRI</b>	
Description	The indicator captures the cross-cutting nature of the jobs agenda, as beneficiaries (disaggregated by gender) may be individuals, workers, households, farmers, microenterprises, small and medium-sized enterprises (SMEs), and other target groups that benefit from World Bank-financed operations in different sectors and types of operations. The indicator is a composite indicator and in addition to being used as a standalone indicator it aggregates values from following Corporate Indicators (CRI) for corporate reporting: (i) farmers reached with agricultural assets and services; (ii) beneficiaries of labor market programs (iii) firms benefiting from private sector initiatives; (iv) teachers recruited or trained; (v) students benefiting from direct interventions to enhance learning (TVET & tertiary learning only); (vi) beneficiaries reached with financial services.
Frequency	Annually
Data source	NIRC, Wami Ruvu Basin Water Board, Kilosa, Mpwapwa and Chamwino District Councils
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	NIRC Project Implementation Team
<b>Millions of people with enhanced resilience to climate risks (Number)</b>	
Description	The number of people benefitting directly & indirectly from improved climate risk management and increased climate resilience due to investments & activities by IDA during the intervention period.
Frequency	Annually
Data source	Population data
Methodology for Data Collection	Project progress report
Responsibility for Data Collection	NIRC Project Implementation Team
<b>Component C: Operational and Institutional Support</b>	
<b>Open access operations: At least one private sector operator providing freight train services (Yes/No)</b>	
Description	Core indicator to monitor progress towards open access reforms of TRC.
Frequency	Annually
Data source	TRC Operations and Business departments
Methodology for Data Collection	Quarterly project progress reports
Responsibility for Data Collection	TRC Project Implementation Team
<b>Infrastructure Manager Unit within TRC is created and operational (Yes/No)</b>	

Description	The indicator will measure the progress towards open access and railway reforms of TRC.
Frequency	Quarterly
Data source	TRC
Methodology for Data Collection	Information on the progress geared towards the achievement of this indicator is to be made available during the implementation support missions and documented in the Aide Memoires and also in the monthly progress reports to be delivered by the project implementation team for the project's monitoring and evaluation.
Responsibility for Data Collection	TRC Project Implementation Team
<b>Asset management system for the railway track developed and becomes operational under TRC (Yes/No)</b>	
Description	The indicator will measure the progress towards sustainable management of railway assets.
Frequency	Quarterly
Data source	TRC's Directorate of Civil Engineering and Infrastructure
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	TRC Project Implementation Team
<b>Number of TEUs carried by the Container Block Train Unit of the TRC (Number)</b>	
Description	The indicator will measure the progress toward the railway corridor's improved capacity between Dar es Salaam and Isaka.
Frequency	Annually
Data source	Container Block Train Unit
Methodology for Data Collection	Project progress report
Responsibility for Data Collection	TRC Project Implementation Team
<b>Beneficiaries of job-focused interventions (Number) <sup>CRI</sup></b>	
Description	The indicator captures the cross-cutting nature of the jobs agenda, as beneficiaries (disaggregated by gender) may be individuals, workers, households, farmers, microenterprises, small and medium-sized enterprises (SMEs), and other target groups that benefit from World Bank-financed operations in different sectors and types of operations. The indicator is a composite indicator and in addition to being used as a standalone indicator it aggregates values from following Corporate Indicators (CRIs) for corporate reporting: (i) farmers reached with agricultural assets and services; (ii) beneficiaries of labor market programs (iii) firms benefiting from private sector initiatives; (iv) teachers recruited or trained; (v) students benefiting from direct interventions to enhance learning (TVET & tertiary learning only); (vi) beneficiaries reached with financial services.
Frequency	Annually
Data source	TRC Human Resource Department
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	TRC Project Implementation Unit
<b>Beneficiaries of job-focused interventions - Female (Number) <sup>CRI</sup></b>	
Description	The indicator captures the cross-cutting nature of the jobs agenda, as beneficiaries (disaggregated by gender) may be individuals, workers, households, farmers, microenterprises, small and medium-sized enterprises (SMEs), and other target groups that benefit from World Bank-financed operations in different sectors and types of operations. The indicator is a composite indicator and in addition to being used as a standalone indicator it aggregates values from following Corporate Indicators (CRIs) for corporate reporting: (i) farmers reached with agricultural assets and services; (ii) beneficiaries of labor market programs (iii) firms benefiting from private sector initiatives; (iv) teachers recruited or trained; (v) students benefiting from direct interventions to enhance learning (TVET & tertiary learning only); (vi) beneficiaries reached with financial services.
Frequency	Annually

Data source	TRC Human Resource Department
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	TRC Project Implementation Unit
<b>Percentage of females trained and who will receive a licence as locomotive drivers (Percentage)</b>	
Description	The indicator will measure the progress towards enhancing women's participation in the railway sector and the reformation of TRC.
Frequency	Annually
Data source	TRC Human Resource Department
Methodology for Data Collection	Project progress reports
Responsibility for Data Collection	TRC Project Implementation Unit
<b>Component D: Contingent Emergency Response</b>	

**ANNEX 1: Implementation Arrangements and Support Plan****A. Project Implementation Arrangements**

1. **The overall implementing agency of the project is TRC, under the MoT that will also be responsible for implementation of Components A, C, and D.** NIRC under the MoA will be responsible for implementation of Component B activities. LATRA and the MoW will be supporting entities. The project implementation arrangements have been designed to ensure that project implementation and management is more efficient and risk management oriented. TRC and NIRC will take overall responsibility for the implementation, management, and coordination of all aspects of their project components including procurement and FM, contract management, social and environmental aspects, safety aspect, M&E, and audits. The PITs will also be responsible for the oversight of M&E aspects of the project.

2. **The TRC and NIRC PIT will report to the Director Generals (of TRC and NIRC) and will consist of regular staff and consultants.** The TRC PIT team will include project manager, project coordinator, FM and accounting specialist, contract management specialist, procurement specialist, project engineers, business specialist, institutional specialist, rail operations specialist, rail economic specialist, rail infrastructure and track specialist, railway safety expert, rail access compliance specialist, signaling specialist, M&E specialist, railway open access specialist, land management specialist, environmental and health specialist, and social specialist. The NIRC PIT will consist of project manager, project coordinator, dam design engineer, dam safety engineer, materials/geotechnical engineer, procurement specialist, FM specialist/accountant, environmental specialist, social specialist, agriculture/irrigation engineer, water resources engineer, M&E specialist, and project engineers. The project will also be supported by a consulting firm to provide additional expertise as per project requirements.

3. **The TIRP-2 Steering Committee will oversee overall project implementation progress; it will support effective project coordination between agencies and agree on actions and recommendations made during the implementation.** The Steering Committee will be meeting biannually and will be co-chaired by the PSs of the MoT and MoA with representation from TRC, NIRC, LATRA, MoA, MoW, Ministry of Land Housing and Human Settlement, Ministry of Livestock and Fisheries, MoF, President's Office - Planning Commission, WRWBW, TPA, Attorney General's Office, and the Regional Administrative Secretaries of Dodoma and Morogoro regions. The PIT will report on technical matters to the Technical Committee and provide an overall implementation progress report to the Steering Committee. The Technical Committee will comprise the Director Generals of TRC and NIRC, technical directors and technical assistants from TRC, NIRC, MoT, MoA and MoW, TRC and NIRC project coordinators and managers, and the Director of the Dam Safety Unit from the MoW.

**B. Procurement Risk Assessment and Arrangements**

4. **Procurements will be carried out in accordance with the following World Bank procedures:** (a) the World Bank Procurement Regulations for IPF Borrowers, dated September 2023; (b) Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006, and revised in January 2011 and as of July 1, 2016 (Anti-Corruption Regulations); and (c) other provisions stipulated in the Financing and Project Agreements.

5. **PPSD and Procurement Plan.** In line with the requirement of the Procurement Regulations, a PPSD has been prepared, based on which the Procurement Plan for at least the first 18 months of project implementation has been developed by the recipient and approved by the World Bank.

6. **Systematic Tracking of Exchanges in Procurement.** The World Bank's STEP tool will be used to prepare, clear, and update Procurement Plans and conduct all procurement transactions for all implementing agencies of the project. The World Bank, in collaboration with the Public Procurement Regulatory Authority (PPRA), has piloted the Tanzania National e-Procurement System (TANePS) since February 2021 in the World Bank-financed projects. However, TANePS was closed

on September 30, 2023. The GoT has developed a new system, the National e-Procurement System (NeST). The NeST is being implemented in a phased manner. The first phase officially started from July 1, 2023 (informally, the system started in June), with the e-Registration and the e-Tendering Modules. The second phase has started., which includes e-Catalog, e-Auctions (Forward and Reverse auctions), Contract Management, Dispute/Appeal Management, Direct Purchase from Manufacturer, Emergency Procurement, and System Billing.

**7. Procurement templates.** The World Bank's SPDs will be used for procurement of goods, works, and non-consulting services under the open international competitive procurement approach. Similarly, selection of consultant firms will use the World Bank's SPDs, in line with procedures described in the Procurement Regulations. While approaching the national market using national procurement procedures, the national standard bidding documents may be used with appropriate modifications acceptable to the World Bank and additional annexes to incorporate the World Bank's Anti-Corruption Guidelines, universal eligibility, and the World Bank's right to inspection and audit.

**8. National Open Competitive Procedures (NOCPs).** NOCPs may also be used, provided that such procedures are consistent with the following requirements, as provided in paragraph 5.4 of the Procurement Regulations: (a) there is open advertising of the procurement opportunity at the national level; (b) the procurement is open to eligible firms from any country; (c) the request for bids/request for proposals document will require that bidders/proposers submitting bids/proposals present a signed acceptance at the time of bidding, to be incorporated in any resulting contracts, confirming application of, and compliance with, the World Bank's Anti-Corruption Guidelines, including without limitation the World Bank's right to sanction and the World Bank's inspection and audit rights; (d) the procurement documents include sufficient provisions, as agreed with the World Bank, to adequately mitigate against environmental and social (including SEA-SH) risks and impacts; (e) contracts have an appropriate allocation of responsibilities, risks, and liabilities; (f) contract award information is published; (g) the World Bank has rights to review procurement documentation and activities; (h) there is an effective complaints handling mechanism; and (i) records of the procurement process are maintained. Other national procurement arrangements (other than NOCP), that may be applied by the recipient (such as limited/restricted competitive bidding, request for quotations/shopping, direct contracting), will be consistent with the requirements set out in paragraphs 5.3 and 5.4 d. as appropriate.

**9. Publication (advertising).** The recipient is required to prepare and submit to the World Bank a General Procurement Notice. The World Bank will arrange for its publication in the United Nations Development Business online (UNDB online) and on the World Bank's external website. Specific Procurement Notices for all procurement under international competitive procedures and requests for expressions of interest for all consulting services, estimated equivalent to US\$300,000 and above, will be published in UNDB online and on the World Bank's external website and at least one newspaper of national circulation in the recipient's country or in the official gazette or on a widely used website or electronic portal with free national and international access.

**10. Public procurement in Tanzania is governed by the Public Procurement Act, Cap 410 (as amended) and the Public Procurement Regulations, 2013 GN No. 446 of 2013 (as amended in 2016).** Under the new act, procurement functions remain decentralized to procuring entities, with the PPRA continuing to provide oversight functions for public procurement. In addition, the new act has maintained the definitions of fraud and corruption with regard to coercive practices, collusive practices, and obstructive practices. The new act has introduced, among others: (a) mandatory inclusion of local firms and experts in consultancy contracts; (b) domestic preference to both international and national competitive bidding; (c) a requirement to set aside contracts to be used for capacity building of local firms; (d) a requirement to set aside contracts below a set threshold to be awarded to local firms only; (e) negotiations with the lowest evaluated bidder to reduce price in the case of goods, works, and non-consulting services; (f) fixed budget method for goods, works, and non-consulting services; and (g) established and approved procurement standards by the Government.

**11. The new act has been reviewed by the World Bank and found to be satisfactory to a large extent, except for the**

**following provisions:** (a) there will be no preference accorded to domestic suppliers and contractors under national competitive bidding for goods, non-consulting services, and works under this project; (b) there should be no mandatory requirements for inclusion of local experts and firms for the consulting assignments; (c) negotiations with the lowest evaluated bidder to reduce price in the case of goods, works, and non-consulting services where competitive methods have been used will not be allowed; (d) the fixed budget method will not be used for goods, works, and non-consulting services; and (e) procurement standards established and approved by the Government may be used, provided that they are not restrictive. Furthermore, in accordance with paragraph 5.4 of the Procurement Regulations, the following will be observed: (a) the request for bids/request for proposals document will require that bidders/proposers submitting bids/proposals present a signed acceptance at the time of bidding, to be incorporated in any resulting contracts, confirming application of, and compliance with, the World Bank's Anti-Corruption Guidelines, including without limitation to the World Bank's right to sanction and the World Bank's inspection and audit rights; and (b) rights for the World Bank to review the recipient's procurement documentation and activities.

12. **Procurement implementation arrangements.** TRC and NIRC will be responsible for procurement implementation. TRC and NIRC have gained experience in procurement under the World Bank-financed projects through the closed TIRP and the ongoing REGROW Project; NIRC is among the implementing agencies for the latter project. The TIRP-2 will follow the same arrangements to manage all procurement activities and to oversee general project coordination, procurement, FM, M&E, and environment and social aspects. The PITs will be responsible for the day-to-day management of the procurement activities of the project. Responsibilities will include: (a) preparing and updating Procurement Plan/PPSD; (b) providing technical support in the procurement process including contract management; and (c) preparing user requirements, specification, and procurement documents and submitting to the World Bank for 'no objection'.

13. **The procurement capacity assessment for TRC and NIRC were carried out in April 2023 and October 2023, respectively.** The assessments reviewed the organizational structure for implementing the project, functions, staff skills and experiences, adequacy for implementing the project, and the interaction between the project's staff responsible for procurement activities and the relevant documents such as internal audit reports, PPRA audit reports (including PPRA special procurement audits for construction projects FY20/21 for NIRC), and Implementation Completion and Results Report (ICR) for TIRP. TRC has a good track record and experience in implementing the World Bank-financed projects. The assessment revealed that both TRC and NIRC have established all the necessary organs for adjudicating and managing procurement activities in accordance with the provisions of the Public Procurement (Amendment) Act 2016 (Revised 2022) and Public Procurement (Amendment) Regulations (2016). Currently, the TRC PMU has three procurement staff with limited experience in managing procurement of large and complex works, goods, and consulting services, in accordance with the World Bank Procurement Regulations, including the use of STEP. The PMU is supported by one experienced procurement specialist; his contract has been awarded.

14. **Outcome of TRC assessment.** Based on the PPRA's procurement audits for FY21/22, TRC's performance is satisfactory (score of 84.50). For the planning and design/tender documentation stage, the score was 93.75 percent; procurement stage was 95.75 percent; construction stage was 80.00 percent; project completion and closure stage was 77.67 percent and for quality of executed works, the score was 77.67 percent (satisfactory performance). Despite good scores, the assessment of TRC revealed: (a) insufficient staff in the PMU to cope with the volume of procurement transactions; (b) inadequate records filing, storage space, and management system; and (c) inadequate office space and office facilities. Other risks identified were: (a) inefficiencies in processing procurement activities (delays initiating procurement activities, preparing terms of reference and specifications, preparing bidding documents and request for proposals, evaluating bids and proposals, and signing contracts) in all organs involved in procurement transactions (Accounting Officer, Tender Board, PMU, User Departments, and Evaluation Committees); (b) delays in paying vendors, which impairs project implementation; (c) delays in resettlement plan and providing full access to site; (d) frequent staff transfers (Tender Board members and PMU's staff) - newly appointed members and recruited staff take time to

understand issues related to project procurement activities and procedures; (e) lack of succession planning for the procurement staff in TRC; and (f) lack of awareness and low capacity of the ministry staff and local construction industry to comply with ESHS requirements.

15. **Outcome of NIRC assessment.** There are 7 NIRC PMU procurement staff, however, they have: (a) inadequate knowledge of procurement planning, preparation of bidding and request for proposals documents, evaluation of bids/proposals, and customization of draft contract documents and contract managements; (b) inefficiencies in processing procurement activities in terms of preparation of terms of references, specifications, bidding documents, request for proposals, and bids/proposals evaluations; (c) inadequate records filing, storage space, and management system; and (d) inadequate office space and office facilities. Other risks identified were: (a) inefficiencies in processing procurement activities (delays initiating procurement activities, preparing terms of reference and specifications, preparing bidding documents and request for proposals, evaluating bids and proposals, and signing contracts) in all organs involved in procurement transactions (Accounting Officer, Tender Board, PMU, User Departments, and Evaluation Committees); (b) delays in paying vendors, which impairs project implementation; (c) inadequate contract management (stolen spares, inadequate equipment, staff shifting, and some contracts not completed on time as scheduled); (d) ineffective compliance and quality assurance; (e) delays in site possessions and non-extension of bids/proposals validity; (f) lack of a sustainability plan in NIRC; and (g) lack of awareness and low capacity of the local construction industry to comply with ESHS requirements.

16. **To address the capacity gap and mitigate the risks identified,** the procurement capacity of TRC and NIRC will be strengthened. To ensure sustainability, apart from recruiting procurement consultants to build internal capacity and assisting managing procurement activities, TRC and NIRC will prepare a capacity-building program for the PMUs, Tender Boards, and technical departments' staff involved in contract management and supervision of works, which will articulate areas to be strengthened, capacity strengthening activities to be undertaken, and the duration of each activity.

17. **The overall project procurement risk was assessed to be Substantial.** The risk is reduced to a residual rating of Moderate in view of the mitigation measures detailed in table 1.1.

**Table 1.1. Project Risks Affecting Procurement**

Risk	Mitigation Measure	Time Frame	Responsibility
The PMU staff have inadequate experience in managing procurement of large complex works, goods, and consulting works, in accordance with World Bank Procurement Regulations and procedures.	Provide training on the World Bank Procurement Regulations and Procedures. For sustainability reasons, TRC and NIRC will prepare a capacity-building plan for the Tender Boards, PMUs, and technical departments.	Throughout project implementation	TRC, NIRC
Inadequate staff to cope with volume of procurement transactions at the PMU	TRC: Recruit adequate staff including technical staff at the PIT and PMU support in processing procurement activities. NIRC: Recruit an individual procurement expert to support and build capacity of the PMU apart from assisting in processing procurement activities.	After credit effectiveness	TRC, NIRC
Inadequate skills and knowledge in contract management, disputes, and claims management	Conduct training tailored for contract management, disputes, and claims management for the PMU and technical	Throughout project implementation	TRC, NIRC

Risk	Mitigation Measure	Time Frame	Responsibility
	departments' staff.		
Inefficiencies in processing, approving, and managing procurement activities	Ensure procurements are processed as per the timelines in the procurement plans, including timely, Tender Board approvals, preparation of Terms of References and specifications by user and technical departments	Throughout project implementation	TRC, NIRC
Inadequate storage and record management system	Establish a sound filing and records management system.	Throughout project implementation	TRC, NIRC
Lack of awareness and low capacity of the TRC and NIRC staff and local construction industry to comply with ESHS requirements	Create awareness and conduct training on ESHS for the project staff, potential contractors, and consulting firms. Further, contracts will have adequate provisions of ESHS requirements and effective contract management.	Throughout project implementation	TRC, NIRC
Delays in paying contractors, consultants, and suppliers on time per the terms of the contracts	Expedite approving processes to ensure funds are released timely to the projects.	Throughout project implementation	MoF, TRC, NIRC

18. **Procurement oversight and monitoring arrangements.** The World Bank exercises its procurement oversight through a risk-based approach comprising prior and post reviews as appropriate. The World Bank sets mandatory thresholds for prior review based on the procurement risk rating of the project. The requirement for a prior or post review will be specified in the Procurement Plan. The World Bank will carry out post reviews of procurement activities undertaken by the recipient to determine whether they comply with the requirement of the Financing and Project Agreements. The World Bank may also use the services of the PPRA for carrying out post reviews for the project.

19. **Because the assessed procurement risk rating is Substantial,** the recipient will seek the World Bank's prior review for contracts of value equivalent to the thresholds, as detailed in table 1.2.

**Table 1.2. Thresholds for Prior Review and Procurement Approaches and Methods**

Category	Prior Review (US\$, millions) -	Procurement Approaches and Methods (US\$, millions)		
		Open International	Open National	Request for Quotation
Works	≥10	≥20	<20	≤0.2
Goods, IT, and non-consulting services	≥2	≥5	<5	≤0.1
<b>Consulting Services</b>				
Category	Prior Review (US\$, millions) -	Short List of National Consultants (US\$, millions)		
		Consulting Services	Engineering and Construction Supervision	
Consultants (Firms)	≥1	≤0.3		≤0.3
Individual consultants	≥0.3	n.a.		n.a.

**Notes:**

- **Terms of reference** for all contracts will be cleared by the World Bank, regardless of whether the assignment is for prior or post review.
- **Advertisement.** Consultancy service for contracts estimated to cost US\$300,000 equivalent and above per contract will be advertised in UNDB online in addition to advertising in national newspaper(s) of wide circulation and/or regional newspaper(s).
- **Frequency of procurement supervision.** In addition to the prior review supervision to be carried out by the World Bank, the capacity assessment of the implementing agencies recommends one supervision mission every six months to visit the field to carry out post review of procurement actions.
- **Training and workshops.** The project will finance training and workshops, if required, based on an annual training plan and budget, which will be submitted to the World Bank for its prior review and approval. The annual training plan will identify, among other things: (a) the training envisaged; (b) the justification for the training; (c) the personnel to be trained, including staff in regional offices; (d) the duration for such training; and (e) the estimated cost of the training. At the time of the actual training, the request will be submitted to the World Bank for review and approval. Upon completion of the training, the trainees will be required to prepare and submit a report on the training received.

**C. Financial Management Implementation Arrangements****C.1 FM Arrangements for TRC**

20. **Annual planning and budgeting arrangements.** Preparation of the annual work plans and budgets (AWPBs) is participatory. Project budgets are prepared by the project accountants with input from project staff and approved by the project coordinator/manager. Budgets are approved before the new financial year begins and monitored during project implementation using unaudited IFRs and quarterly physical progress reports. TRC staff is competent to carry out the preparation, review, and consolidation of the AWPB. The budget arrangements are assessed as adequate.

21. **Accounting arrangements.** The project is required to maintain adequate financial records in accordance with accepted international accounting standards and practices and Public Financial Act 2016 and its guidelines. The regulations describe the accounting system, policies, and procedures, that is, the accounting records, supporting documents, computer files, and chart of accounts; the accounting processes from the initiation of a transaction to its inclusion in the financial statements; authorization procedures for transactions; and the financial reporting process used to prepare the financial statements. These arrangements are considered sufficient to the World Bank.

22. **Staffing arrangements.** TRC has 65 accounting staff, 48 based in the headquarters in Dar es Salaam. Three project accounting staff are available for the project, and they have experience in managing and auditing the World Bank-financed

projects through TIRP. All accountants dedicated to support TIRP-2 and internal auditors will be trained on the World Bank's FM and disbursement procedures to ensure smooth project operations. Some TRC accounting and internal audit staff are CPA/CPA equivalent qualified, including the project accountant and Chief Internal Auditor. The internal audit unit at TRC consists of 10 staff including the Chief Internal Auditor; five of the internal auditors are CPAs. TRC will support the other internal auditors in becoming CPAs.

23. **Accounting system.** Enterprise Resource Management System (ERMS) was introduced in May 2022 and training was conducted for the finance team. It is reported that there are challenges in producing reports using ERMS, so TRC is considering adapting to the Government Payment System (MUSE) which is currently satisfactory.

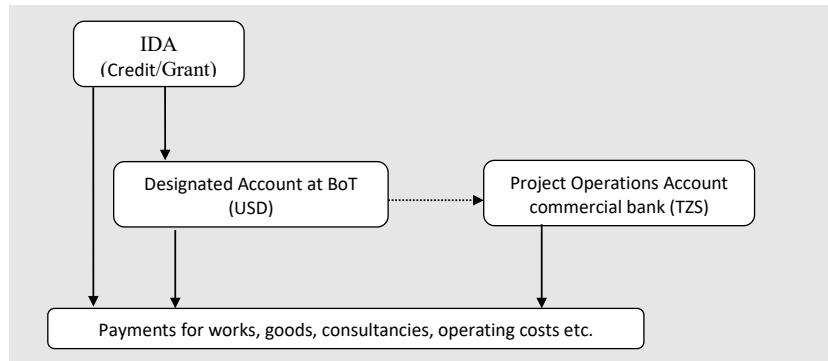
24. **Internal control and internal auditing.** The internal control system at TRC is assessed as moderately satisfactory with adequate segregation of duties, accounting and arithmetic controls, approval and authorization, and other controls. The internal control system is documented comprehensively in the Public Finances Act, which is deemed to be sufficient for the project. Some issues are noted in internal controls under the previous TIRP.

- (a) Some payment vouchers were not stamped 'PAID', exposing project funds to misuse and fraud.
- (b) As per the internal audit report for quarter one of FY22/23, it was reported that there is absence of coding numbers on assets which had been handed over by TIRP to TRC and there is absence of some TIRP assets on the fixed asset register.

25. **Internal audit.** The review noted that internal audit reports were produced quarterly; however, upon review of the last report for TIRP (Q1 2022/2023), weak follow-up of previous recommendations was noted. Follow-up of previous internal audit recommendations was not presented in the report. TRC will facilitate internal audit staff training both internal and external ones to increase their capacity. Additionally, insufficient capacity in internal audit is leading to delays in conducting and producing internal audit reports. There is a need for continuous capacity building of the internal audit unit to enable them to carry out their work effectively. Training on risk management, donor-funded project auditing, project management, and contract management auditing is necessary to build their capacity.

26. **Funds flow arrangements.** The TRC PIT will open and maintain two sets of bank accounts: (a) a US dollar designated account, and (b) a Tanzanian shilling (TZS) project account for implementing the project. The designated account may be opened at the Bank of Tanzania (BoT) and the project accounts may be opened at the BoT or a commercial bank acceptable to the World Bank. Transfers from IDA will be made into the designated account. Transfers will be made from the designated account to the project account primarily to meet transactions. The designated account will be opened after the Financing Agreement is signed. The project will adopt a report-based disbursement method.

**Figure 1.1. Funds Flow Arrangements**



27. **Financial reporting arrangements.** The quarterly IFRs will be prepared at the end of each quarter and submitted to the World Bank no later than 45 days after the end of the quarter. The format and content of the IFRs has been discussed

and agreed. The IFRs will include Sources and Uses of Funds Statement, Uses of Funds by Project Activity/Component, and Designated Account Activity Statement. To support the continued use of report-based disbursement, TRC will be required to submit:

- (a) An IFR,
- (b) Designated Account Activity Statement,
- (c) Designated account and project bank account statements,
- (d) Bank reconciliations for both the designated account and project bank accounts,
- (e) Summary statement of designated account expenditures for contracts subject to prior review, and
- (f) Summary statement of designated account expenditures for contracts not subject to prior review.

28. The annual financial statements will be prepared in accordance with International Public Sector Accounting Standards (IPSAS accruals). The IDA Financing Agreement will require the submission of audited financial statements to the World Bank within six months after the financial year-end. These financial statements will consist of:

- (a) A Statement of Sources and Uses of Funds/Cash Receipts and Payments;
- (b) A Statement of Affairs/Balance Sheet;
- (c) The accounting policies adopted and explanatory notes. The explanatory notes will be presented in a systematic manner with items on the Statement of Cash Receipts and Payments being cross-referenced to any related information in the notes; and
- (d) A Management Assertion that World Bank funds have been expended in accordance with the intended purposes as specified in the relevant World Bank legal agreement.

29. The standard format that has already been agreed with the Government will be used for this project and will be communicated to the project team. A short training will be conducted together with coaching during project implementation.

30. **External auditing arrangements.** The Office of the Controller and Auditor General of the United Republic of Tanzania has the responsibility for auditing all government projects. The audits are done in accordance with International Standards on Auditing (ISA) and International Standards for Supreme Audit Institutions (ISSAI). The government and the World Bank have agreed that the Controller and Auditor General will conduct the audit. The audit report together with the Management Letter will be submitted to the World Bank not later than six months after the end of the financial year. TRC is required to make public disclosure of the audited financial statements in a manner acceptable to the World Bank. Following the World Bank's formal receipt of the audit report, the World Bank will make them available to the public in accordance with the World Bank Policy on Access to Information.

31. **Governance and anticorruption arrangements.** Both PITs have agreed to continually improve on the use of hotlines to report corruption and other forms of fraudulent activities. The TRC PIT will strengthen the current arrangements of the Integrity Committee which is meant to handle complaints.

32. **FM action plan.** Table 1.3 indicates the actions agreed to be taken for the project to strengthen its FM system and the due completion dates.

**Table 1.3. FM Action Plan**

	Action	Due Date
1	Open a designated account and project account and communicate the details of the bank account and signatories to IDA.	By credit effectiveness
2	Continue with implementing the accounting systems to enhance reporting on a timely basis and assist in project and procurement management.	By credit effectiveness
3	Train the accountants and internal audit staff on the World Bank Financial Management and Disbursement Guidelines.	Within three months after effectiveness

33. The overall project FM risk was assessed to be **Moderate**.

34. **Implementation support plan.** Based on the risk assessment of the project, the World Bank FM implementation support review will be conducted at least twice per year. The objectives will include ensuring that strong FM systems are maintained for the project throughout its life. Reviews will be carried out regularly to ensure that expenditures incurred by the project remain eligible for IDA funding. The Implementation Status and Results Report prepared by the World Bank following the review will include an FM rating for the components.

**Table 1.4. Implementation Support Plan**

Activity	Frequency
<b>Desk reviews</b>	
IFR review	Quarterly
Audit report review	Annually
Review of other relevant information such as internal audit reports	Quarterly
<b>On-site visits</b>	
Review of overall operation of the FM system	Biannually during implementation support missions
Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit, and other reports	Continuous
In-depth transaction reviews	As required
<b>Capacity building</b>	
FM training	Within three months after project effectiveness and thereafter annually
Technical assistance	Continuous

## C.2 FM Arrangements for NIRC

35. **Risk assessment and mitigation.** Table 1.5 identifies the key risks that management may face during project implementation leading to failure to achieve project objectives. It also provides a basis for determining how management should address these risks.

36. The overall risk rating is Substantial and expected to improve to Moderate upon the successful implementation of the mitigating measures in the risk assessment report. These risks will be reviewed and assessed during each implementation support mission and support provided to the project team in implementation of the mitigation measures.

37. **Implementation arrangements.** NIRC will be one of the implementing agencies under the project, together with

TRC. NIRC will have a PIT, headed by a project coordinator. NIRC has no direct experience in managing the World Bank-funded projects but has experience as a sub-implementor on the REGROW Project. Capacity building will be provided to the PIU during project implementation to ensure compliance with requirements. Necessary mitigation of any assessed gaps in implementation capacity will be included as a part of project support through a combination of training, capacity building, and hiring of embedded project staff/consultants.

38. **Budgeting arrangements.** Preparation of the AWPBs is participatory. Project budgets are prepared by the project accountants with inputs from project staff and approved by the project coordinator/manager. Budgets will be approved before the new financial year begins and monitored during project implementation using unaudited IFRs and quarterly physical progress reports. The ministry is staffed with 10 accountants including the Chief Accountant and seven staff in the Planning Department. A project accountant will manage budgeting.

39. **Accounting arrangements.** The project is required to maintain adequate financial records in accordance with accepted international accounting standards and practices and Public Financial Act 2016 and its guidelines. The regulations describe the accounting system, policies, and procedures, that is, the accounting records, supporting documents, computer files, chart of accounts; the accounting processes from the initiation of a transaction to its inclusion in the financial statements; authorization procedures for transactions; and the financial reporting process used to prepare the financial statements. NIRC uses the government MUSE accounting system.

**Table 1.5. FM Risks and Mitigation Measures**

Type of Risk	Description of Risk	Risk Rating	Risk Mitigating Measures Risk	Residual Risk Rating
<b>Inherent Risk</b>				
<b>Country level</b>	Despite the ongoing public financial management reforms, key challenges remain in improving revenue forecasting and management; budget planning, execution, and monitoring; public procurement; accounting; internal controls and internal audit; and external audit and oversight.	S	<p>There are a number of initiatives that MoF intends to pursue/be pursuing to improve the public financial management system for better use of public resources. These include the following:</p> <ul style="list-style-type: none"> <li>Reforming tax policy and institutional arrangements as well as conducting tax assessment and revenue baseline studies</li> <li>Upgrading Integrated Financial Management Information System and training in its operation</li> <li>Finalizing installation of integrated payroll system and Human Resource Management Information System including consolidation of information on civil servants contained in different databases.</li> </ul>	S

Type of Risk	Description of Risk	Risk Rating	Risk Mitigating Measures Risk	Residual Risk Rating
<b>Entity level</b>	There may be a risk that the relevant financial reports including budget and IFRs will not be prepared and submitted on time due to the lack of experience in managing World Bank projects.	S	The World Bank plans a detailed training session for the client's project team on FM and disbursement guidelines.	M
<b>Project level</b>	The risk of failure of the project to achieve the intended objectives	S	The World Bank plans a detailed training session for the client's project team on FM and disbursement guidelines.	M
<b>Overall Inherent Risk</b>		S		M
<b>Control Risk</b>				
<b>Budgeting</b>	No weaknesses noted in budget arrangement setup at NIRC. The risk is assessed as Moderate.	M	NIRC is staffed with 10 accountants including the Chief Accountant. A project accountant who will manage budgeting. NIRC also has seven staff in the planning department who are responsible for organizational budgeting.  There will be proper segregation of duties between junior and senior staff.	L
<b>Accounting</b>	Failure of the accounting team to deliver quality and timely reports due to lack of experience.  NIRC uses the government MUSE accounting system.	S	Regular capacity building training will be undertaken during supervision missions. There will be proper segregation of duties between preparers and reviewers of accounting reports including bank reconciliations.	M

Type of Risk	Description of Risk	Risk Rating	Risk Mitigating Measures Risk	Residual Risk Rating
<b>Internal Controls</b>	<p>There may be delays in submission of the quarterly/semiannual and annual internal and external audit reports.</p> <p>Control issues noted on payments include:</p> <ul style="list-style-type: none"> <li>• Lack of proof of payment on some payments,</li> <li>• Some payments not stamped 'PAID',</li> <li>• Bank reconciliations prepared and approved by the same people who prepare and approve payments, and</li> <li>• Insufficient number of internal auditors.</li> </ul>	S	<p>Regular capacity building training of finance staff and internal auditors</p> <p>Continuous implementation of recommendations of the internal audit reports to improve controls.</p> <p>NIRC will increase the number of internal auditors.</p> <p>There will be proper segregation of duties between junior and senior staff.</p>	M
<b>Funds Flow</b>	<p>Delays in submission of IFRs and withdrawal application could affect disbursement of funds.</p> <p>NIRC has not yet operated an IPF Designated Account (DA) with the World Bank.</p>	S	Regular capacity building on the use of the World Bank's Client Connection as well as reporting and disbursement guidelines	M
<b>Financial Reporting</b>	<p>Risk of delay in submission of quarterly IFRs and annual financial statements due to lack of experience in managing World Bank-financed projects.</p> <p>Quality of financial reports could also be compromised.</p>	S	<p>Capacity building and training to be done on need basis and during supervisory missions.</p> <p>There will be proper segregation of duties between preparers and reviewers of accounting reports including bank reconciliations.</p>	M
<b>Auditing</b>	<p>There may be delays in submission of the annual external audit reports.</p> <p>Slow or lack of implementation of audit recommendations</p>	S	<p>Early notification and appointment of external auditors. Early submission of draft financial statement to the National Audit Office – Tanzania (NAOT).</p> <p>Close follow-up by the World Bank on implementation of audit findings.</p>	M

Type of Risk	Description of Risk	Risk Rating	Risk Mitigating Measures Risk	Residual Risk Rating
Overall Control Risk		S		M
Overall Risk Rating		S		M

Note: Risk ratings: H = High, S = Substantial, M = Moderate, L = Low.

40. **Staffing arrangements.** NIRC has 10 accounting staff, one of whom has been nominated to be the project accountant for this project. Some of the accounting staff, including the Chief Accountant, are Certified Public Accountant (CPA)/CPA equivalent qualified. NIRC will support more staff to acquire the CPA qualification to enhance their capacity. There will be proper segregation of duties between junior and senior staff, enabling the junior staff to learn by doing and for seniors to review transactions, processes, and reports.

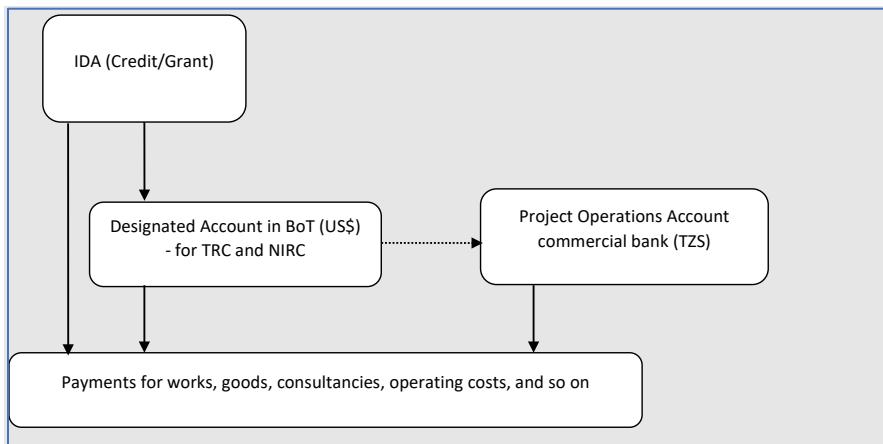
41. **Internal controls and internal auditing.** The internal control system is documented comprehensively in the Public Finances Act, which is deemed to be sufficient for the project. NIRC had well-documented procedures; however, some issues noted during the review include the risks described under internal controls in table 2.5.

42. **Internal audit.** There are currently three internal audit staff, including the Chief Internal Auditor. Internal audits are conducted on a quarterly basis, based on the internal audit annual plan. Terms of reference and engagement letters are issued before work commencement. Given the workload, the number of internal audit staff is insufficient to carry out their roles effectively. The internal audit team will audit NIRC as an organization and all its projects. TIRP-2 will also be audited. NIRC will hire at least two more audit staff as per the establishment to increase effectiveness. There is also a need for continuous capacity building of the internal audit unit to enable it to carry out its work effectively. Training on risk management, donor-funded project auditing, project management, and contract management auditing is necessary to build their capacity.

43. **Funds flow arrangements.** The PIT will open and maintain two sets of bank accounts: (a) a US dollar designated account, and (b) a Tanzanian shilling (Tzs) project account for implementing the project. The designated account may be opened at the BoT and the project accounts may be opened at BoT or a commercial bank acceptable to the World Bank. Transfers from IDA will be made into the designated account. Transfers will be made from the designated account to the project account primarily to meet transactions. The designated account will be opened after the Financing Agreement is

signed. The project will adopt a report-based disbursement method.

**Figure 1.2. Funds Flow Arrangements**



44. **Financial reporting arrangements.** The quarterly IFRs will be prepared at the end of each quarter and submitted to the World Bank not later than 45 days after the end of the quarter. The format and content of the IFRs was discussed and agreed. The IFRs will include Sources and Uses of Funds Statement, Uses of Funds by Project Activity/Component, and designated account Activity Statement. To support the continued use of report-based disbursement, NIRC will be required to submit:

- (a) An IFR,
- (b) Designated account Activity Statement,
- (c) Designated account and project bank account statements,
- (d) Bank reconciliations for both the designated account and project bank accounts,
- (e) Summary statement of designated account expenditures for contracts subject to prior review, and
- (f) Summary statement of designated account expenditures for contracts not subject to prior review.

45. The annual financial statements will be prepared in accordance with International Public Sector Accounting Standards (IPSAS accruals). The IDA Financing Agreement will require the submission of audited financial statements to the World Bank within six months after the financial year-end. These financial statements will consist of:

- (a) A Statement of Sources and Uses of Funds/Cash Receipts and Payments;
- (b) A Statement of Affairs/Balance Sheet;
- (c) The accounting policies adopted and explanatory notes. The explanatory notes will be presented in a systematic manner with items on the Statement of Cash Receipts and Payments being cross-referenced to any related information in the notes; and
- (d) A Management Assertion that World Bank funds have been expended in accordance with the intended purposes as specified in the relevant World Bank legal agreement.

46. The standard format that has already been agreed with the Government will be used for this project and will be communicated to the project team. A short training will be conducted together with coaching during project implementation.

47. **External auditing arrangements.** The Office of the Controller and Auditor General has the responsibility for

auditing of all government projects.

48. The audits are done in accordance with International Standards on Auditing (ISA) and International Standards for Supreme Audit Institutions (ISSAI). The audit report together with the Management Letter will be submitted to the World Bank not later than six months after the end of the financial year. NIRC is required to make public disclosure of the audited financial statements in a manner acceptable to the World Bank. Following the World Bank's formal receipt of the audit report from NIRC, the World Bank will make it available to the public in accordance with the World Bank Policy on Access to Information.

49. **Governance and anticorruption arrangements.** Both PITs committed to improve on the use of hotlines to report corruption and other forms of fraudulent activities. The NIRC PIT will strengthen the current arrangements of the Integrity Committee which is meant to handle complaints.

50. **FM action plan.** Table 2.6 indicates the actions agreed to be taken for the project to strengthen its FM system and the due completion dates.

**Table 1.6. FM Action Plan**

	Action	Due Date
1	Open a designated account and project account and communicate the details of the bank account and signatories to IDA.	By credit effectiveness
2	Continue with implementing the accounting systems to enhance reporting on a timely basis and assist in project and procurement management.	By credit effectiveness
3	Hire two additional internal auditors.	Within six months after credit effectiveness
4	Train the accountants and internal audit staff on the World Bank Financial Management and Disbursement Guidelines.	Within three months after credit effectiveness

51. **Conclusion of the assessment.** The results of the assessment indicate that the overall FM arrangements satisfy the World Bank minimum requirements.

52. The FM risk rating for the project is **Substantial**.

53. **Implementation support plan.** Based on the risk assessment of the project, the World Bank FM implementation support review will be conducted at least twice per year. The objectives will include ensuring that strong FM systems are maintained for the project throughout its life. Reviews will be carried out regularly to ensure that expenditures incurred by the project remain eligible for IDA funding. The Implementation Status and Results Report prepared by the World Bank following the review will include an FM rating for the components.

**Table 1.7. Implementation Support Plan**

<b>Activity</b>	<b>Frequency</b>
<b>Desk reviews</b>	
IFR review	Quarterly
Audit report review	Annually
Review of other relevant information such as internal audit reports.	Quarterly
<b>On-site visits:</b>	
Review of overall operation of the FM system	Annually during implementation support missions
Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit, and other reports	Continuous
In-depth transaction reviews	As required
<b>Capacity building</b>	
FM training	Before project start and thereafter annually
Technical assistance	Continuous

**ANNEX 2: Strengthening the Climate Resilience of the Kilosa-Gulwe-Igandu Section****Context**

1. **The Kilosa-Gulwe-Igandu (120 km) railway section is prone to floods.** Studies have been conducted by the Government since post-colonial times; this also includes the Integrated Development Plan for Dodoma Region (1985) and various research studies by different sectors to understand the hydrology of the Kinyasungwe catchment area and to generate information that would inform investment along the catchment. The Kinyasungwe River is ephemeral, and its catchment is described as a leaf-like, regular-shaped watershed because major tributaries join the river in the lower reach from the Ukaruru and Rubeho Mountains as well as from Mount Kandai and the steep hills surrounding it. The runoff occurs only after a heavy rainfall when both the infiltration capacity and the potential evaporation are exceeded by the rainfall intensity. The swamps and *mbugas* (seasonal swamps) in the north act as natural reservoirs contributing to the erratic occurrences of stream flow. Their extraordinary retention capacity accounts for the moderation of the flood flow.

2. **The 1985 Integrated Development Plan for Dodoma region explored the potential for medium and small dams along the Kinyasungwe catchment in relation to the Water Master Plan to use the Dabalo, Ikowa and Hombolo as flood control dams and consequently supply water for irrigation, livestock, and domestic use.** The flood control dams were constructed in a cascading flow down to Kimagai and Kidete dams along the central railway in a basin-wide approach. Kinyasungwe River is joined by the Mkonda River downstream and the river width at this point is about 350m. Remarkable riverbank erosion and sediment deposition are observed near the confluence with the Kinyasungwe River.

3. **More recent studies provide details of the potential threats to the railway and identify actions to prevent these.** JICA's 'Preparatory Survey on Flood Protection Measures for Central Railway Line' (URT 2016)<sup>38</sup> and the study 'Undertaking River Infrastructure Inventory and Risk Assessment, Design and Construction Supervision of River Infrastructure and River Training' conducted by WRBWB (Interim report, April 2023) provide detailed analysis of the potential and threats of the water resource extraction along the catchment. All studies indicate that integrated measures in the short and medium term are required to strengthen climate resilience of the railway between Kilosa and Igandu to safeguard the investment and protect the ecosystem in the Wami/Ruvu Basin.

4. **Water resources management is a multisectoral activity the water resource management policy argues, and it requires an effective collaboration and coordination mechanism among various sectors.** The policy emphasizes integrated, and intersectoral water resource planning based on river basins as a planning unit. It also promotes participatory processes and emphasizes community involvement in the management of water schemes. The actors involved and their roles include the following:

- (a) **MoW:** Strengthening of water resources management frameworks; sector coordination; development and review of national water policy, guidelines, and legislation; oversight of basin water offices; effective operations of water boards; water law implementation; and conflict resolution between national sectors.
- (b) **Wami Ruvu Basin Water Office, Morogoro:** Undertaking water resource planning and management, issuing water rights, and monitoring their use and collection of fees, monitoring hydrology in the basin and database management, building awareness, and assisting water user associations.
- (c) **Wami Ruvu Basin Water:** Water allocation, the determination and modification of water rights, the measures to be taken in case of drought, and priorities to be given to different uses of water in the basin.
- (d) **District and local governments:** Planning and development of water resources in accordance with basin plans, protection and conservation of natural resources, establishment of water management bylaws and conflict resolution, assessment of district water demands and participation in the preparation of basin plans.
- (e) **MoA through the NIRC and agro-industrial sectors:** Development of irrigation infrastructure and allocation

<sup>38</sup> [https://openjicareport.jica.go.jp/pdf/12262887\\_01.pdf](https://openjicareport.jica.go.jp/pdf/12262887_01.pdf)

of water for irrigation and operations for increased agricultural and livestock productivity.

- (f) **MoT and TRC:** Investing in infrastructure that protects and safeguards the railway to minimize risks and losses due to floods.

### **Impact on Livelihoods, Environment, and Railways**

5. **In the Kinyasungwe sub-basin, land is used for extensive livestock grazing and crop production.** As agricultural practices are often not environmentally sustainable, soil conservation measures such as terracing, contour planting, strip cropping, and/or use of fertilizer are rarely practiced even on the steepest of the slopes. This led to accelerated erosion and sedimentation. Uncontrolled grazing has led to severe erosion and the process is accelerated by the steep slopes and destruction of the natural vegetation cover by bush burning and deforestation for charcoal making. Soil erosion is a grave problem in the catchment which is due to both natural (soils, rainfall intensities, and slopes) and man-made reasons (overgrazing, bush clearing, and burning of vegetation) causing siltation and considerably shortening the lifespan of the dams. Reduced dam capacity affects the potential for irrigation and hence the livelihoods of the people. Thus, efforts to restore the dams should go together with conservation for the upstream area of the watershed to reduce the sediment production in the upstream area that affects the meanderings of the mainstream of the Kinyasungwe River.

### **Interventions**

6. **The Government has established a multiagency Technical Committee from 15 government agencies to lead the preparation of a permanent solution for addressing the flood challenge along the Kilosa-Gulwe-Igandu section.** The team comprises members from the Vice President's Office; MoT; MoF; Ministry of Land, Housing, and Human Settlement Development; Ministry of Livestock and Fisheries; MoW; MoA; and TRC. The team has prepared a draft terms of reference for conducting a feasibility study and design of flood relief structures (ponds) at the Kinyasungwe catchment area. The PS MoT is expected to take the lead in the formation of the Steering Committee which will review and approve the Technical Committee submissions, including the draft terms of references and study deliverables, and provide guidance for further action. The study will inform the designs of the six upstream reservoirs of Kidete, Kimagai, Buigiri, Ikowa, Hombolo, and Dabalo that were constructed by the Government in the 1950s and were dilapidated due to old age, sediment load, damaged dam embankment, and drying due to climate change.

7. **Currently, the MoA, through NIRC, is constructing two multipurpose dams in Kinyasungwe catchment at Msagali and Membe areas in FY22/23, which will contribute to reducing the runoff to the rain section.** A total of TZS 27.96 billion has been allocated by the Government and construction of the dams/ponds is ongoing. The Msagali charco-dam will have the capacity to store 92 million m<sup>3</sup> of water, and it is estimated to irrigate 5,000 ha and provide water for a total of 27,461 livestock and for domestic water supply. The Membe charco-dams in Chamwino District Council with the capacity to store 12 million m<sup>3</sup> of water are envisaged to irrigate 3,200 ha and have a provision for livestock and domestic use. A total of TZS 12.5 billion has been allocated by the Government for this investment. Resources for feasibility studies are allocated by the MoA through NIRC. The proposed interventions need to consider sustainable dam management which would include promotion of climate-smart agriculture that involves conservation interventions upstream for erosion control which can result in a high inflow of silt into the reservoir, causing reduction of storage capacity. NIRC plans to oversee operations and maintenance of irrigation schemes to ensure increased efficiency in water management, sustainability of water storage facilities, and minimizing of risks of climate change.

8. **The origin of the floods goes beyond Kilosa-Gulwe, starting from Manyara region where runoff is collected and drains into the Kinyasungwe sub-basin.** The solutions require a cascade of investments and need a multisectoral approach. Intervention calls for the following:

- (a) Joint studies on a wider scale of the catchment starting from Manyara region where runoff is collected and drains through the Kinyasungwe sub-basin as a long-term solution. The studies need to focus on developing models for quantification of the runoff and establish how this would be harvested to address water demands

in the area while maintaining sustainability of the central railway including the SGR.

- (b) Joint prioritization of the key sectoral cascading investments to be supported by developing multisectoral criteria for identification of priority infrastructure of common interest to control floods, support livelihoods, and ensure environmental services along the Kinyasungwe catchment.

9. Strengthening of collaboration and expediting implementation of plans to deliver on the ministry's key sector agenda such as the irrigation subsector that is currently operating under a tight timeline.

### **General Summary**

10. The Ikowa, Buigiri, Dabalo, Hombolo, Kidete, and Kimagai dams were constructed purposely to control floods and stormwater and to protect meter gauged railway line. These dams have also been used for other activities and thus serve nearby communities. These dams were built more than 60 years ago. The site parameters and conditions then were generally satisfactory because of negligible human impacts on the river and the dams in subject. Increase in population, human activities, deforestations, land use changes, and climate change have severely increased the land to be potentially erodible in all weather and thus during rainfall, the removal of topsoil becomes inevitable.

11. The existing dams had no sand/traps, no check dams, or small sluice gates for flushing out sedimented materials. Furthermore, the sizes of spillway opening were generally smaller and there was no regulation of speed of water approaching the dams. The designs were not defensive as per the current threatening situation.

12. Currently, high sediment load is the most detrimental factor that has led many dams to be non-functional. The sediments have decreased the size of the reservoir, and hence the amount of water is also affected by high evaporation rate because dams generally increase the surface area of the body of water. Most of the dams' embankments are either leaking, collapsed, deformed, settled, or washed away and this can be seen in all old dam sites. The appurtenant structures (spillways, sluice gates, crest protection, and intake chambers) are not effective, failed, clogged, or washed away and some are small and wrongly positioned.

13. It is important that these dams are reinstated. With the major issue being siltation control, the rule of siltation is to 'keep it away' from reservoir at any cost. If silt accidentally reaches the reservoir, the sluice gates act as a flushing system and make the removal of silt from the reservoir easy.

14. Some dams can be rehabilitated and upgraded with minor studies and relatively lower cost, for example, Ikowa, Buigiri, Dabalo, and Hombolo Reservoirs. Other dams like Kidete and Kimagai need detailed feasibility studies; the suitability of current dam sites, size, demands, effectiveness, suitability of site, and other risks need to be well studied.

### **A. KIDETE RESERVOIR**

#### **Dam Details**

Location	Kilosa, Morogoro	Type of Dam	Dam Dimensions (m)				
<b>Coordinates (UTM)</b>	Latitude -6.637456° Longitude 36.703596°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embarkment length	Spillway width
			9.5	75.5	12	250	40-50

#### **General Site Observations**

- (a) The geomorphological behaviour of the river is changing. The river width has increased from 2011 to 2022.
- (b) The river meandering is changing by allowing deposition of sand within the river.
- (c) The river's water speed was high (while approaching the dam) between 2010 and 2018. Because the depth of the river was high, width was relatively narrow. This was the time that deposition was high.

- (d) Weak riverbanks allow erosion and widening of the river, which increases the sediment level.
- (e) Excessive sedimentation seen at the reservoir (soil height 4 m to 6 m).

**Dam Structure and Associated Facilities**

- (a) Embankment was constructed using inferior materials. It is weak and deformed and settles (embankment consists of silt which is cohesionless material. Loose materials cannot compact well if some optimal amounts of clay are not incorporated; thus, the embankment was not well compacted, and no clay binder is visible).
- (b) The spillway does not exist; spillway protection is worn out.
- (c) The direction of river versus spillway and reservoirs is not in line.
- (d) No check dams, no energy dissipators, and no sluice gate for flushing sediment materials.
- (e) The intake chamber is worn out.
- (f) The pipes are in good condition.

**Failure Types of Embankments**

The failure types in the first (1960s) dam, washed away in 1997 and 1998, and the second (2012) constructed dam:

- (a) Hydraulic failures (overtopping, erosion of upstream surface, downstream toe, and face by gully formation)
- (b) Structural failures (slide in the embankment, foundation slide, faulty construction, and poor maintenance)
- (c) Seepage failures (piping through the dam body and foundation, sloughing of the dam downstream side)

**B. KIMAGAI RESERVOIR****Dam Details**

Location	Chamwino, Dodoma	Type of Dam	Dam Dimensions (m)				
Coordinates (UTM)	Latitude -6.937457° Longitude 36.903597°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embankment length	Spillway width
			6	94	16	340	50

**General Site Observations**

- (a) The type of dam, based on location, terrain, and nature of reservoir, could not be identified because the dam was washed away.
- (b) The spillway indicates check dam/pressure reducer dam which reduces the speed of water.
- (c) No indication of siltation. The dam was placed right at the center of the river axis. The water force washed away the supposed earth-fill dam.
- (d) The location indicates velocity of water is high during rainy season.
- (e) No indication of siltation.
- (f) If a dam existed, it was placed in the wrong site; type of dam was not supposed to be earth fill.
- (g) No indication of river to change its course from 2008 through 2012 to 2023.

**Dam Structure and Associated Facilities**

- (a) Worn-out concrete spillway structure. The direction of river versus spillway and reservoirs is not in line.
- (b) Other dam facilities components are not found.

### C. BUGIRI RESERVOIR

#### Dam Details

Location	Chamwino, Dodoma	Type of Dam	Dam Dimensions (m)				
<b>Coordinates (UTM)</b>	Latitude -6.152147° Longitude 36.032238°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embankment length	Spillway width
			5.5	45.5	5.5	940	80

#### General Site Observations

- (a) The sedimentation load is high (siltation). Excessive sedimentation at the reservoir (soil height 2 m to 3 m).
- (b) Sedimentation was observed from 2002 to 2018.
- (c) There are no sand traps and erodible soil in the catchment area near the site.
- (d) Intense human activities of sandmining and excavation were being done within the reservoir.
- (e) Spillway is broken.
- (f) There is animal interference (large number of animals seen than any other dam).
- (g) Maintenance is poor (routine dredging or system to flush silt).

#### Failure Types of Embankments

- (a) Minor leakage is observed.
- (b) Embankment slopes are weak and thus need upgrades.
- (c) There are operational failures (excessive sedimentation, inflow, evaporation).

### D. IKOWA RESERVOIR

#### Dam Details

Location	Ikowa/Chalinze, Dodoma	Type of Dam	Dam Dimensions (m)				
<b>Coordinates (UTM)</b>	Latitude -6.13903° Longitude 36.22664°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embankment length	Spillway width
			5	50	7	500	40

#### General Site Observations

- (a) The sedimentation load is high (siltation); excessive sedimentation at the reservoir (soil height 2 m to 3 m).
- (b) Established in 1959, no maintenance since then.
- (c) Partially collapsed (inner wall) in 2002.
- (d) No sand traps and erodible soil in catchment area near the site.
- (e) The intake chamber wall was raised, which increased the rate of sedimentation.
- (f) The spillway position needs to be changed.
- (g) Spillway height needs to be increased.
- (h) Maintenance is poor (routine dredging or system to flush silt).

#### Failure Types of Embankments

- (a) Collapse of inner wall.
- (b) Embankment slopes are weak and thus need upgrades.

## E. DABALO RESERVOIR

### Dam Details

Location	Chamwino, Dodoma	Type of Dam	Dam Dimensions (m)				
<b>Coordinates (UTM)</b>	Latitude -5.800038° Longitude 36.120692°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embankment length	Spillway width
			14	40	6	400	40

### General Site Observations

- (a) The sedimentation load is high (siltation); excessive sedimentation at the reservoir (soil height 2 m to 3 m).
- (b) Established in 1958, no maintenance since then.
- (c) No sand traps and erodible soil in the catchment area near the site.
- (d) The intake chamber wall was raised, which increased the rate of sedimentation.
- (e) The spillway position needs to be changed.
- (f) Spillway height needs to be increased.
- (g) Maintenance is poor (routine dredging or system to flush silt).
- (h) There is leakage beneath the embankment.

### Failure Types of Embankments

- (a) Minor leakage observed.
- (b) Embankment slopes are weak and thus need upgrades.
- (c) Operational failures (excessive sedimentation, inflow, evaporation).

## F. HOMBOLO RESERVOIR

### Dam Details

Location	Chamwino, Dodoma,	Type of Dam	Dam Dimensions (m)				
<b>Coordinates (UTM)</b>	Latitude -5.800038° Longitude -35.969372°	Earth-fill/earth/embankment dam	Top width	Bottom width	Height	Embankment length	Spillway width
			14	40	6	400	40

### General Site Observations

- (a) High sedimentation load (siltation); excessive sedimentation at the reservoir (soil height 1.0 m to 2.2 m).
- (b) No sand traps and erodible soil in catchment area near the site.
- (c) The intake chamber wall was raised, which increased the rate of sedimentation.
- (d) The spillway position needs to be changed.
- (e) Spillway height needs to be increased and modified.
- (f) Maintenance is poor (routine dredging or system to flush silt).
- (g) Minor leakage observed.

**ANNEX 3: Climate Change Adaptation and Mitigation**

1. The project (TIRP-2) presents several opportunities to generate climate co-benefits, both for adaptation and mitigation. TIRP-2 seeks to improve the safety and efficiency of the railway for all users along the Central Corridor Railway Network in Tanzania. This will be done through targeted rehabilitation and improvements that make the railway more climate resilient. It is estimated that a more efficient, safer, and climate-resilient railway corridor will induce modal shift from freight trucking to the less carbon-intensive railways and will therefore reduce GHG emissions in freight transport along the corridor. Box 4.1 sets out the climate vulnerability context and provides the project's statement of intent to enhance climate resilience. Table 4.1 describes how each project component will contribute to climate adaptation and mitigation and therefore generate climate co-benefits. Annex 4 on 'Economic and Financial Analysis' presents the results of GHG accounting for this project.

**Box 3.1 Climate Vulnerability Context and Project's Intent for Enhancing Climate Resilience****Climate Vulnerability Context**

Tanzania is already experiencing natural hazards like floods (river, urban, and coastal floods), landslides, extreme heat, and water scarcity, which are expected to increase in frequency and intensity with climate change impacts.<sup>39</sup> Trend analysis for 1961 and 2013 shows a rise in mean annual maximum and minimum temperatures and a slight decline in precipitation, though not statistically significant. Projected changes in mean annual temperature show an increase of 2–4°C by 2100 (RCP6.0),<sup>40</sup> which varies by country zone. More warming is projected over the western side of Tanzania (3.5°C by 2100), with less warming projected over the northern coastal regions and northeastern highlands (1.76°C for 2050 and 3.28°C for 2100). Rainfall projections indicate that some parts of the country may experience an increase in mean annual rainfall of up to 28 percent by 2100, particularly over the Lake Victoria Basin and northeastern highland. The southwestern highlands and western zones of the country are projected to experience an increase in annual rainfall by up to 9.9 percent in 2050 and by up to 17.7 percent in 2100.<sup>41</sup>

Figure 3.1, Figure 3.2, and Figure 3.3 show the mean percentage values of flooded areas by region for pluvial and fluvial flooding and the percentage changes between the predicted mean regional flood areas in the future and current flood model outputs across all return periods for fluvial flooding.

A systemic climate vulnerability assessment of multimodal transport networks was conducted for Tanzania, which showed that with climate change, greater lengths of the transport network will be exposed to extreme fluvial flooding. Climate change scenarios have been applied to flood hazard simulation model outputs to represent future fluvial flood hazard in 2030. The analysis estimated that the worst-case transport network disruption in Tanzania has the potential to cause economic losses of US\$1.4 million per day at present and this would potentially increase to US\$2.5 million per day by 2030.<sup>42</sup>

<sup>39</sup> Think Hazard, consulted on May 11, 2023 (Link: [Think Hazard - Tanzania](#)).

<sup>40</sup> Pant, R., E. E. Koks, T. Russell, and J. W. Hall. 2018. *Transport Risks Analysis for The United Republic of Tanzania - Systemic Vulnerability Assessment of Multi-Modal Transport Networks*. Final Report Draft, Oxford Infrastructure Analytics Ltd., Oxford, UK.

[https://www.researchgate.net/publication/330134472\\_Transport\\_Risks\\_Analysis\\_for\\_The\\_United\\_Republic\\_of\\_Tanzania\\_-\\_Systemic\\_vulnerability\\_assessment\\_of\\_multi-modal\\_transport\\_networks](https://www.researchgate.net/publication/330134472_Transport_Risks_Analysis_for_The_United_Republic_of_Tanzania_-_Systemic_vulnerability_assessment_of_multi-modal_transport_networks).

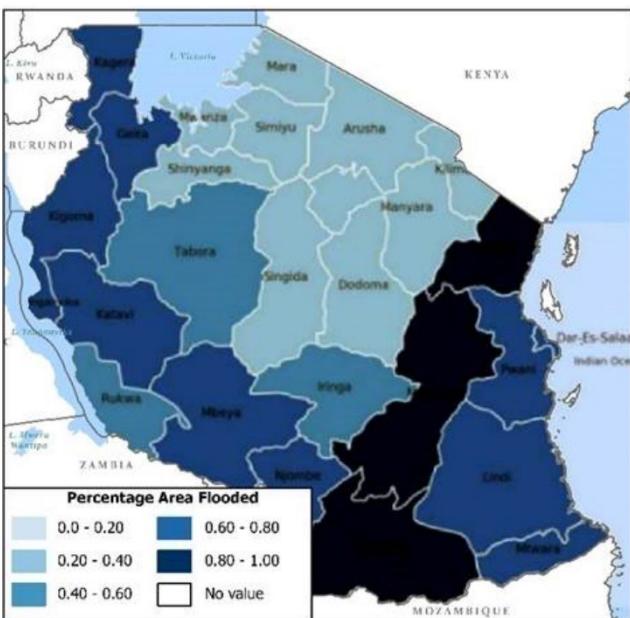
<sup>41</sup> United Republic of Tanzania; Second National Communication to the UNFCCC; September 2014.

<https://unfccc.int/sites/default/files/resource/tzanc2.pdf>.

<sup>42</sup> Pant, R., E. E. Koks, T. Russell, and J. W. Hall. 2018. *Transport Risks Analysis for The United Republic of Tanzania - Systemic Vulnerability Assessment of Multi-Modal Transport Networks*. Final Report Draft, Oxford Infrastructure Analytics Ltd., Oxford, UK.

[https://www.researchgate.net/publication/330134472\\_Transport\\_Risks\\_Analysis\\_for\\_The\\_United\\_Republic\\_of\\_Tanzania\\_-\\_Systemic\\_vulnerability\\_assessment\\_of\\_multi-modal\\_transport\\_networks](https://www.researchgate.net/publication/330134472_Transport_Risks_Analysis_for_The_United_Republic_of_Tanzania_-_Systemic_vulnerability_assessment_of_multi-modal_transport_networks).

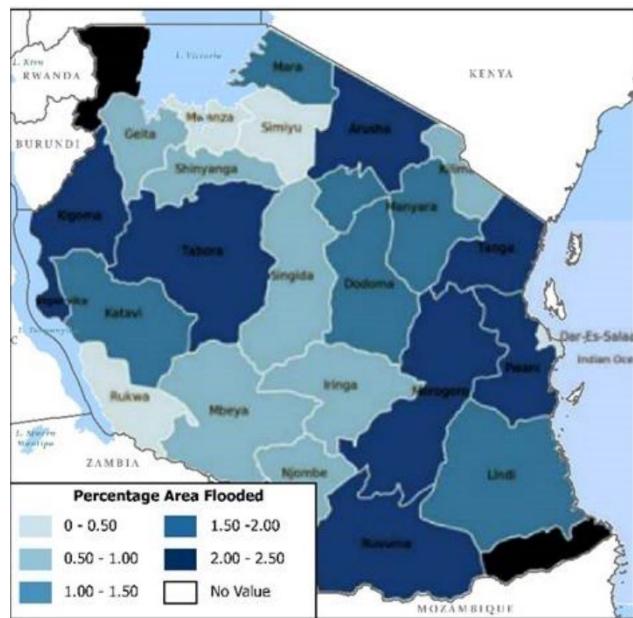
**Figure 3.1. Map Representation of Regional Concentrations of Current Pluvial Flooding**



Source: Oxford Infrastructure Analytics, 2018.

Note: The values are estimated across all return periods.

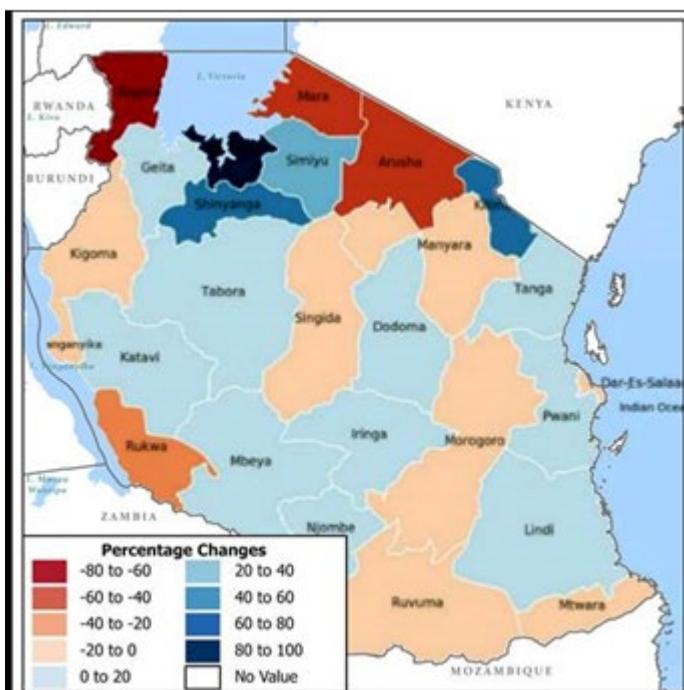
**Figure 3.2. Map Representation of Regional Concentrations of Current Fluvial Flooding**



Source: Oxford Infrastructure Analytics, 2018.

Note: The values are estimated across all return periods.

**Figure 3.3. Map Representation of Regional Changes in Fluvial Flooding Due to Climate Change**



Source: Oxford Infrastructure Analytics, 2018.

### **Climate Vulnerability of the Central Corridor Railway Network**

The Central Corridor Railway Network is exposed to floods, erosion, and sand deposition. Risks are particularly high in the Kilosa-Gulwe-Igandu railway section. People within the section have been suffering from floods for more than 25 years but the impacts have been worse over the last few years. The JICA study (2016) concluded that freight traffic carried by the railway has declined substantially over the last decade and that the primary reasons for this include repeated flooding between Kilosa and Gulwe. Between 2011 and 2014, there were 40 flooding incidents along that stretch of line. In 2021, the Kilosa-Gulwe section was closed for about three months due to flooding.

Kinyasungwe/Mkondoa catchment has an approximate catchment area of 16,538 km<sup>2</sup>. The catchment includes three major rivers of Great Kinyasungwe, Little Kinyasungwe, and Lumuma originated from Chandama highland in the northwest of the catchment, which all end in Mkondoa River, which flows through the lowlands of Kilosa. The six reservoirs (Kidete, Kimagai, Ikowa Buigiri, Hombolo, and Dabalo) and an 8 km long embankment along Mkondoa River were constructed as a preventive measure to control flooding. However, due to climate change, environmental degradation, and lack of maintenance, most of the reservoirs are currently either not in good condition or completely dysfunctional.

### **Statement of purpose or intent**

In alignment with Tanzania's NTP<sup>43</sup> and the 2012 National Climate Change Strategy, the project aims to enhance the climate resilience of rail freight logistics along the Central Corridor Railway Network in Tanzania and in this way, improve the efficiency and attractiveness of the sector and induce modal shift from trucking to railways, thus lowering GHG emissions. This is to be achieved by: (a) rehabilitation and strengthening of railway infrastructure to climate resilient standards and support of railway design studies, (b) strengthening of climate resilience of the Kilosa-Gulwe-Igandu section, (c) strengthening of operational and institutional support, and (d) a contingent emergency response mechanism.

**Table 3.1. Climate Adaptation and Mitigation Measures by Project Component**

Activities	Adaptation Actions	Mitigation Actions
<b>Component A: Strengthening of Railway Infrastructure and Support of Transport Studies</b>		
1. Dar es Salaam to Tabora Railway Infrastructure Strengthening - 257.4 km 2. Rehabilitation of the Tabora-Isaka railway line - 130 km 3. Bridge repairs and rehabilitation 4. Improvement of intermodal terminals 5. Recovery from the annual flooding of	The project will refurbish the tracks to selected sections of about 350 km between Dar es Salaam and Tabora, rehabilitate the Tabora-Isaka (130 km) section, and upgrade bridges below 18.5-ton axle load to climate resilient standards, as follows: <ul style="list-style-type: none"> <li>• The impacts of flooding on rail infrastructure will be minimized through designing for scour and including slope erosion control measures, river training works, boulder pitching, turfing, and retaining walls at high banks. Surface water accumulations are being addressed by cross-drainage systems.</li> <li>• A total of 156 bridges will be repaired, and two new bridges will be constructed at Ruvu. Risks associated with river flooding are adapted through appropriately designed bridges and culverts, incorporating resilient           </li> </ul>	<ul style="list-style-type: none"> <li>• The project will contribute significantly to climate mitigation by reducing GHG emissions due to greater operational efficiencies, fewer disruptions due to climate-related natural hazards, and modal shift of freight from road transport to rail.</li> <li>• The completion of realignment of rail and loading platform at three intermodal terminals—two constructed under this           </li> </ul>

<sup>43</sup> The United Republic of Tanzania, Ministry of Works, Transport and Communications, National Transport Policy, October 2017.

Activities	Adaptation Actions	Mitigation Actions
<p>the Kilosa-Gulwe segment for continued operational efficiency</p> <p>6. Support for key transport studies</p> <p>7. Supervision of track, bridge, maintenance, and installation works</p> <p>8. Railway track repairs and rehabilitation</p>	<p>engineered designs. Measures include replacing of culverts with box culverts, riverbed protection, and river flow improvement. Bridges will be designed for a minimum flood recurrence interval of 1 in 100 years for important and major bridges and 1 in 50 years for minor bridges.</p> <ul style="list-style-type: none"> <li>• To adapt to extreme heat, electrical and signaling equipment are being designed and installed for operational efficiency within the temperature range of <math>-10^{\circ}\text{C}</math> to <math>+70^{\circ}\text{C}</math> to address extreme impacts due to temperature variations.</li> <li>• Tracks are designed considering the minimum/maximum rail temperature and accordingly distress temperatures are fixed to avoid buckling/rail fracture.</li> <li>• The project will construct two intermodal terminals of Ilala and Isaka using weather-resistant construction materials, appropriate surface drainage, and power backups and recovery systems will be installed to deal with climate events that could adversely affect business continuity.</li> <li>• Maintenance programs, observing climate risk considerations, will be established for the Dar es Salaam and Tabora railway section and the Tabora-Isaka railway section.</li> <li>• The project will therefore include provisions to plan and support the emergency rapid response along Kilosa-Gulwe as well as a response mechanism to any other unforeseen disaster on an emergency basis within the Dar es Salaam to Isaka section.</li> <li>• The project will support a study for a permanent solution to the flooding that occurs in the Kilosa-Gulwe-Igandu segment of the Dar es Salaam-Isaka section, which closes the track two to four months per year.</li> <li>• The project will support studies for designs for rehabilitation of the rest of the central railway.</li> <li>• The rehabilitation of the railway track along the Kilosa-Guwe-Igandu section to climate resilient standards.</li> </ul>	<p>project and a third implemented under the Dar es Salaam Maritime Gateway project—will improve operational efficiency by reducing train in-and-out maneuvers and address cargo loading and unloading delays at the intermodal terminals.</p> <ul style="list-style-type: none"> <li>• Intermodal terminals are being designed under the ‘Green Building Concept’, thereby optimizing energy efficiency and conserving natural resources. Energy efficiency certification will be sought for the terminals, as for example, EDGE, Building Research Establishment Environmental Assessment Method (BREEAM), certificate issued by the German Sustainable Building Council (DGNB), <i>Haute Qualité Environnementale</i> (HQE), GREEN STAR, and the Leadership in Energy and Environmental Design (LEED).</li> <li>• Intermodal terminals will use locally produced, renewable resources, thereby reducing the overall carbon impact of construction.</li> </ul>

#### **Component B: Strengthening Climate Resilience of the Kilosa-Gulwe-Igandu section**

<ul style="list-style-type: none"> <li>• Design studies and supervision of Kilosa-Gulwe-Igandu flood control</li> </ul>	<p>The Kilosa-Gulwe-Igandu railway section is affected by flooding, leading to railway closure for about three to four months annually. The project will support the following:</p> <ul style="list-style-type: none"> <li>(a) The development of analytical studies for the</li> </ul>	<p>Improvements in railway climate resilience will improve its reliability and efficiency, making railway transport more</p>
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Activities	Adaptation Actions	Mitigation Actions
<ul style="list-style-type: none"> <li>• Flood control infrastructure</li> <li>• Dam safety technical assistance to the NIRC and MoW</li> </ul>	<p>design of flood control systems in the Kinyasungwe catchment area, affecting the Kilosa-Gulwe-Igandu railway section.</p> <p>(b) Technical assistance to support the establishment of contracts to deploy flood control ponds/reservoirs in the Kinyasungwe catchment area to reduce flooding of the Kilosa-Gulwe-Igandu railway section.</p>	attractive. This is supportive of modal shift from road transport to railways thus contributing to GHG emissions reduction and climate mitigation objectives.
<b>Component C: Operational and Institutional Support</b>		
<ul style="list-style-type: none"> <li>• Development of a safety culture in the railway network</li> <li>• Support to TRC in the introduction of open access operations and switch to condition-based maintenance as part of enterprise-wide asset management transformation</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building of TRC on developing maintenance contracts, considering climate risks</li> </ul>	<ul style="list-style-type: none"> <li>• Improvements in railway safety and operations will improve railway productivity, efficiency, and attractiveness and therefore contribute to inducing modal shift from road freight transport to railway freight transport, reducing GHG emissions.</li> </ul>
<b>Component D: Contingent Emergency Response</b>		
	<p>The CERC facilitates the swift reallocation of resources to emergency response and reconstruction in a climate emergency and other emergencies.</p>	

**ANNEX 4: Economic and Financial Analysis****Introduction**

1. TIRP-2 aims at improving safety, climate resilience, and operational efficiency of the railway for users along the Dar es Salaam to Isaka (970 km) Central Corridor in Tanzania. By the project, the economy would benefit from:

- (a) Strengthened railway infrastructure to upgrade the corridor's efficiency and capacity,
- (b) Established reliable and efficient open access operations in the railway subsector,
- (c) Improved safety in the railway network and institutional safety of the supporting regulatory agencies,
- (d) Reduced GHG emissions resulting from excessive freight movement by road, and
- (e) Improved reliability of railway services to enable increased freight and railway modal share along the corridor due to the Kilosa-Gulwe-Igandu section's enhanced climate resilience.

2. **The analysis is based on the CBA comparing the 'with project' and 'without project' scenarios.** The expected main economic benefits come from: (a) the reduction of transport user costs; (b) a higher value of time expected because of increased operating rail speed and improved reliability in rail operations; (c) the emission reduction by diverting the traffic from road to rail transport, which is induced by the lower cost; and (d) reduced casualties due to safety improvement in rail transport compared to road transport. The current rail operations are inefficient and unreliable. The current rail operating speed is 19 km/hour, which is expected to be increased to 27 km/hour. Road transport is considered to be more efficient and reliable. The average truck speed between Dar es Salaam and Isaka may be about 21 km/hour (that is, 45 hours for a distance of 970 km), similar to the current rail speed; however, the last-mile flexibility and operational reliability are much higher than rail operations. Therefore, despite relatively high road user costs—twice as high as rail costs—many shippers currently prefer to use truck transportation. By increasing the reliability and efficiency in rail operations, TRC's Central Corridor is expected to attract more traffic to rail, diverting from road transport. The introduction of the project-supported open access and block chain operations will also help increase rail freights.

3. **Positive externalities of rail transportation are also important.** The project is expected to contribute to reducing GHG emissions, compared to road transport. In addition, rail transport is considered to be safer: though available road and rail statistics may not be perfect, the number of fatal accidents in the rail sector is smaller than in the road sector. The following analysis is focused on the investment and the infrastructure operation and maintenance costs. The project will also provide technical assistance to strengthen the institutional capacity to ensure safety and environmental regulations.

4. The following analysis ignores potential benefits and costs associated with passenger services, which are important but numerically substantially minimal compared to the above costs and benefits on the freight side.

5. **To balance expected benefits and required costs, the analysis takes into account the rolling stock (3 locomotives and 44 new flat wagons) that was procured under the first phase, TIRP, between October and November 2021.** Theoretically, this investment has already been sunk; thus, under the 'without project' scenario, it would have no value. From the overall program point of view, this rolling stock plays an essential role to generate all economic benefits mentioned above. Without this rolling stock, none of the benefits can be realized.

**Assumptions**

6. **Investment costs.** The analysis covers 25 years from 2023 to 2048, including an investment period for the first 5 years. The sunk cost of purchasing the rolling stock (that is, US\$49 million) is assumed to have occurred at Year 0.<sup>44</sup> The investment costs for the railway infrastructure under TIRP-2, that is, US\$150 million, are assumed to be allocated evenly

<sup>44</sup> Through TIRP, in 2021, 3 (3,000 hp) locomotives and 44 new flat wagons were procured for US\$9 million and US\$40 million, respectively.

from Year 1 to Year 5. This includes an estimated investment cost of US\$129.17 million for strengthening of railway infrastructure along the 970 km central railway line between Dar es Salaam and Isaka and Support of Design Studies (Component A), US\$55.3 million for strengthening climate resilience of the Kilosa-Gulwe-Igandu section (Component B), and US\$15.53 million for operational and institutional support (Component C).

7. **The applied exchange rate is TZS 2,315 per US\$.**<sup>45</sup> The economic discount rate of 6 percent has been applied following the World Bank practice, and an inflation rate of 4.7 percent has been used.<sup>46</sup>

8. **Operation and maintenance (O&M) costs.** The analysis assumed the current O&M cost of US\$38 million per year.<sup>47</sup> Additionally, the analysis assumed an average annual O&M cost of US\$91 per ton. Based on the current operating unit costs per ton-km, it is assumed that the project's additional operating costs would be proportional to the increased or diverted traffic. Fuel consumption in the amount of 5.45 liters per 1,000 metric tons per km,<sup>48</sup> with a fuel price of US\$1.33 per liter,<sup>49</sup> is employed in the analysis.

9. **Traffic.** It is envisaged that for containerized traffic, additional 3,000 twenty-foot equivalent units (TEUs) will be shipped by direct project beneficiaries in Year 1, which is assumed to increase up to 6,000 TEUs<sup>50</sup> by Year 5 that all rail infrastructure investment is made. For non-containerized freight, the improved rail operations are also expected to attract 5–10 percent more bulk cargo from road transport, compared to the current total TRC traffic (416,000 tons). This assumption was based on data from TRC, whereby TRC operations (ton-km) have increased by approximately 10 percent annually over the last decade; therefore, it is more likely that the new investment could assure a 10 percent increase in general cargo. Overall, around 173,687 tons of cargo (after Year 5) are expected to be diverted from road and newly transported by rail per year. The additional freight volume is 168 million ton-km after Year 5, which corresponds to 45 percent of the current TRC operations, 366 million ton-km (2021).

10. **Operational speed.** Currently, it takes 50 hours to transport freight by train from Dar es Salaam to Isaka, which corresponds to a speed of 19.4 km/hour. However, once the project is complete, it is anticipated that this time would drop to 30 hours, which corresponds to an increase in speed to 26.9 km/hour. Additionally, it is assumed that it would take 45 hours to transport freight by road from Dar es Salaam to Isaka, which is equivalent to the speed of 21.4 km/hour. According to the Central Corridor Transport Observatory Annual Report (2021), it took four days to transport cargo from Dar to Kigali, Rwanda. Assuming that one day is used for border crossing, stopovers for a driver, and so on, the driving time is divided in proportion to distance, that is, 970 km between Dar es Salaam and 570 km from Isaka to Kigali. Thus, average road speed in Tanzania is 21.4 km/hour, slightly higher than the current rail speed, 19.4 km/hour. This motivates shippers to use road transport at present.

11. **Value of time.** Ad-valorem tariff of delayed shipment per day is estimated at 0.6 percent of the value of shipment.<sup>51</sup> Assuming that the value of cargo is about US\$2,600 per ton, the value of time is calculated to be US\$67 per ton-hour. This is used to evaluate the time saved by increased transport speed by rail after the project (above).

12. **Transport user costs.** The analysis considers the following road and rail user costs, respectively.

(a) Average road transport cost by truck is US\$3,535<sup>52</sup> per container-km from Dar es Salaam to Isaka, which

<sup>45</sup> Average exchange rate of 2021 according to the WBG.

<sup>46</sup> Bank of Tanzania. 2022. *2021/22 Annual Report*.

<sup>47</sup> Based on the O&M cost obtained from an ex post economic analysis of TIRP during the ICR preparation in 2022.

<sup>48</sup> According to TRC, as of 2023.

<sup>49</sup> Tanzania Diesel Prices, 2022–2023, according to GlobalPetrolPrices.com.

<sup>50</sup> The increase in containerized cargo up to 6,000 TEUs is based on the CPCS study (2013).

<sup>51</sup> Hummels, D. L., & Schaur, G. (2013). Time as a trade barrier. *American Economic Review*, 103(7), 2935–2959.

<sup>52</sup> This is according to the CPCS study (2013b).

translates into US¢16.5 per ton-km.

- (b) Rail transport cost of transporting a container from Dar es Salaam to Isaka is US\$1,590, that is, approximately US¢7.4 per ton-km.<sup>53</sup>

13. Assuming that these costs would not change after the project, an incremental cost of about US¢9.1 could be saved by transporting 1 ton-km by rail rather than truck.

14. **GHG assessment.** The reduced emissions by diverting traffic from road to rail are incorporated as an economic benefit in the assessment. An analysis on GHG emissions was conducted by using the non-urban rail tool based on two dimensions: ‘CO<sub>2</sub> emissions without project’ and ‘CO<sub>2</sub> emissions with project’. The analysis considered freight traffic transported by railway (trains) and road (trucks) modes for the 25-year project period. SPC analysis considered the latest (2023) low and high SPC values. Since CO<sub>2</sub> emissions are anticipated to account for the biggest portion of GHG emissions compared to other source-wise GHG emissions, the GHG accounting assessment focused on CO<sub>2</sub> emissions, applying the Transport Global Practice tool designed for the specific type of transport operations.

15. **Safety benefits.** It is difficult to assess economic benefits from improved transport safety because of the lack of reliable data and complexity of the issue. In this analysis, available national statistics are used. According to Tanzania Transport and Meteorology Sectors Statistics, 2012, there were 21 incidences of death in TRC operations, which translates to an incidence rate of 0.057 per millions of ton-km. On the other hand, based on the road safety statistics, Tanzania had 31 vehicle accident deaths per 100,000 population. Assuming that the modal split for freight is 95 percent for road and 5 percent for rail, the incidence rate for road transport is estimated at 1.50 deaths per millions of ton-km. Thus, by using rail more, a considerable number of lives could be saved. The value of people’s life is complex but calculated simplistically based on current per capita GDP as well as the nation’s median age and life expectancy.

### Main Result and Sensitivity Analysis

16. **The project provides sufficient economic returns to justify the investment.** Based on the SPC estimates,<sup>54</sup> the NPV is estimated at US\$84.3 million with an EIRR of 12.0 percent under the low carbon price scenario, while the application of high SPC yields an NPV of US\$93.9 million and an EIRR of 12.5 percent. Thus, the project is economically viable.

**Table 4.1. Project Economic Analysis Results**

Indicator	With Low SPC	With High SPC
NPV (US\$, millions)	84.3	93.9
EIRR (%)	12	12.5

Source: World Bank Staff 2023.

17. **Sensitivity analysis has been conducted based on three scenarios: 20 percent increase in investment cost, lower diverted traffic levels (demand) by 20 percent, and a combination of both scenarios.** The results show that TIRP-2 is largely robust to the 20 percent increase in investment cost and 20 percent less diverted traffic levels but is susceptible to the combination of both increased investment cost and lower demand. As indicated in table 4.2, the application of both low SPC and high SPC yields positive NPV when investment cost is increased by 20 percent and diverted traffic is lowered by 20 percent distinctly. Conversely, when both case scenarios are considered, then the application of low SPC and high

<sup>53</sup> This is the price charged by TRC per container-km. This price includes the return of the empty container.

<sup>54</sup> The SPC was estimated following the WBG 2017 SPC Guidance Note, with carbon prices adjusted to 2023 Consumer Price Index. Shadow Price of Carbon in Economic Analysis Guidance Note; November 2017, World Bank. <https://thedocs.worldbank.org/en/doc/911381516303509498-0020022018/original/2017ShadowPriceofCarbonGuidanceNoteFINALCleared.pdf>

SPC results in significantly lowered NPVs and EIRRs.

**Table 4.2. Summary of Economic Sensitivity Analysis Results**

Indicator	20% Increase in Investment Cost	20% Less Diverted Traffic	Both
<b>LOW SPC</b>			
NPV (US\$, millions)	60.5	47.9	24
EIRR (%)	9.8	9.5	7.6
<b>HIGH SPC</b>			
NPV (US\$, millions)	70	55.5	31.6
EIRR (%)	10.4	10	10

Source: World Bank Staff 2023.

#### *GHG Accounting*

18. The GHG accounting assessment analyzed the impact of refurbishment of the Dar es Salaam to Tabora railway section (257.4 km), rehabilitation of the Tabora to Isaka section (130 km), and rehabilitation of Kilosa-Gulwe-Igandu flood-prone section (84 km) of the Central Corridor railway network. It is estimated that these works, as well as the improvement in safety, climate resilience, and operational efficiency, will result in modal shift from freight transport by road to the Central Corridor line. Additionally, the analysis suggested that the project's fuel and carbon intensity will be efficient. Over the 25-year evaluation period, the with-project CO<sub>2</sub> emissions are estimated at 403,597 tons and the without-project emissions are estimated at 728,256 tons. This corresponds to a total net CO<sub>2</sub> emissions reduction of 324,659 tons, or a 45 percent CO<sub>2</sub> emissions reduction, and an annual average net emissions reduction of 12,986 tons. The World Bank-approved GHG accounting tool (non-urban rail tool) was used to conduct GHG accounting of the project. Table 4.3 summarizes the results.

**Table 4.3. CO<sub>2</sub> Emissions (tons)**

Road Work	Without Project	With Project	Total Net
Refurbishment of Dar es Salaam to Tabora railway section (257.4 km), rehabilitation of Tabora to Isaka railway section (130 km), and rehabilitation of Kilosa-Gulwe-Igandu flood-prone section (84 km)	728,256	403,597	324,659

Source: World Bank Staff 2023.

#### **Potential Regional and Country-wide Economic Returns**

##### *Regional Benefits*

19. Increased potential for Tanzania to emerge as a major regional transport hub. The project will enable improved intermodal integration and railway performance as a result of improved safety, resilience, and operational efficiency of the regional rail network. Strengthened and resilient rail infrastructure will promote efficient and reliable transport services to its six landlocked neighbors (the Democratic Republic of Congo, Rwanda, Burundi, Malawi, Uganda, and

Zambia). This in turn will promote investment opportunities and growth in the regional economy.

#### *Country Benefits*

20. **Greater contribution to the country's economic growth and development.** The high levels of traffic congestion in major cities, particularly Dar es Salaam, and the prolonged dwell times of ships at the port of Dar es Salaam, as well as the difficulty in exporting goods like cement to neighboring countries due to subpar infrastructure, including railway services, are all indicators of the country's growing need for transportation. High levels of post-harvest losses are also a result of these issues in many remote areas. Traffic will be diverted from road to rail as a result of the project, and more traffic will be generated by private operators along the rail network. Rail freight volume growth will ease traffic, lower GHG emissions, and open up new investment opportunities.

21. **Transport sector infrastructure that is less prone to climate change and natural hazards.** Flooding has detrimental social and economic effects since it not only destroys transportation infrastructure but also disrupts the transportation network, adding to delays. Reliability of railway services will be improved by a strengthened Kilosa-Gulwe-Igandu railway segment, which is affected by flooding and closures for roughly three to four months each year. Through the construction of flood control dams, the project will enable accessibility to socioeconomic activities including irrigation, livestock raising, and fishing, supporting the livelihood of dwellers around the catchment area, thus resulting in high-quality livelihood through food security and self-sufficiency.

#### **Financial Analysis**

22. **The financial analysis provides an evaluation of the financial returns from the investment made under TIRP-2.** This analysis also considers both the TRC rolling stock (13 locomotives and 274 wagons) procured through the BRN Strategy in 2013 and the TIRP rolling stock (3 locomotives and 44 new flat wagons) procured through TIRP in October 2021.

#### *Assumptions*

23. **The project period applied is 25 years between 2023 and 2048.** The model uses a financial discount rate of 3 percent. Inflation of 4.7 percent is also assumed. The assumptions for investment cost and O&M cost, traffic forecast, and user fees (tariff) are the same as in the economic model.

#### *Summary of Financial Analysis Results*

24. **The financial assessment results indicate that the project provides sufficient financial returns to justify the investment under TIRP-2.** The project is expected to provide an NPV of US\$39.8 million (at 3 percent discount rate) and yield an FIRR of 7.3 percent. Table 4.4 summarizes the results.

**Table 4.4. Project Financial Analysis Results**

Indicator	TIRP Phase 1
NPV (US\$, millions)	39.8
FIRR (%)	7.3

*Source:* World Bank Staff 2023.

#### *Sensitivity Analysis*

25. **Sensitivity analysis was also conducted assuming 20 percent increase in investment cost, lower diverted traffic levels (demand) by 20 percent, and a combination of both scenarios.** Similar to the economic sensitivity analysis, the results showed that TIRP-2 is robust to the 20 percent increase in investment cost and 20 percent less diverted traffic levels but is highly sensitive to the combination of both increased investment cost and lower demand. Further, TIRP-2 is

more robust to the 20 percent less diverted traffic levels compared to the 20 percent increase in investment cost. Table 4.5 depicts the summary of financial sensitivity results.

**Table 4.5. Summary of Financial Sensitivity Analysis Results**

Indicator	20% Increase in Investment Cost	20% Less Diverted Traffic	Both
NPV (US\$, millions)	13.1	38.4	-37.4
FIRR (%)	4.1	7.1	0.4

Source: World Bank Staff 2023.

**Table 4.6. Impact of TIRP-2 on TRC**

Average Results per Year (2023–2048)	
<b>Revenue</b>	<b>US\$, millions</b>
Container tariff	9.26
Non-containerized tariff	2.55
Infrastructure access tariff	3.27
Access fee - Other traffic	9.88
<b>Total revenue</b>	<b>24.96</b>
<b>O&amp;M costs</b>	<b>-15.02</b>

Source: World Bank Staff 2023.

## **ANNEX 5: Project Map**

