



FEDERAL REPUBLIC OF SOMALIA

MINISTRY OF AGRICULTURE AND IRRIGATION (MOAI)

BEERO OO BARWAAQEE SOOMAALIYA (BBS) IRRIGATION PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

Revitalizing Irrigation Infrastructure and Climate-Smart Agriculture in Somalia

BEERO OO BARWAAQEE SOOMAALIYA (BBS) PROJECT

HIRSHABELLE STATE

BALCAD DISTRICT - MIDDLE SHABELLE REGION - 13 CANAL REHABILITATION SITES

FINANCED BY	African Development Bank (AfDB)
AFDB CATEGORY	Category 2
PROPONENT	Ministry of Agriculture and Irrigation (MoAI), Federal Republic of Somalia
REPORT DATE	July 2026
FIELD VERIFICATION	December 2025 - January 2026
PROJECT SITES	13 irrigation canal rehabilitation sites - Balcad District, Middle Shabelle Region: Busley 1, Busley 2, Caday, Danwadaag, Faragaab, Mashruuca, Sagaarey, Shoobe, Suufi, Yaxaasow 1, Yaxaasow 2, Yaxaasow 3 and Farax Galoolay Canals

DECLARATION PAGE

This Environmental and Social Impact Assessment (ESIA) Report has been prepared for the Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project in Hirshabelle State, covering thirteen irrigation canal rehabilitation sites in Balcad District, Middle Shabelle Region, under the Ministry of Agriculture and Irrigation (MoAI) of the Federal Republic of Somalia, with financing from the African Development Bank (AfDB).

The undersigned hereby declare that this ESIA has been carried out in accordance with the applicable environmental and social laws, regulations, and policies of the Federal Republic of Somalia and the requirements of the African Development Bank's Integrated Safeguards System (ISS, 2023). To the best of our knowledge, the information contained in this Report is true, complete, and accurate, and the environmental and social risks and impacts of the Project have been assessed in a professional and objective manner.

This Declaration Page is signed upon submission of the Report for environmental and social clearance, and a signed copy shall be shared with the African Development Bank.

Declaration and Signatures

Action	Name / Position	Organization	Date & Signature
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ABBREVIATIONS

Abbreviation	Full Form
AfDB	African Development Bank
ARAP	Abbreviated Resettlement Action Plan
BBS	Beero oo Barwaaqee Soomaaliya Project
C-ESMP	Contractor Environmental and Social Management Plan
CLO	Community Liaison Officer
CRA	Climate Risk Assessment
ESHS	Environment, Social, Health, and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ERW	Explosive Remnants of War
FAO	Food and Agriculture Organization
FGS	Federal Government of Somalia
FMS	Federal Member States
GBV	Gender-Based Violence
GIIP	Good International Industry Practice(s)
GRM	Grievance Redress Mechanism
HVRM	Highly Vulnerable and Marginalized (groups)
IDP	Internally Displaced Persons
IPC	Integrated Phase Classification
ISS	Integrated Safeguards System (AfDB 2023)
LMP	Labour Management Procedures
LTIFR	Lost Time Injury Frequency Rate
MoAI	Ministry of Agriculture and Irrigation
MoECC	Ministry of Environment and Climate Change
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
OS	Operational Safeguard
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
SEA/SH	Sexual Exploitation, Abuse, and Sexual Harassment
SEP	Stakeholder Engagement Plan
SMP	Security Management Plan
SWALIM	Somalia Water and Land Information Management
UXO	Unexploded Ordinance
WUA	Water User Association / Canal Committee

EXECUTIVE SUMMARY

1. Project Background and Development Rationale

The Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project is a Federal Republic of Somalia initiative led by the Ministry of Agriculture and Irrigation and financed by the African Development Bank. The Hirshabelle component focuses on Balcad District in Middle Shabelle, one of Somalia's most productive irrigated agricultural corridors. The canal network diverts water from the Shabelle River to support maize, sesame, vegetables, fruit and other smallholder production. Deteriorated canal infrastructure has reduced conveyance, increased water losses and bank failures, weakened control of allocation, disadvantaged tail-end users and increased local flood exposure where silted canals cannot convey high flows effectively.

The project will rehabilitate thirteen existing irrigation canals rather than construct new irrigation corridors. The rehabilitation package may include desilting, bank reshaping and stabilisation, selective lining of high-loss or high-erosion reaches, repair or replacement of diversion boxes, sluice gates and cross-regulators, culverts at road and track crossings, and water kiosks and livestock troughs. The works are intended to restore conveyance capacity, improve head-end/tail-end distribution equity, reduce canal-bank and flooding risks, and strengthen community operation and maintenance.

2. ESIA Purpose, Scope and Assessment Approach

The ESIA has been prepared to support AfDB and Borrower decision-making by identifying the environmental and social risks and impacts of the thirteen-canal rehabilitation programme, applying the mitigation hierarchy, defining implementation conditions and monitoring requirements, and establishing the Environmental and Social Management Plan (ESMP). The assessment covers pre-construction and mobilisation, construction and rehabilitation, commissioning and handover, operation and maintenance, and demobilisation/reinstatement of temporary works.

The assessment integrates the updated BBS Master List, site screening, field verification, stakeholder consultation, project engineering and preparation information, Shabelle hydrological data, climate-risk analysis and other secondary data. Impact significance is assessed using magnitude, duration, geographic extent, receptor sensitivity, reversibility and likelihood, with ratings of Negligible, Minor, Moderate and Major. The ESIA explicitly distinguishes the direct canal works from the broader hydraulic and downstream effects of operating a river-fed irrigation system.

3. Project Components, Sites and Area of Influence

Village / Area	No. of Canals	Canal Sites
Busley	2	Busley 1; Busley 2
Kurshaale	3	Caday; Danwadaag; Sagaarey
Maqaar Careys	3	Faragaab; Shoobe; Suufi
Halgan	3	Yaxaasow 1; Yaxaasow 2; Yaxaasow 3
Weberi	1	Mashruuca

Village / Area	No. of Canals	Canal Sites
Farax Galoolay	1	Farax Galoolay

The ESIA recognises four levels of area of influence: the direct works footprint along canal beds, banks, structures and temporary work areas; the hydraulic zone comprising connected offtakes and canal reaches affected by changes in conveyance; the irrigated command area supporting an estimated 2,200–3,800 farming households; and the downstream influence area along the Shabelle below the Balcad offtakes, where flows support domestic supply, bank-infiltration wells, flood-recession agriculture, riverine fisheries and livestock watering.

The project does not create a new canal-level abstraction right. Its engineering purpose is to restore conveyance in existing infrastructure. However, improved reliability may induce increased consumptive use through expanded cultivation, which is why aggregate dry-season abstraction and downstream environmental flow are treated as material cumulative risks rather than assumed to be resolved through efficiency gains.

4. AfDB Environmental and Social Categorization and Operational Safeguards

The BBS Project is classified as an AfDB Category 2 operation. The Hirshabelle ESIA applies the AfDB Integrated Safeguards System (ISS 2023) as the binding minimum environmental and social standard, including where the national or state legal framework is incomplete or implementation capacity is limited.

OPERATIONAL SAFEGUARD	STATUS	HIRSHABELLE APPLICATION
OS1 - Assessment and Management of E&S Risks and Impacts	Applicable	Overall ESIA/ESMP; Shabelle hydrology and flood risk; cumulative/downstream effects; pre-works studies and adaptive management.
OS2 - Labour and Working Conditions	Applicable	Construction workforce, Labour Management Procedures, worker terms, Workers' GRM, water safety, excavation and heat-stress controls.
OS3 - Resource Efficiency and Pollution Prevention and Management	Applicable	Sediment, spoil, waste, fuels/chemicals, canal-water quality, irrigation efficiency and downstream environmental-flow management.
OS4 - Community Health, Safety and Security	Applicable	Flood and drowning risks, child safety, malaria/vector management, community crossings, SEA/SH and security.
OS5 - Land Acquisition / Access / Resettlement	Precautionary minimal trigger	/ No permanent acquisition anticipated; temporary access and crop losses managed through Land Access Protocol, replacement-cost compensation and stop-work trigger.
OS6 - Biodiversity and Living Natural Resources	Precautionary minimal trigger	/ Existing modified canal/agricultural corridors; minimum vegetation clearing, riparian reinstatement and downstream ecosystem-service protection.
OS7 - Vulnerable Groups	Applicable	Tenant/sharecropper households, tail-end users, female-headed households, IDPs, minority groups and youth.
OS8 - Cultural Heritage	Precautionary	No known sites identified; Chance Finds Procedure applies to excavation/desilting.
OS9 - Financial Intermediaries	Not applicable	No financial-intermediary structure.

OS10 - Stakeholder Engagement and Information Disclosure	Applicable	Consultation/disclosure, canal disruption schedules, allocation governance, GRM and downstream engagement.
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5. Policy, Legal and Institutional Framework

The project is subject to the Federal Republic of Somalia legal and policy framework and the Hirshabelle State administrative context. The principal instruments identified in the ESIA include the Provisional Federal Constitution, the Environmental Protection and Management Act (2024), the ESIA Regulations (2024), the National Environmental Policy, National Climate Change Policy, National Water Resource Strategy, National WASH Sector Policy, National Gender Policy, Agriculture Sector Strategy, Somali Labour Code, public-health requirements and relevant pesticide/fertilizer policies. Somalia's international obligations on climate change, desertification, biodiversity, gender equality, labour rights, child protection and internally displaced persons reinforce the project safeguards commitments.

The Shabelle is a transboundary river originating upstream in Ethiopia, but Somalia is the lowermost riparian in the relevant reach. The ESIA concludes that the project does not trigger notification of a downstream foreign state; instead, the relevant international-watercourse principles are equitable and reasonable use and prevention of significant harm, implemented through environmental-flow floors, dry-season abstraction management, monitoring and data-sharing with the national water authorities.

The MoAI PIU owns the ESMP and reports to AfDB. The Hirshabelle/Galmudug E&S Officer provides day-to-day safeguards oversight; the Supervision Consultant verifies contractor compliance; contractors implement approved C-ESMPs; Hirshabelle State ministries and Balcad District support water governance, access, security and local coordination; and canal committees/WUAs assume operational responsibility at handover. Limited state-level permitting, inspection and grievance capacity is addressed through contractual controls, independent supervision and capacity building.

6. Analysis of Alternatives and Design Rationale

The alternatives analysis considered the no-project option, site selection, canal lining and bank treatment, flow management during works, water-control structures, community water access, construction timing and work-front sequencing. The no-project option was rejected because continued sedimentation, bank failure and non-functional control structures would further reduce irrigation reliability, sustain allocation conflict, worsen flood-conveyance problems and reduce agricultural production.

DECISION	ALTERNATIVES	PREFERRED APPROACH AND RATIONALE
Canal lining	Full/no lining vs selective treatment	Selective lining on high-loss/high-erosion reaches; avoids unnecessary cost, disturbance and embodied carbon.
Desilting	Mechanical only vs combined methods	Combined mechanical/manual method improves control near structures and increases local employment.
Flow during works	Full closure vs bypass/partial flow	Partial flow preferred to protect downstream crops and livelihoods.

Water-control structures	Informal earthen checks vs engineered gates/regulators	Engineered, schedule-operated control enables transparent and measurable allocation.
Bank protection	Hard protection throughout vs compaction/bioengineering with targeted hard points	Bioengineering-led approach is lower cost and more locally maintainable.
Community water access	Direct canal-edge draw vs kiosks/troughs	Kiosks/troughs reduce bank erosion, drowning exposure and domestic/livestock conflict.
Timing	Year-round vs low-flow windows	February–March or August–September low-flow scheduling reduces flood exposure and livelihood disruption.

7. Environmental and Social Baseline

7.1 Physical and Riverine Setting

Balcad lies within the low-relief Middle Shabelle floodplain. The Shabelle River and its canal network dominate drainage, irrigation and flood behaviour. River stage responds strongly to rainfall in the Ethiopian highlands and can rise independently of local rainfall. Canal sedimentation has reduced conveyance to an estimated 40–60% of design capacity, while eroded and breached banks and dysfunctional control structures contribute to water losses, local flooding and inequitable distribution.

The climate is hot and semi-arid with a bimodal Gu and Deyr rainfall pattern and high inter-annual variability. Climate projections indicate Very High flood risk, High heat-stress risk and Moderate–High drought risk, with approximately +1.0°C warming by 2040 and a 10–20% increase in extreme rainfall intensity. Floodplain soils are deep silty/clayey and fertile, but saturation-sensitive and vulnerable to erosion and bank collapse during excavation.

7.2 Biological and Community Context

The project occurs within a heavily modified agricultural landscape. No protected areas or critical habitats were identified at the thirteen sites. Local riparian vegetation has ecological value for birds and small mammals and is retained/reinstated where disturbed. Community receptors include irrigated farmland, canal-side settlements, domestic and livestock water users, schools and crossings, downstream river users, and the construction workforce.

7.3 Livelihoods, Vulnerability and Gender

The canal corridors support irrigated maize, sesame, vegetables and fruit, with widespread tenancy and sharecropping. Vulnerable groups include poor farming households, tenant farmers and landless labourers, tail-end communities, female-headed households, women generally as primary domestic water users, youth, IDP households near Balcad and minority communities. Women are substantially under-represented in water governance despite depending heavily on canal water. The ESIA therefore requires minimum female representation in canal committees, differentiated consultation, a female CLO and confidential SEA/SH channels.

8. Stakeholder Engagement and Consultation Findings

Consultations were undertaken during field verification in December 2025 and January 2026, with a supplementary round in June 2026 to confirm the expanded thirteen-site scope. Participants included Hirshabelle State authorities, Balcad District Administration and health officials, state water authorities, canal committees and water user groups, farming households including tenant farmers and sharecroppers, women's groups, elders and youth representatives.

ISSUE RAISED	ESIA / ESMP RESPONSE
Head-end / tail-end allocation inequity	Engineered control structures, inclusive canal committees, public allocation schedules and a dedicated allocation-grievance track.
Tenant farmer and sharecropper exclusion	Explicit representation and compensation eligibility based on actual loss rather than land title.
Crop loss during rehabilitation	Canal-specific signed disruption schedules, maintained partial flows, advance notice and replacement-cost compensation for verified project-caused loss.
Women's participation / safe water access	Minimum 30% canal-committee membership, female CLO, women's input to kiosk/trough siting and confidential SEA/SH reporting.
Flood risk during works	Low-flow work windows, hydrological assessment, flood gauges, suspension thresholds and evacuation arrangements.
Local employment	Transparent local hiring preference and accessible employment grievances.
Maintenance sustainability	Canal-committee O&M training, Somali manuals, toolkits, annual post-Gu desilting and PIU oversight.
Security	Per-site security assessment, SMP, coordination with state/district structures and work suspension/resequencing where supervision is unsafe.

9. Key Environmental and Social Risks and Residual Significance

RISK / IMPACT	PRE-MITIGATION	RESIDUAL	KEY CONTROL BASIS
Sediment release during desilting	Moderate–Major	Minor–Moderate	Bypass/cofferdam, spoil ≥ 10 m from canal edge, downstream turbidity monitoring.
Canal-bank collapse during excavation	Major	Minor	Per-canal geotechnical assessment, phased cutting, immediate stabilisation.
Flooding of active work areas	Major	Minor–Moderate	Low-flow scheduling, gauges, suspension thresholds, equipment removal and evacuation.
Irrigation supply disruption / crop loss	Major	Moderate	Signed schedules, partial flows, advance notice and replacement-cost compensation; requires disciplined implementation.
Worker drowning / water safety	Major	Minor	Non-swimmer assessment, life jackets, throw ropes/lifebuoys, rescue drills and no lone work.
Worker OHS / heat / plant hazards	Moderate–Major	Minor–Moderate	Approved OHS plan, work/rest/hydration controls, PPE, first aid and emergency routes.
Community safety / child exposure	Moderate	Minor	Barriers, Somali signage, safe crossings, community/school awareness and fencing at high-risk reaches.
SEA/SH	Moderate	Minor–Moderate	Codes of Conduct, training, confidential PIU channel, female CLO and survivor-centred referral.
Land access / temporary crop disturbance	Moderate	Minor	Written access agreements, actual-user identification, reinstatement and replacement-cost compensation.

RISK / IMPACT	PRE-MITIGATION	RESIDUAL	KEY CONTROL BASIS
Security constraints	High	Moderate	SMP, per-site classification, coordination, halt thresholds and supervision controls.
Water allocation conflict - O&M	Moderate–Major	Moderate	Inclusive committees, public schedules, gate-operation rules, GRM and PIU oversight.
Canal re-sedimentation	Moderate	Minor–Moderate	Annual post-Gu inspection/desilting and <75% conveyance trigger.
Flood damage - O&M	Moderate	Minor–Moderate	Climate-adjusted design, post-flood inspection and emergency repair fund.
Malaria / vector risk	Moderate	Minor	Positive drainage, standing-water elimination, WUA vector focal persons and district-health coordination.
Water-quality deterioration - O&M	Moderate	Minor–Moderate	Observation, laboratory testing and corrective-action triggers.

10. High Interim Downstream-Flow Risk and Cumulative Water Management

The most material cumulative issue identified in the ESIA is dry-season downstream flow in the Shabelle. At the Belet Weyne reference gauge, mean monthly flow ranges from approximately 18 m³/s at the February minimum to about 188 m³/s at the May peak. Aggregate abstraction across the wider BBS scheme is estimated at approximately 48–64% of mean river flow in January–February and 24–42% in March, July and December, falling below 15% only during the April–October high-flow period. Because other formal and informal abstraction occurs between Belet Weyne and Balcad, actual dry-season pressure at the offtakes may be higher. The ESIA therefore rates this interim cumulative impact High.

The project responds with binding environmental-flow floors: at least 20% of natural flow at all times, at least 30% during April–October and at least 40% during the January–March dry season, supported by calibrated abstraction control, dry-season monitoring, downstream community engagement and a scheme-level water-accounting study. If monitoring confirms that the High impact cannot be reduced to Moderate, or if project scope expands, the PIU and AfDB are to revalidate the environmental category. Rehabilitation of the Jowhar Natural Storage Barrage, with an identified design storage of approximately 200 million m³, is tracked as the structural development most likely to improve regulated dry-season releases and trigger reassessment of abstraction thresholds.

11. Positive Impacts and Development Benefits

POSITIVE PATHWAY	EXPECTED BENEFIT
Irrigation reliability and production	Restored conveyance toward design performance supports improved irrigated area, yields and cropping reliability for approximately 2,200–3,800 farming households.
Water-distribution equity	Engineered control structures and inclusive committee governance improve access for tail-end and tenant users.
Flood-risk reduction	Desilted canals and repaired banks restore flood-conveyance function and reduce local waterlogging/flood damage.
Safer water infrastructure	Stabilised banks, safe crossings, kiosks and troughs reduce bank erosion and community drowning exposure.
Local employment and skills	Canal works create local labour opportunities and safety/technical training, with benefits to youth and eligible women.

POSITIVE PATHWAY	EXPECTED BENEFIT
Institutional strengthening	Thirteen canal committees receive governance/O&M training, allocation rules, manuals, tools and post-handover oversight.
Climate adaptation	Improved irrigation reliability and flood conveyance increase resilience to rainfall variability and extreme events.

12. Mitigation Hierarchy and Priority Safeguards Commitments

Confine rehabilitation to existing canal corridors and existing abstraction rights; no new canal alignment or permanent land acquisition.

Complete pre-works hydrological, geotechnical and security assessments before mobilisation on each canal. Carry out earthworks within confirmed Shabelle low-flow windows and maintain gauge-based flood-suspension protocols.

Maintain agreed partial flows through bypass/cofferdam arrangements and implement signed canal-specific disruption schedules.

Place spoil on suitable high ground at least 10 m from canal edges and prohibit spoil/waste in active canals, drainage lines or farmland without written agreement.

Apply geotechnically determined excavation profiles, immediate compaction/stabilisation and appropriate bank/bioengineering measures.

Implement mandatory worker water-safety, excavation, plant and heat-stress controls and verified emergency-response routes.

Protect community members through barriers, safe crossings, signage, advance notification, child-safety awareness and operational fencing.

Use individual worker Codes of Conduct, confidential SEA/SH reporting, survivor-centred referrals and a female CLO.

Apply the Land Access Protocol, compensate verified project-caused crop/asset losses at full replacement cost, and stop/reassess if OS5 thresholds are exceeded.

Establish inclusive canal committees before commissioning, including head-end/tail-end, tenant/sharecropper and at least 30% female representation.

Operate environmental-flow floors and downstream monitoring as binding conditions for the wider Shabelle abstraction system.

Maintain an Associated Facilities and Support-Sites Register for borrow areas, spoil sites, camps, lay-down areas, construction-water points and temporary access routes.

13. Environmental and Social Management Plan

The Hirshabelle ESMP is the operative management instrument for the thirteen sites. It includes an Operational Safeguards applicability matrix, comprehensive implementation matrix, procurement and contract clauses, ESHS hold points, stakeholder engagement and GRM requirements, numeric monitoring thresholds, institutional arrangements, capacity development, implementation schedule, budget, risk-management matrix, key performance indicators and associated management plans. No contractor may

mobilise until the applicable pre-works hold points and C-ESMP requirements have been approved in writing by the PIU.

13.1 Monitoring and Reporting

MONITORING THEME	CORE COMMITMENT
Construction ESHS compliance	Weekly Supervision inspection; monthly PIU audit; quarterly AfDB reporting.
Flood conditions	Twice-daily gauges at active reaches during Gu / defined suspension threshold.
Irrigation continuity	Daily verification against signed disruption schedule during active works.
Desilting water quality	Downstream turbidity monitoring during active desilting; corrective action if threshold exceeded.
GRM	Monthly case review; target $\geq 80\%$ resolved within 30 days; allocation complaints ≤ 15 working days.
Canal condition	Annual post-Gu inspection; major desilting when conveyance falls below 75% of design.
Canal committees	PIU oversight at 3, 6 and 12 months post-commissioning and annually.
Downstream flow	Dry-season river/abstraction monitoring against environmental-flow floors and downstream-access trends.
OHS / incidents	Continuous reporting and investigation, with serious-event notification under the controlling AfDB/Financing Agreement procedure.
Vector/public health	Canal-margin and standing-water monitoring with Balcad District Health Office coordination.

13.2 Institutional Responsibilities

ACTOR	PRINCIPAL ROLE
MoAI PIU	Overall ESMP ownership, approvals, audits, incident management, budget, corrective actions and AfDB reporting.
Hirshabelle/Galmudug E&S Officer	Day-to-day inspection, GRM, community liaison, WUA/canal committee support and corrective-action tracking.
Hirshabelle State ministries / water authorities	State coordination, canal/water governance, environmental and technical oversight support.
Balcad District Administration	Site access, community liaison, security/flood communication and local dispute resolution.
Contractors	Implement C-ESMP, OHS, water safety, waste/pollution, labour, SEA/SH, security and site records.
Supervision Consultant	Independent weekly construction compliance, quality/hold-point verification and handover sign-off.
Canal Committees / WUAs	Operate structures, implement allocation schedules, maintain canals, manage routine safety/vector controls and report grievances.
AfDB	External safeguards oversight, supervision, report review and corrective-action requirements.

14. Stakeholder Engagement, GRM and SEA/SH Arrangements

Ongoing engagement is governed by the Stakeholder Engagement Plan and must remain accessible to tenant farmers, sharecroppers, tail-end users, women, IDPs, minority communities and downstream river users as relevant. The project GRM includes multiple uptake channels, defined escalation and a dedicated water-allocation track. Land/access and compensation complaints must be addressed within the defined

project timelines, and unresolved complainants retain access to external recourse including AfDB's Independent Recourse Mechanism.

SEA/SH complaints are excluded from ordinary community or canal-committee mediation and are handled only through the confidential PIU survivor-centred pathway. All workers sign Codes of Conduct and receive induction and refresher training; the project maintains a female CLO and documented referral routes to available health and support services.

15. Land Access, Livelihood Protection and Inclusion

No permanent land acquisition or physical displacement is anticipated because works remain within existing canal corridors. Temporary access across farmed plots is documented before mobilisation. Compensation is based on actual project-caused loss rather than title, so tenants and sharecroppers are eligible for their own losses. Verified crop and asset damage is compensated at full replacement cost, supported by a funded contingency. Any physical displacement or loss above the project's defined OS5 threshold triggers immediate suspension and formal OS5 determination before the affected activity proceeds.

Inclusion commitments require head-end and tail-end representation, tenant farmer voice, at least 30% female canal-committee membership, differentiated consultation and accessible GRM arrangements. These measures are integral to ensuring that restored hydraulic capacity does not simply reinforce existing inequalities in water control.

16. ESMP Budget and Financing

FUNDING COMPONENT	AMOUNT / TREATMENT	COVERAGE
PIU / safeguards ESMP envelope	USD 253,662 over four years	Community engagement/disclosure, GRM, pre-works studies, water quality, committee capacity building, female CLO, crop-compensation contingency, emergency flood maintenance, monitoring equipment, security, SEA/SH service mapping, annual audit and shared E&S staffing.
Contractor ESHS	Additional to USD 253,662	C-ESMP, contractor ESHS staff, OHS/water-safety equipment, PPE, flood gauges, waste/spill controls and other construction ESHS obligations through works contracts.
Shared Hirshabelle/Galmudug E&S Officer	Included as shared staffing arrangement	Cost split between the two state components as described in the ESMP.

17. Conditions for Mobilization, Commissioning and Operation

17.1 Before Mobilization

National/environmental and works authorizations required for the relevant activity are obtained or formally confirmed.

Canal-specific hydrological, geotechnical and security assessments are complete and incorporated into design/method statements.

Written land/access agreements and signed canal disruption schedules are complete, with the crop-compensation mechanism funded and operational.

C-ESMP, OHS, water-safety, pollution/waste, labour, SEA/SH, community-safety and security arrangements are approved in writing.

Project GRM, confidential SEA/SH channel and female CLO are operational and disclosed to communities.

Worker induction is complete before assignment, including OHS, water safety, SEA/SH, Code of Conduct and Chance Finds.

Associated facilities/support sites have been screened, permitted/agreed and entered in the project register before use.

17.2 Before Commissioning / Handover

Rehabilitation, bank stabilisation, crossings, kiosks/troughs and safety defects are verified and closed.

Inclusive canal committee is formed/strengthened and trained, with head-end/tail-end, tenant and female representation verified.

Allocation schedule is documented and publicly posted, O&M responsibilities/tools/manuals are handed over, and GRM arrangements remain functional.

Any water-quality or community-use controls required for kiosks/domestic abstraction are passed before use.

Environmental-flow and dry-season abstraction monitoring arrangements are operational before full O&M.

18. Outstanding Finalization and Technical-Control Matters

MATTER	REQUIRED FINAL CONTROL
High interim downstream-flow risk	Retain environmental-flow floors and dry-season monitoring as binding conditions; revalidate the AfDB environmental category if the impact cannot be reduced to Moderate or scope expands.
Per-canal hydrology and geotechnics	Final design flows, flood-stage halt thresholds, bank profiles and excavation limits must come from approved pre-works studies, not generic assumptions.
Faragaab and Mashruuca alignment records	The source records a single verified reference point rather than complete alignment; confirm full alignment in detailed design/pre-works survey.
OHS heat/hydration numeric provision	The source ESIA includes a very high drinking-water quantity. Final tender/C-ESMP requirements should be confirmed by a competent OHS standard while retaining the mandatory heat-risk controls.
National environmental clearance / permits	The ESIA notes national submission/clearance and activity permits as pending or to be confirmed; close these before affected works commence.
OS trigger wording consistency	The source uses both precautionary/minimal-trigger language for OS5/OS6/OS8. The final report should use one controlled applicability table consistently across the Executive Summary, legal chapter and ESMP.

19. Overall Environmental and Social Conclusion

The Hirshabelle component is environmentally and socially feasible as an AfDB Category 2 operation provided the project remains within the assessed rehabilitation scope and the ESMP is fully integrated into design, procurement, construction supervision, commissioning and operation. Most construction and operational residual impacts are Minor to Moderate after mitigation, and the project has substantial positive

benefits for irrigation reliability, crop production, flood resilience, community water access, local employment and water governance.

The qualification to this conclusion is the High interim cumulative dry-season downstream-flow risk. Acceptability therefore depends on effective environmental-flow floors, dry-season abstraction monitoring, downstream engagement and adaptive management, together with the explicit commitment to revalidate the environmental category if the High impact cannot be brought to Moderate. Subject to these conditions and the pre-mobilisation hold points, the expected development benefits to the Balcad irrigation corridor are assessed to outweigh the temporary and manageable adverse effects of rehabilitation.

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CHAPTER 1: INTRODUCTION AND SCOPING

1.1. Background and Project Context

Somalia faces a persistent water and food security crisis driven by recurrent droughts, floods, climate variability, institutional fragility, and decades of underinvestment in productive infrastructure. Hirshabelle State, composed of Hiraan and Middle Shabelle regions, is closely tied to the Shabelle River system. Balcad District in Middle Shabelle is one of Somalia's most productive agricultural zones, where a dense network of canals diverts Shabelle River water to irrigate maize, sesame, vegetables, and fruit grown by smallholder farming households. Canal infrastructure is the lifeline of this agricultural system: deteriorated canals translate directly into reduced irrigated area, lower crop yields, increased water allocation conflicts among canal users, and heightened flooding risk when blocked channels cannot convey peak Shabelle flows.

The Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project is an initiative of the Federal Republic of Somalia's Ministry of Agriculture and Irrigation (MoAI), financed by the African Development Bank (AfDB). The project rehabilitates and upgrades priority water infrastructure across ten districts in Somalia. This ESIA report addresses the Hirshabelle component specifically — thirteen irrigation canal rehabilitation sites in Balcad District, as recorded in the updated BBS Master List (June 2026) — to provide a detailed, site-specific assessment of environmental and social risks and impacts, and to define the management measures required to ensure environmentally and socially responsible implementation.

This ESIA has been prepared as part of the broader BBS Environmental and Social Impact Assessment programme, consistent with AfDB Integrated Safeguards System (ISS) 2023 requirements for a Category 2 operation. It supersedes and expands the interim Hirshabelle ESMP (BBS-ESMP-HIR-001, March 2026), incorporating the updated site inventory — which adds the Farax Galoolay Canal as a thirteenth site and revises village attributions and canal alignment coordinates — and providing the full assessment chapters (scoping, legal framework, alternatives, baseline, impact evaluation, residual effects, and consultations) required for a state-level ESIA. Where cross-cutting issues are common to the whole project, this report draws on and adapts content from the project-wide ESIA while providing additional detail specific to Hirshabelle's riverine environmental and social context.

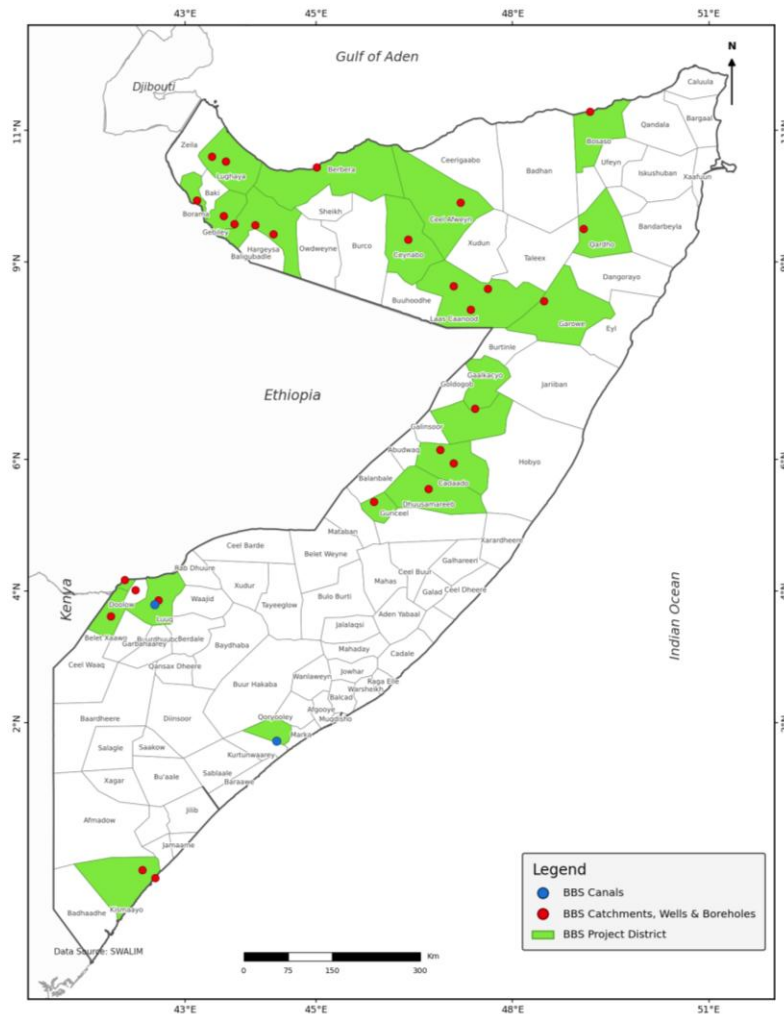


Figure 1: BBS Project Map

1.2. Purpose of the ESIA and Objectives

The purpose of this ESIA is to assess the anticipated environmental and social risks and impacts of the BBS Project interventions in Hirshabelle State, to propose mitigation and management measures, and to define monitoring and reporting requirements. The ESIA supports informed decision-making by the AfDB, the Federal Government of Somalia, and the Hirshabelle State government, as well as by communities and stakeholders in the project area.

The specific objectives of this ESIA are to:

- Present the Hirshabelle component project scope, intervention types, and site distribution in detail, including all thirteen canal rehabilitation sites in Balcad District.
- Establish baseline environmental and social conditions for the Balcad canal corridor using field verification data, stakeholder consultations, and reliable secondary sources.
- Identify and assess risks and impacts across project phases - pre-construction, construction, operation and maintenance, and decommissioning of temporary works - and determine their significance using transparent criteria.

- Define mitigation and enhancement measures following the mitigation hierarchy (avoid, minimize, restore, and, where applicable, compensate) and assign clear responsibilities for implementation and supervision.
- Provide an ESMP for Hirshabelle with defined roles and responsibilities, monitoring indicators, reporting requirements, and costed measures.
- Document stakeholder engagement undertaken during ESIA preparation for Hirshabelle and define arrangements for ongoing engagement, information disclosure, and grievance management consistent with OS10.

1.3. Scope of the ESIA

This ESIA covers all thirteen BBS Project sites in Hirshabelle State, all located in Balcad District, Middle Shabelle Region: two canals at Busley, three canals at Kurshaale, three canals at Maqaar Careys, three canals at Halgan, one canal at Weberi, and one canal at Farax Galoolay. It assesses risks and impacts across the full project life cycle - pre-construction and mobilization, construction and rehabilitation, commissioning and handover, operation and maintenance, and decommissioning of temporary works - recognizing that risk pathways differ by project phase and by season, particularly in relation to the Shabelle River flood regime.

The ESIA is scoped to focus on issues that are material to the Balcad riverine canal context, in particular: surface water hydrology and canal hydraulics; sediment management and downstream water quality; canal bank stability and erosion; flood risk during and after works; irrigation supply continuity and downstream livelihoods; worker water safety and occupational health and safety; community health and safety, including child safety and vector-borne disease; social inclusion, gender, tenancy arrangements, and equitable water allocation; land access and temporary crop disturbance; security; and stakeholder engagement and grievance management.

1.4. ESIA Methodology

This ESIA follows a structured process consistent with AfDB ISS 2023 requirements for a Category 2 operation. The methodology integrates screening results, site verification, stakeholder engagement, baseline establishment, impact assessment, and management planning. Key steps included reviewing project preparation and technical documentation for all Hirshabelle sites; consolidating and reviewing site screening outputs for all 13 canals; conducting field verification to confirm canal conditions, infrastructure status, and environmental and social sensitivities; consulting with Hirshabelle State authorities, Balcad District Administration, canal committees, farming communities, and vulnerable groups; identifying and assessing impacts using defined significance criteria; and developing mitigation, monitoring, and supervision requirements aligned with the mitigation hierarchy.

Impact significance was determined using criteria including magnitude, duration, geographic extent, receptor sensitivity, reversibility, and likelihood. The assessment accounts for the expected effectiveness of proposed mitigation in reducing residual significance to acceptable levels. Significance ratings used throughout this report are: Negligible, Minor, Moderate, and Major.

1.5. Stakeholder Engagement Approach Used During ESIA Preparation

Stakeholder engagement was integrated throughout ESIA preparation to support scoping, validate baseline conditions, identify local concerns, and strengthen mitigation planning. This approach aligns with OS10 requirements for disclosure, consultation, and feedback. For Hirshabelle specifically, engagement activities included:

- Consultations with the Hirshabelle State Ministry of Agriculture and relevant line departments.
- Meetings with the Balcad District Administration, including the District Commissioner and sector focal points.
- Community consultations in and around the canal corridor villages of Busley, Kurshaale, Maqaar Careys, Weberi, Halgan and Farax Galoolay.
- Targeted consultations with women's groups, tenant farmers and sharecroppers, landless agricultural labourers, elders, youth representatives, and existing canal committee members.
- Field-based discussions along canal alignments with the farming households most likely to be directly affected by works and by changes in water distribution.

The consultation process confirmed the significance of canal infrastructure to farming livelihoods, highlighted community concerns about water equity between head-end and tail-end users and about disruption during works, and identified specific local risks relating to flooding, security, construction practices, and long-term maintenance. This feedback is reflected in the mitigation and monitoring measures described in Section 9.

1.6. Purpose and Objectives of Scoping

Scoping defines the environmental and social issues that require assessment in this ESIA, the geographic area of influence, the project phases to be covered, and the depth of analysis appropriate to each issue. For the Hirshabelle component, scoping is tailored to the specific characteristics of riverine irrigation canal rehabilitation - desilting, bank works, lining, and control structures - in a densely settled, flood-prone agricultural floodplain, rather than the dryland borehole and catchment context relevant to other BBS components.

The objectives of scoping for the Hirshabelle component are to:

- Identify the material environmental and social risks and impacts associated with canal desilting, bank excavation and stabilisation, lining, control structure works, and culvert installation across all thirteen Balcad canal sites.

- Define the spatial area of influence for canal rehabilitation works, including downstream reaches and the irrigated command areas served.
- Establish the project phases to be assessed.
- Confirm issues of limited relevance that can be screened out with appropriate justification.
- Link each scoped issue to the relevant AfDB ISS 2023 Operational Safeguard.

1.7. Scoping Approach and Inputs Used

Scoping for the Hirshabelle component was informed by: confirmed canal typologies, alignments, and locations per the updated BBS Master List (June 2026); environmental and social screening outputs prepared by the project safeguards team for all 13 canals; field verification visits conducted in December 2025 and January 2026, with a supplementary verification for the Farax Galoolay Canal; consultations with the Balcad District Administration, canal communities, and existing canal committee structures; and project preparation documentation including technical design information. The scoping process specifically distinguished the riverine canal intervention type present in Hirshabelle from the dryland borehole and catchment types present elsewhere in the BBS Project, ensuring that risk pathways specific to the Shabelle floodplain context - flooding, sediment, bank stability, drowning risk, irrigation disruption, and head-end/tail-end allocation dynamics - are assessed at appropriate depth.

1.8. Spatial Scope and Area of Influence

The area of influence for the Hirshabelle component is defined at three levels:

- Direct footprint of works: the construction footprint along each of the 13 canal alignments, including canal beds and banks under active works, control structure and culvert locations, kiosk and trough sites, spoil placement areas on high ground, access corridors agreed with farmers, and temporary storage and lay-down areas.
- Immediate surrounding zone: the area within approximately 500 metres of active canal works where communities and farmland may experience construction disturbance including noise, dust, vehicle traffic, safety risks, temporary access restrictions, and localized flooding or waterlogging if flows are mismanaged during works.
- Broader hydraulic and livelihood area: the downstream canal reaches and irrigated command areas served by each canal, where changes in flow continuity, sediment load, and water allocation during and after works affect crop production and household livelihoods. For interconnected canal systems drawing on the same Shabelle intakes, this area extends across the full canal command, estimated to cover 2,200–3,800 farming households across the thirteen corridors.

The area of influence also recognizes security and access constraints that affect supervision, monitoring, and contractor behaviour in parts of Balcad District.

1.9. Temporal Scope and Project Phases Covered

The ESIA covers the following project phases for the Hirshabelle component: (i) pre-construction and mobilization, including pre-works hydrological, geotechnical, and security assessments and community agreement processes; (ii) construction and rehabilitation, scheduled within Shabelle low-flow windows (February–March or August–September) and phased canal by canal; (iii) commissioning and handover to canal committees; and (iv) operation and maintenance, including annual post-Gu desilting cycles and flood damage response. Temporary works demobilization and site reinstatement are assessed within the construction phase. The temporal scope explicitly accounts for the bimodal Guu (April–June) and Deyr (October–December) rainfall seasons and the independent Shabelle flood regime driven by Ethiopian highland rainfall.

1.10. Key Environmental and Social Issues to be Assessed

1.10.1. Surface Water Hydrology, Canal Hydraulics, and Flood Risk

Canal works interact directly with the Shabelle River flow regime. Key issues include flood inundation of active work areas, hydraulic obstruction during works, altered flow distribution between canals sharing intakes, and the flood-conveyance function of rehabilitated canals. Assessed under OS1 and OS3, with climate risk integration.

1.10.2. Soils, Bank Stability, Erosion, and Sedimentation

Desilting and bank excavation on cohesive but saturation-sensitive floodplain soils create bank collapse and erosion risks, while spoil management determines whether sediment re-enters canals or degrades farmland. Assessed under OS1 and OS3.

1.10.3. Water Quality and Pollution Risks

Sediment release during desilting, fuel and chemical handling near active water, and concrete works in or adjacent to flowing canals pose downstream water quality risks for domestic, livestock, and irrigation users. Assessed under OS3.

1.10.4. Land Access, Land Use, Tenancy, and Livelihoods

Works corridors cross farmed plots; temporary crop disturbance, access-route agreements, and the interaction of restored water distribution with sharecropping and tenancy arrangements are material issues. No involuntary land acquisition or physical displacement is anticipated; OS5 is applied on a precautionary basis through a Land Access Protocol.

1.10.5. Labour, Working Conditions, and Occupational Health and Safety

Canal works expose workers to drowning hazards, bank collapse, excavation hazards, heat stress in a hot humid environment, and equipment risks. Labour Management Procedures apply to all contractors. Assessed under OS2.

1.10.6. Community Health and Safety

Open excavations, active machinery, altered pedestrian crossings, child drowning risk near operational canals, and stagnant-water malaria vectors are assessed under OS4.

1.10.7. Social Inclusion, Conflict Sensitivity, and Equitable Water Allocation

Restored conveyance changes the distribution of a scarce resource. Head-end versus tail-end dynamics, landowner–tenant relations, clan-based resource sensitivities, and the governance of control structures are assessed under OS7 and OS10.

1.10.8. Vulnerability Analysis and Differentiated Measures

Tenant farmers and landless labourers, female-headed households, tail-end communities, IDP households near Balcad town, and youth are identified as groups requiring differentiated measures. Assessed under OS7.

1.10.9. Cultural Heritage and Chance Finds

No known cultural heritage sites are present along the canal alignments; earthworks nonetheless carry chance-find potential. OS8 is applied on a precautionary basis through the Chance Finds Procedure (Appendix 9.4).

1.10.10. Climate Risk and Resilience

Projected increases in extreme rainfall intensity (10–20%) and flood magnitude in the Shabelle basin, alongside heat stress and drought variability, are integrated into design (1-in-25-year embankment design; +0.5 m intake freeboard) and construction planning. Assessed under OS1 and the AfDB Climate Safeguards System.

1.11. Scoping Outputs

The scoping outputs are: the issue register carried into Section 7 (impact evaluation); the area-of-influence definition applied to baseline and consultation coverage; the phase structure applied throughout this ESIA; the OS trigger determination presented in Section 2; and the pre-works assessment requirements (hydrological, geotechnical, security) embedded as hold points in Section 9.

1.12. Structure of the ESIA Report

This ESIA report is organized as follows:

- Executive Summary - ES.1 to ES.7: project overview; location and environmental and social context; legal and institutional framework; significant and moderate impacts; stakeholder engagement; the Environmental and Social Management Plan; and conclusions and conditions for approval.
- Chapter 1 - Introduction and Scoping: background and project context; ESIA purpose and objectives; scope and methodology; stakeholder-engagement approach; scoping purpose, spatial and temporal scope; material environmental and social issues; scoping outputs; and the structure of the ESIA report.
- Chapter 2 - Legal and Institutional Framework: national policy framework; national and local legal framework, including the Hirshabelle State framework; international and regional obligations; AfDB requirements; institutional framework and capacity; and the gap analysis between the Borrower's framework and AfDB requirements.
- Chapter 3 - Analysis of Alternatives: project purpose and need; the no-project alternative; location, design, technology and timing alternatives; their environmental and social implications, mitigation feasibility and costs; institutional, training and monitoring requirements; quantification and valuation; stakeholder participation in evaluating alternatives; and the preferred alternative and its justification.
- Chapter 4 - Design Measures: the basis for selecting the proposed design, application of the mitigation hierarchy at design stage, the environmental and social measures built into the design, and the design response to stakeholder input.
- Chapter 5 - Project Description: purpose and objectives, components and activities, geographic and environmental and social context, temporal context and schedule, life-cycle activities, associated facilities, third parties, off-site investments, primary suppliers, project site and area of influence, and project maps.
- Chapter 6 - Project Baseline: baseline scope and area; data sources, accuracy, gaps and uncertainties; the physical, biological, health, safety and security, social and socioeconomic, cultural heritage and vulnerability baselines; the climate-change baseline; contextual risks; existing and planned developments; and anticipated changes without the project.
- Chapter 7 - Environmental and Social Risks and Impacts: assessment scope and approach; receptors and valued components; direct, indirect, cumulative and associated-facility impacts; construction, operational and closure-phase impacts; the thematic risk assessments by Operational Safeguard; positive impacts; and residual impacts after mitigation.
- Chapter 8 - Mitigation Measures: application of the mitigation hierarchy; avoidance, minimisation, mitigation and compensation measures; measures for significant residual impacts and their acceptability; enhancement of positive impacts; differentiated measures for vulnerable groups; feasibility, costs and suitability; institutional, training and monitoring requirements; and matters not requiring further assessment.
- Chapter 9 - Environmental and Social Management Plan: objectives and scope; summary of risks; the mitigation, monitoring, institutional, capacity, schedule and budget provisions; procurement and

contract clauses; stakeholder engagement measures and the grievance redress mechanism; the ESMP implementation, monitoring and risk matrices; implementation indicators; integration of the ESMP into design, procurement and budget; and the associated management plans.

- Chapter 10 - Conclusion and Recommendations: the assessment's overall conclusion and the recommendations for implementation.
- Appendices: preparers and contributors; references; stakeholder engagement and consultation records and materials; baseline data tables; maps; technical studies and supporting assessments; monitoring information; associated reports and plans; and the ESMP matrices.

CHAPTER 2: LEGAL AND INSTITUTIONAL FRAMEWORK

2.1. National policy framework

The instruments below are analysed by the regulatory theme most relevant to canal rehabilitation, water abstraction, and irrigation works in Hirshabelle state. Where a national instrument is absent, in draft, or not yet operational, the AfDB Integrated Safeguards System (ISS 2023) is applied as the governing minimum standard (see Section 2.6).

Several national policies frame the project's environmental and social commitments: the National Environmental Policy (2019), which promotes sustainable natural-resource management and requires environmental impact assessment for development projects; the National Climate Change Policy (2020), which guides adaptation and disaster-risk reduction and supports investment in climate-resilient water infrastructure; the National Water Resource Strategy (2021–2025), which establishes water-sector governance and integrated water resources management; the National WASH Sector Policy (2018), relevant to worker welfare, sanitation, and water quality; and the National Gender Policy (2016, updated in draft in 2018), which underpins the project's gender-equality and gender-based-violence-prevention commitments in water governance and employment.

2.2. National and local legal framework

The BBS Project in Hirshabelle is subject to the national legal, regulatory, and policy framework of the Federal Republic of Somalia. Key instruments relevant to the Hirshabelle component include:

Table 2: National Legal, Regulatory, and Policy Framework

Instrument	Lead Institution	Relevance to this ESIA and Project
Provisional Federal Constitution (2012), Articles 25, 43, and 45	Federal Government of Somalia	Establishes the right to a healthy environment and constitutional principles for the sustainable management of land, natural resources, and the environment.
National Transformation Plan (2025–2029)	Ministry of Planning, Investment and Economic Development	Aligns project with national priorities for resilience, productive sectors, and service delivery.
National Climate Change Policy (2020)	Ministry of Environment and Climate Change	Sets national direction on climate resilience, adaptation mainstreaming, and climate risk management relevant to irrigation and flood risk reduction.
National Adaptation Plan (NAP)	Ministry of Environment and Climate Change	Identifies priority adaptation needs for water security and resilient infrastructure.
Nationally Determined Contribution (NDC)	Ministry of Environment and Climate Change	Establishes national climate commitments relevant to resilient water systems.
Environmental Protection and Management Act (2024); ESIA Regulations (2024)	Ministry of Environment and Climate Change (with Hirshabelle State Ministry of Environment)	Requires environmental impact assessment and permits before works commence; this ESIA is prepared to AfDB ISS 2023, with national submission and clearance pending.
National Water Resource Strategy (2021–2025)	Ministry of Energy and Water Resources	Provides the policy basis for water-sector governance and integrated water resources management of the Shabelle system; no comprehensive federal Water Act is currently in force.

Instrument	Lead Institution	Relevance to this ESIA and Project
Natural Water Resources Law (1984)	Ministry of Energy and Water Resources	Pre-1991 statute on regulated water use, no longer operational; abstraction is currently governed by strategy and customary land-based rights rather than a functioning federal licensing regime.
National Gender Policy (2016, draft 2018)	Ministry of Family and Human Rights	Provides national commitments on gender equality for participation, benefit distribution, and grievance systems.
Agriculture Sector Strategy and Plan	Ministry of Agriculture and Irrigation	Provides sector policy for irrigation rehabilitation, climate-smart agriculture, and institutional roles.
National Food Security and Nutrition Policy	Ministry of Agriculture and Irrigation	Guides food security and nutrition objectives relevant to irrigation-supported production and targeting of vulnerable households.
National Pesticide Policy	Ministry of Agriculture and Irrigation	Requires integrated pest management and safe handling measures as restored irrigation intensifies crop production.
National Fertilizer Policy	Ministry of Agriculture and Irrigation	Requires management of nutrient runoff into canals and safe storage practices if fertilizer use increases.
Somali Labour Code (Law No. 65 of 1972)	Ministry of Labor and Social Affairs	Sets minimum employment standards and basic occupational health and safety duties; limited modern OHS provisions are supplemented by AfDB OS5 and contractor Labour Management Procedures.
Public Health and Communicable Disease Control Regulations	Ministry of Health & Human Services	Provides baseline requirements for public health protection, waste, sanitation, and vector control — directly relevant to malaria management near canals.
Land Administration and Local Government Instruments	Relevant federal and local authorities	Defines land administration processes relevant to access, use restrictions, tenancy, and documentation.
National Environmental Policy (2019)	Ministry of Environment and Climate Change	Promotes sustainable natural-resource management and requires environmental impact assessment for development projects.
National WASH Sector Policy (2018)	Ministry of Energy and Water Resources / Ministry of Health	Relevant to worker welfare, sanitation, and water quality during works and operation.
Somali Penal Code (1962) and Family Code (1975)	Ministry of Justice	Criminalise sexual violence (Penal Code Articles 398–401) and set the minimum age of marriage at 18; underpin the project's SEA/SH prevention and response regime.
Cultural heritage / Chance Finds Procedure	Relevant cultural authority; AfDB OS8	No modern federal antiquities statute is in force; cultural heritage is protected through the Chance Finds Procedure (Appendix 9.4) and AfDB requirements.

- a. Environmental assessment and permitting. The principal federal instrument is the Environmental Protection and Management Act, enacted by presidential decree on 13 February 2024, which operationalizes the constitutional right to a healthy environment and requires environmentally impactful projects to obtain permits and undergo environmental impact assessment. It is supplemented by the ESIA Regulations (2024) issued by the Ministry of Environment and Climate Change (MoECC), which set the screening, assessment, and clearance procedure. The MoECC is the federal competent authority, exercised jointly with the Hirshabelle State Ministry of Environment. This ESIA has been prepared to the AfDB ISS 2023 standard and will be submitted for national environmental clearance prior to works.
- b. Water abstraction, diversion, and river/canal works. Somalia has no comprehensive federal water statute currently in force; the Natural Water Resources Law of 1984 predates the collapse of central government and is not operational. Water governance therefore rests on policy and strategy — principally the National Water Resource Strategy (2021–2025) of the Ministry of Energy and Water

Resources (MoEWR) — together with customary, land-based water rights under which riparian access historically required no formal permit. There is accordingly no functioning federal abstraction- or diversion-licensing regime for the Shabelle; in practice, canal diversion and works are authorised through the MoAI/state and governed at scheme level by canal committees and water user groups. The project introduces no new withdrawal right and manages abstraction through committee-agreed allocation, environmental-flow floors, and monitoring (Sections 7.5 and 8.8).

- c. Irrigation governance, land, tenancy, and compensation. Irrigation policy is set by the Ministry of Agriculture and Irrigation through the Agriculture Sector Strategy, with scheme-level operation delegated to canal committees. Somalia has no unified federal land law; tenure along the Shabelle is predominantly customary (xeer), administered through community and district structures, with widespread tenancy and sharecropping. In the absence of a statutory land-acquisition and compensation regime, land access and any compensation are governed by the project's Land Access Protocol (Section 9.3.4) and AfDB OS5 — no permanent acquisition or involuntary resettlement is required, temporary access is secured through written agreements, and crop or asset damage is compensated at full replacement cost.
- d. Labour, occupational health and safety, and public health. Labour relations and worker protection are governed by the Somali Labour Code (Law No. 65 of 1972), which sets basic employment standards but contains limited modern occupational health and safety provisions; the gap is filled by AfDB OS5 and the contractor's Labour Management Procedures. Public health protection — including sanitation, waste, and vector control directly relevant to malaria management near canals — is administered by the Ministry of Health and, locally, the Balcad District Health Office. Sexual exploitation, abuse, and harassment are criminal offences under the Somali Penal Code (1962) (Articles 398–401), and the Family Code (1975) sets the minimum age of marriage at 18; these instruments underpin the project's SEA/SH prevention and response regime (Section 9.3.5).
- e. Agro-chemicals, biodiversity, and cultural heritage. Pesticide and fertilizer use is guided by the National Pesticide Policy and National Fertilizer Policy (MoAI), reinforced by the hazardous-materials and pollution-control provisions of the Environmental Protection and Management Act (2024); integrated pest management and safe handling apply as restored irrigation intensifies production. Biodiversity and ecosystem protection also fall under the 2024 Act. Somalia has no modern federal antiquities statute in force; cultural heritage is therefore protected through the project's Chance Finds Procedure (Appendix 9.4) and AfDB OS requirements.
- f. Security and local government. There is no project-specific security statute; security is managed through federal and state security arrangements and the Balcad District Administration, which also exercises local-government functions relevant to works permissions, community coordination, and grievance handling under the Federal Member State structure established by the Provisional Constitution (2012). State-level regulatory and enforcement capacity across these domains is limited, which is why the AfDB ISS 2023 is applied as the binding baseline throughout (Section 2.6).

Table 3: Permit and Authorization Matrix — Hirshabelle Component

AUTHORIZATION / PERMIT	LEGAL BASIS	ISSUING AUTHORITY	TIMING	STATUS
Environmental clearance / ESIA approval	Environmental Protection and Management Act 2024; ESIA Regulations 2024	MoECC (federal) with Hirshabelle State Ministry of Environment	Before commencement of works	ESIA prepared to AfDB ISS 2023; national submission and clearance pending
Water abstraction / diversion authorization	National Water Resource Strategy 2021–2025; customary land-based water rights (no federal Water Act in force)	MoEWR; Hirshabelle state water authority; canal committees	Before O&M abstraction	No formal licensing regime; managed via committee allocation and e-flow floors; water-accounting study recommended
Canal / river works authorization	MoAI / state mandate over public irrigation infrastructure	MoAI; Hirshabelle Ministry of Agriculture; Balcad District Administration	Before works on each canal	To be confirmed through state and district works agreements
Land access / temporary use	Customary (xeer) tenure; Land Access Protocol; AfDB OS5	Landowners / community; District Administration; canal committees	Before mobilisation on each canal	Written -access agreements to be executed; no permanent acquisition
Labour and occupational health & safety	Somali Labour Code (Law No. 65 of 1972); AfDB OS5	Ministry of Labour and Social Affairs	Before workforce mobilisation	Contractor Labour Management Procedures required
Public health / vector control coordination	Public health regulations (MoH)	Ministry of Health; Balcad District Health Office	Construction and O&M	Coordination commitment in ESMP
Pesticide and fertilizer handling	National Pesticide Policy; National Fertilizer Policy; EPMA 2024 (hazardous materials)	MoAI; MoECC	O&M, as cropping intensifies	IPM and safe-handling measures committed
Borrow areas / materials extraction	EPMA 2024; local authority permissions	MoECC / state; District Administration; landowners	Before extraction	Contractor to obtain permits and land agreements
Waste / effluent management	EPMA 2024 (effluent reporting; emission licences)	MoECC	Construction and O&M	Contractor ESMP waste controls
Cultural heritage / chance finds	Chance Finds Procedure (Appendix 9.4); AfDB OS (no modern federal antiquities statute in force)	Relevant cultural authority via District Administration	During excavation	Procedure adopted in ESMP

2.2.1. Hirshabelle State legal and administrative framework

Hirshabelle State operates under the Federal Member State governance structure established under the Provisional Constitution. The Hirshabelle State Administration has jurisdiction over resource management, land administration, environmental oversight, and public infrastructure within the state, subject to federal law. Key institutional structures relevant to this project include the Hirshabelle State Ministry of Agriculture, the state water authorities responsible for Shabelle canal governance, and the Balcad District Administration.

2.3. International and regional obligations

Somalia is party to several international conventions relevant to this ESIA, including the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement, directly relevant to the climate-adjusted design of Shabelle canal infrastructure; the United Nations Convention to Combat Desertification (UNCCD); the Convention on Biological Diversity (CBD); and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). These commitments reinforce the project's obligations to protect environmental resources, address gender inequality in water governance, and build climate resilience. Beyond these, Somalia is also party to the African Convention on the Conservation of Nature and Natural Resources (ratified 2016); the Convention on International Trade in Endangered Species (CITES, 1986); the Vienna Convention for the Protection of the Ozone Layer (2001), the Basel Convention on the transboundary movement of hazardous wastes (2010), and the Stockholm Convention on persistent organic pollutants (2010); the ILO Freedom of Association Convention No. 87 (2014) and Forced Labour Convention No. 29 (1960); the Convention on the Rights of the Child (2015); and the African Union (Kampala) Convention on internally displaced persons (2019). Together these reinforce commitments on biodiversity and land protection, the safe handling of chemicals and wastes, core labour rights, child protection, and the rights of displaced and vulnerable groups.

International-watercourse and downstream-consultation requirements. The Shabelle is a transboundary river: more than two-thirds of its drainage basin lies in Ethiopia, upstream of Somalia, and the river enters Somalia at Belet Weyne. Somalia is the downstream and effectively terminal riparian — the Shabelle dissipates within Somalia in the floodplains and wetlands of the lower valley and connects to the Juba only in extreme flood years, so no sovereign state lies downstream of the project. There is no basin-wide treaty or bilateral Somalia–Ethiopia agreement on the Shabelle in force, and no active basin organisation; the applicable framework is therefore customary international water law, principally the principles of equitable and reasonable utilisation and the obligation not to cause significant transboundary harm.

Applicability to this project. The riparian-notification duty recognised in international practice — under which a state planning measures that may adversely affect other watercourse states notifies those states — runs from upstream toward downstream. Because Somalia is the lowermost riparian on the Shabelle, the rehabilitation of the thirteen Balcad canals triggers no obligation to notify or consult a downstream foreign state, as none exists below the works. The transboundary dimension relevant here is instead twofold: preserving Somalia's equitable share of the river against growing upstream (Ethiopian) abstraction and climate-driven flow variability, and managing the in-country downstream effects on the lower Shabelle already assessed as a High interim risk (Sections 7.5 and 6.25.3).

How these requirements are satisfied. The project authorises no new withdrawal right and does not increase Somalia's aggregate claim on the river; it restores conveyance within existing infrastructure and improves distribution equity. Consistency with the no-significant-harm and equitable-use principles is maintained through the adopted environmental-flow floors, dry-season abstraction scheduling and

monitoring, and the recommended scheme-level water-accounting study, and through alignment with the National Water Resource Strategy (2021–2025) and its integrated water resources management approach. Monitoring outputs will be made available to the MoEWR to support data-sharing and any future Somalia–Ethiopia dialogue on the Shabelle. On this basis, no formal riparian notification is legally required for the project, and the applicable international-watercourse principles are satisfied.

2.4. AfDB requirements

The BBS Project is classified as an AfDB Category 2 operation, requiring preparation of a full ESIA and comprehensive ESMP. This classification is confirmed in the AfDB Environmental and Social Categorization Memorandum prepared for the BBS Project. The following Operational Safeguards (OS) are triggered for the Hirshabelle component:

- **OS1 — Assessment and Management of Environmental and Social Risks and Impacts:** Applies to all aspects of the ESIA and ESMP, including flood risk management and climate risk integration.
- **OS2 — Labor and Working Conditions:** Applies to all contractors engaged for Hirshabelle canal sites, including the mandatory water-safety regime. Labour Management Procedures (LMP) are applicable.
- **OS3 — Resource Efficiency and Pollution Prevention and Management:** Applies to sediment management during desilting, spoil and waste management, fuel and chemical handling, and downstream water quality protection at all 13 canals.
- **OS4 — Community Health, Safety, and Security:** Applies to community safety during construction and operation, child drowning prevention, malaria vector management, SEA/SH prevention, and security management.
- **OS5 — Land Acquisition, Restriction on Access to Land and Land Use, and Involuntary Resettlement:** Minimally triggered on a precautionary basis. All canal rehabilitation works are confined to existing canal footprints and public rights-of-way, so no involuntary land acquisition or physical displacement is anticipated; temporary and voluntary land access is managed through the Land Access Protocol (Section 9), which requires immediate works suspension and OS5 determination should any activity result in physical displacement or a greater than 10% loss of a household's productive capacity.
- **OS6 — Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources.** Yes. Site-specific ESIAES will be undertaken to assess impacts on project biodiversity and ecosystems etc. Works are confined to existing man-made canal footprints within an actively farmed landscape; no natural or critical habitats, protected areas, or significant biodiversity features are present or affected. However, this ESIA ESMP outlines mitigation measures to be implemented to ensure that the project activities do not have severe impact on biodiversity and ecosystems. The project proposes to rehabilitate and or construct water resources. Site-specific

ESIAs will be undertaken during mobilization to verify excavation extents during canal rehabilitation and to confirm the extent of riparian land disturbance; any riparian vegetation disturbed during works will be reinstated.

- **OS7 — Vulnerable Groups:** Applies given the presence of tenant farmers and landless labourers, female-headed households, tail-end water users, IDPs, and minority clan communities.
- **OS8 — Cultural Heritage:** Not affected. No known cultural heritage sites, archaeological features, or sites of religious or cultural significance are located within or adjacent to the canal works; the Chance Finds Procedure (Appendix 9.4) applies should any previously unrecorded feature be encountered during excavation.
- **OS9 — Financial Intermediaries:** Not triggered. The project involves no lending through financial intermediaries.
- **OS10 — Stakeholder Engagement and Information Disclosure:** Applies throughout project preparation and implementation, including signed canal disruption schedules and the GRM.

OS5 (Land Acquisition), OS6 (Biodiversity), and OS8 (Cultural Heritage) were screened but determined minimally to be triggered for the Hirshabelle component, subject to footprint limitations and precautionary controls: a Land Access Protocol (Section 9), riparian vegetation reinstatement, and the Chance Finds Procedure (Appendix 9.4).

2.5. Institutional framework and capacity

Clear, enforceable roles across the PIU, Supervision Consultant, contractors, and district-level counterparts are essential for effective ESMP implementation in Hirshabelle. The PIU will lead safeguards oversight and will be accountable for ensuring site-wide compliance with AfDB ISS 2023 and applicable national requirements. The shared Galmudug/Hirshabelle E&S Officer will provide day-to-day oversight across all 13 canal sites. Contractors will be required to assign dedicated ESHS officers for Hirshabelle works. The Balcad District Administration will support community liaison, access coordination, flood alert communication, and local dispute resolution. Canal committees will manage infrastructure during operation under documented allocation rules.

At the federal and state level, the institutions relevant to the project and its safeguards are: the Ministry of Environment and Climate Change (MoECC), which administers ESIA review and clearance, with the Hirshabelle State Ministry of Environment coordinating at state level; the Ministry of Energy and Water Resources (MoEWR), responsible for surface- and groundwater management, including rivers; the Ministry of Agriculture and Irrigation (MoAI), the lead ministry for irrigation and the borrower's implementing ministry; the Ministry of Labour and Social Affairs, responsible for labour administration and occupational health and safety; the Ministry of Health, responsible for public health and vector control; the Ministry of Humanitarian Affairs and Disaster Management together with the Somalia Disaster Management Agency (SoDMA), for flood and disaster-risk coordination; and the Ministry of Finance and the Ministry of Planning, Investment and Economic Development, for financing and economic oversight. At state and

local level, the Hirshabelle line ministries, the project PIU, and the Balcad District Administration exercise implementation and coordination roles.

Hirshabelle's institutional capacity for environmental and social governance remains limited. The state's regulatory framework for environmental assessment and management is nascent, and enforcement capacity is constrained by resource limitations and security conditions. The project's application of the AfDB ISS 2023 standard as the minimum baseline across all Hirshabelle sites ensures a higher standard than may currently be required by state-level regulation, addressing the capacity gap identified in the project-wide gap review.

Table 4: Hirshabelle State Framework

Institution	Role Relevant to Project	Engagement Approach
Hirshabelle State Ministry of Agriculture	Project counterpart; canal rehabilitation coordination; agricultural development oversight; environmental permits	Regular coordination with PIU; participation in oversight and joint monitoring missions
Hirshabelle State water authorities	Shabelle canal system governance; water allocation policy; intake management	Coordination on canal-system hydrology; joint oversight of allocation rules
Balcad District Administration	Canal site access coordination; farmer and canal committee liaison; security coordination; flood alert communication; local dispute resolution	Pre-works consultations; ongoing liaison through construction; GRM support
Canal Committees / Water User Associations (13 canals)	Day-to-day canal operation and water allocation; annual desilting; flood damage reporting; dispute resolution	Committee formation/strengthening prior to commissioning; ongoing engagement and capacity building

2.6. Gap analysis

This section compares the Borrower's environmental and social framework with the requirements of the AfDB Integrated Safeguards System (ISS 2023) and identifies the measures adopted to close the differences. The comparison is made at the level of the instruments and institutions actually operative in Somalia and in Hirshabelle State, rather than at the level of policy intent.

The principal differences between the Borrower's framework and AfDB requirements are as follows:

- **Environmental assessment.** The Environmental Protection and Management Act (2024) and the ESIA Regulations (2024) establish an assessment and permitting requirement, but the implementing procedures, review capacity and enforcement machinery are new and not yet fully operational, particularly at state level. OS1 is applied in full, and this ESIA has been prepared to the ISS 2023 standard ahead of national submission and clearance.
- **Water abstraction and diversion.** There is no operational federal water statute and no functioning abstraction- or diversion-licensing regime for the Shabelle; the Natural Water Resources Law (1984) is not in force in practice. The project therefore manages abstraction through committee-agreed allocation rules, binding environmental-flow floors, dry-season abstraction scheduling and monitoring, and a recommended scheme-level water-accounting study, in place of a licence condition.

- Land acquisition and compensation. Somalia has no unified federal land law and no statutory land-acquisition and compensation regime; tenure along the Shabelle is predominantly customary (xeer), with widespread tenancy and sharecropping. OS5 is applied on a precautionary basis through the Land Access Protocol (Section 9.3.4): written temporary-access agreements before mobilisation, compensation of crop and asset damage at full replacement cost within 30 days, and mandatory works suspension and OS5 determination if any activity would cause physical displacement or greater than 10% loss of a household's productive capacity.
- Labour and occupational health and safety. The Somali Labour Code (1972) sets basic employment standards but contains limited modern occupational health and safety provisions and no framework for a workers' grievance mechanism. OS2 requirements are imposed contractually through Labour Management Procedures, a worker register with age verification, written contracts, a Workers' GRM, and the mandatory water-safety and heat-stress regimes set out in Sections 9.3 and 8.5.
- Cultural heritage. No modern federal antiquities statute is in force. OS8 is satisfied through the Chance Finds Procedure (Appendix 9.4), which is posted at every site and covered in worker induction.
- Gender-based violence, exploitation and harassment. Sexual violence is criminalised under the Penal Code (1962) and the Family Code (1975) sets the minimum age of marriage at 18, but there is no project-level SEA/SH prevention framework in national practice. The project applies the OS4 and OS10 requirements through Codes of Conduct, a confidential reporting channel managed exclusively by the PIU GBV Specialist, a female Community Liaison Officer, and documented survivor-centred referral pathways (Section 9.3.5).
- Stakeholder engagement and grievance redress. National practice does not require a formal, project-level grievance redress mechanism with defined uptake channels and response timelines. OS10 is applied through the Stakeholder Engagement Plan (Appendix 9.1) and the four-level GRM with a dedicated water-allocation track and a separate confidential SEA/SH channel (Section 9.7).

Gaps affecting implementation of the project arise principally from institutional capacity rather than from policy. State-level environmental permitting, inspection and enforcement capacity in Hirshabelle is limited; district administration resources are constrained; and security conditions in parts of Balcad District affect the consistency of supervision. Canal committees, which will hold operational responsibility after handover, are in most cases informal and are not uniformly inclusive of tail-end users, tenant farmers or women.

The measures adopted to address these deficiencies are: (i) application of the ISS 2023 as the binding minimum standard for all thirteen sites, with the more protective provision prevailing wherever national and Bank requirements differ; (ii) administrative and procedural measures in place of absent statutory instruments — the Land Access Protocol, environmental-flow floors, the Chance Finds Procedure, Labour Management Procedures and the Security Management Plan; (iii) contractual transfer of obligations to contractors through the Contractor ESMP and ESHS hold points, which must be approved in writing before any mobilisation; (iv) independent supervision and audit, through weekly Supervision Consultant

inspections, monthly PIU audits and an annual independent environmental and social audit; and (v) institutional strengthening and capacity building, budgeted in Section 9.13, covering canal committee formation and training at all thirteen canals, a dedicated female Community Liaison Officer, GRM operation, and training for PIU, state and district counterparts as set out in Section 9.11.

CHAPTER 3: ANALYSIS OF ALTERNATIVES

3.1. Project purpose and need

The purpose of the Hirshabelle component is to restore the conveyance, control and flood-conveyance function of thirteen deteriorated irrigation canals in Balcad District so that irrigation supply becomes reliable and equitably distributed for an estimated 2,200–3,800 farming households. The need arises from the measured condition of the asset base: sedimentation has reduced conveyance to an estimated 40–60% of design capacity, banks are eroded and in places breached, and control structures are non-functional, so water distribution is captured by head-end users, irrigated area and yields are falling, and blocked channels cannot convey peak Shabelle flows, raising flood risk to adjacent farmland.

Alternatives were therefore assessed against the question of how this function can best be restored, rather than whether new irrigation capacity should be created. The analysis covered the no-project alternative, location and siting alternatives, design and technology alternatives, and construction timing and implementation alternatives, evaluated against technical feasibility, environmental impact, social benefit, cost, and operational sustainability. The preferred alternative is the one that maximises social benefit while minimising environmental and social risk at a technically feasible and affordable cost.

The alternatives analysis for the Hirshabelle component assessed options across four dimensions: the no-project alternative; location and siting alternatives; design and technology alternatives; and construction alternatives. Alternatives were evaluated against criteria including technical feasibility, environmental impact, social benefit, cost, and operational sustainability. The preferred alternative is that which optimizes social benefit while minimizing environmental and social risk, at a technically feasible and affordable cost.

3.2. No-project alternative

Without the BBS Project, the thirteen Balcad canals would continue to deteriorate: sedimentation already reduces conveyance to an estimated 40–60% of design capacity, eroded and breached banks cause water losses and localised flooding of farmland, and non-functional control structures perpetuate inequitable distribution favouring head-end users. The no-project scenario would sustain declining irrigated area and crop yields for 2,200–3,800 farming households, deepen water allocation conflicts, maintain elevated flood risk from blocked channels unable to convey peak Shabelle flows, and continue drowning and bank-failure safety hazards. Given the severity of the baseline deterioration in one of Somalia's most productive agricultural corridors and the limited availability of other financing, the no-project scenario is unacceptable from a development perspective.

3.3. Alternative project locations

3.3.1. How sites were selected

Canals in Balcad were selected through a multi-stage process combining national and state government prioritization, community demand, technical screening of canal condition and rehabilitability, hydraulic significance within the Shabelle canal network, feasibility assessment, and environmental and social

screening. Priority was given to canals where deterioration was severe but rehabilitable, where the served command area and household numbers were substantial, and where community management structures existed or could be strengthened. The thirteen selected canals — including the Farax Galoolay Canal added following supplementary screening — represent the highest-priority interventions from this process. The following are site photos for Busley canal in Balcad location.



3.3.2. Sites screened out or deprioritized

Additional canals in Balcad and neighbouring districts were considered but screened out or deprioritized due to: severe security access constraints prohibiting safe implementation and supervision; canal conditions assessed as beyond economic rehabilitation or requiring full reconstruction outside project scope; command areas with unresolved land or water disputes that rehabilitation would inflame; or hydraulic dependencies requiring upstream intake works outside the project's remit. Screened-out canals are documented in the project screening records.

3.3.3. Trade-offs and preferred siting approach

Trade-offs in siting included the balance between reaching the most deteriorated canals (whose communities are worst affected) and ensuring hydraulic coherence, security access, and management capacity for successful implementation. The preferred approach concentrates interventions on canal clusters sharing villages and intake systems — Busley, Kurshaale, Maqaar Careys, Halgan, Weberi, and Farax Galoolay — enabling efficient work fronts, coherent water-management outcomes across interconnected canals, and consolidated community engagement, while accepting that some canals outside these clusters are deferred to future phases.

3.4. Alternative designs

Design alternatives were assessed for each principal engineering decision in the canal rehabilitation package — the extent of lining, the method of bank protection, the type of water-distribution control, and the form of community water access. The comparison and the preferred approach for each are set out below.

Table 5: Design and Technology Alternatives

Design Issue	Alternative A	Alternative B	Preferred Approach and Rationale
Canal lining	No lining (earthen canal throughout)	Selective concrete/compacted-soil lining on high-loss reaches	Selective lining preferred: full lining is unaffordable and unnecessary; targeted lining of high-seepage and high-erosion reaches maximizes conveyance gains per dollar and limits embodied carbon
Desilting method	Mechanical excavator only	Combined mechanical and manual labour-based approach	Combined approach preferred: maximizes local employment, allows finer control near structures and banks, and reduces heavy-equipment loading on fragile bank edges
Flow management during works	Full canal closure for duration of works	Cofferdam / bypass with agreed partial flows maintained	Partial-flow approach preferred: full closure would impose unacceptable crop losses on downstream farmers; bypass arrangements plus signed disruption schedules protect livelihoods
Water distribution control	Informal earthen checks operated ad hoc	Engineered sluice gates and cross-regulators with documented operating schedule	Engineered structures preferred: enable measurable, equitable head-end/tail-end allocation and transparent committee governance; ad hoc checks perpetuate capture by upstream users
Bank protection	Hard protection (masonry/concrete) throughout	Compaction, seeding within 5 days, and bioengineering, with hard protection only at structures	Bioengineering-led approach preferred: lower cost, locally maintainable, ecologically preferable on floodplain soils; hard protection reserved for hydraulically stressed points
Community water access	Direct draw from canal edge	Water kiosks and dedicated livestock troughs	Kiosks and troughs preferred: reduce bank trampling and erosion, separate domestic and livestock use, reduce drowning exposure, and improve hygiene

3.5. Alternative technologies

Technology alternatives for the Hirshabelle component are limited by the nature of the works, which restore existing gravity-fed earthen infrastructure rather than introduce new technology. Three technology choices were nonetheless material and are recorded in the table above. First, desilting method: mechanical excavation alone was compared with a combined mechanical and manual labour-based approach; the combined approach was preferred because it maximises local employment, allows finer control of excavation near structures and bank edges, and reduces heavy-equipment loading on fragile banks. Second,

flow management during works: full canal closure was compared with cofferdam or bypass arrangements maintaining agreed partial flows; the partial-flow approach was preferred because full closure would impose unacceptable crop losses on downstream farmers. Third, water-distribution control: informal earthen checks operated ad hoc were compared with engineered sluice gates and cross-regulators operated to a documented schedule; the engineered option was preferred because it makes allocation measurable, enforceable and transparent.

Pumped or pressurised distribution, and lined conveyance across the full canal length, were both screened out: they would introduce recurrent energy and maintenance costs that cannot be sustained by canal committees, and they are disproportionate to the conveyance gains achievable by desilting and selective lining.

3.6. Alternative timing and implementation arrangements

3.6.1. Scheduling alternatives

The primary scheduling alternative was whether to conduct canal earthworks year-round or restrict them to Shabelle low-flow windows. Restricting earthworks to the low-flow windows (February–March and August–September) confirmed by the pre-works hydrological assessment minimizes flood inundation risk, allows desilting and bank works under manageable flow conditions, and reduces the duration of irrigation disruption during peak cropping periods. This is the preferred approach. Where programme pressure requires working into shoulder periods, enhanced controls apply: twice-daily flood gauge monitoring, defined suspension thresholds per canal, end-of-day equipment removal from the canal, and pre-positioned evacuation arrangements.

3.6.2. Work team and work front alternatives

Given that all thirteen canals lie within Balcad District, the preferred approach is to operate two to three simultaneous canal-cluster work fronts (e.g., Busley, Kurshaale/Maqaar Careys, Halgan/Weberi, Farax Galoolay), sequenced so that canals sharing a common intake are not disrupted at the same time. This shortens the overall programme and limits community disruption at any one location, while a single sequential team would extend the programme across multiple flood seasons and delay benefits.

3.7. Environmental and social implications of each alternative

The environmental and social implications of each alternative were assessed as follows. The no-project alternative has the highest adverse implications: continued deterioration of conveyance, sustained inequity in water distribution, elevated flood risk from blocked channels, continued bank-failure and drowning hazards, and declining crop production and food security for 2,200–3,800 households, with no offsetting environmental benefit. Alternative locations — canals in Balcad and neighbouring districts that were screened out — carried higher implementation and safeguards risk: severe security-access constraints preventing safe supervision, conditions requiring full reconstruction beyond project scope, unresolved land

or water disputes that rehabilitation would inflame, and hydraulic dependencies on upstream intake works outside the project's remit.

Among design and technology alternatives, full lining would have increased embodied carbon, cost and disturbance without proportionate benefit; hard bank protection throughout would have raised cost and reduced local maintainability on floodplain soils; full canal closure during works would have transferred a Major livelihood impact to downstream farmers; and direct canal-edge water abstraction by the community would have sustained bank trampling, erosion and drowning exposure. Among construction alternatives, year-round earthworks would have exposed workers, works and communities to the Gu and Deyr flood regime, and a single sequential work team would have extended the programme across multiple flood seasons, prolonging both disruption and exposure. The preferred alternative in each case is the one with the lower residual environmental and social implication, as recorded in Section 3.13.

3.8. Feasibility of mitigating impacts under each alternative

The feasibility of mitigating impacts differs materially between the alternatives, and this was a decisive criterion in the analysis. Under the no-project alternative the principal adverse effects — progressive loss of conveyance, inequitable allocation and rising flood exposure — are not mitigable at all, because there is no intervention through which to apply mitigation; they can only be borne. Under the screened-out siting alternatives, mitigation would have been technically possible but not reliably deliverable: measures depending on continuous supervision, community agreement or dispute resolution cannot be assured where security access is constrained or where land and water disputes are unresolved, so residual risk would have remained high in practice regardless of the measures specified on paper.

Under the preferred alternative, every material impact has an identified, proportionate and enforceable mitigation route, and each is capable of verification: sediment release is controlled by cofferdam or bypass, spoil placement and downstream turbidity checks; bank collapse by per-canal geotechnical assessment, phased cutting and immediate compaction; flood exposure by low-flow scheduling, twice-daily gauge monitoring and defined suspension thresholds; irrigation disruption by signed disruption schedules, maintained partial flows and a funded compensation framework; and worker and community safety by the water-safety regime, heat-stress protocols, barriers, signage and safe crossings. The measures are technically standard, locally implementable, and enforceable through the Contractor ESMP and ESHS hold points, which is the basis on which residual significance is assessed as Minor to Moderate in Section 7.25.

3.9. Capital and recurrent costs of alternative mitigation measures

The capital and recurrent costs of mitigation differ between alternatives principally in whether they fall on the project or on affected people. Under the no-project alternative, no mitigation cost is incurred by the project, but the costs of continued deterioration — recurrent crop losses, flood damage to farmland, and dispute resolution over water — are borne by farming households, and there is no mechanism through which they are compensated or recovered.

Under the preferred alternative, mitigation costs are of two kinds. Capital and one-off costs are incurred largely in the first year and include the pre-works hydrological and geotechnical assessment across all thirteen canals, monitoring equipment (flow gauges, EC meters, GPS and field kits), GRM establishment, and the initial round of canal-committee formation and training. Recurrent costs run for the four-year project period and include community engagement and disclosure, GRM operation, water-quality monitoring, the female Community Liaison Officer, security risk management, SEA/SH service mapping and referral, the annual independent environmental and social audit, and provisions for crop compensation and emergency flood maintenance. The indicative total of these PIU-borne measures is USD 253,662 over four years, itemised in Section 9.13.

Contractor ESHS costs — the Contractor ESMP, site ESHS officers, occupational health and safety provision, water-safety equipment, flood gauges, personal protective equipment and waste management — are additional to that figure and are funded through the works contracts, so that the cost of mitigation is carried within the price of the works rather than as an external add-on. Alternatives that would have required continuous mechanical or pumped operation, or full-length lining, were rejected in part because they would have generated recurrent operation and maintenance costs beyond the means of canal committees, transferring an unfunded liability to the communities at handover.

3.10. Institutional, training and monitoring requirements

The institutional, training and monitoring requirements of the preferred alternative were assessed as achievable within the project's implementation arrangements, and this was itself a criterion in selecting it. Institutionally, the alternative requires a PIU safeguards function within MoAI, a dedicated Environmental and Social Officer covering the Hirshabelle sites, contractor ESHS officers, an independent Supervision Consultant, and functioning canal committees at each of the thirteen canals — all of which are provided for in Section 9.9. Alternatives relying on formal regulatory licensing of abstraction, or on statutory land-acquisition and compensation machinery, were not viable because the corresponding institutions are not operational in Somalia.

Training requirements follow directly from the preferred construction method: because works are labour-intensive and take place in and beside flowing water, the alternative depends on a water-safety and heat-stress induction regime for every worker, bank-excavation safety training for excavation crews, flood-alert training before each season, and governance and operation and maintenance training for all thirteen canal committees before commissioning. These are set out in Section 9.11 and costed in Section 9.13.

Monitoring requirements are correspondingly higher for the preferred alternative than for a full-closure or year-round-works approach, because maintained partial flows and seasonal scheduling must be verified continuously: twice-daily flood-gauge readings during the Gu season, daily verification of irrigation supply continuity against signed disruption schedules, downstream turbidity checks during desilting, weekly Supervision Consultant inspections, monthly PIU audits, and quarterly safeguards reporting to AfDB. The monitoring regime is specified in Section 9.8 and consolidated in Appendix 8.

3.11. Quantification and economic valuation of environmental and social impacts

Quantification of environmental and social impacts has been carried out to the extent that data permit, and the assessment is explicit about where it does not. Quantified parameters include the aggregate dry-season abstraction ratio of the wider BBS scheme against mean monthly discharge at the Belet Weyne reference gauge (approximately 48–64% of flow in January–February, 24–42% in March, July and December, and below 15% during April–October); mean monthly Shabelle flow at that gauge, ranging from about 18 m³/s at the February minimum to about 188 m³/s at the May flood peak; the loss of canal conveyance to sedimentation, estimated at 40–60% of design capacity; the number of households in the command area, estimated at 2,200–3,800; the projected 10–20% increase in extreme rainfall intensity and the projected +1.0°C temperature increase by 2040 for Middle Shabelle; and indicative workforce numbers of 20–50 workers per active canal.

Formal economic valuation of environmental and social impacts has not been undertaken for the Hirshabelle component, and no monetised damage or benefit figures are presented, because the underlying data — per-canal command areas, cropped areas by season, yields, farm-gate prices and per-canal design flows — are not yet established at the resolution that valuation would require. Two elements are nonetheless costed rather than valued: the crop-compensation framework, which pays verified project-caused losses at full replacement cost and carries a funded contingency of USD 30,000 over the project period, and the emergency maintenance provision for flood damage of USD 32,000. The pre-works hydrological assessment and the recommended scheme-level water-accounting study will generate the per-canal flow and command-area data on which a quantified water-allocation and benefit analysis can subsequently be built; until then, the assessment relies on the significance-rating method described in Section 7.1 rather than on monetary valuation.

3.12. Stakeholder participation in identifying and evaluating alternatives

Stakeholders participated in identifying and evaluating alternatives at three points. During scoping and site selection, canal priorities were established through national and state government prioritisation combined with community demand, and canals were selected where deterioration was severe but rehabilitable, where the served command area and household numbers were substantial, and where community management structures existed or could be strengthened. Canals with unresolved land or water disputes were deprioritised on the basis of community and district feedback rather than technical criteria alone.

During field verification in December 2025 and January 2026, and in the supplementary round in June 2026 that confirmed the expanded thirteen-site scope, canal committees, farming households including tenant farmers and sharecroppers, women's groups, elders and youth representatives were consulted on the construction alternatives that most affect them. Two design decisions follow directly from that input: the rejection of full canal closure in favour of cofferdam or bypass arrangements maintaining agreed partial flows, which responds to the crop-loss concern raised consistently by farmers on every canal; and the

confinement of earthworks to the Shabelle low-flow windows, which responds to community recollection of flood events causing major crop losses and to the concern that works could worsen flooding.

Community input also shaped the water-access and governance alternatives: women's groups supported dedicated kiosks and livestock troughs over direct canal-edge abstraction, on grounds of safety and convenience, and requested a role in siting them; and the preference for engineered, schedule-operated control structures over informal earthen checks reflects tail-end users' and tenant farmers' stated fear that restored flows would otherwise be captured upstream. The issues raised and the project's responses are recorded in Appendix 3.2, and the design response is summarised in Section 4.4.

3.13. Preferred alternative and justification

The preferred alternative for the Hirshabelle component is the project as designed: rehabilitation of thirteen canals in Balcad District through desilting, bank repair and stabilisation, selective lining, engineered control structures, culverts, kiosks, and troughs, delivered through clustered work fronts within Shabelle low-flow windows, with partial flows maintained and canal committee governance formalised before handover. This combination maximizes irrigation and flood-management benefits, minimizes environmental and livelihood disruption, and supports sustainable, equitable community management. It represents the most technically viable, socially beneficial, and environmentally sound option available within the project scope.

CHAPTER 4: DESIGN MEASURES

4.1. Basis for selecting the proposed project design

The proposed project design was selected because it restores the function of existing infrastructure within its established footprint, which is the design basis that carries the lowest environmental and social risk while delivering the required irrigation and flood-conveyance outcome. Every intervention — desilting, bank reshaping and stabilisation, selective lining, repair or replacement of control structures, culverts at crossings, and water kiosks and livestock troughs — is applied to an existing canal alignment. No new canal is constructed, no new land is taken, no new abstraction right is created, and no riparian corridor is cleared for a new alignment.

Within that basis, the design responds to three governing site conditions. The first is the Shabelle flood regime, which is driven by Ethiopian highland rainfall and can raise river stage rapidly and independently of local rain; the design therefore adopts embankments and culverts sized for the 1-in-25-year event and a raised intake freeboard of +0.5 m, reflecting the projected 10–20% increase in extreme rainfall intensity. The second is the character of the bank soils, which are cohesive when moist but weaken rapidly on saturation or sudden drawdown; the design therefore fixes cross-section dimensions and bank slopes against a per-canal geotechnical assessment rather than a single standard profile, and favours compaction, seeding and bioengineering over hard protection except at hydraulically stressed points. The third is the distributional problem the project exists to solve; the design therefore specifies engineered sluice gates and cross-regulators capable of being operated to a documented, publicly posted allocation schedule, in place of the informal earthen checks that allow head-end capture.

Detailed engineering design for each canal establishes, or confirms before mobilisation, the design flow rate and flood return period, the cross-section and bank slope specification, control-structure discharge and gate specification, lining extent on high-loss or high-erosion reaches, culvert sizing against the design rainfall event, and kiosk and trough placement relative to community use patterns. These parameters are carried into the contractor method statements submitted to the PIU for approval, so that the design basis is enforceable at the point of construction.

4.1.1. Design and technical parameters

Detailed engineering design for each Hirshabelle canal has established, or will confirm before mobilisation, the following site-specific technical parameters: pre-works hydrological assessment of the Shabelle canal system at Balcad confirming design flow rates and flood return period for each canal; canal cross-section dimensions and bank slope specifications informed by geotechnical assessment of bank soils; control structure design discharge and gate specifications; lining specifications for selected reaches; culvert sizing based on drainage area and design rainfall event (1-in-25-year, given climate change projections); embankment design for 1-in-25-year flood events with raised intake freeboard (+0.5 m); and kiosk and trough placement relative to canal access and community use patterns. All design parameters were finalised

and below is technical design for one of the 13 canals for Balcad. All the 13 designs is be provided in the annex.

The designs will be incorporated into contractor method statements submitted to the PIU for approval.

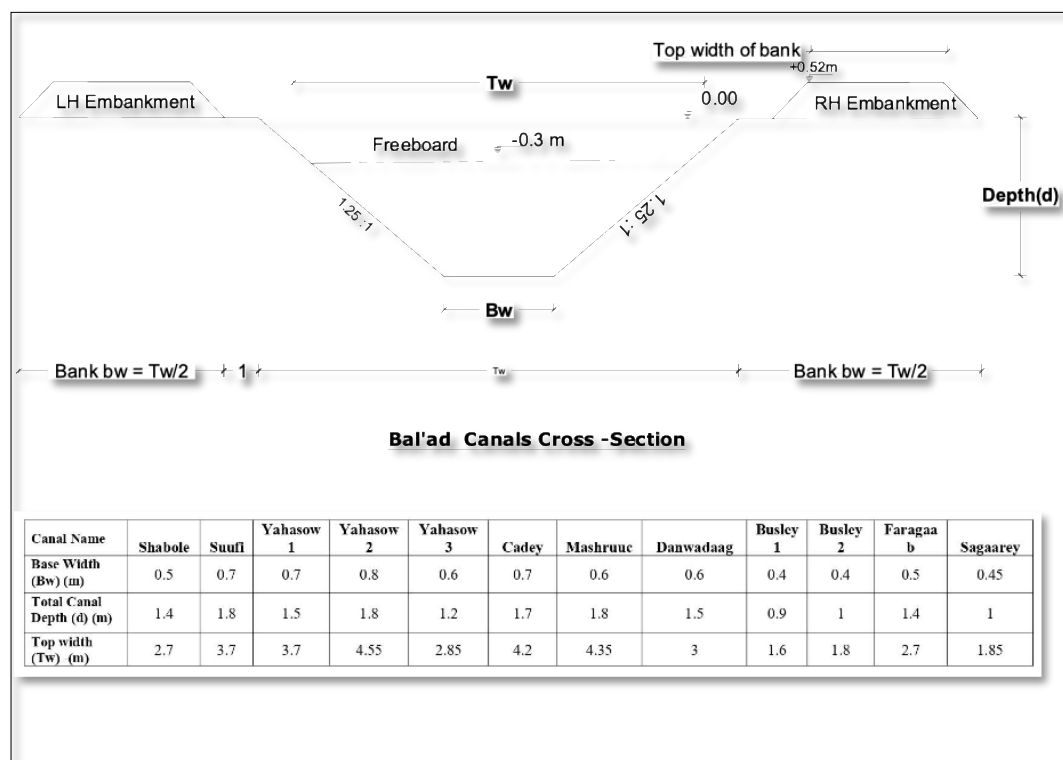


Figure 3: Cross-section of a Balcad canal (representative design)

4.2. Application of the mitigation hierarchy

The mitigation hierarchy has been applied in sequence at the design stage, and the sequence is recorded here so that the residual measures carried into the ESMP can be traced to the design decisions that precede them.

- Anticipation and avoidance. Works are confined to existing canal footprints, avoiding new land take, physical displacement and riparian clearance. Earthworks are confined to the Shabelle low-flow windows of February–March or August–September, avoiding the highest flood exposure for workers, works and communities. Spoil is placed on high ground at least 10 metres from the canal edge, avoiding re-sedimentation of the channel and degradation of farmland. Water kiosks and livestock troughs are provided so that domestic and livestock water use is drawn away from hazardous canal-edge points. Sites with unresolved land or water disputes, and sites where security conditions prevent safe supervision, were not selected.
- Minimisation and reduction. Canal closure is avoided in favour of cofferdam or bypass arrangements that maintain agreed partial flows, reducing the irrigation disruption impact from Major to Moderate.

Desilting is phased upstream to downstream and works are sequenced so that canals sharing a common intake are not disrupted simultaneously, limiting corridor-wide supply loss. Lining is applied selectively to high-loss and high-erosion reaches rather than along the full length, limiting cost, embodied carbon and disturbance. Vegetation clearing is held to the minimum required, and bank cutting is phased with immediate compaction and seeding within five days of earthworks.

- **Mitigation.** Where an impact cannot be avoided or further reduced by design, it is managed through the measures specified in Section 8 and made enforceable through the ESMP in Section 9: the water-safety regime for workers, heat-stress protocols, barriers, signage and safe pedestrian crossings for communities, flood gauges with defined suspension thresholds, downstream turbidity monitoring during desilting, Codes of Conduct and the confidential SEA/SH channel, and inclusive canal committees operating documented allocation rules.
- **Compensation or offsetting of significant residual impacts.** No biodiversity offset is required, as no natural or critical habitat is affected. Compensation applies to livelihood impacts: verified project-caused crop and asset losses are compensated at full replacement cost within 30 days under the Land Access Protocol, supported by a funded contingency. For the one impact rated High before mitigation and not fully resolvable at project level — the reduction of dry-season downstream flow in the Shabelle arising from aggregate scheme abstraction — the response is a binding operating constraint rather than compensation: environmental-flow floors of a minimum 20% of natural flow at all times, 30% during April–October and 40% during the January–March dry season, with dry-season abstraction monitoring and revalidation of the environmental category should monitoring show the impact cannot be reduced to Moderate.

4.3. Environmental and social measures incorporated into the project design

The following environmental and social measures are incorporated into the project design itself, rather than being left to construction-phase management, and are therefore fixed before any contractor is mobilised:

- **Climate-adjusted hydraulic design:** embankments and culverts sized for the 1-in-25-year flood and design rainfall event, and a raised intake freeboard of +0.5 m, against projected increases in extreme rainfall intensity and flood magnitude.
- **Restored flood-conveyance function:** desilting and bank repair are specified to restore the canals' capacity to convey peak flows, so that flood risk reduction is a design output rather than an incidental benefit.
- **Geotechnically determined bank profiles:** cross-section dimensions and side-slope specifications set per canal against assessed bank-soil conditions, with bioengineering-led stabilisation and hard protection reserved for hydraulically stressed points.
- **Engineered, schedule-operable control structures:** sluice gates, cross-regulators and diversion boxes designed to enable measurable and enforceable head-end/tail-end allocation under a documented and publicly posted schedule.

- Selective lining on high-loss and high-erosion reaches, reducing seepage losses and erosion where they are greatest without full-length lining.
- Water kiosks and dedicated livestock troughs, separating domestic and livestock water use from the canal edge to reduce bank trampling and erosion, drowning exposure and hygiene risk.
- Culverts at road and track crossings, maintaining community access and conveying drainage without obstructing canal flows, with safe pedestrian crossing points retained through the works.
- Positive drainage and elimination of water-trapping depressions in the works design, reducing *Anopheles* breeding habitat as a design measure ahead of operational vector management.
- Gravity-fed operation with no operational energy requirement, avoiding a recurrent fuel and maintenance liability for canal committees and generating no operational greenhouse gas emissions.

4.4. Design response to stakeholder input

The design responds to stakeholder input at specific, identifiable points. Farmers on every canal raised the risk of crop loss if canals were closed during works; the design response is the cofferdam or bypass arrangement maintaining agreed partial flows, together with signed canal-specific disruption schedules and two weeks' written notice before each disruption. Communities recalled flood events causing major crop losses and were concerned that works could worsen flooding; the design response is the confinement of earthworks to confirmed low-flow windows, climate-adjusted embankment and culvert sizing, and the restoration of flood conveyance as an explicit design output.

Tail-end farmers and tenant farmers expressed the fear that head-end users would capture restored flows and that tenants would be excluded from allocation decisions; the design response is the specification of engineered control structures capable of operating to a documented schedule, coupled with the requirement for inclusive canal committees with head-end and tail-end representation at every canal before commissioning. Women's groups sought safe and convenient water access and a role in deciding where it is sited; the design response is the inclusion of water kiosks and livestock troughs in the works package, with siting decided in consultation with women's groups. Parents raised child drowning risk at canals; the design response is canal fencing at community crossing points and high-risk sections, safety signage, and safe pedestrian crossings retained through the works.

Communities also expressed frustration with previous projects that rehabilitated infrastructure and left it unmaintained; the response is reflected in the design's bias towards locally maintainable solutions — bioengineering-led bank protection, gravity operation, and manually operated gates — together with committee capacity building, an operation and maintenance manual in Somali, and basic tool kits provided before commissioning. The full record of issues raised and responses is at Appendix 3.2.

CHAPTER 5: PROJECT DESCRIPTION

5.1. Project purpose and objectives

The BBS Irrigation Project's development objective is to improve water security, agricultural productivity, and climate resilience for pastoral, agro-pastoral, and farming communities in targeted districts of Somalia; Somaliland, Puntland, Galmudug, Hirshabelle, Southwest & Jubaland states. For Hirshabelle State specifically, the project targets the canal-fed irrigated agriculture of Balcad District, where deteriorated canal infrastructure — sedimentation estimated to reduce conveyance to 40–60% of design capacity, eroded and breached banks, and non-functional control structures — directly constrains crop production, distorts water distribution in favour of head-end users, and elevates flood risk.

The thirteen canal rehabilitation sites represent a critical intervention package for one of Somalia's most productive agricultural corridors. Restored conveyance, functional control structures, and strengthened canal committee governance are expected to result in measurable improvements in irrigated area, crop yields, water distribution equity, and household food security for an estimated 2,200–3,800 farming households.

5.2. Project components and activities

5.2.1. Canal rehabilitation works

All thirteen Hirshabelle sites involve rehabilitation of existing irrigation canals. The specific scope at each canal will be confirmed in detailed design and contractor method statements, and may include:

- **Desilting of canal reaches** — removing accumulated sediment to restore design conveyance capacity, using excavation equipment and manual labour, with cofferdam or flow bypass around active work areas.
- **Reshaping and repair of canal banks and side slopes** — re-profiling eroded banks, compacting and stabilising embankments, and repairing breached sections, with geotechnical assessment per canal before works.
- **Canal lining on selected high-loss or high-erosion reaches** — concrete or compacted-soil lining to reduce seepage and erosion; specific reaches confirmed in design based on pre-works assessment.
- **Repair or replacement of control structures** — diversion boxes, sluice gates, and cross-regulators to enable effective water management and equitable allocation between head-end and tail-end users.
- **Culvert construction** — at road and track crossings to maintain community access and convey drainage without obstructing canal flows.
- **Water kiosk and livestock watering trough installation** — community distribution points and animal water access along canal corridors.
- **Bank reinstatement and stabilisation** — compaction, seeding within 5 days of earthwork, and bioengineering measures to protect rehabilitated banks from erosion.

5.3. Geographic context

5.3.1. Site locations

The thirteen BBS Project sites in Hirshabelle State are presented in the table below with canal alignment coordinates (start and end points) per the updated BBS Master List (June 2026). All sites are in Balcad District, Middle Shabelle Region; all are existing canals under rehabilitation; all are AfDB Category 2.

Table 6: Site Locations Table — Hirshabelle

No.	Canal Name	Village / Area	Start (Lat, Long)	End (Lat, Long)	ESS Category
29	Busley 1 Canal	Busley	2.360038, 45.400689	2.353494, 45.403521	Cat. 2
30	Busley 2 Canal	Busley	2.360079, 45.398990	2.353588, 45.399920	Cat. 2
31	Caday Canal	Kurshaale	2.378031, 45.415000	2.370132, 45.413123	Cat. 2
32	Danwadaag Canal	Kurshaale	2.369949, 45.405423	2.364816, 45.411916	Cat. 2
33	Faragaab Canal	Maqaar Careys	2.360678, 45.397625	2.360678, 45.397625	Cat. 2
34	Mashruuca Canal	Weberi	2.343702, 45.381459	2.343702, 45.381459	Cat. 2
35	Sagaarey Canal	Kurshaale	2.378823, 45.414329	2.376527, 45.412150	Cat. 2
36	Shoobe Canal	Maqaar Careys	2.353600, 45.319000	2.353200, 45.322600	Cat. 2
37	Suufi Canal	Maqaar Careys	2.352100, 45.319900	2.351000, 45.327600	Cat. 2
38	Yaxaasow 1 Canal	Halgan	2.364140, 45.389713	2.369456, 45.385881	Cat. 2
39	Yaxaasow 2 Canal	Halgan	2.364270, 45.390220	2.373556, 45.391518	Cat. 2
40	Yaxaasow 3 Canal	Halgan	2.364044, 45.390608	2.368262, 45.397648	Cat. 2
119	Farax Galoolay Canal	Farax Galoolay	2.407238, 45.415809	2.419531, 45.314408	Cat. 2

The Farax Galoolay Canal (No. 119) is extending approximately 11 km westward from its offtake. The Faragaab and Mashruuca entries record a single verified reference point; their full alignments will be confirmed in detailed design and the pre-works hydrological assessment.

5.4. Environmental and social context

The project sits in the Middle Shabelle floodplain, a low-relief, densely settled and intensively farmed riverine landscape that is one of Somalia's most productive agricultural zones. Land use along the thirteen canal corridors is dominated by irrigated maize, sesame, vegetable and fruit plots, interspersed with settlement clusters, homestead gardens, livestock corridors and watering points, and rural tracks that cross the canals at multiple points. Canal margins are themselves used for pedestrian movement, livestock watering and domestic water collection. Livelihoods, food security and household income in the corridor are directly dependent on canal performance, and the population most exposed to changes in that performance includes tenant farmers and sharecroppers, female-headed households, tail-end water users, IDP households near Balcad town, and minority clan communities.

Environmentally, the setting is defined by the Shabelle River and its canal network, by deep silty and clayey floodplain soils that are fertile but erodible, and by a flood regime driven by rainfall in the Ethiopian highlands that can raise river stage independently of local rain. No protected areas or critical habitats occur at any of the thirteen sites, and no known cultural heritage features were identified along the alignments. The full baseline is presented in Section 6.

5.5. Temporal context and project schedule

The Hirshabelle works are programmed within the wider BBS Project construction period of 48 months. Works are phased canal by canal within that period rather than executed simultaneously, and indicative construction durations are 6–14 weeks per canal depending on length, desilting volume, lining extent, and the number of control structures and culverts; the Farax Galoolay Canal, being the longest reach in the component, is programmed as the longest single-canal package.

The controlling temporal constraint is hydrological rather than programmatic. All canal earthworks are scheduled within the Shabelle low-flow windows of February–March or August–September, as confirmed by the pre-works hydrological assessment, avoiding the Gu (April–June) and Deyr (October–December) flood-risk periods. Two to three canal-cluster work fronts operate in parallel, sequenced so that canals sharing a common intake are not disrupted at the same time. The assessed phases are pre-construction and mobilisation, construction and rehabilitation, commissioning and handover to canal committees, and operation and maintenance; demobilisation of temporary works and site reinstatement are assessed within the construction phase. The implementation schedule and reporting calendar are set out in Section 9.12.

5.6. Project life-cycle activities

5.6.1. Preparation and pre-construction

Preparation and pre-construction activities are the pre-works assessments and agreements that must be complete before any physical activity begins at a canal. They comprise the hydrological and geotechnical assessment of the Shabelle canal system at Balcad, commissioned at least six weeks before mobilisation and producing design flow rates, flood-stage suspension thresholds and bank-soil conditions per canal; the security assessment of each of the thirteen sites and its Green/Yellow/Red classification; canal committee consultation and the signing of a canal-specific disruption schedule; written confirmation of the land access corridor with farmers and the canal committee; establishment and testing of the grievance redress mechanism, including the confidential SEA/SH channel and the female Community Liaison Officer; and submission and written approval of the Contractor ESMP and supporting plans. No mobilisation authorisation is issued until the PIU site-readiness checklist for that canal is signed off; the full hold-point list is at Section 9.5.

5.6.2. Construction methods and sequencing

Works at Hirshabelle sites will be delivered through canal-cluster work packages within Balcad District. Prior to mobilization, contractors will prepare canal-specific method statements and management plans consistent with the ESMP requirements. Construction sequencing will:

- Prioritize canals with confirmed readiness: access agreed, signed disruption schedule, security clearance, hydrological and geotechnical assessment complete, and community notification issued.
- Schedule all canal earthworks within Shabelle low-flow windows (February–March or August–September) confirmed by the pre-works hydrological assessment, avoiding the Gu (April–June) and Deyr (October–December) flood-risk periods.

- Phase desilting upstream to downstream on each canal, with cofferdam or flow bypass maintained so that agreed partial flows continue to downstream users.
- Sequence works so that no more than an agreed number of canals sharing a common intake are disrupted simultaneously, protecting aggregate irrigation supply across the corridor.

Indicative construction durations are 6–14 weeks per canal depending on length, desilting volume, lining extent, and the number of control structures and culverts; the Farax Galoolay Canal, given its length, is programmed as the longest single-canal package.

5.6.3. Workforce numbers and labour profile

Hirshabelle works are expected to be implemented by one or more contractors operating canal-cluster work fronts within Balcad District. Workforce numbers per active canal are estimated at 20–50 workers depending on scope, including skilled operators (excavator operators, masons for lining and structures) and unskilled labour for desilting and bank works. The contractor will be required to prioritize local hiring from Balcad District for unskilled and semi-skilled roles, with preference given to unemployed youth from canal communities and to women in administrative, liaison, or supervisory roles. Workers from outside the district may be required for specialized roles.

5.6.4. Materials sourcing and transport routes

Construction materials will include cement, aggregate, and reinforcement for lining, control structures, and culverts; sluice gates and metalwork; geotextile and bank-stabilisation materials; and pipes and fittings for kiosks and troughs. Materials will be sourced from established suppliers in Mogadishu or Jowhar and transported by road to Balcad and then along agreed access routes to individual canals. Aggregate and fill may be sourced from local borrow areas where suitable material is confirmed, subject to environmental screening of each proposed borrow area. Materials transport routes and schedules will be agreed with the Balcad District Administration to minimize disruption.

5.6.5. Borrow areas, spoil disposal and waste streams

Desilting will generate substantial spoil volumes. Spoil will be placed on high ground at least 10 metres from the canal edge — never in the active canal, drainage channels, or farmland without the farmer's written agreement — and used for embankment reinforcement where geotechnically suitable, or disposed of at agreed off-site locations confirmed during detailed design. Borrow areas will be subject to pre-works environmental screening. Construction waste (packaging, scrap metal, used fluids) will be segregated, stored in labeled containers, and removed weekly to approved disposal points. Fuel and chemical containers will be removed within 24 hours of use, with spill kits and secondary containment (drip trays) at all fuel storage points.

5.6.6. Temporary site facilities

Temporary facilities at each active canal will include a lay-down and materials storage area on high ground, tool and equipment storage, bundled fuel storage (minimum capacity 110% of the largest container), welfare and sanitation facilities for workers, drinking water supply, shade, first aid facilities, and communication equipment. All tools and equipment will be removed from the canal at the end of each working day per the flood alert protocol. Worker accommodation, if required, will be located away from community residential areas, with sleeping quarters separated by gender and secure personal storage. All temporary facilities will be demobilized and sites reinstated upon completion of works.

5.6.7. Operation and maintenance concept

Rehabilitated canals will be handed over to canal committees (Water User Associations) at each of the thirteen canals, with support from the Balcad District Administration and Hirshabelle State water authorities. Canal committees will be responsible for day-to-day operation of control structures per documented and publicly posted allocation schedules, annual post-Gu desilting, flood damage inspection and reporting, child safety inspections, malaria vector management, and adherence to agreed water allocation rules. The project will provide committee capacity building, operational training, O&M manuals in Somali, and basic tool kits before commissioning of each canal. The PIU will conduct oversight visits at 3, 6, and 12 months post-commissioning and annually thereafter.

5.6.8. Routine maintenance activities and waste streams

Routine maintenance during operation will include: annual post-Gu inspection of sediment depth, bank condition, and control structure function on every canal; annual desilting by the canal committee, with major desilting triggered when conveyance capacity is estimated below 75% of design; greasing and servicing of sluice gates and control structures; vegetation management at canal margins to limit mosquito breeding and maintain bank integrity; repair of fencing and signage at community crossing points; and post-flood inspections within 5 days of significant Shabelle flood events. Maintenance generates minor waste streams (silt spoil, vegetation cuttings, used lubricants, packaging) managed per the O&M manual, with silt spoil placed on high ground and never returned to drainage lines.

5.6.9. Resource requirements

5.6.9.1. Water requirements

Construction water requirements include water for concrete mixing, compaction, dust suppression, and worker welfare, sourced from the canals themselves or the Shabelle River under arrangements agreed with canal committees so that abstraction does not compromise agreed partial flows to downstream users. Operational water requirements are internal to the system — the project restores conveyance rather than consuming additional water, and it authorises no new canal-level withdrawal right. This does not, however, mean that net dry-season depletion of the river is unchanged: more reliable delivery can induce expanded

cultivation and higher consumptive use that offset conveyance savings, which is why aggregate dry-season abstraction is assessed as a High interim risk in Section 7.5.

5.6.9.2. Energy needs and power source

Construction energy needs will be met primarily through diesel-powered excavation equipment and small generators for site facilities and concrete works. Generator fuel will be stored in bunded containment. The rehabilitated canal system is gravity-fed and requires no operational energy input, apart from manual operation of sluice gates and control structures.

5.6.9.3. Greenhouse gas emissions

Diesel consumption during construction will generate greenhouse gas emissions that are minimal relative to project scale and temporary in nature. During operation, the gravity-fed system generates no direct emissions; restored conveyance efficiency reduces water losses per unit of production, and improved flood conveyance reduces climate-related crop loss, contributing a modest positive climate adaptation benefit over the project lifecycle.

5.7. Associated facilities

The Project may rely on associated facilities and temporary support sites that are not fixed at the design stage, including borrow areas for fill and aggregate, spoil disposal sites, water abstraction points used during construction, worker camps and laydown areas, and temporary access routes. The PIU will establish and maintain an Associated Facilities and Support-Sites Register recording each such site, its location, ownership, intended use, and environmental and social status. No associated facility or support site may be established or used until it has: (i) undergone environmental and social screening using the project screening forms (Appendix 7.1); (ii) obtained the regulatory permits and documented landowner or community-use agreements required for its use; (iii) an approved site-specific protection and management plan addressing erosion and drainage control, waste and fuel management, water use, and post-use reinstatement; (iv) been subject to consultation with affected communities and landholders, with outcomes recorded in the consultation log; and (v) had the relevant ESMP mitigation and monitoring measures incorporated into the contractor's method statements. The Register will be updated as sites are added or closed out, verified by the HIR E&S Officer, and reported in the periodic environmental and social monitoring reports submitted to AfDB.

5.8. Third parties involved in the project

Third parties involved in the project are the works contractors and their subcontractors, who carry the construction-phase environmental, social, health and safety obligations through the Contractor ESMP and are required to assign dedicated ESHS officers to the Hirshabelle sites; the independent Supervision Consultant, who conducts weekly site inspections across all thirteen canals, verifies ESMP compliance,

issues and tracks corrective actions, and approves each canal reach before handover; the technical consultant commissioned to carry out the pre-works hydrological and geotechnical assessment; and any security providers engaged in connection with the works, whose conduct is governed by the Security Management Plan, including a security personnel code of conduct, pre-deployment and refresher training, and explicit proportionality and use-of-force provisions.

The canal committees and water user associations at each of the thirteen canals are third parties in a different sense: they are not contracted by the project but assume operational responsibility for the rehabilitated asset at handover, including operation of control structures to the documented allocation schedule, annual post-Gu desilting, flood damage inspection and reporting, child safety inspection and vector management. The project's ability to sustain its outcomes depends on their capacity, which is why committee formation, inclusivity verification and training are pre-commissioning requirements. The Balcad District Administration supports site access, community and canal committee liaison, security coordination, flood alert communication and local dispute resolution. Responsibilities of contractors and third parties are set out in full in Section 9.9.

5.9. Off-site investments and supporting infrastructure

The project involves no permanent off-site investment. There is no access road construction, no dedicated pipeline, no power supply infrastructure, no permanent water supply installation, no permanent worker housing, and no product-storage facility associated with the works. The rehabilitated canal system is gravity-fed and requires no operational power supply.

The supporting infrastructure that is required is temporary and site-based: temporary access corridors along each canal, agreed in writing with farmers and the canal committee before mobilisation and reinstated on completion; lay-down and materials storage areas on high ground; tool and equipment storage; bunded fuel storage sized to at least 110% of the largest container; welfare and sanitation facilities, drinking water, shade and first aid for workers; and, where required, worker accommodation sited away from community residential areas with sleeping quarters separated by gender and secure personal storage. Borrow areas for fill and aggregate, and spoil disposal sites, are also required where suitable material or capacity is confirmed. All such sites are subject to the Associated Facilities and Support-Sites Register and the screening, permitting and management requirements set out in Section 5.7, and all temporary facilities are demobilised and their sites reinstated on completion of works.

5.10. Primary suppliers

The project has no primary suppliers in the sense of suppliers providing a primary production input on which the project's core function depends, and it does not procure agricultural commodities, timber, aggregates or other natural-resource-based inputs from concentrated or high-risk supply chains. Construction materials — cement, aggregate, reinforcement, sluice gates and metalwork, geotextile and

bank-stabilisation materials, and pipes and fittings for kiosks and troughs — are procured from established commercial suppliers in Mogadishu or Jowhar and transported by road to Balcad.

The one input with a site-based supply risk is aggregate and fill, which may be sourced from local borrow areas rather than commercial suppliers. Where this occurs, each proposed borrow area is treated as an associated facility: it must be screened using the project screening forms, hold the required regulatory permits and documented landowner or community-use agreements, have an approved site-specific management plan covering erosion and drainage control, waste and fuel management, water use and post-use reinstatement, and be recorded in the Associated Facilities and Support-Sites Register. Contractors are additionally required to apply the Labour Management Procedures — including age verification and written contracts — to any labour engaged at borrow or spoil sites, so that the labour standards applying to the works are not displaced into the supply of materials. Supply-chain risk is assessed at Section 7.22.

5.11. Project site and area of influence

The project site is the thirteen canal alignments listed at Section 5.3.1, all within Balcad District, Middle Shabelle Region. The area of influence is defined at four levels. The direct footprint comprises the canal beds, banks and immediate working corridors under rehabilitation, together with control structure and culvert locations, kiosk and trough sites, spoil placement areas on high ground, agreed access corridors, and temporary storage and lay-down areas. The immediate surrounding zone extends approximately 500 metres from active works, where communities and farmland may experience construction noise, dust, vehicle traffic, safety risk, temporary access restriction, and localised flooding or waterlogging if flows are mismanaged. The hydraulic zone comprises the connected offtakes, control structures and canal reaches affected by changes in conveyance, together with the irrigated command area served by the thirteen canals, estimated to support 2,200–3,800 farming households. The downstream influence area extends along the Shabelle below the Balcad offtakes, where river flows sustain domestic supply, shallow wells recharged by bank infiltration, flood-recession and spate cultivation, small-scale riverine fisheries, and dry-season livestock watering.

The area of influence also recognises the security and access constraints in parts of Balcad District that affect supervision, monitoring and contractor behaviour, and which are therefore treated as a determinant of where and when works can proceed rather than as an external condition.

5.11.1. Land requirements and access pathways

All Hirshabelle project works occur within existing canal corridors crossing farmland held under a mixture of private ownership, customary arrangements, and tenancy/sharecropping agreements. No permanent land acquisition or involuntary resettlement is anticipated. Temporary construction access corridors along each canal will be agreed in writing with farmers and the canal committee before mobilisation, specifying access route, working width, and reinstatement protocol. Any project-caused crop damage will be compensated at full replacement cost within 30 days. The PIU will maintain a record of all access

arrangements, and any activity that would result in physical displacement or greater than 10% loss of a household's productive capacity triggers immediate works suspension and referral for OS5 determination.

5.12. Project maps

Figure 4 is a GIS map showing the geographic distribution of the thirteen BBS canal rehabilitation sites along the Middle Shabelle corridor in Balcad District, based on the field-verified coordinates recorded in the BBS Master List (June 2026).

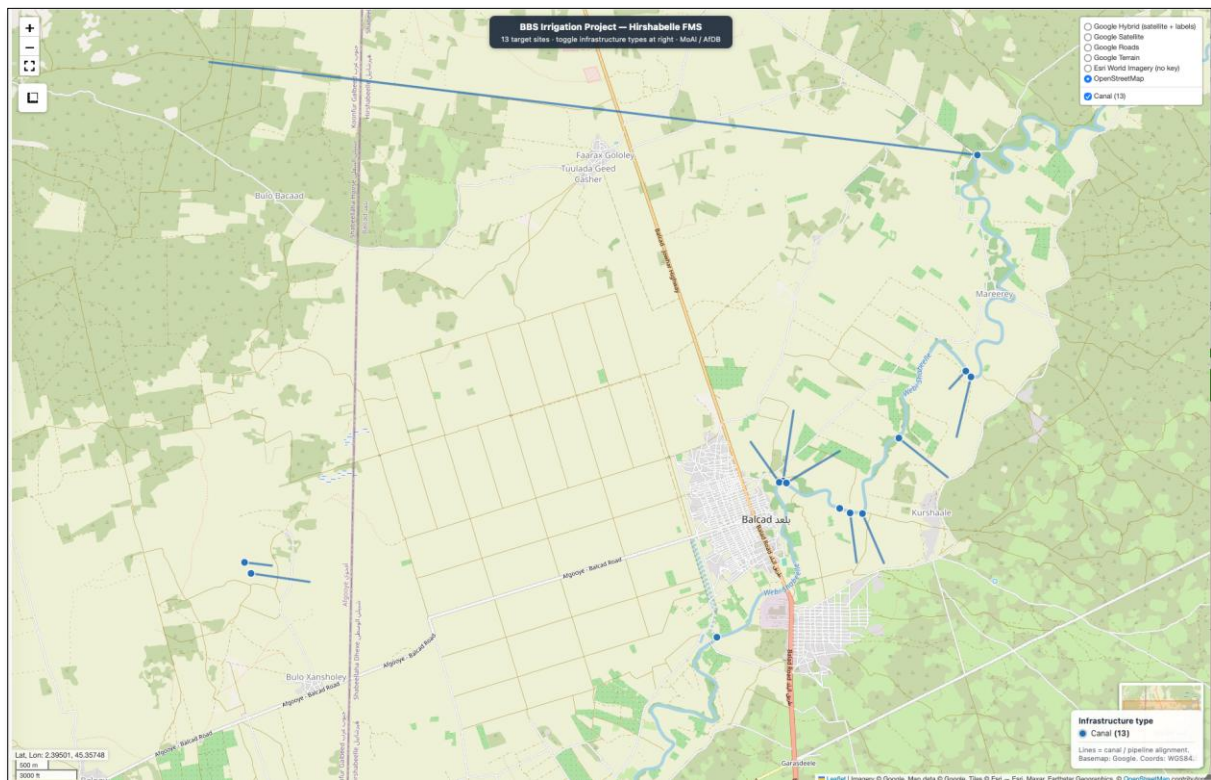


Figure 4: Hirshabelle State — BBS Irrigation Project canal locations (13 sites, Balcad District)

CHAPTER 6: PROJECT BASELINE

6.1. Baseline study scope and area

The baseline study covers the thirteen canal corridors in Balcad District, Middle Shabelle Region, and the areas of influence defined at Section 5.11: the direct works footprint, the immediate surrounding zone within approximately 500 metres of active works, the hydraulic zone and irrigated command area served by the thirteen canals, and the downstream influence area along the Shabelle below the Balcad offtakes. Baseline conditions are described at three scales — national and regional setting, Middle Shabelle regional context, and canal-corridor conditions — because the flood regime, climate drivers and humanitarian context that determine risk at the sites are generated well beyond the works footprint.

The depth of baseline description is proportionate to the risks and impacts identified at scoping. Surface-water hydrology and canal hydraulics, flood behaviour, bank soils and stability, water quality, land use and tenure, livelihoods, vulnerability, health, and security conditions are described in detail because they are decision-relevant for this project. Groundwater, ambient air quality, ambient noise, and biodiversity beyond the riparian corridor are described only to the extent needed to confirm the screening conclusion that they are not material, consistent with Section 8.16.

6.2. Data sources, dates and methods

The baseline draws on primary field data collected for this ESIA and on established secondary sources. Primary data comprise field verification visits to the canal sites conducted in December 2025 and January 2026, with a supplementary verification visit for the Farax Galoolay Canal; environmental and social screening of all thirteen canals against the updated BBS Master List of June 2026; direct observation of canal condition, bank state, control-structure function, crossing points and community use patterns along the alignments; recording of canal alignment start and end coordinates; and stakeholder consultations held in December 2025 and January 2026 with a supplementary round in June 2026, covering Hirshabelle State authorities, the Balcad District Administration and District Health Office, canal committees and water user groups on all thirteen canals, farming households including tenant farmers and sharecroppers, women's groups, elders and youth representatives.

Secondary sources comprise FAO SWALIM river gauging and flood monitoring datasets for the Shabelle; regional hydrological assessments of the Shabelle basin; Population Estimation Survey regional totals for demographic data; FSNAU food security and nutrition surveillance data; FEWS NET livelihood zone profiles for Middle Shabelle; World Bank Climate Change Knowledge Portal data and CMIP6 mean projections; CORDEX-Africa downscaled projections under RCP 2.6 and RCP 8.5; W5E5 bias-corrected reanalysis data processed through the FAO Climate Hazard Toolbox; IPCC Sixth Assessment findings; and the AfDB Climate Safeguards System climate risk screening. Remote sensing review was used to supplement direct observation where field access was constrained. Project preparation and technical design documentation, the June 2026 BBS Master List, and the interim Hirshabelle ESMP of March 2026 were also reviewed.

6.3. Data accuracy and reliability

The reliability of the baseline varies by parameter and is stated here so that the weight placed on each is transparent. Highest confidence attaches to the parameters verified directly in the field in December 2025 and January 2026: canal locations and alignment coordinates, canal condition and sedimentation state, bank condition and breach locations, control-structure functionality, crossing points, and community use patterns along the corridors. These were observed at the sites and reconciled against the June 2026 Master List; two entries, Faragaab and Mashruuca, record a single verified reference point rather than a full alignment, and their alignments will be confirmed in detailed design and the pre-works hydrological assessment.

Moderate confidence attaches to parameters derived from established secondary datasets applied at a scale coarser than the canal corridor — Shabelle flow statistics referenced to the Belet Weyne gauge some 300–400 km upstream of the Balcad offtakes, regional demographic totals, food security classifications and livelihood profiles. These are reliable at regional scale but do not resolve conditions canal by canal, and quantitative statements drawn from them are expressed as ranges rather than point values. Lower confidence attaches to forward-looking climate projections at corridor scale and to per-canal hydraulic parameters, which is why design flow rates, flood-stage thresholds and bank-soil conditions are treated as matters to be established by the mandatory pre-works assessment rather than as established baseline facts. Estimates carried through the assessment as ranges — conveyance loss of 40–60% of design capacity, 2,200–3,800 households in the command area, and the aggregate dry-season abstraction ratios — are presented as ranges precisely because the underlying data do not support greater precision.

6.4. Data availability, gaps and uncertainties

This ESIA is based on finalized site selection, completed screening results, field verification, and stakeholder consultations conducted in December 2025 and January 2026. Several limitations were noted:

- Detailed hydrological data for the Shabelle canal system at Balcad — including per-canal design flows, flood stage relationships, and sedimentation rates — is incomplete. These gaps were addressed by drawing on SWALIM river gauging datasets, regional hydrological assessments, and field observations. A pre-works hydrological and geotechnical assessment covering all 13 canals is included as a mandatory pre-mobilization requirement in the ESMP.
- The Farax Galoolay Canal was added to the project scope after the initial field verification round; its screening was completed through a supplementary verification visit and consultation, and its pre-works assessments carry the same hold-point requirements as the original twelve canals.
- Access constraints and security conditions in parts of Balcad District affected the timing and depth of field verification at certain canal reaches. Where direct field access was limited, verification was supplemented by consultations with local counterparts and remote sensing review.
- Socioeconomic data at district and village level is limited. The ESIA draws on Population Estimation Survey regional totals, FSNAU food security surveillance data, and field consultation findings.

- Climate change projection data at canal-corridor scale is limited. The assessment uses national and regional climate data (CORDEX, CMIP6) and trend projections, supplemented by regional literature on the Shabelle basin.

These limitations do not prevent a sound assessment of the material risks and impacts of the Hirshabelle component. They reinforce the importance of adaptive management, pre-works surveys, and iterative monitoring as part of ESMP implementation.

6.5. Physical environment

6.5.1. National environmental and climate setting

Somalia is located in the Horn of Africa and covers approximately 637,657 square kilometers. The country's physical setting includes long coastal plains, extensive plateaus, and localized highlands, with most of the territory characterized by arid and semi-arid conditions. National climate patterns are influenced by seasonal monsoon winds, the migration of the Inter-Tropical Convergence Zone, and large-scale ocean–atmosphere drivers affecting the Indian Ocean and the wider region. Rainfall is bimodal, with the Gu season generally occurring from March to May and the Deyr season from September to November, while the intervening Jilaal and Hagaa periods are typically drier and are often associated with heightened water stress. This national climate setting frames the BBS Project's operating environment because it shapes both water scarcity and recharge limitations in dryland areas and flood generation and river response in the Shabelle and Juba basins where irrigated agriculture and canal systems are concentrated.

Somalia's livelihood systems reflect this climatic gradient and hydro-ecological variability. Figure 5 illustrates national livelihood patterns dominated by pastoral and agropastoral systems across the drylands, riverine and irrigated agriculture along the Shabelle and Juba corridors, and coastal livelihood systems where fisheries and trade are locally important. The BBS Project spans these different settings. In the northern and central drylands, water access investments support drought resilience for agropastoral and pastoral households whose livelihoods depend on rainfall variability and the reliability of communal water sources. In the riverine south, rehabilitation and improvement of irrigation conveyance and related structures support agricultural production systems that remain exposed to floods, erosion, sedimentation, and seasonal variability in river flows.

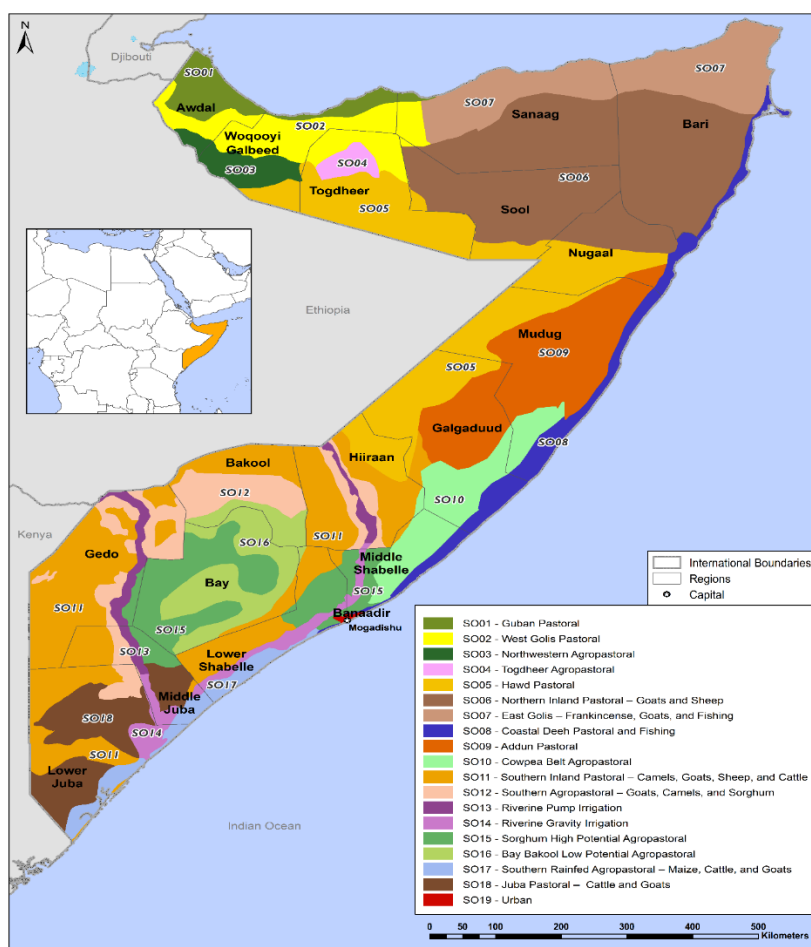


Figure 3: Somalia Livelihood zones. Source: FEWSNET

Somalia’s humanitarian context provides an additional national baseline lens on vulnerability and sensitivity. **Figure 2** highlights the scale and geographic distribution of humanitarian needs linked to recurrent climatic shocks, displacement, and disease outbreaks. This context is relevant for the BBS Project because many target areas face compounding shocks and limited coping capacity, which influences sensitivity to temporary disruptions during construction, the importance of transparent and inclusive benefit sharing, and the need for accessible grievance channels throughout implementation.

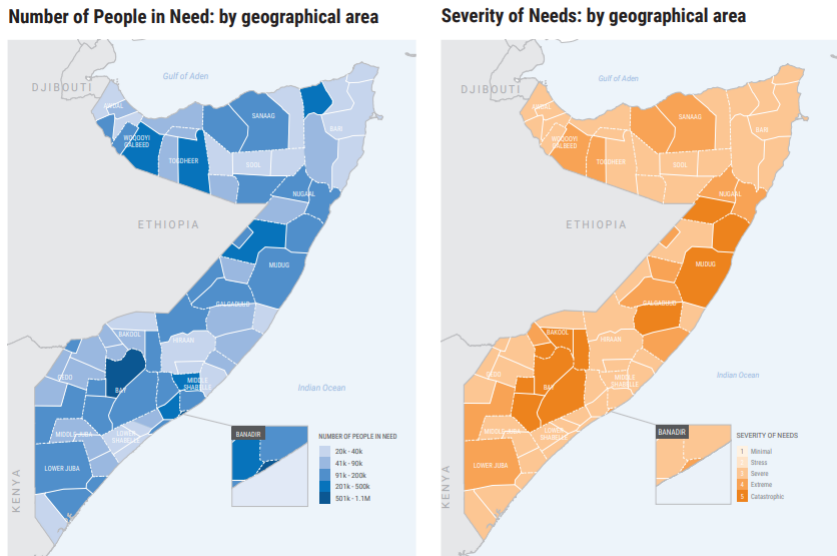


Figure 6: Humanitarian needs in Somalia as of 2023 (Humanitarian Needs Overview, 2023)

Somalia's hydroclimatic variability is reflected in strong interannual fluctuations in rainfall and the recurrence of droughts and floods. Historical patterns show pronounced year-to-year variability in seasonal rainfall performance, with associated impacts on rangeland conditions, groundwater recharge, crop performance, and river flooding. **Figure 3** provides national evidence of sustained warming alongside variability in rainfall. For the BBS Project, this trend context matters because higher temperatures increase evapotranspiration and water demand, while rainfall variability drives both acute flood risk in riverine settings and chronic water insecurity in dryland settings.

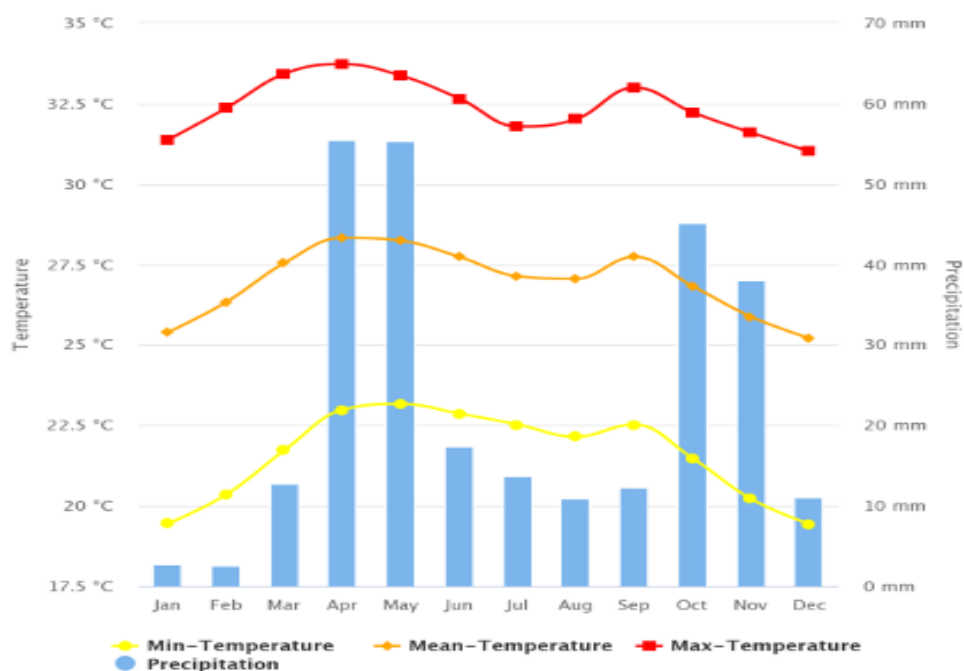


Figure 7: Rainfall and temperature trends between 1991 and 2020 (Source: World Bank Group, 2021)

Observed rainfall variability is also reflected in national trend analysis presented in this chapter. **Figure 4** presents national trends in total precipitation, **Figure 5** presents trends in the annual number of heavy rainfall days at or above 20 mm per day, and **Figure 6** presents trends in the annual number of dry days below 1 mm per day. Together, these figures describe recent historical patterns in rainfall totals and rainfall intensity that provide a practical national baseline for the BBS Project. The same national rainfall regime influences river response and flood risk in the Shabelle and Juba systems in the south while also driving water scarcity, groundwater recharge limitations, and rangeland stress in dryland areas. This linkage is important for interpreting riverine irrigation interventions, where heavy rainfall days can increase erosion and overtopping risks, and dryland water interventions, where prolonged dry-day periods can reduce recharge and intensify competition for water access.

Figure 8: Yearly change in total precipitation in Somalia (1981-2010)

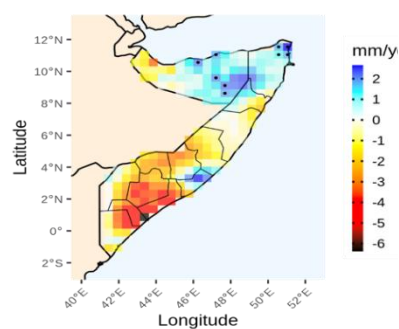


Figure 9: Yearly change in the # of days with heavy rainfall conditions (≥ 20 mm/day) in Somalia (1981-2010)

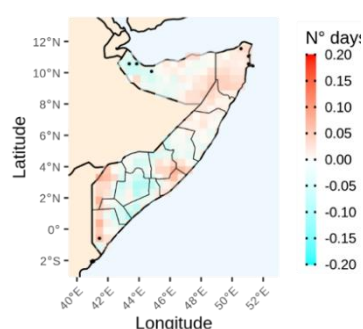
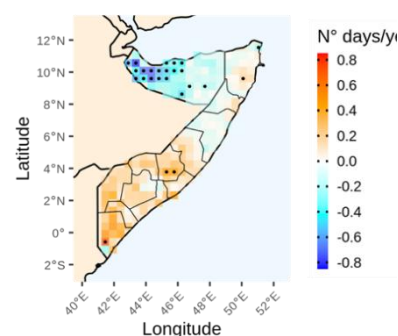


Figure 10: Yearly change in the # of dry days (<1mm/day) in Somalia (1981-2010)



Data source: W5E5 bias-corrected reanalysis dataset. Figure produced with the Climate Hazard toolbox (CHAT) developed at FAO.

Climate projections indicate that warming will continue and intensify under both lower and higher emissions pathways. The maximum and minimum temperatures are expected to increase under both RCP 2.6 and RCP 8.5, with more pronounced increases projected for the northern part of Somalia compared to the southern regions (see **Figure 11**). Heat extremes are also expected to increase. The number of days with daily maximum temperatures above 35°C is projected to rise substantially, reaching up to 200 days per year in inland areas under far-future RCP 8.5 conditions (see **Figure 12**). These projected conditions are relevant to the BBS Project because they imply greater stress on rural water systems, increased water demand for people and livestock, and higher heat exposure risks for workers and communities during construction and maintenance activities.

Projected rainfall changes indicate increasing variability and intensification of heavy rainfall events, particularly under higher emissions scenarios. The analysis shows a predicted increase in annual precipitation, especially under RCP 8.5, alongside more erratic rainfall patterns (see **Figure 13**). The increase in precipitation is expected to be more pronounced in coastal areas and parts of southern Somalia, with projected increases of up to 300 mm compared to the historical reference period (1976–2005). Somalia is

also expected to experience an increased frequency of heavy rainfall events, ranging from 1 to 4 additional days compared to the baseline period (1976–2005) (see **Figure 14**). Changes in dry-day frequency provide additional evidence of increasing rainfall concentration, with coastal areas projected to receive more rain during a shorter period, reflected in increased heavy rainfall days and reduced dry days in some coastal zones, particularly under RCP 8.5 (see **Figure 15**). In inland areas, the frequency of dry days is expected to increase under some scenarios, reinforcing the likelihood of drought stress even where annual precipitation may not decline.

Figure 11: CC signal in mean annual maximum temperature over the 21st century from historical period (1976–2005)

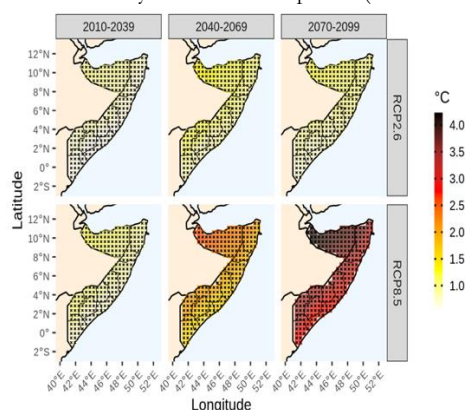
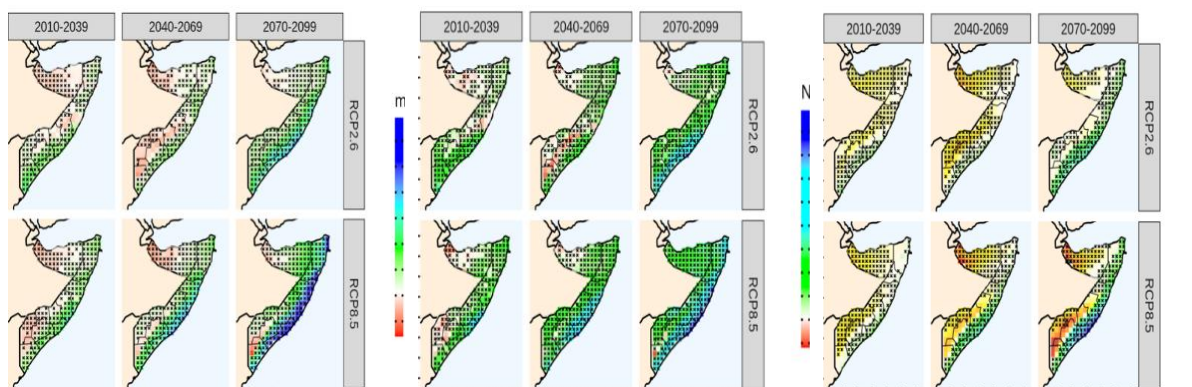
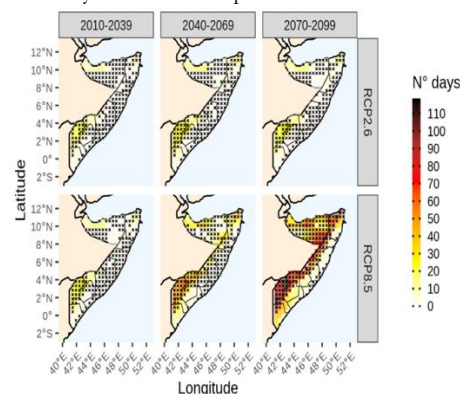


Figure 12: Mean of the CC signal for the number of days with daily maximum temperature above 35°C



Data source: W5E5 bias-corrected reanalysis dataset. Figures produced with the Climate HAZard toolbox (CHAT).

Figures 13–15: Projected change in annual precipitation, number of heavy rainfall days (≥ 20 mm/day) and number of dry days (< 1 mm/day), RCP 2.6 and RCP 8.5. Data source: W5E5 bias-corrected reanalysis; figures produced with the FAO Climate Hazard Toolbox (CHAT).

For the BBS Project, these temperature and rainfall trends translate into distinct exposure pathways across intervention settings. In riverine and irrigated areas, more intense rainfall events increase the likelihood of river flooding, canal overtopping, bank erosion, and higher sediment loads that can damage infrastructure and reduce irrigation performance. In dryland areas, the combination of warming, erratic rainfall, and

potential increases in dry-day frequency supports the need for reliable water infrastructure that can buffer seasonal variability and drought conditions while maintaining fair access during stress periods.

Somalia’s exposure to climate hazards is compounded by fragile infrastructure and socioeconomic vulnerability. The World Bank identifies Somalia as exposed to multiple hazards, including drought, floods, cyclones, and climate-related diseases and epidemics (see **Figure 16**). Droughts are often followed by severe floods, particularly in the south where the Shabelle and Juba rivers are sensitive to heavy rains in upstream catchments. Large-scale climate variability, including the El Niño–Southern Oscillation (ENSO), influences Somalia’s rainfall and temperature patterns, with El Niño periods often associated with increased rainfall and flooding risk and La Niña periods associated with drought stress. This hazard profile aligns with the BBS Project’s focus on strengthening irrigation system reliability in riverine settings and improving drought-relevant water access infrastructure in dryland settings.

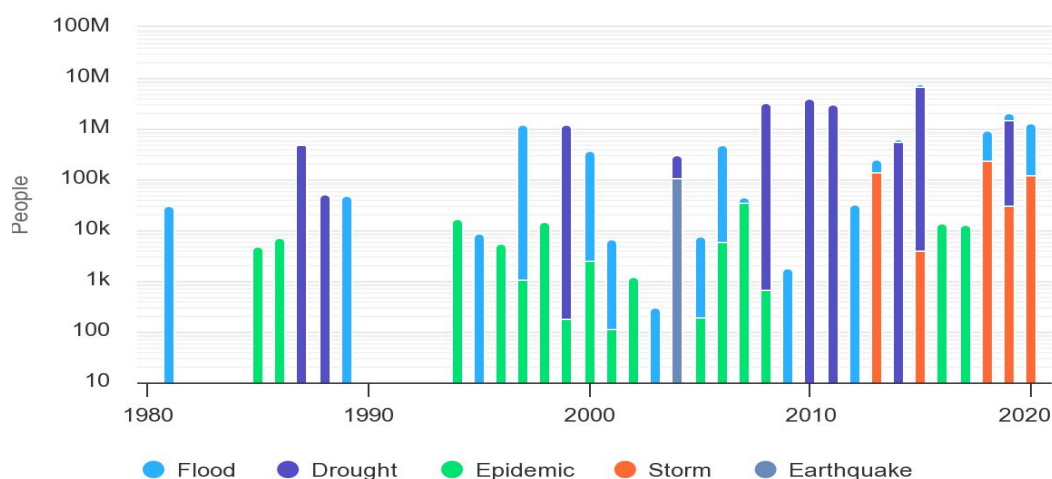


Figure 16: Key natural hazard statistics 1980–2020 (number of people affected). Source: World Bank Climate Knowledge Portal

National vulnerability mapping provides further evidence of spatial patterns in drought and flood sensitivity. **Figure 17** highlights broad areas of drought vulnerability consistent with pastoral and agropastoral dependence on rainfall and limited water storage capacity, while **Figure 18** highlights flood vulnerability patterns aligned with riverine corridors and low-lying zones influenced by floodplain dynamics and extreme rainfall events. These national patterns support interpretation of baseline sensitivities in the BBS Project’s target districts and provide context for understanding why site-level baseline conditions, exposure pathways, and vulnerability drivers differ between dryland and riverine locations.

Figure 17: Vulnerability to potential droughts¹

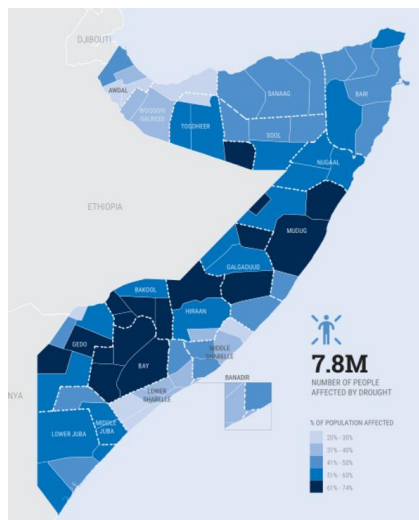
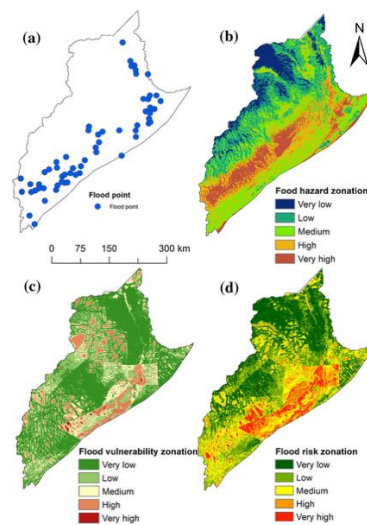


Figure 18: Vulnerability to potential floods²



Taken together, **Figures 1–19** provide the national baseline lens for the ESIA. They show that Somalia’s livelihoods, humanitarian vulnerability, rising temperatures, and increasingly variable rainfall interact to intensify both drought and flood risks. This national context frames the regional and district baselines presented in the following sections and supports interpretation of environmental and social sensitivities relevant to the BBS Project.

6.5.2. Geographic location and topography

Hirshabelle project district includes Balcad (Middle Shabelle). This setting is closely tied to the Shabelle river system and irrigated agriculture corridors. **Figure 19** presents the Hirshabelle project locations and the surrounding administrative boundaries. Baseline conditions reflect riverine flood exposure, canal dependence for livelihoods, and higher settlement density along irrigation infrastructure.

Project interventions in Hirshabelle target multiple canal systems in Balcad District:

- Balcad District: Rehabilitation of 13 existing irrigation canal. These canal rehabilitation works will improve water conveyance for farm irrigation along the Middle Shabelle corridor.

¹ <https://www.unocha.org/publications/map/somalia/somalia-drought-affected-population-october-2022-20-october-2022>

² https://www.researchgate.net/figure/Flood-mapping-of-Shebelle-River-Basin-a-Flood-Inventory-map-b-Flood-hazard-mapping-using_fig7_369941202

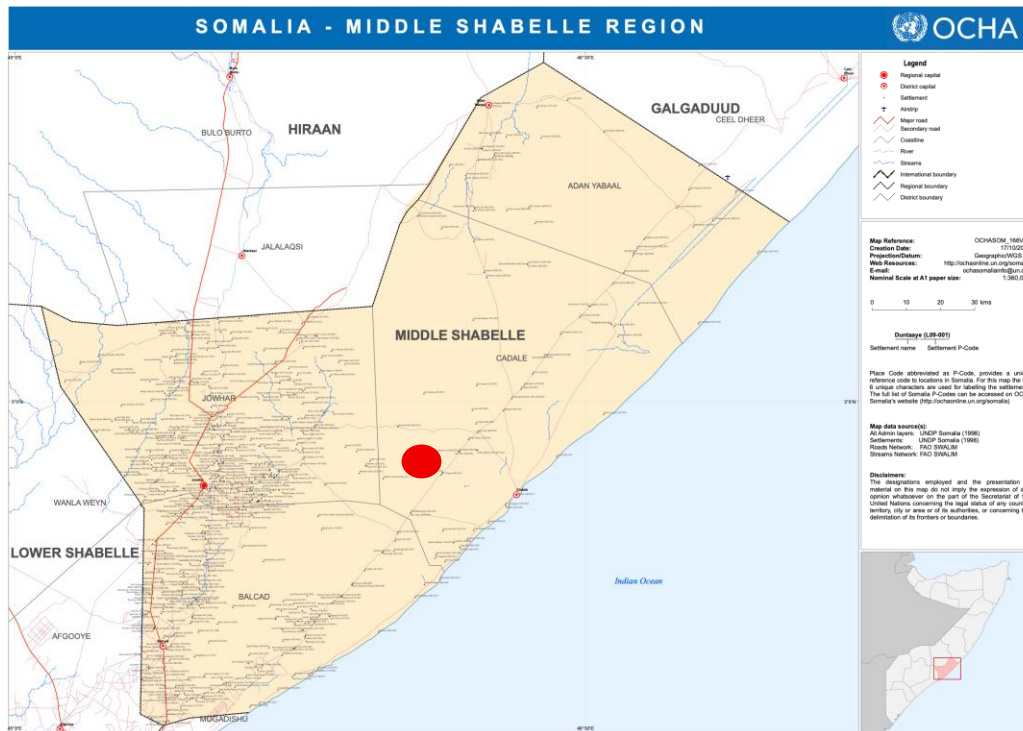


Figure 19: Middle Shabelle Region map

Balcad District occupies low-lying riverine plains along the Middle Shabelle floodplain, characterised by very low relief and floodplain features. All thirteen canals lie within a compact corridor between approximately 2.34°N and 2.42°N and 45.31°E and 45.42°E, in the villages of Busley, Kurshaale, Maqaar Careys, Weberi, Halgan and Farax Galoolay. The flat terrain and low elevation mean that canal blockages, breaches, or work-related obstructions can rapidly cause localised flooding and waterlogging of adjacent farmland.

6.5.3. Topography and drainage

Drainage is dominated by the Shabelle River and its associated canal network. Flood behaviour is strongly influenced by Shabelle River flow rates driven by upstream conditions in the Ethiopian highlands, canal condition and maintenance status, and local obstructions. This compound flood dynamic — external river flows combined with local canal management — is a defining risk characteristic for Hirshabelle canal works: river stage can rise rapidly and independently of local rainfall, and deteriorated canals both lose irrigation function and fail as flood conveyance pathways.

6.5.4. Climate and meteorology

Hirshabelle has a hot semi-arid climate with localised sub-humid characteristics along the Shabelle floodplain. Annual rainfall ranges between 400–600 mm, with a bimodal Gu (April–June) and Deyr (October–December) pattern, but high inter-annual variability creates recurrent drought and flood risk.

Temperatures regularly exceed 30–35°C year-round, making heat stress a significant OHS concern for construction workers in the humid riverine environment.

Climate projections for Middle Shabelle (AfDB ISS 2023 CRA; CORDEX RCP8.5) indicate: Very High flood risk; High heat stress risk; and Moderate–High drought risk. Temperature increase is projected at +1.0°C by 2040. A projected increase of 10–20% in extreme rainfall intensity will increase flood magnitude and frequency in the Shabelle River; historical flood events have caused crop losses exceeding 50% in affected canal areas. Canal design and flood alert protocols are climate-adjusted accordingly: embankments designed for 1-in-25-year flood events, raised intake freeboard (+0.5 m), and culverts sized for the 1-in-25-year design rainfall event. The full climate risk assessment is presented in Appendix 7.2.

6.5.5. Geology and soils

Soils in Balcad are deep, silty, and clayey floodplain soils formed from Shabelle River deposits — generally fertile and well suited to irrigated agriculture. These soils are productive but highly susceptible to erosion where canal banks degrade and where concentrated flows cut into unprotected embankments. Bank soils are cohesive when moist but can weaken rapidly when saturated or subjected to sudden drawdown — a controlling factor for excavation safety and bank-works methodology. In low-lying areas adjacent to canals, poor drainage and seasonal waterlogging can reduce agricultural productivity.

6.5.6. Surface water and irrigation water resources

The Shabelle River provides the primary water source for all thirteen project canals. Canal intakes divert river water into the network, which distributes water to farming plots along the corridor. Canal condition — sedimentation levels, bank integrity, and control structure functionality — directly determines irrigation reliability and water distribution equity. Current conditions are generally poor: sedimentation reduces conveyance capacity by an estimated 40–60% of design; eroded and breached banks cause water losses and localised flooding; and non-functional control structures prevent equitable distribution, systematically disadvantaging tail-end users. Rehabilitation will restore system performance for an estimated 2,200–3,800 farming households along the thirteen canal corridors.

6.6. Biological environment

Modified agricultural landscapes dominate Balcad District. Riparian vegetation along canal banks and the Shabelle River provides localised ecological value, including habitat for birds and small mammals. No designated protected areas or critical habitats are present at any of the thirteen canal sites. Works remain within existing canal infrastructure footprints, minimising new disturbance; vegetation clearing is limited to the minimum required, and riparian buffer vegetation is reinstated after works (OS6 precautionary).

6.7. Health, safety and security conditions

6.7.1. Community health conditions

Health services are provided primarily through the Balcad District Health Centre, with tertiary referral to Jowhar Hospital. Malaria is endemic along the canal corridor, with stagnant water in blocked canal reaches providing *Anopheles* breeding habitat — a baseline condition the project both interacts with (temporary ponding during works) and improves (restored flow-through). These two facilities are also the documented GBV referral pathway and the emergency medical route for construction incidents.

6.7.2. Community safety and security conditions

Security conditions in Hirshabelle, including Balcad District, are affected by Al-Shabaab presence and activity in parts of the state, clan tensions over resource access, and general crime risk. Security risks affect project staff movement, supervision continuity, contractor safety, and community relations. A Security Management Plan (SMP) is required for all thirteen canal sites and must be updated before each construction phase. Security assessments are mandatory before mobilisation to each canal, coordinated with Hirshabelle State security structures and the Balcad District Administration; sites are classified Green/Yellow/Red, with Red sites not mobilised until conditions improve. No project branding or signage that could attract unwanted attention is used in security-sensitive areas.

6.8. Social and socioeconomic conditions

6.8.1. Population and demographics

Middle Shabelle and Hiraan regions together account for approximately 1.0 million people (Population Estimation Survey). Balcad District has significant settlement density along the Shabelle canal corridor, as irrigation infrastructure supports more intensive agriculture and denser habitation than surrounding dryland areas. Seasonal labour movement brings additional workers during planting and harvest periods, temporarily increasing population and social interaction along the corridors.

6.8.2. Land use

Land use along the thirteen canal corridors is dominated by intensively farmed irrigated plots (maize, sesame, vegetables, fruit), interspersed with settlement clusters at Busley, Kurshaale, Maqaar Careys, Halgan, Weberi, and Farax Galoolay, homestead gardens, livestock corridors and watering points, and rural access tracks crossing canals at multiple points. Canal margins are used for pedestrian movement, livestock watering, and domestic water collection — use patterns that shape community safety and water-access design (kiosks, troughs, crossings, fencing).

6.8.3. Livelihoods, labour and land tenure

Livelihoods in Balcad are dominated by canal-fed irrigated agriculture: maize, sesame, vegetables, and fruits are the primary crops. Agricultural tenancy and sharecropping are common — many farmers cultivate land

they do not own under agreements with landowners. Canal access and land tenure are closely linked: canal rehabilitation changes water distribution patterns, which can affect agricultural productivity and associated tenancy arrangements. The project must engage carefully with existing tenancy arrangements to ensure that benefits reach both landowners and tenant farmers equitably, and that control structure operation rules do not advantage one group at the expense of another.

6.8.4. Education

Education access in Balcad District is constrained by limited school infrastructure, household poverty, and seasonal agricultural labour demands on children. Schools in canal-corridor villages are relevant receptors for construction-phase safety risks: school routes cross canal alignments at several points, informing the requirement for safe pedestrian crossings, flagmen at peak movement times, and school-age child safety awareness sessions before works.

6.8.5. Poverty and social exclusion

Poverty in the project area is closely tied to irrigation performance: households along canals with severe sedimentation and bank failure report reduced cultivated area, lower yields, and higher exposure to food insecurity during drought and flood shocks (IPC surveillance). Sharecropping arrangements transmit water scarcity into deepened poverty for tenant households, who bear crop losses without owning compensable assets. Restored conveyance is therefore directly poverty-reducing, provided distribution rules protect tail-end and tenant users.

6.8.6. Gender conditions

Gender inequalities in Hirshabelle are shaped by pervasive male dominance in social, political, and economic decision-making. Women are largely excluded from water management committees and canal governance structures despite being primary users of water for domestic purposes and significant contributors to agricultural labour (weeding, harvesting, food preparation). Women face restricted mobility, limited access to financial services and credit, and heightened GBV risk; cultural norms restrict participation in public forums. The project carries specific obligations under AfDB OS7 to promote women's inclusion in canal committee governance (minimum 30% membership), ensure safe water access through kiosk design and placement, and provide confidential GRM channels for GBV and SEA/SH complaints. The gender and social inclusion analysis is presented in Appendix 9.3.

6.9. Cultural heritage

No known cultural heritage sites, graves, or archaeologically sensitive areas were identified along the canal alignments during screening and field verification. Given that desilting and bank excavation disturb

accumulated floodplain sediments, a chance-find potential remains; the Chance Finds Procedure (Appendix 9.4) applies to all earthworks, is posted at each site, and is covered in worker induction (OS8 precautionary).

6.10. Vulnerable individuals and groups

Vulnerable groups in the project area include:

- Poor farming households dependent on canal water for their livelihoods, with minimal buffer against disruption.
- Tenant farmers and landless agricultural labourers — common in Balcad's sharecropping systems — who depend on crop income but have limited voice in water governance and weak claims in compensation processes.
- Female-headed households facing multiple resource-access constraints.
- Communities at the tail-end of canal systems who historically receive less water than head-end users.
- Youth with limited employment options and high expectations around construction jobs.
- IDP households near Balcad town with insecure access to canal water.

6.11. Climate-change baseline and risks

The climate baseline for the project area is set out at national and regional scale in Section 6.5.1 and at Middle Shabelle scale in Section 6.5.4, and the full climate risk assessment prepared under the AfDB Climate Safeguards System is at Appendix 7.2. This section states the resulting climate baseline and risk position.

Existing conditions. The corridor has a hot semi-arid climate with localised sub-humid characteristics along the Shabelle floodplain, annual rainfall of 400–600 mm in a bimodal Gu (April–June) and Deyr (October–December) pattern, and high inter-annual variability producing recurrent drought and flood. Temperatures regularly exceed 30–35°C year-round. River flow is strongly seasonal, ranging at the Belet Weyne reference gauge from about 18 m³/s at the February dry-season minimum to about 188 m³/s at the May flood peak, with Gu and Deyr driving the two annual flood pulses. Critically, Shabelle flood behaviour is governed by rainfall in the Ethiopian highlands and can therefore rise rapidly and independently of local rainfall.

Projected conditions. Projections for Middle Shabelle under CORDEX RCP8.5 and CMIP6, screened under the AfDB Climate Safeguards System, indicate a temperature increase of +1.0°C by 2040, a 10–20% increase in extreme rainfall intensity, and a consequent increase in Shabelle flood magnitude and frequency. Hazard ratings are Very High for flood, High for heat stress and Moderate–High for drought. Historical flood events have caused crop losses exceeding 50% in affected canal areas, which indicates the scale of consequence attaching to the flood rating.

Influence of climate change on project risks and impacts. Climate change acts on this project principally by raising the probability that design and construction assumptions are exceeded. More intense rainfall increases the likelihood of river flooding and canal overtopping during works, bank erosion and higher sediment loads; rising temperature and heat extremes raise occupational heat-stress exposure for a largely manual workforce in a hot, humid riverine environment; and greater drought frequency intensifies

competition for dry-season water and increases the risk that aggregate scheme abstraction depletes downstream flow, which is the one impact rated High before mitigation. The design and management responses — 1-in-25-year embankments and culverts, +0.5 m intake freeboard, low-flow construction windows with gauge-based suspension thresholds, heat-stress protocols, and environmental-flow floors — are set out in Sections 4.3 and 7, and residual climate risk is assessed at Section 7.25.4.

Project contributions to climate change. Project contributions are minimal. Construction generates temporary greenhouse gas emissions from diesel excavation equipment and small generators. Operation is gravity-fed and generates no direct emissions. Restored conveyance efficiency reduces water losses per unit of production, and restored flood conveyance reduces climate-related crop loss, so the project's net climate effect over its lifecycle is a modest adaptation benefit.

6.12. Contextual risks

Contextual risks are those arising from the operating environment rather than from the project's own activities, and they are material to this component because they determine whether safeguards measures can actually be delivered on the ground.

Political-economy conditions. Somalia's federal structure is still consolidating, and the division of regulatory competence between federal ministries and Hirshabelle State institutions is not settled in several domains relevant to this project, notably environmental permitting and water governance. Several controlling instruments are absent, in draft, or not operational: there is no functioning federal water abstraction licensing regime, no unified federal land law, and no modern antiquities statute. Water rights along the Shabelle rest on customary, land-based claims administered through community and district structures rather than on statutory entitlement, and scheme-level allocation is exercised in practice by canal committees. Access to restored water is therefore mediated by local power relations — between head-end and tail-end users, between landowners and tenants, and along clan lines — which is the reason committee inclusivity is treated as a binding pre-commissioning requirement rather than a good-practice aspiration.

Conflict, fragility and human security. Security conditions in Hirshabelle, including parts of Balcad District, are affected by Al-Shabaab presence and activity. The practical consequences for this project are constraints on the timing and depth of field verification at certain canal reaches, constraints on the consistency of supervision and monitoring, exposure of field teams and contractor personnel, and the risk that works attract attention. These are managed through per-site security assessment and Green/Yellow/Red classification before any mobilisation authorisation is issued, coordination with Hirshabelle State security structures and the Balcad District Administration, defined halt thresholds, avoidance of attention-attracting branding, and a documented Security Management Plan governing the conduct of any security providers. The region's conflict history also gives rise to a residual risk of explosive remnants of war, for which formal clearance confirmation is required before excavation begins at any canal reach not previously worked.

Contextual factors affecting compliance with the Operational Safeguards. Three contextual factors bear directly on safeguards compliance. First, limited state and district institutional capacity means that regulatory

oversight cannot be relied upon as an independent check, so compliance assurance rests on contractual obligation, independent supervision and audit. Second, security-driven access constraints mean that supervision continuity cannot be assumed, which is why weekly Supervision Consultant inspections and monthly PIU audits are supplemented by canal committee reporting and an accessible grievance mechanism. Third, the humanitarian context — recurrent climatic shocks, displacement and limited household coping capacity, described at Section 6.5.1 — means that temporary disruption during works has a disproportionate effect on affected households, which is why disruption scheduling, maintained partial flows and prompt compensation are treated as the most livelihood-sensitive commitments in the ESMP.

International human-rights considerations. The project operates against Somalia's commitments under the conventions listed at Section 2.3, including CEDAW, the Convention on the Rights of the Child, the ILO Freedom of Association and Forced Labour Conventions, and the African Union (Kampala) Convention on internally displaced persons. The human-rights considerations of practical relevance are the right to water and to an adequate standard of living for downstream users affected by dry-season abstraction; the rights of women to participate in the governance of a resource they depend on and to be free from sexual exploitation, abuse and harassment; child protection, engaged both by the age-verification requirement in the Labour Management Procedures and by child drowning risk at operational canals; the rights of internally displaced households near Balcad town to non-discriminatory access to project benefits and to the grievance mechanism; and freedom from forced labour and freedom of association for the construction workforce.

6.13. Existing and planned developments

Existing developments in the project area are the canal network itself and its associated intakes, control structures, crossings and command-area farmland; the settlement clusters at Busley, Kurshaale, Maqaar Careys, Weberi, Halgan and Farax Galoolay; rural access tracks crossing the canals; and the district infrastructure at Balcad, including the District Health Centre, with tertiary referral to Jowhar Hospital. Upstream of the offtakes, the Jowhar Natural Storage Barrage, with a design storage of approximately 200 million m³, exists but is not currently operational.

Proposed developments not directly connected to the project, but which bear on its assessment, are of three kinds. First, the rehabilitation of the Jowhar Natural Storage Barrage would allow regulated dry-season releases and is the single development most likely to change the dry-season abstraction picture below the Balcad offtakes; its commissioning is tracked by the PIU as the trigger to reassess dry-season extraction thresholds. Second, continuing and expanding abstraction upstream in Ethiopia, which holds more than two-thirds of the Shabelle drainage basin, together with unmeasured formal and informal abstraction between Belet Weyne and Balcad, will influence the water available at the intakes independently of anything the project does. Third, the other components of the wider BBS Project, which rehabilitate water infrastructure across ten districts and five Federal Member States and Somaliland, include further canals drawing on the same Shabelle system.

Developments potentially contributing to cumulative impacts are therefore principally the other BBS canals drawing on the Shabelle, whose aggregate dry-season abstraction is the basis of the High interim risk assessed at Section 7.5, and upstream abstraction beyond Somalia's control. Within the corridor itself, restored conveyance may induce expanded cultivated area, intensified fertiliser and pesticide use, and further concentration of settlement along improved canal corridors; these induced developments are assessed at Sections 7.4 and 6.5 and managed through corridor-level works sequencing, canal committee coordination and operation-phase monitoring.

6.14. Anticipated changes without the project

In the absence of the project, the baseline does not remain static; it continues to deteriorate along an established trajectory. Sedimentation, already estimated to have reduced conveyance to 40–60% of design capacity, would continue to accumulate without the capital desilting that canal committees cannot finance from their own resources. Eroded and breached banks would continue to lose water and to flood adjacent farmland locally. Non-functional control structures would continue to prevent enforceable allocation, so head-end capture and the systematic disadvantage of tail-end users would persist and sharpen as available water declined.

The consequences for the affected population would be a continuing contraction of irrigated area and crop yields for the 2,200–3,800 farming households in the command area, with tenant farmers, sharecroppers, female-headed households and tail-end communities absorbing the largest share of the loss; deepening disputes over water allocation; sustained exposure to flooding, because canals unable to convey peak Shabelle flows fail as flood-conveyance pathways; and continuing bank-failure and drowning hazards at degraded canal edges and unmanaged access points. Climate trends would compound this trajectory: projected increases in extreme rainfall intensity and flood magnitude would act on infrastructure with declining conveyance and integrity, while increasing drought frequency would intensify competition for dry-season water under allocation arrangements that cannot be enforced.

No environmental benefit offsets this trajectory. The canals are man-made features in an actively farmed landscape, and their deterioration produces no habitat or ecosystem-service gain; the riparian margin is not restored by neglect, and stagnant reaches in degraded canals sustain rather than reduce *Anopheles* breeding habitat. The anticipated changes without the project are therefore adverse across environmental, social and economic dimensions, which is the basis on which the no-project alternative is rejected at Section 3.2.

CHAPTER 7: ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

7.1. Impact-assessment scope and approach

7.1.1. Method used for evaluating impacts

Impacts were identified by overlaying project activities (desilting, bank excavation, lining, structure and culvert works, kiosk/trough installation, and O&M activities) against baseline receptors (canal water and downstream users, bank soils and farmland, workers, community members, vulnerable groups, and the flood regime) for each project phase. Each credible impact pathway was characterised by magnitude, duration, geographic extent, receptor sensitivity, reversibility, and likelihood, drawing on field verification observations, consultation findings, and comparable canal rehabilitation experience in the Shabelle basin.

7.1.2. Significance determination

Pre-mitigation significance was assigned on a four-level scale — Negligible, Minor, Moderate, Major — by combining consequence and likelihood, with receptor sensitivity elevating significance where vulnerable groups or already-stressed resources are affected. Residual significance was then assessed assuming full implementation of the ESMP measures in Section 9, and acceptability was determined against AfDB ISS 2023 expectations for a Category 2 operation.

7.2. Impact receptors and valued environmental and social components

Impact receptors and valued environmental and social components (VECs) were identified at scoping from the interaction of project activities with the baseline described in Section 5, and were used to structure the assessment that follows. The physical and biological receptors are the Shabelle River flow regime and its downstream reaches; canal water quality and the domestic, livestock and irrigation users that depend on it; floodplain soils and canal bank stability; the irrigated command area and its crop production; and the riparian vegetation along canal banks and the river, which provides localised habitat for birds and small mammals in an otherwise modified agricultural landscape.

The human receptors are the farming households of the thirteen canal corridors, distinguished between head-end and tail-end users because their exposure to allocation change differs; tenant farmers, sharecroppers and landless agricultural labourers, whose access to both benefits and compensation depends on deliberate inclusion; female-headed households and women generally, as primary domestic water users and as parties historically excluded from canal governance; children, as the group most exposed to drowning risk at open excavations and restored flowing canals; IDP households near Balcad town with insecure water access; youth, whose employment expectations are a source of both benefit and grievance; the construction workforce, exposed to drowning, bank collapse, heat stress and equipment hazards; and downstream river communities below the Balcad offtakes who are not project beneficiaries but who depend on Shabelle flows for domestic supply, shallow wells, flood-recession cultivation, fisheries and livestock watering.

Two receptor groups warrant particular note because they are easily overlooked. Downstream river communities lie outside the command area and gain nothing from rehabilitation, yet they bear the dry-season abstraction risk assessed at Section 7.5; the assessment therefore treats them as a distinct receptor rather than folding them into the beneficiary population. Tenant farmers and sharecroppers occupy the land but do not own it, so measures keyed to landownership — access agreements, compensation, committee membership — will exclude them unless they are named explicitly, which is why they are carried through the assessment as a separate receptor group.

7.3. Direct impacts and impact pathways by project phase

7.3.1. Pre-construction and mobilization

Principal pathways: mobilisation without confirmed access, community consent, signed disruption schedules, or security clearance, creating conflict and safety exposure; and inadequate pre-works hydrological and geotechnical understanding leading to flood and bank-failure risk during works. These pathways are controlled through the ESHS hold points in Section 9.

7.3.2. Construction phase

Principal pathways: sediment release into active flows during desilting; bank collapse during excavation; flood inundation of work areas; irrigation supply disruption to downstream farmers; worker drowning and OHS hazards; community safety exposure at open works; SEA/SH risk from worker influx; waste and fuel contamination; chance finds during earthworks; and security incidents.

7.3.3. Operation and maintenance phase

Principal pathways: inequitable water allocation between head-end and tail-end users through restored control structures; canal re-sedimentation reducing conveyance and raising flood risk; flood damage to rehabilitated infrastructure; child drowning risk near flowing canals; malaria vector habitat where flow stagnates; and water quality deterioration from upstream contamination.

7.3.4. Decommissioning and rehabilitation

Temporary works demobilisation pathways: incomplete site reinstatement, abandoned spoil or waste, and un-reinstated access corridors. Controlled through reinstatement obligations verified at commissioning inspection of each canal.

7.4. Indirect impacts

Indirect impacts are those that follow from the project's effects rather than from its activities, and for this component they arise principally from the fact that restored conveyance changes the productivity and reliability of a farming system.

The principal indirect impact is induced agricultural intensification. More reliable water delivery is expected to expand cultivated area and increase cropping intensity within the command area, which in turn increases

the use of fertiliser and pesticides and the associated risk of nutrient and agro-chemical runoff into the canal network and, through it, to the river. This is managed through the requirements of the National Pesticide Policy and National Fertilizer Policy, integrated pest management and safe-handling messaging delivered through agricultural extension, and the water-quality monitoring regime at Section 9.8. A second indirect effect operates on water consumption: more reliable delivery can induce higher consumptive use that offsets the conveyance savings achieved by rehabilitation, so the project's net effect on dry-season depletion of the river is not simply the arithmetic of improved efficiency — this is the mechanism underlying the abstraction risk assessed at Section 7.5.

Further indirect effects include the concentration of settlement and population density along improved canal corridors, with incremental pressure on local services and on canal-side land; increased local economic activity and demand for agricultural labour, which is a benefit but which also raises the salience of hiring decisions and the grievance risk attached to them; changes in land and tenancy values along rehabilitated corridors, which may alter the terms available to tenant farmers and sharecroppers and could erode their share of the project's benefits if committee representation is not maintained; and increased vector-breeding opportunity where expanded irrigation creates new standing water outside the canal prism, addressed through the vector-management commitments at Section 7.8.5. These effects are assessed as Moderate and manageable through canal committee governance, corridor-level coordination and operation-phase monitoring.

7.5. Cumulative impacts

Cumulative effects arise from the simultaneous rehabilitation of thirteen canals drawing on the same Shabelle system: aggregate diversion behaviour, sequencing of works across canals sharing intakes, and corridor-wide changes in cropping intensity. Restored conveyance may induce expanded cultivated area and intensified input use (fertilizer, pesticides), with attendant runoff considerations addressed through the national pesticide and fertilizer policy requirements and extension messaging. Population and settlement density may further concentrate along improved corridors. These effects remain Moderate and manageable through corridor-level works sequencing, canal committee coordination, and O&M-phase monitoring.

A further cumulative concern operates below the intakes rather than within the scheme: the aggregate dry-season abstraction from the Shabelle by all BBS canals drawing on the system, of which the thirteen Hirshabelle canals form part. Measured against mean monthly discharge at Belet Weyne, aggregate BBS withdrawals equate to roughly 48–64% of flow in January–February and 24–42% in March, July, and December — well above the 20–40% of mean flow generally recommended as a minimum ecological-flow floor — falling below 15% only in the April–October high-flow months. Because unmeasured formal and informal abstractions occur between Belet Weyne and Balcad, effective dry-season extraction ratios at the offtakes are likely higher than the gauge implies, and in drought years — projected to become more frequent under mid-century climate scenarios for the Shabelle basin — combined abstraction could contribute to reaches of the lower river ceasing to flow in January and February, cutting off downstream domestic supply,

flood-recession farming, and fisheries. This dry-season abstraction risk is assessed as High for the interim period. It is expected to ease once the Jowhar Natural Storage Barrage upstream of the Balcad intakes (design storage 200 million m³) is rehabilitated and able to provide regulated dry-season releases; as that infrastructure is not yet operational, the High classification stands, and the PIU should track its commissioning as the trigger to reassess dry-season extraction thresholds. Corresponding e-flow, abstraction-scheduling, and downstream-monitoring measures are set out in Sections 9.3 and 8.8.

7.6. Associated-facility impacts

Associated facilities for this component are not fixed at the design stage. They comprise borrow areas for fill and aggregate, spoil disposal sites, water abstraction points used during construction, worker camps and lay-down areas, and temporary access routes, as described at Section 5.7. Because their locations are determined during implementation, their impacts are assessed generically here and controlled through a screening and approval regime rather than through site-specific assessment in this report.

The impacts reasonably foreseeable at such sites are: vegetation clearance and soil disturbance at borrow areas, with erosion and drainage alteration where extraction faces and haul routes are left unmanaged; creation of water-trapping depressions at borrow pits, which become *Anopheles* breeding habitat in this setting; degradation of farmland or drainage lines where spoil is placed without agreement or on unsuitable ground; localised water-quality and soil contamination from fuel and chemical handling at lay-down areas and camps; dust, noise and traffic safety impacts along temporary access routes through settled corridors; abstraction pressure on canals or the river where construction water is drawn without reference to agreed partial flows; and social risks at worker camps, including SEA/SH exposure where accommodation is sited near residential areas, and labour-standards risk where site labour falls outside the contractor's main workforce controls.

These impacts are controlled through the Associated Facilities and Support-Sites Register maintained by the PIU. No associated facility or support site may be established or used until it has been screened using the project screening forms, has obtained the required regulatory permits and documented landowner or community-use agreements, has an approved site-specific protection and management plan addressing erosion and drainage control, waste and fuel management, water use and post-use reinstatement, has been the subject of consultation with affected communities and landholders recorded in the consultation log, and has had the relevant mitigation and monitoring measures written into the contractor's method statements. Borrow pits must be backfilled or contoured within seven days of works completion, and the Register is verified by the Hirshabelle Environmental and Social Officer and reported in the periodic monitoring reports submitted to AfDB. On this basis, residual associated-facility impacts are assessed as Minor.

7.7. Construction-phase risks and impacts

7.7.1. Sediment release during canal desilting

Desilting mobilises accumulated sediment into active canal flows, raising downstream turbidity and affecting domestic, livestock, and irrigation water users. Pre-mitigation significance: Moderate–Major. Mitigation centres on cofferdam or flow-bypass around active work areas, upstream-to-downstream phasing, spoil placement on high ground at least 10 m from the canal edge with settling areas, and daily turbidity checks 500 m downstream. Residual: Minor–Moderate.

7.7.2. Canal bank collapse during excavation

Excavation of cohesive but saturation-sensitive bank soils creates collapse risk endangering workers and adjacent farmland. Pre-mitigation: Major. Mitigation: geotechnical assessment of each bank section before excavation, phased cutting with immediate compaction and seeding within 5 days, maximum unsupported face heights per geotechnical output, no heavy equipment on bank edges unless bearing capacity is confirmed, stockpiled emergency repair materials, and no excavation below the bank where water level is above trench floor. Residual: Minor.

7.7.3. Flooding risk during construction

Shabelle River stage can rise rapidly and independently of local rainfall, inundating work areas, damaging works, and endangering workers. Pre-mitigation: Major. Mitigation: scheduling all earthworks within confirmed low-flow windows, flood gauges at each active reach monitored twice daily in the Gu season, defined suspension thresholds per canal, end-of-day removal of tools and equipment from the canal, pre-positioned evacuation equipment, and no works during active flood conditions. Residual: Minor–Moderate.

7.7.4. Irrigation supply disruption to downstream farmers

Works on any canal interrupt or reduce flows to downstream plots, with direct crop-loss and livelihood consequences — disproportionately for tenant farmers and tail-end users. Pre-mitigation: Major. Mitigation: signed canal-specific disruption schedules agreed with canal committees before mobilisation, partial flows maintained via bypass, two weeks' written notice before each disruption, daily flow-status communication, and a compensation framework paying verified project-caused crop losses at full replacement cost within 21–30 days. Residual: Moderate — this impact requires meticulous implementation throughout works.

7.7.5. Worker drowning and water safety

Canal and river work exposes workers to drowning hazards. Pre-mitigation: Major. Mitigation: non-swimmer assessment before assignment (non-swimmers restricted to bank tasks), mandatory life jackets within 3 m of active canals, throw rope and lifebuoy at every work front, no lone working near water, rescue drills at the start of each canal phase, rescue boat for works on primary canals, and documented hospital routes. Residual: Minor.

7.7.6. Occupational health and safety — heat stress and riverine hazards

The hot, humid riverine environment creates heat stroke and dehydration risk, compounded by excavation, machinery, and concrete-works hazards. Pre-mitigation: Moderate–Major. Mitigation: 3 L drinking water per worker per hour, no heavy work 11:00–15:00, shaded rest areas, waterproof PPE for canal workers and hard hats at all earthworks, daily toolbox talks, trained first responders on every work front, and documented emergency routes to Balcad District Health Centre and Jowhar Hospital. Residual: Minor–Moderate.

7.7.7. Community health and safety near works

Open excavations, machinery movement, and severed pedestrian crossings endanger community members — especially children — along densely settled corridors. Pre-mitigation: Moderate. Mitigation: physical barriers at all open sections, Somali-language signage at 50 m intervals, safe pedestrian crossings at least every 200 m of active works with flagmen at peak times, 7-day advance community notification per reach, school-age child safety awareness sessions, and no unguarded open canal at the end of the working day. Residual: Minor.

7.7.8. SEA/SH risk from worker influx

Worker presence in and near farming communities elevates SEA/SH risk against a baseline of existing GBV vulnerability. Pre-mitigation: Moderate. Mitigation: individual Codes of Conduct signed on Day 1, SEA/SH induction and quarterly refreshers, a confidential reporting channel managed exclusively by the PIU GBV Specialist, a female CLO accessible to all thirteen canal communities, documented survivor-centred referral pathways, and worker accommodation sited away from residential areas. Residual: Minor–Moderate. Full measures are set out in Section 9.3.5.

7.7.9. Social and conflict-related risks

Employment expectations, perceived hiring unfairness, crop damage disputes, and clan-based resource sensitivities can generate grievances and conflict during works. Pre-mitigation: Moderate. Mitigation: local hiring preference with transparent recruitment criteria communicated before mobilisation, written land-access agreements, prompt compensation, an accessible GRM, and continuous community liaison. Residual: Minor.

7.8. Operational-phase risks and impacts

7.8.1. Water allocation conflict — head-end versus tail-end users

Restored conveyance and functional control structures redistribute a scarce resource; without governance, head-end users can capture disproportionate flows and landowner–tenant tensions can sharpen. Pre-mitigation: Moderate–Major. Mitigation: inclusive canal committees at all thirteen canals with head-end and tail-end representation and minimum 30% female membership, documented and publicly posted allocation schedules, control structure operation per schedule, PIU oversight visits, and a GRM track resolving

allocation complaints within 15 working days. Residual: Moderate — requiring ongoing management attention.

7.8.2. Canal re-sedimentation

Without maintenance, sedimentation recurs, degrading conveyance and raising flood risk. Pre-mitigation: Moderate. Mitigation: canal committee responsibility for annual post-Gu desilting, annual condition inspection, and a major-desilting trigger when conveyance falls below 75% of design. Residual: Minor–Moderate.

7.8.3. Flood damage to rehabilitated canals

Shabelle flood events can breach banks and damage structures. Pre-mitigation: Moderate. Mitigation: climate-adjusted design (1-in-25-year embankments, +0.5 m intake freeboard), post-flood inspection within 5 days of significant events, an emergency repair fund activated within 14 days for critical damage, and canal committee first-response authority for temporary breach plugging. Residual: Minor–Moderate.

7.8.4. Child safety near operational canals

Restored flowing canals present drowning risk to children. Pre-mitigation: Moderate. Mitigation: canal fencing at community crossing points and high-risk sections, quarterly signage inspection, annual community safety awareness sessions, and immediate incident reporting. Residual: Minor.

7.8.5. Malaria risk near canal water

Stagnant reaches breed *Anopheles* mosquitoes. Pre-mitigation: Moderate. Mitigation: restored flow-through, canal committee training in identifying and eliminating stagnant pools, routine margin vegetation clearing, and reporting of increased malaria cases to the Balcad District Health Office. Residual: Minor.

These measures are elaborated in the project's standalone Integrated Pest and Vector Management Plan (P/VMP), which places the Balcad canal corridor within its highest-risk Riverine Irrigated Zone. The following Hirshabelle-specific vector-management commitments apply to all thirteen canal sites and are cross-referenced into this ESMP and the Environmental and Social Monitoring Plan (Appendix 8):

- **Mosquito breeding inspection:** each canal committee (WUA) designates a Vector Management Focal Person responsible for monthly canal-margin inspection, documented on the P/VMP Canal Site Vector Management Monthly Inspection Log (P/VMP Annex C, Form C1); during construction the contractor must demonstrate that no water-trapping depressions remain within 5 m of the works footprint at the end of each working day, verified through a borrow-pit close-out form signed off by the PIU and WUA.
- **Larval habitat management:** source reduction is the primary control — restoring positive canal drainage, eliminating standing pools, backfilling or contouring borrow pits within 7 days of works completion, and routine margin vegetation clearing; larviciding with WHO-approved *Bacillus*

thuringiensis israelensis (Bti) is permitted only in persistent stagnant water that cannot feasibly be drained.

- **District health coordination:** the PIU coordinates with the Balcad District Health Office and MoH on insecticide-treated bed net (ITN) distribution to farming households within 500 m of canal sites (prioritising women and children), while trained community health volunteers in each canal village operate a documented malaria symptom-recognition, rapid-diagnostic-test, and referral pathway to the nearest health facility.
- **Worker and community awareness:** BBS community-mobilisation events and worker toolbox sessions deliver malaria-prevention messaging — mosquito breeding-source identification and elimination, ITN use, and early care-seeking — targeting both canal-side households and the construction workforce.
- **Monitoring indicators:** number of breeding sites identified and larval counts (weekly in the gu peak season, monthly otherwise); number of canal sites under active vector and vegetation management (monthly — WUA Focal Person and State E&S Officer); malaria case incidence in canal communities (monthly during transmission season — Balcad District MoH); percentage of WUA Vector Focal Persons trained (annual); and percentage of borrow pits and construction water points drained or backfilled (daily during construction) — consolidated in the quarterly P/VMP report.

7.8.6. Water quality deterioration during operation

Upstream contamination can affect canal water used for domestic and livestock purposes. Pre-mitigation: Moderate. Mitigation: canal committee visual observation with immediate reporting of anomalies, annual laboratory testing (bacteriological and basic chemical) or on complaint, and results shared with committees. Residual: Minor–Moderate.

7.9. Closure and decommissioning risks and impacts

The project does not involve closure or decommissioning of the rehabilitated asset. The canals are permanent public irrigation infrastructure that is being restored rather than built, and they pass to canal committee operation at handover with no defined end of life; there is accordingly no decommissioning phase for the works themselves and no closure liability, restoration obligation or financial provision attaching to them.

What is decommissioned is the temporary works. At the end of construction on each canal, contractors demobilise lay-down and materials storage areas, tool and equipment storage, banded fuel storage, welfare and sanitation facilities, any worker accommodation, temporary access corridors and cofferdam or bypass arrangements. The impact pathways at this point, as identified at Section 7.3.4, are incomplete site reinstatement, abandoned spoil or waste, un-reinstated access corridors and residual excavations or depressions, and residual fuel or chemical contamination at storage points. Each carries a specific consequence in this setting: un-reinstated access corridors across farmland prolong crop loss and access

disputes beyond the works period; abandoned spoil degrades farmland and can re-enter drainage lines; and residual depressions become vector-breeding habitat and, near settlements, a child-safety hazard.

These are managed as construction-phase obligations rather than as a separate closure regime: temporary facilities are demobilised and sites reinstated on completion, spoil is placed on high ground or removed to agreed locations, borrow pits are backfilled or contoured within seven days, access corridors are reinstated to the protocol agreed in writing with the farmer and canal committee before mobilisation, and the Supervision Consultant must approve each canal reach before handover to the canal committee. Pre-mitigation significance is Minor to Moderate and residual significance is Minor, subject to the reach-by-reach handover approval holding.

7.10. Environmental risks and impacts

This section consolidates the environmental risks and impacts assessed by phase at Sections 7.7 and 6.8, so that the environmental position can be read as a whole. Five environmental themes are material.

- Surface-water quality and sediment. Desilting mobilises accumulated sediment into active canal flows, raising downstream turbidity for domestic, livestock and irrigation users; spoil handling determines whether sediment re-enters the channel or degrades farmland; and fuel, chemical and concrete works near flowing water present contamination risk. Pre-mitigation significance is Moderate to Major, reduced to Minor to Moderate by cofferdam or bypass arrangements, spoil placement on high ground at least 10 metres from the canal edge, and daily downstream turbidity checks. In operation, upstream contamination and stagnation risk water-quality deterioration, managed by committee observation, annual laboratory testing and defined investigation triggers.
- Soils, bank stability and erosion. Excavation of cohesive but saturation-sensitive floodplain bank soils creates collapse risk endangering workers and adjacent farmland, and unprotected banks erode under concentrated flows. Pre-mitigation significance is Major, reduced to Minor by per-canal geotechnical assessment before excavation, phased bank cutting, immediate compaction, and seeding within five days of earthworks, with bioengineering-led stabilisation and hard protection at hydraulically stressed points.
- Hydrology, flow regime and flood risk. Shabelle stage can rise rapidly and independently of local rainfall, inundating active work areas; works can obstruct conveyance while in progress; and rehabilitation alters flow distribution between canals sharing intakes. Pre-mitigation significance is Major, reduced to Minor to Moderate by confining earthworks to low-flow windows, twice-daily gauge monitoring with defined per-canal suspension thresholds, end-of-day equipment removal, and evacuation arrangements. In operation, restored conveyance improves flood-conveyance function, and flood damage to rehabilitated canals is managed by climate-adjusted design, post-flood inspection within five days and an emergency repair fund.
- Downstream flow and aggregate abstraction. The one environmental impact rated High before mitigation is the reduction of dry-season downstream flow in the Shabelle arising from aggregate

abstraction across the wider BBS scheme, of which the thirteen Hirshabelle canals form part. This is assessed in full at Section 7.5 and managed through binding environmental-flow floors, dry-season abstraction scheduling and monitoring, and category revalidation if monitoring shows the impact cannot be reduced to Moderate.

- Waste, resource use and emissions. Desilting generates substantial spoil volumes, and construction generates packaging, scrap metal and used fluids; construction water is drawn from the canals or river; and diesel equipment generates temporary emissions. These are managed through segregated storage and weekly removal to approved disposal points, secondary containment and spill kits at fuel storage, abstraction arrangements agreed with canal committees so that partial flows are not compromised, and are assessed at Section 7.14. Operation is gravity-fed and generates no emissions and no additional water consumption.

7.11. Labour and working-condition risks

Labour and working-condition risks arise under OS2 and apply to all contractors and subcontractors engaged for the Hirshabelle canal sites, and to any labour engaged at borrow, spoil or lay-down sites. The workforce is estimated at 20–50 workers per active canal, comprising skilled operators — excavator operators and masons for lining and structures — and unskilled labour for desilting and bank works, with a contractual preference for local hiring from Balcad District for unskilled and semi-skilled roles.

The material risks are: engagement without written contracts or on terms not communicated in a language workers understand; engagement of workers below the legal minimum age, given the prevalence of agricultural child labour in the corridor and the labour-intensive nature of desilting; absence of an accessible workers' grievance mechanism, which is not required by national practice and would otherwise leave workers without recourse on pay, hours or conditions; inadequate welfare provision on remote canal reaches, specifically drinking water, shade, sanitation and first aid; and discrimination or exclusion in recruitment, including the exclusion of women from the roles for which they are eligible. A further risk attaches to the local-hiring commitment itself: because employment expectations in canal communities are high and youth unemployment is significant, opaque recruitment generates grievance and, in this operating context, social tension — this dimension is assessed at Section 7.23.

The controlling requirement is that Labour Management Procedures apply to all contractors, with a worker register, age verification, written contracts and a Workers' GRM in place before mobilisation as an ESHS hold point (Section 9.5). Occupational health and safety risks, which are the largest labour-related risks on this project, are assessed separately at Section 7.12. Pre-mitigation significance is Moderate; residual significance is Minor, subject to verification of the worker register and induction records by the Supervision Consultant.

7.12. Occupational health and safety risks

Occupational health and safety risks are the most severe worker-facing risks on this component, because the work is manual, in and beside flowing water, in excavated ground of variable stability, in a hot and humid climate, and alongside heavy plant. Four hazards dominate.

- Drowning and water safety. Canal and river work exposes workers to drowning, with pre-mitigation significance assessed as Major. The controlling measures are non-swimmer assessment before assignment, with non-swimmers restricted to bank tasks; mandatory life jackets within 3 metres of active canals; a throw rope and lifebuoy at every work front; no lone working near water; rescue drills at the start of each canal phase; a rescue boat for works on primary canals; and documented hospital routes. Residual significance is Minor.
- Heat stress. The hot, humid riverine environment creates heat-stroke and dehydration risk, aggravated by projected temperature increase and heat extremes. Pre-mitigation significance is Moderate to Major. Controls are 3 litres of drinking water per worker per hour, no heavy work between 11:00 and 15:00, shaded rest areas, and daily toolbox talks. Residual significance is Minor to Moderate.
- Excavation and bank collapse. Workers in or beside excavations in saturation-sensitive bank soils are exposed to collapse. Controls are per-canal geotechnical assessment, phased cutting with a defined maximum unsupported face height, immediate compaction, and bank-excavation safety training for excavation crews and supervisors before bank works at each canal.
- Plant, equipment and flood exposure. Machinery movement, concrete works and the possibility of rapid river rise during active works require waterproof PPE for canal workers and hard hats at all earthworks, trained first responders on every work front, end-of-day removal of equipment from the canal, and documented emergency routes to Balcad District Health Centre and Jowhar Hospital.

These measures are imposed through the contractor's OHS plan, which must be approved in writing before mobilisation, and are verified through weekly Supervision Consultant inspection and monthly PIU audit, with OHS statistics reported quarterly to AfDB.

7.13. Community health, safety and security risks

Community health, safety and security risks arise under OS4 and are elevated for this component because the canals run through densely settled corridors where the canal margin is itself in daily community use for pedestrian movement, livestock watering and domestic water collection.

- Construction-phase community safety. Open excavations, machinery movement and severed pedestrian crossings endanger community members, particularly children. Pre-mitigation significance is Moderate, reduced to Minor by physical barriers at all open sections, Somali-language signage at 50 metre intervals, safe pedestrian crossings at least every 200 metres of active works with flagmen at peak times, seven days' advance community notification per reach, school-age child safety awareness sessions, and the requirement that no unguarded open canal is left at the end of the working day.

- Child safety at operational canals. Restored flowing canals present a drowning risk to children that did not exist to the same degree in degraded, partially dry channels — this is a risk created by project success rather than by construction. Pre-mitigation significance is Moderate, reduced to Minor by canal fencing at community crossing points and high-risk sections, quarterly signage inspection, annual community safety awareness sessions, and immediate incident reporting.
- Vector-borne disease. Stagnant reaches and water-trapping depressions breed *Anopheles* mosquitoes in a corridor already within the highest-risk riverine irrigated zone. Pre-mitigation significance is Moderate, reduced to Minor through restored positive drainage as the primary control, elimination of standing pools, backfilling or contouring of borrow pits within seven days, routine margin vegetation clearing, WUA Vector Management Focal Persons conducting monthly inspection, Bti larviciding only where drainage is not feasible, coordination with the Balcad District Health Office on bed-net distribution and referral, and monitoring of larval counts and malaria incidence.
- Water quality for community use. Canal water is used for domestic and livestock purposes, so turbidity during desilting and contamination during operation are community health issues as well as environmental ones; they are managed through the measures at Section 7.10 and the annual laboratory testing regime.
- Security. Security conditions in parts of Balcad District expose community members and workers to incident risk and constrain supervision. Management is through per-site security assessment and Green/Yellow/Red classification before mobilisation, coordination with Hirshabelle State security structures and the Balcad District Administration, defined halt thresholds, avoidance of attention-attracting branding, and a Security Management Plan governing security provider conduct, including proportionality and use-of-force provisions. UXO and explosive remnants of war clearance confirmation is required before excavation at any reach not previously worked.

7.14. Pollution-prevention and resource-efficiency risks

Pollution-prevention and resource-efficiency risks arise under OS3 and are concentrated in the construction phase, because operation is gravity-fed, consumes no additional water and generates no direct emissions.

The material pollution risks are: sediment release into active canal flows during desilting, which is the dominant pollution pathway on this project and is assessed at Section 7.10; fuel and chemical handling near flowing water, controlled by bunded storage sized to at least 110% of the largest container, drip trays and spill kits at all fuel storage points, and removal of fuel and chemical containers within 24 hours of use; concrete works in or adjacent to flowing canals, controlled through method statements and bypass arrangements; and construction waste — packaging, scrap metal and used fluids — controlled by segregation, storage in labelled containers and weekly removal to approved disposal points. Spoil is the largest single waste stream: desilting generates substantial volumes, which are placed on high ground at least 10 metres from the canal edge, never in the active canal, drainage channels or farmland without the farmer's

written agreement, and used for embankment reinforcement where geotechnically suitable. Sanitary waste from temporary welfare facilities is managed through the contractor's waste management plan.

On resource efficiency, construction water for concrete mixing, compaction, dust suppression and worker welfare is drawn from the canals or the Shabelle under arrangements agreed with canal committees so that agreed partial flows to downstream users are not compromised. Construction energy is diesel — excavation plant and small generators — and the associated emissions are temporary and minor relative to project scale. The project's principal resource-efficiency outcome is on the water side: restored conveyance reduces conveyance losses per unit of production, although, as noted at Sections 7.4 and 6.5, efficiency gains may be offset at scheme level by induced consumptive use, which is why abstraction is managed by flow floors rather than assumed to be resolved by efficiency. Operation generates minor recurrent waste streams — silt spoil, vegetation cuttings, used lubricants and packaging — managed under the operation and maintenance manual, with silt spoil placed on high ground and never returned to drainage lines. Pre-mitigation significance is Moderate; residual significance is Minor to Moderate.

7.15. Land acquisition, access restrictions and resettlement risks

OS5 is triggered on a precautionary basis only. All thirteen canal rehabilitation works are confined to existing canal footprints and public rights-of-way. No permanent land acquisition, no physical displacement and no involuntary resettlement is anticipated, and no economic displacement in the sense of permanent loss of productive assets is expected.

The land-related risks that do arise are temporary and access-related. Construction access corridors along each canal cross farmed plots, so temporary crop disturbance and loss of access to parts of a holding occur during works. Spoil placement, lay-down areas and borrow sites require the use of third-party land. Because tenure along the Shabelle is customary and there is no statutory land-acquisition or compensation regime, arrangements rest on written agreement rather than legal process, which creates a risk that agreements are made with landowners while the losses fall on tenant farmers and sharecroppers who actually work the land. A further risk is that restored water distribution alters the value of tenancies and the terms available to tenants, an indirect effect assessed at Section 7.4.

These risks are managed through the Land Access Protocol at Section 9.3.4: temporary access corridors agreed in writing with farmers and the canal committee before mobilisation, specifying access route, working width and reinstatement protocol; no works on any reach without written access confirmation; compensation of any project-caused crop damage at full replacement cost within 30 days, with a funded contingency; a PIU record of all access arrangements; land grievances resolved within 15 working days through the GRM; and the binding trigger that any activity resulting in physical displacement, or in greater than 10% loss of a household's productive capacity, requires immediate suspension of works and referral for OS5 determination. Compensation eligibility is defined by loss suffered rather than by title held, so that tenant farmers and sharecroppers are compensated for their own losses. Pre-mitigation significance is Moderate; residual significance is Minor.

7.16. Biodiversity, habitat and ecosystem-service risks

OS6 is applied on a precautionary basis. The works are confined to existing man-made canal footprints within an actively farmed landscape. No protected areas, internationally recognised areas, natural habitats or critical habitats are present at or affected by any of the thirteen sites, and no significant biodiversity features were identified during screening or field verification.

The biodiversity value that does exist in the corridor is the riparian vegetation along canal banks and the Shabelle River, which provides localised habitat for birds and small mammals in an otherwise modified agricultural landscape, and the ecosystem services that the river and canal system provide — water supply for domestic, livestock and irrigation use, flood conveyance, and support for flood-recession cultivation and small-scale riverine fisheries downstream. The risks to these are: clearance of riparian bank vegetation during bank reshaping and lining, beyond the minimum required; disturbance of the riparian margin at spoil placement, lay-down and access areas; downstream turbidity and water-quality effects on aquatic habitat during desilting; and, most significantly for ecosystem services rather than habitat, reduction of dry-season downstream flow through aggregate abstraction, which is assessed at Section 7.5 and which bears directly on riverine fisheries and flood-recession cultivation.

Management is through confinement of works to existing footprints, limitation of vegetation clearing to the minimum required, reinstatement of riparian buffer vegetation after works, bioengineering-led bank stabilisation using seeding within five days of earthworks, the sediment and water-quality controls at Section 7.10, and the environmental-flow floors at Section 7.5. Site-specific verification during mobilisation will confirm excavation extents and the extent of riparian land disturbance at each canal. Pre-mitigation significance is Minor to Moderate; residual significance is Minor.

7.17. Risks and impacts on vulnerable groups

Beyond phase-specific risks, cross-cutting social dynamics require sustained attention: the position of tenant farmers and sharecroppers, whose access to project benefits and compensation depends on deliberate inclusion in consultation, committee representation, and the compensation framework; gendered exclusion from governance, addressed through the 30% committee membership requirement and female CLO; the risk of elite or clan capture of committee decision-making, mitigated through documented rules, public posting, and PIU oversight; and employment-related grievances, managed through transparent local hiring. The project's positive social impacts — restored irrigation for 2,200–3,800 households, local employment, reduced flood losses, safer canal infrastructure, and strengthened inclusive governance — substantially outweigh residual adverse effects if these dynamics are actively managed.

7.18. Cultural-heritage risks and impacts

OS8 is applied on a precautionary basis. No known cultural heritage sites, archaeological features, graves, or sites of religious or cultural significance were identified within or adjacent to the canal alignments during

screening or field verification, and no tangible or intangible heritage receptor has been identified that would be affected by the works.

A chance-find risk nonetheless remains, and it is specific to the nature of these works: desilting and bank excavation disturb accumulated floodplain sediments to depths and across lengths that have not previously been systematically excavated, and floodplain deposits are a context in which previously unrecorded material can occur. The risk is compounded by the absence of a modern federal antiquities statute, which means there is no statutory notification and clearance route to fall back on and no national authority routinely exercising the function.

Management is therefore procedural. The Chance Finds Procedure at Appendix 9.4 applies to all earthworks at all thirteen sites, is posted at each site, and is covered in worker induction. It requires immediate cessation of work on encountering any suspected item; securing of a minimum 20 metre radius with no removal or handling; photographic and GPS recording in situ; notification of the PIU within 4 hours, with onward notification to the relevant cultural authority; additional notification of the Balcad District Administration where human remains are suspected; and resumption of work in the affected area only on written clearance from the PIU. All chance-find events, notifications and clearances are recorded in the Hirshabelle incident register and reported to AfDB. Pre-mitigation significance is Minor; residual significance is Negligible to Minor, contingent on the stop-work discipline holding under programme pressure.

7.19. Stakeholder-engagement and information-disclosure risks

Stakeholder-engagement and information-disclosure risks arise under OS10 and are material for this component because the project's most livelihood-sensitive commitments — disruption scheduling, partial flows, compensation and allocation rules — are only effective if the affected people know about them, believe them, and have a route to complain when they are not honoured.

The identified risks are: failure to reach the people most affected, particularly tenant farmers, sharecroppers, landless labourers, female-headed households and IDP households, whose participation depends on being invited specifically rather than through general community meetings; capture of engagement by canal committee leadership, elders or landowners, so that consultation records reflect the views of the already-influential rather than of tail-end and tenant users; disclosure in a form that is not usable — English-only documents, technical presentation, or posting at locations that women and tail-end users do not reach; failure to disclose the specific commitments that matter operationally, notably the signed disruption schedule, the compensation entitlement and the allocation schedule at each canal; grievance channels that exist on paper but are not known, not accessible, not confidential where they need to be, or not responsive within the stated timelines, which converts a manageable complaint into a dispute; and the security-related constraint that access limitations in parts of Balcad District can interrupt the continuity of engagement during construction.

Management is through the Stakeholder Engagement Plan at Appendix 9.1 and the measures at Section 9.6: disclosure of the ESIA and ESMP in English and in Somali-language summary form, dissemination

through state authorities, the District Administration, canal committees and community leaders, and posting at project information boards along the canal corridors; canal committee meetings before and during works on each canal; bi-monthly community meetings at district level and quarterly coordination meetings with the district administration and community representatives; a dedicated female Community Liaison Officer covering all thirteen canals; gender-disaggregated attendance and participation records; and the four-level grievance redress mechanism with a dedicated 15-working-day water-allocation track and a separate confidential SEA/SH channel, described at Section 9.7. Pre-mitigation significance is Moderate; residual significance is Minor, contingent on the GRM remaining accessible and responsive throughout.

7.20. Gender, GBV and SEA/SH risks

Gender, gender-based violence and SEA/SH risks are material for this component and are assessed here as a cross-cutting theme, drawing on the construction-phase assessment at Section 7.7.8 and the baseline at Sections 6.8 and 5.10.

The baseline position is one of pervasive male dominance in social, political and economic decision-making, in a corridor where women are primary users of canal water for domestic purposes, major contributors to agricultural labour, and typically spend two to six hours a day collecting water in the dry season. Women have historically been absent from canal governance, so a project that formalises allocation through committees risks formalising their exclusion unless representation is required. Female-headed households face compounded resource-access constraints and are among the groups least able to absorb temporary disruption.

The identified risks are: SEA/SH arising from the presence of a largely male construction workforce in and near farming communities, against a baseline of existing GBV vulnerability, assessed as Moderate before mitigation; exclusion of women from canal committee membership and from the allocation decisions those committees make; exclusion of women from project employment beyond token roles; loss of safe and convenient water access if kiosk and trough siting is decided without women's input; increased exposure at canal-edge collection points during and after works; and the specific risk that SEA/SH complaints handled through male-dominated community structures — canal committees, traditional leaders — result in disclosure, retaliation and non-reporting.

Management is through the measures at Section 9.3.5 and Appendix 9.3: individual Codes of Conduct signed by all workers, including drivers, security staff and subcontractors, before commencing work, with defined disciplinary consequences; SEA/SH induction on day one and quarterly refreshers; a confidential reporting channel established before mobilisation and managed exclusively by the PIU Social/GBV Specialist, with no disclosure to the contractor, canal committees, district administration or state authorities; a female Community Liaison Officer physically accessible to all thirteen canal communities; documented survivor-centred referral pathways to Balcad District Health Centre and Jowhar Hospital, confirmed operational before mobilisation; worker accommodation sited away from residential areas with gender-separated quarters; monthly review of the SEA/SH channel by the PIU GBV Specialist, with AfDB

notification within 24 hours of any confirmed incident; a minimum of 30% female membership in every canal committee, verified before commissioning; kiosk and trough placement decided with women's groups; preference for women in contractor administrative, liaison and supervisory roles; and gender-disaggregated records across all engagement and training. Residual significance is Minor to Moderate, and this is one of the impacts identified at Section 7.25.5 as requiring sustained management attention throughout implementation.

7.21. Climate-change risks and impacts

Climate projections for Middle Shabelle indicate Very High flood risk, High heat stress risk, and Moderate–High drought risk, with a projected 10–20% increase in extreme rainfall intensity amplifying Shabelle flood magnitude and frequency. The project responds through climate-adjusted design (1-in-25-year embankments and culverts; +0.5 m intake freeboard), construction scheduling within low-flow windows with gauge-based suspension protocols, restored flood-conveyance function of the canal network itself, and O&M arrangements (post-flood inspection, emergency repair fund) that sustain resilience. Heat stress projections are embedded in the OHS regime. Residual climate risk is assessed in Section 7.25; the full climate risk assessment is at Appendix 7.2.

7.22. Supply-chain and primary-supplier risks

Supply-chain and primary-supplier risks are limited for this component. The project has no primary suppliers in the OS sense — it procures no agricultural commodity, timber or other natural-resource-based primary input on which its function depends — and its manufactured inputs, principally cement, reinforcement, sluice gates and metalwork, geotextile, pipes and fittings, are procured from established commercial suppliers in Mogadishu or Jowhar in quantities that are small relative to those suppliers' output. Two supply-chain exposures are nonetheless recognised. The first is locally sourced aggregate and fill from borrow areas, which is the one input taken directly from the environment rather than from a commercial supplier. The risks are environmental degradation at unregulated extraction sites, extraction without landowner or community agreement, un-reinstated pits creating vector habitat and child-safety hazards, and the possibility that labour engaged at borrow sites falls outside the contractor's workforce controls, including age verification and written contracts. These are managed by treating every borrow area as an associated facility under the regime described at Section 7.6, and by extending the Labour Management Procedures to all labour engaged at such sites.

The second is road transport of materials from Mogadishu or Jowhar to Balcad and along agreed access routes to individual canals, which carries traffic-safety and dust risk through settled corridors and, in this operating environment, security exposure. Transport routes and schedules are agreed with the Balcad District Administration to minimise disruption, and driver conduct is covered by the contractor's Code of Conduct and community health and safety plan. Pre-mitigation significance is Minor to Moderate; residual significance is Minor.

7.23. Contextual, conflict and human-security risks

Contextual, conflict and human-security risks are assessed here as project-facing risks; the underlying conditions are described at Section 6.12.

Security risk to the project is the dominant contextual risk. Al-Shabaab presence and activity in parts of Hirshabelle, including Balcad District, exposes field teams, contractor personnel and, indirectly, participating communities to incident risk; constrains the timing and depth of field verification and the consistency of supervision; and creates the possibility that visible project activity attracts attention. This was assessed as High before mitigation and Moderate after, on the basis of per-site security assessment and Green/Yellow/Red classification before any mobilisation authorisation, coordination with Hirshabelle State security structures and the Balcad District Administration, defined halt thresholds, communication check-ins, avoidance of attention-attracting branding, security awareness training for field teams, and a Security Management Plan that governs security provider conduct including a personnel code of conduct, pre-deployment and refresher training, and explicit proportionality and use-of-force provisions. The conflict history of the region also gives rise to a residual risk of explosive remnants of war, for which formal clearance confirmation is required from the relevant security authorities or a recognised demining agency before excavation at any reach not previously worked.

Conflict risk generated by the project itself is distinct and is principally distributional. Employment expectations in canal communities are high and youth unemployment is significant, so perceived unfairness in hiring generates grievance; crop damage disputes arise where access and compensation arrangements are not documented; and, most significantly, restored conveyance redistributes a scarce resource between head-end and tail-end users, between landowners and tenants, and across clan-based resource sensitivities. Pre-mitigation significance is Moderate, reduced to Minor by transparent recruitment criteria communicated before mobilisation with a local hiring preference, written land-access agreements, prompt compensation, inclusive canal committees operating documented and publicly posted allocation rules, an accessible grievance mechanism with a dedicated 15-working-day allocation track, and continuous community liaison. The allocation dimension is assessed in full at Section 7.8.1 and remains Moderate after mitigation, requiring sustained governance support particularly in the first one to two years of operation.

Human-security considerations relevant to the project are the dependence of downstream communities on Shabelle flows for domestic water, addressed through the environmental-flow floors at Section 7.5; the exposure of women and girls, who bear the water-collection burden, and of marginalised minority groups such as Somali Bantu households, when river stage falls; child protection, engaged through age verification in the Labour Management Procedures and through child drowning risk at operational canals; and the position of IDP households near Balcad town, whose access to canal water is insecure and whose inclusion in consultation, committee representation and the grievance mechanism is a specific commitment under Section 8.9.

7.24. Positive impacts and development opportunities

The project's positive impacts are substantial and are the reason it is being undertaken; they are recorded here so that they carry the same assessment status as the adverse impacts.

- Restored irrigation reliability and agricultural production. Rehabilitation restores conveyance from an estimated 40–60% of design capacity toward design performance across thirteen canals, with corresponding gains in irrigated area, crop yields and cropping intensity for an estimated 2,200–3,800 farming households. This is the project's primary benefit and it accrues directly to household food security and income in one of Somalia's most productive agricultural corridors.
- More equitable water distribution. Functional control structures operated to a documented and publicly posted allocation schedule, together with inclusive canal committees carrying head-end and tail-end representation, convert allocation from a matter of upstream position into a matter of agreed rule. The beneficiaries are specifically tail-end users and tenant farmers, who are disadvantaged under current conditions.
- Flood risk reduction. Canals restored to conveyance capacity function again as flood-conveyance pathways for peak Shabelle flows, reducing the localised flooding and waterlogging of farmland that occurs when blocked channels cannot pass flood water. Climate-adjusted design — 1-in-25-year embankments and culverts and +0.5 m intake freeboard — extends this benefit against projected increases in flood magnitude.
- Safer infrastructure and improved water access. Stabilised banks reduce bank-failure hazard; water kiosks and dedicated livestock troughs move domestic and livestock water use away from hazardous canal-edge points, reducing drowning exposure, bank trampling and hygiene risk; culverts and safe crossings maintain community access; and restored positive drainage reduces stagnant water and the associated *Anopheles* breeding habitat.
- Local employment and skills. Works generate 20–50 jobs per active canal across a four-year programme, with a contractual local hiring preference for unskilled and semi-skilled roles, preference for unemployed youth from canal communities, and preference for women in administrative, liaison and supervisory roles, together with induction and safety training that transfers transferable skills.
- Strengthened and more inclusive water governance. Formation and training of canal committees at all thirteen canals, with minimum 30% female membership, head-end and tail-end representation and tenant farmer voice, documented allocation rules, operation and maintenance manuals in Somali, tool kits and post-commissioning oversight visits, creates institutional capacity that outlasts the works and provides a route through which future water disputes are resolved by rule rather than by position.
- Climate adaptation. More reliable irrigation buffers households against rainfall variability, restored flood conveyance reduces climate-related crop loss, and improved conveyance efficiency reduces water losses per unit of production, making the corridor's farming system more resilient to the drought and flood variability projected for the Shabelle basin.

Enhancement measures to secure and broaden these benefits are set out at Section 8.8, and the differentiated measures required to ensure that vulnerable groups actually receive them are at Section 8.9.

7.25. Residual impacts

7.25.1. Residual effects during construction

Table 7 summarizes residual construction effects after application of all ESMP mitigation measures for the Hirshabelle component. All residual effects are considered acceptable, provided ESMP implementation is verified through the specified monitoring regime.

Table 7: Residual Effects During Construction

Impact	Pre-Mitigation	Residual	Acceptability Basis
Sediment release during canal desilting	Moderate–Major	Minor–Moderate	Acceptable with cofferdam/bypass, spoil on high ground, downstream turbidity monitoring
Canal bank collapse during excavation	Major	Minor	Acceptable with geotechnical assessment per canal, phased excavation, and immediate stabilisation
Flooding of active work areas	Major	Minor–Moderate	Acceptable with dry-season scheduling, twice-daily flood gauge monitoring, work suspension protocol, and evacuation plan
Irrigation supply disruption to downstream farmers	Major	Moderate	Acceptable with pre-agreed canal-specific disruption schedule, partial flows maintained, compensation framework — requires meticulous implementation throughout
Worker drowning / canal water safety	Major	Minor	Acceptable with non-swimmer assessment, life jackets, rescue equipment on every work front, no lone working
Worker OHS — heat stress, riverine hazards	Moderate–Major	Minor–Moderate	Acceptable with OHS plan, 11:00–15:00 work break, 3L water/hour, waterproof PPE, daily toolbox talks
Community safety near canal works	Moderate	Minor	Acceptable with barriers, Somali-language signage, safe pedestrian crossings, advance notification, school awareness sessions
SEA/SH risk from worker influx	Moderate	Minor–Moderate	Acceptable with Code of Conduct, induction training, confidential GRM channel (PIU GBV Specialist), quarterly refreshers
Land access and crop disturbance adjacent to works	Moderate	Minor	Acceptable with written land access confirmation, compensation at replacement cost within 30 days, immediate reinstatement
Social conflict and employment grievances	Moderate	Minor	Acceptable with transparent local hiring, community engagement, and functional GRM
Security incidents affecting implementation	High	Moderate	Acceptable with Security Management Plan, pre-works assessment per site, Hirshabelle security coordination, halt threshold defined

7.25.2. Residual effects during operation and maintenance

Table 8: Residual Effects During Operation and Maintenance

Impact	Pre-Mitigation	Residual	Acceptability Basis
Water allocation conflict — head-end vs tail-end farmers	Moderate–Major	Moderate	Acceptable with inclusive canal committee, documented and publicly posted rules, control structure operation per schedule, PIU oversight — requires ongoing management

Impact	Pre-Mitigation	Residual	Acceptability Basis
Canal re-sedimentation	Moderate	Minor–Moderate	Acceptable with annual post-Gu inspection, canal committee annual desilting responsibility, desilting trigger at <75% conveyance
Flood damage to rehabilitated canals	Moderate	Minor–Moderate	Acceptable with post-flood inspection within 5 days, emergency repair fund, canal committee first-response authority
Child safety near operational canals	Moderate	Minor	Acceptable with canal fencing at crossings, quarterly signage inspection, annual community awareness sessions
Malaria risk near canal water	Moderate	Minor	Acceptable with stagnant water elimination, committee vector-management training, district health reporting protocol
Water quality deterioration during operation	Moderate	Minor–Moderate	Acceptable with committee observation, annual laboratory testing, and investigation triggers

7.25.3. Residual cumulative and induced effects

Residual cumulative effects — corridor-wide intensification of cultivation, aggregate diversion behaviour across canals sharing intakes, and induced settlement density — are expected to remain Moderate and manageable if canal committee governance, documented allocation rules, and coordinated works and desilting sequencing are maintained, and if corridor-level water distribution trends are reviewed through the O&M monitoring and oversight-visit regime.

7.25.4. Residual climate-related effects

Residual climate-related effects remain because extreme Shabelle floods and heat trends can exceed design assumptions. The most significant residual climate risk for Hirshabelle is a flood event exceeding the 1-in-25-year design standard, causing bank breaches and canal damage. This risk remains Moderate and acceptable given the post-flood inspection protocol, emergency repair fund, and canal committee first-response authority. Drought-driven low Shabelle flows reducing divertible water are an expected operational condition addressed through allocation governance rather than infrastructure.

7.25.5. Residual impacts requiring particular management focus

The following residual effects require sustained management attention for the Hirshabelle component because they are governance- and behaviour-dependent rather than purely engineering-dependent:

- Irrigation disruption management during works: signed schedules, partial flows, and prompt compensation must be implemented meticulously on every canal.
- Equitable water allocation governance: committee inclusivity, documented rules, and control structure discipline require active support, particularly in the first 1–2 years of operation.
- SEA/SH risk prevention: ongoing code of conduct enforcement, training refreshers, and the confidential channel must remain functional throughout.
- Flood alert discipline: gauge monitoring, suspension thresholds, and end-of-day equipment removal must not lapse under programme pressure.
- Security-related constraints that may affect consistent oversight and supervision continuity.

These issues remain acceptable when the ESMP measures are implemented, contractor performance is managed through effective oversight, stakeholder engagement continues through construction and operation, and the GRM remains accessible and responsive.

CHAPTER 8: MITIGATION MEASURES

8.1. Application of the mitigation hierarchy

Mitigation for the Hirshabelle component follows the mitigation hierarchy in sequence: anticipate and avoid; where avoidance is not possible, minimise or reduce; where residual effects remain, mitigate; and where significant residual impacts persist, compensate or offset. The hierarchy has been applied first at the design stage, as recorded at Section 4.2, and then to construction and operation, as set out in the subsections that follow.

Two features of this project shape how the hierarchy applies. First, because the works restore existing infrastructure within its established footprint, a large share of what would otherwise be mitigation is achieved by avoidance at the design stage — no new land take, no new abstraction right, no new alignment, no riparian clearance for a new corridor. Second, the impacts that remain after design are dominated not by physical effects but by timing, sequencing and governance: when works are done, how flows are maintained while they are done, and who decides how water is distributed afterwards. The measures below therefore weight heavily toward scheduling controls, agreed procedures and institutional arrangements, and their effectiveness depends on discipline in implementation rather than on the installation of physical controls.

Each measure identified below is carried into the ESMP at Section 9, where it is assigned a responsible party, a corrective action, a monitoring requirement and a funding source. Measures are enforceable through the Contractor ESMP and the ESHS hold points at Section 9.5, which must be approved in writing before any mobilisation.

8.2. Avoidance measures

Key risk-avoidance decisions in the Hirshabelle design include: confining all works to existing canal footprints to avoid new land take and riparian clearance; maintaining agreed partial flows rather than closing canals, avoiding livelihood harm; placing spoil on high ground away from drainage lines, avoiding re-sedimentation and farmland degradation; scheduling within low-flow windows, avoiding the highest flood exposure; and installing kiosks and troughs to draw community water use away from hazardous canal-edge points.

8.3. Minimization and reduction measures

Where an impact cannot be avoided, the design and construction approach minimises it at source. The principal minimisation and reduction measures are:

- Maintained partial flows. Canal closure is replaced by cofferdam or flow-bypass arrangements maintaining agreed partial flows to downstream users, with desilting phased upstream to downstream on each canal. This reduces irrigation supply disruption from Major to Moderate.
- Corridor-level sequencing. Works are sequenced so that no more than an agreed number of canals sharing a common intake are disrupted simultaneously, and two to three canal-cluster work fronts

operate in parallel, limiting both the aggregate supply loss across the corridor at any time and the duration of disruption overall.

- Seasonal scheduling with suspension thresholds. Earthworks are confined to the Shabelle low-flow windows of February–March or August–September confirmed by the pre-works hydrological assessment. Where programme pressure requires working into shoulder periods, enhanced controls apply: twice-daily flood-gauge monitoring, defined per-canal suspension thresholds, end-of-day removal of equipment from the canal, and pre-positioned evacuation arrangements.
- Phased excavation and immediate stabilisation. Bank cutting is phased against a per-canal geotechnical assessment, with a defined maximum unsupported face height, immediate compaction, and seeding within five days of earthworks, reducing both the duration and the extent of exposed unstable face.
- Spoil management. Spoil is placed on high ground at least 10 metres from the canal edge and used for embankment reinforcement where geotechnically suitable, reducing both re-sedimentation of the channel and the area of farmland affected.
- Selective rather than blanket treatment. Lining is applied only to high-loss and high-erosion reaches, and hard bank protection only at hydraulically stressed points, minimising disturbance, cost and embodied carbon relative to full-length treatment.
- Minimised clearance and reinstatement. Vegetation clearing is held to the minimum required, riparian buffer vegetation is reinstated after works, and temporary facilities are demobilised and their sites reinstated on completion.
- Exposure reduction for workers and communities. Heat-stress protocols remove heavy work from the hottest part of the day; barriers, signage, safe crossings and advance notification reduce community exposure at active work fronts; and kiosks and troughs move routine water use away from hazardous canal edges.

8.4. Mitigation measures

Where impacts cannot be further avoided or reduced, they are managed through the mitigation measures specified in full in the ESMP mitigation matrices at Sections 9.3.1 to 8.3.3, which set out for each activity and risk the mitigation measure, the applicable Operational Safeguard, the responsible party, the corrective action on non-compliance and the funding source. Those matrices are the operative statement of mitigation for this project; this section summarises their structure and the principal commitments so that the mitigation position can be read alongside the impact assessment.

Pre-construction and mobilisation. Mitigation at this stage takes the form of conditions precedent: a PIU site-readiness checklist for each canal; a pre-works hydrological and geotechnical assessment commissioned at least six weeks before mobilisation; a security assessment and Green/Yellow/Red classification for each site; a canal disruption schedule agreed and signed with each canal committee; written land access confirmation for each corridor; an operational grievance mechanism including the confidential SEA/SH

channel and female Community Liaison Officer; approved Contractor ESMP and supporting plans; and completed worker water-safety pre-induction. No mobilisation authorisation is issued for a canal until these are satisfied.

Construction. Mitigation during works comprises the sediment and spoil controls, bank-stability controls, flood-alert regime, irrigation continuity measures, water-safety regime, heat-stress and occupational health and safety controls, community safety measures, SEA/SH prevention regime, waste and fuel management, and security measures described at Sections 7.10 to 6.23 and specified in Section 9.3.2.

Operation and maintenance. Mitigation in operation is principally institutional: inclusive canal committees operating documented and publicly posted allocation schedules; annual post-Gu desilting with a major-desilting trigger below 75% of design conveyance; post-flood inspection within five days of significant events and an emergency repair fund activated within 14 days for critical damage; canal fencing, signage inspection and community safety awareness; vector management by designated WUA focal persons; annual water-quality testing; and PIU oversight visits at 3, 6 and 12 months after commissioning and annually thereafter.

8.5. Compensation or offset measures

No biodiversity offset is required for this component, as no natural or critical habitat is affected and no significant residual biodiversity impact arises. Compensation applies to livelihood losses and is delivered through a defined, funded framework rather than case-by-case negotiation.

The compensation framework covers verified project-caused crop and asset losses arising from works within and adjacent to the canal corridors. Its terms are: compensation at full replacement cost; payment within 30 days of verification, and within 21–30 days for crop losses arising from irrigation disruption; eligibility determined by loss actually suffered rather than by land title, so that tenant farmers, sharecroppers and landless cultivators are compensated for their own losses; verification by the PIU against the signed disruption schedule and the written access agreement for the reach concerned; and access to the grievance mechanism, with land and compensation grievances resolved within 15 working days. A funded contingency of USD 30,000 over the project period is provided in the ESMP budget at Section 9.13, classified as government counterpart financing, and a further USD 32,000 is provided for emergency maintenance following Shabelle flood damage.

Two boundaries on compensation should be stated explicitly. First, compensation is not a substitute for avoidance: the disruption schedule, maintained partial flows and advance notice exist so that losses are prevented, and payment of compensation for avoidable losses is treated as a compliance failure rather than as the framework operating as intended. Second, the framework operates within the OS5 threshold: any activity that would cause physical displacement or greater than 10% loss of a household's productive capacity is not a compensation case but a suspension trigger, requiring works to stop and an OS5 determination to be made.

8.6. Measures for significant residual impacts

One impact is assessed as significant before mitigation and cannot be resolved at the level of the individual canal: the reduction of dry-season downstream flow in the Shabelle arising from aggregate abstraction across the wider BBS scheme, of which the thirteen Hirshabelle canals form part. Aggregate withdrawals equate to roughly 48–64% of mean monthly flow at the Belet Weyne reference gauge in January–February and 24–42% in March, July and December, above the 20–40% generally recommended as a minimum ecological-flow floor, and falling below 15% only during April–October. Because unmeasured abstraction occurs between Belet Weyne and Balcad, effective extraction ratios at the offtakes are likely higher than the gauge implies. This impact is rated High for the interim period.

The measures adopted for this residual impact are binding operating constraints rather than conventional mitigation:

- Environmental-flow floors. A minimum of 20% of natural flow is maintained at all times, rising to 30% during April–October and 40% during the January–March dry season, enforced at the Shabelle offtakes as a condition of operation.
- Abstraction scheduling and control. Rotational abstraction scheduling, gate-closure protocols and calibrated flumes at the offtakes give the flow floors operational effect, and rehabilitation is phased to prioritise lower-extraction canals until dry-season flow monitoring is established.
- Dry-season abstraction monitoring. Dry-season flow and abstraction are monitored at the offtakes, and flow and household water-access monitoring is extended, with FAO SWALIM, to river communities below the intakes who are not project beneficiaries.
- Downstream community engagement. Consultation and the grievance mechanism are extended to downstream river communities, so that people bearing the residual impact have a route to raise it.
- Category revalidation. If dry-season monitoring confirms that the High downstream-flow impact cannot be reduced to Moderate, or ahead of any expansion of scope, the PIU and AfDB revalidate the project's environmental category.
- Tracking the structural remedy. Rehabilitation of the Jowhar Natural Storage Barrage, with design storage of approximately 200 million m³, would permit regulated dry-season releases and is the development most likely to resolve the impact. Its commissioning is formally tracked by the PIU as the trigger to reassess dry-season extraction thresholds.

A scheme-level water-accounting study is recommended to establish per-canal abstraction against command-area demand, which is the evidence base on which the flow floors can subsequently be refined. The other residual impacts requiring sustained management attention — irrigation disruption discipline, allocation governance, SEA/SH prevention, flood-alert discipline and security-related supervision constraints — are identified at Section 7.25.5 and are managed through the measures at Sections 8.3, 7.4 and 7.9.

8.7. Acceptability of residual impacts

Residual impacts are assessed in full at Section 7.25. Post-mitigation, the residual significance of the great majority of impacts across construction, operation, cumulative and climate categories is Minor to Moderate, and on that basis they are considered acceptable, provided the ESMP is fully implemented and verified through the specified monitoring regime. The acceptability basis for each individual residual effect is recorded in the tables at Sections 7.25.1 and 6.25.2.

Three qualifications attach to that conclusion. First, acceptability is conditional on implementation, not on the measures being specified: five residual effects — irrigation disruption management, equitable allocation governance, SEA/SH prevention, flood-alert discipline, and consistency of supervision under security constraints — are governance- and behaviour-dependent rather than engineering-dependent, and their residual ratings assume sustained discipline throughout the four-year programme. Second, two residual effects remain at Moderate and require ongoing management attention rather than one-time treatment: irrigation supply disruption during works, and water allocation between head-end and tail-end users in the first one to two years of operation.

Third, one impact — the reduction of dry-season downstream flow through aggregate scheme abstraction — is rated High for the interim period and is not reduced to Moderate by project-level measures alone. Its acceptability rests on the binding environmental-flow floors and dry-season abstraction monitoring set out at Section 7.5, on the extension of monitoring and grievance access to affected downstream communities, and on the explicit commitment that the environmental category is revalidated if monitoring confirms the impact cannot be brought to Moderate. Subject to those conditions, and to the conditions for approval recorded in the Executive Summary, the residual impact profile of the Hirshabelle component is assessed as acceptable.

8.8. Measures to enhance positive impacts and opportunities

Measures to enhance the project's positive impacts, identified at Section 7.24, are as follows:

- Securing the irrigation benefit beyond commissioning. Canal committees receive operation and maintenance training, manuals in Somali and basic tool kits before commissioning; annual post-Gu desilting is assigned as a committee responsibility with a major-desilting trigger below 75% of design conveyance; and PIU oversight visits at 3, 6 and 12 months and annually thereafter provide technical support, so that restored conveyance is sustained rather than lost to renewed siltation.
- Broadening the equity benefit. Committee membership requirements — head-end and tail-end representation, minimum 30% female membership, and explicit tenant farmer voice, all verified before commissioning — together with publicly posted allocation schedules and a dedicated 15-working-day allocation grievance track, convert the physical capacity for equitable distribution into an enforceable entitlement.
- Maximising local employment value. Local hiring preference for unskilled and semi-skilled roles is supported by transparent recruitment criteria communicated before mobilisation and an obligation on contractors to advertise locally; preference for unemployed youth from canal communities and

for women in administrative, liaison and supervisory roles broadens who benefits; and day-one induction and ongoing safety training transfer skills that outlast the contract.

- Extending the water-access benefit. Kiosk and trough siting is decided in consultation with women's groups so that improved access is convenient and safe for those who actually collect water, and community safety awareness sessions accompany commissioning.
- Realising the flood-risk benefit. The flood-conveyance function of the rehabilitated canals is protected through post-flood inspection within five days of significant events, an emergency repair fund, canal committee first-response authority for temporary breach plugging, and annual post-Gu condition inspection.
- Compounding the agricultural benefit safely. As restored irrigation intensifies production, integrated pest management and safe-handling messaging are delivered through extension, so that yield gains are not offset by agro-chemical runoff into the canal network.
- Institutional legacy. Capacity building is directed not only at canal committees but at PIU, state and district counterparts, so that the supervision, monitoring and grievance-handling capability developed for this component remains available for subsequent water infrastructure work in Hirshabelle.

8.9. Differentiated measures for vulnerable individuals and groups

Vulnerable individuals and groups in the project area, identified at Section 6.10, are poor farming households with minimal buffer against disruption; tenant farmers, sharecroppers and landless agricultural labourers; female-headed households; communities at the tail end of canal systems; youth with limited employment options; and IDP households near Balcad town with insecure access to canal water. Minority clan communities, including Somali Bantu households, are additionally exposed when river stage falls. Measures keyed to landownership or to general community consultation will not reach several of these groups, so differentiated measures are specified.

- Tenant farmers, sharecroppers and landless labourers. Compensation eligibility is defined by loss actually suffered rather than by land title. Tenant farmer voice is a verified requirement of canal committee composition before commissioning. Consultation is conducted directly with tenant and sharecropping households along canal alignments rather than through landowners, and their participation is recorded separately in the consultation log.
- Female-headed households and women. Minimum 30% female membership in every canal committee, verified before commissioning; a dedicated female Community Liaison Officer physically accessible to all thirteen canal communities and contactable by mobile phone; kiosk and trough placement decided with women's groups; preference for women in contractor administrative, liaison and supervisory roles; a confidential SEA/SH channel managed exclusively by the PIU GBV Specialist and expressly not routed through male-dominated community structures; and gender-disaggregated attendance and participation records across all engagement and training.

- Tail-end water users. Head-end and tail-end representation is a verified requirement of committee composition; allocation schedules are documented and publicly posted at intakes; control structures are operated to schedule under PIU oversight; and a dedicated allocation-complaint track resolves grievances within 15 working days.
- Youth. Local hiring preference for unskilled and semi-skilled roles with preference for unemployed youth from canal communities, transparent recruitment criteria communicated before mobilisation, and contractor obligation to advertise locally, addressing both the employment need and the grievance risk attached to perceived unfairness.
- IDP households. Inclusion in community consultation and in the grievance mechanism on the same terms as resident households, with GRM uptake channels — community liaison contacts, hotline, suggestion boxes and committee reporting — designed to be accessible without requiring recognised community standing.
- Downstream river communities and minority groups. Consultation, grievance access, and flow and household water-access monitoring are extended below the intakes to communities who bear the dry-season abstraction risk without receiving the irrigation benefit, as set out at Section 7.5.
- Children. Age verification under the Labour Management Procedures; canal fencing at community crossing points and high-risk sections; school-age child safety awareness sessions during construction and annual community safety awareness in operation; and the requirement that no unguarded open canal is left at the end of the working day.

Implementation of these measures is monitored through committee inclusivity indicators, grievance trend analysis by complainant category, and gender-disaggregated participation records, as set out at Appendix 9.3.

8.10. Technical and financial feasibility of mitigation measures

The mitigation measures adopted are technically standard for canal rehabilitation works and require no specialised technology, imported systems or capability that is unavailable in the Somali construction market. Cofferdam and bypass arrangements, phased excavation with compaction, seeding and bioengineering, flood gauges, barriers and signage, bunded fuel storage, and personal protective and water-rescue equipment are all conventional items that contractors can source and deploy. The measures with the highest technical content — the pre-works hydrological and geotechnical assessment and the calibrated flumes and gate-closure protocols supporting the environmental-flow floors — are procured as specialist consultancy inputs and are provided for in the ESMP budget.

Financial feasibility is established by the way the measures are funded. Contractor-delivered measures — the Contractor ESMP, site ESHS officers, occupational health and safety provision, water-safety equipment, flood gauges, PPE and waste management — are priced within the works contracts, so they are funded as part of the cost of construction rather than as a discretionary allocation that can be cut. PIU-delivered measures — engagement and disclosure, GRM operation, pre-works surveys, canal-committee

capacity building, water-quality monitoring, the female Community Liaison Officer, security provision, SEA/SH service mapping, monitoring equipment and the annual audit — total an indicative USD 253,662 over four years, which is modest relative to the works programme and is provided for in the project budget. Two provisions are held as contingencies rather than fixed costs: USD 30,000 for crop compensation and USD 32,000 for emergency flood maintenance, both classified as government counterpart financing.

The measures whose feasibility depends least on money and most on discipline are the scheduling and governance controls — low-flow windows, gauge-based suspension, signed disruption schedules, and allocation rules. These are feasible in the sense that they cost little, but they impose a programme cost when enforced: suspending works on a flood threshold, or deferring mobilisation on a canal without a signed disruption schedule, extends the schedule. That cost is accepted explicitly, and is the reason these measures are constituted as hold points and suspension triggers under Section 9.5 rather than as guidance.

8.11. Capital and recurrent costs

The capital and recurrent costs of the mitigation measures adopted are set out in full in the ESMP budget at Section 9.13, which itemises each line by year across the four-year project period and identifies its funding source. In summary, the indicative cost of PIU-delivered measures is USD 253,662, comprising a subtotal of USD 230,601 and a 10% contingency of USD 23,061.

Capital and one-off costs, incurred principally in Year 1, are the pre-works hydrological and geotechnical assessment across all thirteen canals (USD 15,000) and monitoring equipment including flow gauges, EC meters, GPS units and field kits (USD 15,000, of which USD 10,000 in Year 1). Recurrent costs, running across the four-year period, are community engagement in Balcad District (USD 19,000), GRM operation (USD 10,000), canal committee capacity building and training for thirteen committees (USD 17,500), water quality monitoring across thirteen canals (USD 10,000), the female Community Liaison Officer (USD 25,101), information disclosure and consultation materials including translation, printing and radio (USD 9,000), the annual environmental and social audit and independent verification (USD 20,000), security risk management and implementation support (USD 19,000), and SEA/SH service mapping and survivor referral pathway (USD 9,000). Two lines are held as contingencies against events rather than as scheduled expenditure: the crop compensation contingency for project-caused crop and livelihood losses (USD 30,000) and the emergency maintenance fund for Shabelle flood damage (USD 32,000), both classified as government counterpart financing.

Contractor ESHS costs are additional to the figure above and are funded through the works contracts rather than the PIU budget. They cover the Contractor ESMP, site ESHS officers, the occupational health and safety plan, water-safety equipment including life jackets and rescue gear, flood gauges, personal protective equipment, and waste management. The cost of the shared Galmudug/Hirshabelle Environmental and Social Officer is split 50/50 with the Galmudug component. All amounts are indicative and expressed in United States dollars; unit rates and quantities for each line will be fixed against the detailed-design Bill of Quantities.

8.12. Suitability of measures under local conditions

The suitability of the mitigation measures under local conditions was a criterion in their selection, because measures that cannot be maintained after handover, or that depend on institutions that do not function locally, would leave the residual impact unmanaged in practice.

Three characteristics make the adopted measures locally suitable. First, they are maintainable with local resources and skills. Bioengineering-led bank stabilisation using compaction and seeding can be repaired by canal committees with hand tools; manually operated sluice gates require greasing and servicing rather than power or spare electronics; gravity operation removes any fuel or energy dependency; and annual desilting is an activity communities already undertake. Measures requiring imported spares, continuous power or specialist maintenance were avoided for this reason. Second, they are institutionally realistic. Because state regulatory and enforcement capacity is limited, compliance is secured contractually through the Contractor ESMP and ESHS hold points and verified through independent supervision and audit, rather than assumed to follow from a permit condition. Because there is no functioning abstraction licensing regime, water management is delivered through committee-agreed allocation, flow floors and monitoring rather than through a licence.

Third, they are socially and culturally appropriate to the corridor. Signage and safety messaging is in Somali and posted at intervals along working reaches; disclosure is in Somali-language summary form and posted at community information boards; operation and maintenance manuals are provided in Somali; consultation is conducted canal by canal through existing committee and elder structures while deliberately reaching tenant farmers, women and tail-end users directly; SEA/SH reporting is deliberately routed away from male-dominated community structures, which would otherwise suppress reporting; and a female Community Liaison Officer is provided because women's access to a male liaison officer cannot be assumed. Security-sensitive adaptations are also included: avoidance of attention-attracting branding, per-site security classification, and defined halt thresholds. Measures are conveyed to workers through day-one induction and daily toolbox talks rather than through written procedures alone, reflecting the literacy and language profile of the workforce.

8.13. Institutional requirements

Implementation of the mitigation measures requires the institutional arrangement set out in full at Section 9.9. In summary, the requirements are: a PIU within MoAI holding overall ESMP ownership, approving Contractor ESMPs and pre-works plans, conducting monthly audits, managing serious incidents and the compensation framework, and consolidating quarterly safeguards reporting to AfDB; a dedicated Environmental and Social Officer covering the Hirshabelle sites — currently a post shared 50/50 with the Galmudug component — providing day-to-day oversight of all thirteen canals, weekly site inspections, GRM management, committee oversight, security monitoring and disruption-schedule compliance

verification; a PIU Social/GBV Specialist managing the confidential SEA/SH channel; and a female Community Liaison Officer accessible to all thirteen canal communities.

On the delivery side, each contractor is required to assign a dedicated ESHS officer to the Hirshabelle works and to implement all construction-phase measures under an approved Contractor ESMP. An independent Supervision Consultant conducts weekly inspections across all thirteen canals, verifies compliance, issues and tracks corrective actions, and approves each reach before handover. Externally, the Hirshabelle State Ministry of Agriculture provides permits and regulatory oversight and participates in joint monitoring missions; the Balcad District Administration supports access coordination, community liaison, security coordination, flood alert communication and local dispute resolution; and AfDB provides supervision missions, review of quarterly reports, ESMP approval and access to the Independent Recourse Mechanism.

In operation, institutional responsibility transfers to the canal committees at each of the thirteen canals, which operate control structures to the documented allocation schedule, carry out annual desilting, conduct flood damage and child safety inspection, manage vector control at canal margins, and report grievances. The transfer is conditional: committees must be formed, verified for inclusivity and trained before commissioning, and are supported by PIU oversight visits at 3, 6 and 12 months and annually thereafter. Section 9.10 assesses the capacity of these institutions and the strengthening required.

8.14. Training and capacity requirements

The mitigation measures depend on training in three respects: workers must be competent in the safety regimes that protect them, supervisors must be competent in the thresholds and protocols that trigger suspension, and canal committees must be competent in the governance and maintenance obligations they assume at handover. The full training plan, with target participants, content, frequency and responsibility, is at Section 9.11 and Appendix 9.5.

The training requirements that are conditions of mitigation, rather than general capacity building, are: water safety and drowning prevention for all canal workers and supervisors, delivered at day-one induction, refreshed monthly and repeated before each canal phase; occupational health and safety including heat stress, delivered at induction and reinforced through daily toolbox talks; SEA/SH prevention and response including the Code of Conduct and referral pathways, delivered at induction with quarterly refreshers; canal bank excavation safety for excavation crews and supervisors before bank works at each canal; flood alert and emergency response for contractor supervisors and oversight staff before Gu season works and again before Deyr; canal committee governance and operation and maintenance training before commissioning of each canal, with a six-month refresher; GRM operation for the Environmental and Social Officer, district focal points and community liaison officers; security awareness for field teams; and malaria prevention for committee members and workers.

Two features of the training regime are load-bearing for mitigation. First, several trainings are hold points rather than schedule items: worker induction must be complete before any works begin, water-safety pre-

induction and non-swimmer assessment must be complete before any canal-adjacent task, and committee training must be complete before commissioning. Second, refreshers are specified because the highest-risk periods recur seasonally and workforce turnover is expected across a four-year programme; a single induction at project start would not maintain competence at the points where it matters.

8.15. Monitoring requirements

Mitigation measures are verified through the monitoring regime specified at Section 9.8 and consolidated in Appendix 8. Monitoring exists in this project not only to detect environmental change but to verify that procedural commitments — the ones on which the residual ratings depend — are actually being kept.

The monitoring requirements attaching to the principal mitigation measures are: twice-daily flood-gauge readings at all active canal reaches during the Gu season, with immediate work-suspension triggers at defined per-canal thresholds; daily verification of irrigation supply continuity against the signed disruption schedule on every active canal; daily downstream turbidity checks during desilting; end-of-day verification that no water-trapping depressions remain within 5 metres of the works footprint and that no unguarded open canal is left; weekly site inspections by the Supervision Consultant across all thirteen canals using standardised checklists; monthly PIU safeguards audits; monthly GRM case tracking, including analysis by complainant category; monthly review of the SEA/SH channel by the PIU GBV Specialist; monthly canal-margin vector inspection by the designated WUA focal person, with larval counts weekly in the Gu peak season; dry-season flow and abstraction monitoring at the offtakes against the environmental-flow floors; annual water-quality laboratory testing on each canal; and annual post-Gu canal condition inspection.

Reporting requirements are: contractor incident reporting within 24 hours for moderate incidents and within 4 hours for serious incidents; weekly Supervision Consultant reports to the PIU; monthly reports from the Environmental and Social Officer to the PIU; quarterly safeguards performance reports to AfDB including OHS statistics, GRM performance and compliance observations; an annual independent environmental and social audit; and PIU oversight visit reports at 3, 6 and 12 months after commissioning and annually thereafter. Numeric performance standards and thresholds against which monitoring results are assessed are tabulated within Section 9.8.

8.16. Matters not requiring further assessment

The following issues were assessed as of limited relevance for the Hirshabelle component, subject to verification controls: (i) biodiversity and critical habitat — no protected areas or critical habitats occur at any of the 13 canal sites; works remain within existing canal footprints, and riparian buffer vegetation is reinstated after works (OS6 precautionary); (ii) involuntary resettlement — all works occur within existing canal corridors with temporary access agreed in writing; any activity resulting in physical displacement or greater than 10% loss of a household's productive capacity triggers immediate works suspension and OS5 determination; (iii) groundwater — canal works do not abstract groundwater; and (iv) large-scale air quality impacts — emissions are limited to localized dust and equipment exhaust, managed through standard

controls. Each screened-out issue carries a verification trigger in the ESMP requiring reassessment if site conditions differ from screening assumptions.

CHAPTER 9: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Project code	P-SO-A00-003	AfDB category	Category 2
Location	Balcad District, Middle Shabelle Region	Project sites	13 canal rehabilitation sites
Applicable safeguards	OS1, OS2, OS3, OS4, OS7 and OS10	Precautionary safeguards	OS5, OS6 and OS8; OS9 not applicable
Basis	Hirshabelle ESIA (July 2026)	Indicative ESMP budget	USD 253,662 plus contractor ESHS BoQ costs

9.1. ESMP objectives and scope

This ESMP defines the environmental and social management measures, monitoring requirements, institutional arrangements, and budget for the Hirshabelle component of the BBS Project. It is the operational instrument through which the environmental and social obligations identified in this ESIA are translated into actionable requirements for the PIU, contractors, the Supervision Consultant, canal committees, and government authorities. It covers all thirteen canal sites in Balcad District across all project phases, and updates the interim Hirshabelle ESMP (BBS-ESMP-HIR-001, March 2026) to the 13-site scope of the June 2026 Master List. The ESMP is a living document that will be updated if significant changes to project scope, site conditions, or risk context require adjustment; where inconsistencies with project-wide provisions arise, the more protective provision applies.

9.2. Summary of environmental and social risks and impacts

This ESMP responds to the environmental and social risks and impacts assessed at Section 7. They are summarised here by source so that the measures in the following sections can be read against what they are intended to control.

Risks arising from project activities. Construction activities generate: sediment release into active canal flows during desilting; canal bank collapse during excavation in saturation-sensitive floodplain soils; flooding of active work areas driven by Shabelle stage rising independently of local rainfall; irrigation supply disruption to downstream farmers, with direct crop-loss and livelihood consequences; worker drowning and water-safety exposure; occupational heat stress and excavation, plant and equipment hazards; community safety risk at open excavations, machinery movement and severed pedestrian crossings, particularly for children; SEA/SH risk from worker presence in and near farming communities; pollution risk from fuel, chemical and concrete works near flowing water and from construction and spoil waste; land access and temporary crop disturbance along access corridors; and social and conflict risk arising from employment expectations, crop damage disputes and clan-based resource sensitivities. Operation generates: water allocation conflict between head-end and tail-end users and between landowners and tenants; canal re-sedimentation; flood

damage to rehabilitated canals; child drowning risk at restored flowing canals; malaria risk at stagnant reaches; and water-quality deterioration from upstream contamination.

Risks arising from associated facilities. Borrow areas, spoil disposal sites, construction water abstraction points, worker camps, lay-down areas and temporary access routes are not fixed at design stage and generate vegetation clearance and soil disturbance, water-trapping depressions and vector habitat, farmland and drainage degradation from spoil placement, fuel and chemical contamination, dust, noise and traffic safety impacts, abstraction pressure, and labour and SEA/SH risk where camp siting and site labour fall outside main workforce controls. These are controlled through the Associated Facilities and Support-Sites Register and its screening, permitting and management requirements.

Cumulative impacts. Corridor-wide effects arise from the simultaneous rehabilitation of thirteen canals drawing on the same Shabelle system: aggregate diversion behaviour, sequencing across canals sharing intakes, induced expansion of cultivated area and agro-chemical use, and concentration of settlement along improved corridors. The dominant cumulative effect operates below the intakes: aggregate dry-season abstraction across the wider BBS scheme, assessed as High for the interim period and managed through binding environmental-flow floors and dry-season abstraction monitoring.

Risks to vulnerable groups and highly vulnerable rural minorities. Tenant farmers, sharecroppers and landless labourers risk exclusion from consultation, committee representation and compensation; female-headed households and women risk exclusion from governance and employment and exposure to SEA/SH; tail-end users risk continued capture of flows by head-end users; IDP households near Balcad town risk exclusion from benefits and from the grievance mechanism; children face drowning risk at open excavations and restored canals; youth face grievance risk around hiring; and downstream river communities, including Somali Bantu households, bear the dry-season abstraction risk without receiving the irrigation benefit.

Involuntary resettlement. None is anticipated. All works are confined to existing canal footprints and public rights-of-way, with temporary access secured through written agreement under the Land Access Protocol. OS5 is applied on a precautionary basis, and any activity resulting in physical displacement or greater than 10% loss of a household's productive capacity triggers immediate works suspension and OS5 determination.

9.3. Mitigation, compensation and enhancement measures

9.3.1. Pre-construction and mobilisation phase

Table 9: AFDB OPERATIONAL SAFEGUARDS APPLICABILITY AND ESMP CROSS-REFERENCE

AFDB OPERATIONAL SAFEGUARD	APPLICABILITY	MAIN ISSUES ADDRESSED IN THE ESMP
OS1 - Assessment and Management of E&S Risks and Impacts	Applicable	Overall E&S assessment, design controls, site readiness, cumulative water-flow risk, ESMP implementation, monitoring, reporting and corrective action.
OS2 - Labour and Working Conditions	Applicable	Worker contracts, child and forced labour prevention, worker grievance mechanism, OHS, heat stress, excavation and water-safety controls.
OS3 - Resource Efficiency and Pollution Prevention and Management	Applicable	Sediment and spoil management, waste and hazardous materials, water quality, resource efficiency, pesticide and vector-risk controls through the project-level P/VMP.
OS4 - Community Health, Safety and Security	Applicable	Flooding, drowning, open excavations, crossings, traffic, emergency preparedness, security, community safety and disease-vector risks.
OS5 - Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement	Precautionary; screening required	site Temporary access, crop and asset damage, construction disruption, livelihood effects, compensation and land-access agreements.
OS6 - Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources	Precautionary; screening required	site Riparian vegetation, aquatic ecology, habitat disturbance, spoil placement, restoration and ecosystem services.
OS7 - Vulnerable Groups	Applicable	Women, tenants, sharecroppers, IDPs, minority and marginalized groups, differentiated engagement and equitable access to benefits and water governance.
OS8 - Cultural Heritage	Precautionary	Chance-find procedure, sacred or culturally important places, community notification and protection of discoveries.
OS9 - Financial Intermediaries	Not applicable	The project is not a financial intermediary operation.
OS10 - Stakeholder Engagement and Information Disclosure	Applicable	Project-level SEP, disclosure, consultation, GRM, feedback, commitment tracking, vulnerable-group outreach and protection from retaliation.

9.3.2. Construction phase

Table 10: COMPREHENSIVE ESMP IMPLEMENTATION MATRIX - Hirshabelle (all 13 canal sites)

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
OS1 - Assessment and Management of Environmental and Social Risks and Impacts					
Pre-construction	Mobilisation before environmental, social, land, security and technical readiness has been confirmed.	• Apply a PIU site-readiness checklist to each of the 13 canals. • Confirm access, canal-committee consultation, signed disruption schedule, security clearance, completed hydrological/geotechnical assessment and approved contractor ESHS plans. • Issue written PIU mobilisation authorisation before any on-site activity.	PIU / Hirshabelle E&S Officer	• 100% of canals with signed readiness checklist before mobilisation. • PIU monthly audit; no mobilisation where a hold point remains open.	PIU ESMP lines; included in the USD 253,662 indicative budget
Pre-construction	Works proceeding without a sound understanding of canal hydraulics, Shabelle flood risk or canal-bank soil conditions.	• Complete a hydrological and geotechnical assessment at least 6 weeks before mobilisation. • Confirm design flows per canal, flood-stage suspension thresholds, low-flow work windows and bank-soil conditions. • Integrate findings into final designs, BoQs and contractor method statements, including Farax Galoolay.	PIU / qualified technical consultant	• Assessment completed for 13/13 canals. • Supervision Consultant verifies incorporation into designs and method statements before works.	USD 15,000 - PIU (AfDB-financed)
Design / construction	• Structural failure of control structures and culverts. • Hydraulic obstruction, unsafe crossings and disruption of community access.	• Approve a method statement for each control-structure and culvert type. • Confirm culvert hydraulic sizing; shore trenches deeper than 1.2 m; prohibit work in unsupported trenches. • Test concrete quality, observe minimum cure periods, flow-test completed crossings and maintain safe temporary access. • Require Supervision Consultant sign-off before commissioning.	Contractor; Supervision Consultant approves	• Concrete/quality records and flow-test results for every structure. • Inspection and approval before loading or commissioning; non-conforming works rebuilt.	Included in Contractor BoQ / C-ESMP
Construction	Rapid Shabelle River rise may inundate active work areas, injure workers and damage works or equipment.	• Confine earthworks to the low-flow window confirmed by the hydrological assessment. • Install a flood gauge at each active reach and record levels twice daily during the Gu season. • Define canal-specific work-suspension thresholds; remove plant from canals at the end of each day. • Suspend and evacuate immediately when a threshold is reached; prohibit work during active flood conditions.	Contractor; Supervision Consultant	• Twice-daily gauge logs at all active sites. • Zero unsuspended threshold exceedances; immediate halt and evacuation when triggered.	Contractor BoQ; monitoring equipment partly covered by USD 15,000 PIU line

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Operation and maintenance	Flood events may breach canal banks, damage control structures and interrupt irrigation service.	- Canal committee to conduct a post-flood inspection within 5 days of any significant event. - Report damage to the PIU within 5 days and undertake temporary breach plugging where safe. - Activate the emergency repair fund within 14 days for critical damage and obtain engineering review for structural repairs.	Canal committees / PIU	- Post-flood reports; repair completion tracking. - Annual post-Gu inspection and event-based inspections.	USD 32,000 emergency maintenance fund - Government counterpart
Construction close-out	- Incomplete reinstatement of temporary facilities, access corridors and borrow areas. - Abandoned waste, spoil, contaminated soil or depressions creating vector and child-safety hazards.	- Demobilise lay-down areas, fuel storage, welfare facilities, temporary access and cofferdams/bypasses. - Remove waste and contaminated material; reinstate access corridors under the agreed land-access protocol. - Backfill or contour borrow pits and depressions within 7 days and restore vegetation using suitable local species. - Require reach-by-reach handover approval by the Supervision Consultant.	Contractor	- Supervision Consultant close-out checklist for every canal reach. - No handover until site restoration, waste removal and land reinstatement are complete.	Included in Contractor BoQ / C-ESMP
All phases	Failure to monitor ESMP implementation, close corrective actions or adapt measures to changed conditions.	- Use weekly supervision inspections, monthly PIU audits and quarterly E&S performance reports to AfDB. - Issue corrective actions within 48 hours for non-compliance and track them to closure. - Undertake annual independent E&S audit and update the ESMP/C-ESMP where design, site or risk conditions materially change.	PIU / Hirshabelle E&S Officer / Supervision Consultant	- Weekly and monthly compliance checklists, corrective-action register, quarterly reports and annual audit. - Serious incidents investigated and reported under the approved protocol.	USD 20,000 annual audit + USD 15,000 monitoring equipment (PIU, AfDB-financed)
OS2 - Labour and Working Conditions					
Pre-construction / construction	- Unfair or undocumented working conditions. - Child or forced labour, discrimination, unresolved worker grievances and conflict over recruitment.	- Apply the project Labour Management Procedures to contractors, subcontractors and borrow-area labour. - Maintain worker registers, age verification and written contracts; prohibit child and forced labour. - Provide a separate workers grievance mechanism, fair overtime arrangements and freedom of association. - Use transparent local-hiring criteria and report recruitment by sex, age group and community.	Contractor; PIU oversight	- Monthly worker-register and payroll review. 100% of workers with age verification and contracts; zero child/forced labour; worker grievances tracked to closure.	Included in Contractor BoQ / contract administration
Pre-construction	Workers may be assigned to canal-adjacent tasks without water-safety competence.	- Conduct a non-swimmer assessment before assignment. - Restrict non-swimmers to bank-only duties. - Complete life-jacket fitting, rescue-equipment checks and an emergency rescue drill before canal-adjacent works.	Contractor; Supervision Consultant verifies	100% of relevant workers inducted before assignment. - Signed induction and non-swimmer assessment records.	Included in Contractor BoQ / C-ESMP

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Construction	Worker drowning or near-drowning in canals or the Shabelle River.	- Require life jackets for all workers within 3 m of active canal water. - Provide throw ropes and lifebuoys at every work front; no lone working near water. - Repeat rescue drills at the start of each canal phase; provide a rescue boat for primary-canal works. - Document emergency routes to Balcad Health Centre and Jowhar Hospital.	Contractor	- Daily Supervision verification; water-safety incidents and near-misses logged. - Target: zero fatalities and 100% availability of rescue equipment.	Included in Contractor BoQ / C-ESMP
Construction	- Heat stroke, dehydration and fatigue. - General construction injury in a hot and humid riverine environment.	- Provide at least 3 litres of drinking water per worker per hour and shaded rest areas. - Prohibit heavy work from 11:00 to 15:00. - Provide task-appropriate PPE, trained first responders and daily toolbox talks on canal-specific hazards. - Maintain first-aid supplies and documented evacuation routes.	Contractor	- Daily inspections and toolbox records; monthly OHS statistics. - Heat-illness cases, LTIs and near-misses investigated; LTIFR target below 5.	Included in Contractor BoQ / C-ESMP
Construction	Bank collapse, trench collapse or slumping may injure workers during excavation and reshaping.	- Complete geotechnical assessment of each bank section before excavation. - Use phased cutting, immediate compaction and the maximum unsupported height defined by the assessment. - Shore trenches deeper than 1.2 m; prohibit entry to unsupported excavations. - Keep heavy equipment away from bank edges unless bearing capacity is confirmed; stockpile emergency stabilisation materials.	Contractor	- Daily stability inspection during earthworks; immediate notification of instability. - Any instability triggers work suspension and engineer review before resumption.	Included in Contractor BoQ / C-ESMP
Supply chain / associated facilities	Labour at borrow areas or local material sources may fall outside contractor controls.	- Treat approved borrow areas as associated facilities under the C-ESMP. - Extend worker registration, age verification, contracts, PPE, OHS and worker-GRM requirements to all borrow-area labour. - Use only authorised sources with documented landowner/community agreement.	Contractor / subcontractors	- PIU and Supervision Consultant inspect borrow sources and worker records. - No material accepted from an unapproved source or source using non-compliant labour.	Included in Contractor BoQ / procurement controls
OS3 - Resource Efficiency and Pollution Prevention and Management					
Construction	Desilting may release sediment into active canal flows and increase downstream turbidity.	- Install a cofferdam or flow-bypass channel before desilting. - Phase desilting upstream to downstream; place spoil on high ground at least 10 m from the canal edge. - Use sediment settling areas and conduct daily upstream and 500 m downstream turbidity checks. - Stop work and restore containment if a sustained plume or threshold exceedance occurs.	Contractor	- Daily turbidity log; Supervision spot-checks. - Indicative threshold: increase not more than 10% over background or 25 NTU above background.	Included in Contractor BoQ / C-ESMP

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Construction	• Spoil or waste deposited in canals, drainage lines or farmland. • Fuel, oil, chemicals, concrete washout and hazardous waste contaminating water or soil.	• Segregate inert, non-inert and hazardous waste and maintain a waste register. • Prohibit spoil/waste in canals, drainage lines and farmland; transport waste weekly to approved disposal locations. • Provide spill kits and secondary containment for fuel/chemicals; remove empty containers within 24 hours. • Manage wastewater/effluent to the ESIA performance standards and remediate spills immediately.	Contractor	• Supervision weekly; PIU monthly. • Waste records, spill logs and disposal receipts; no waste within 10 m of canal edge.	Included in Contractor BoQ / C-ESMP
Pre-construction / construction / close-out	• Unregulated extraction of fill or aggregate. • Erosion, drainage alteration, farmland degradation, standing water and unreinstated borrow pits.	• Approve borrow sites and access agreements before extraction. • Limit extraction to the approved footprint and manage drainage and erosion. • Backfill or contour pits within 7 days after use; remove residual waste and reinstate affected land and vegetation. • Prohibit extraction from sensitive riparian areas unless specifically assessed and authorised.	Contractor / material suppliers	• Supervision inspection before use, during extraction and at closure. • 100% of borrow sites approved and reinstated; zero standing-water depressions after close-out.	Included in Contractor BoQ / supplier contracts
Construction	Construction water use, dust suppression and concrete works may reduce agreed irrigation supply to downstream users.	• Agree construction-water abstraction with canal committees. • Meter or record construction water use where practicable and maintain the signed partial-flow schedule. • Optimise plant operation, logistics and material delivery to reduce fuel use and unnecessary trips.	Contractor	• Daily flow-status log; canal committee verifies supply continuity. • Zero unplanned disruption beyond signed schedule; construction-water records included in monthly report.	Included in Contractor BoQ / C-ESMP
Operation and maintenance	Re-sedimentation may reduce conveyance capacity and increase flood risk.	• Conduct an annual post-Gu inspection of sediment depth, banks and control structures. • Undertake routine desilting annually and trigger major desilting where estimated capacity falls below 75% of design. • Report structural defects immediately and request PIU support where committee capacity is exceeded.	Canal committees; PIU technical oversight	• Annual inspection report; capacity estimate and maintenance records. • Defects repaired within 30 days; major desilting when threshold is reached.	Canal committee resources; PIU emergency fund where required
Operation and maintenance	Upstream contamination may make canal water unsafe for domestic or livestock use.	• Conduct monthly visual checks for discolouration, foam and odour. • Commission annual bacteriological/basic chemical testing and additional testing after complaints or anomalies. • Suspend domestic use, issue an advisory and investigate/remediate where standards are exceeded. • Share results with canal committees and the district water authority.	Canal committees observe; PIU commissions tests	• Visual checks monthly; laboratory testing annually or on complaint. • E. coli 0 CFU/100 mL; turbidity not more than 5 NTU; pH 6.5-8.5.	USD 10,000 - PIU (AfDB-financed)

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Operation and maintenance	Aggregate dry-season abstraction may reduce Shabelle flows below ecological and community minimums, affecting downstream domestic water supply, flood-recession farming, livestock and fisheries.	- Enforce ecological-flow floors: at least 20% of mean flow at all times, 30% during April-October and 40% during January-March. - Install calibrated measuring flumes and, where feasible, automated gates; use rotational abstraction so canals sharing a reach do not draw at peak capacity simultaneously. - Reduce abstraction or close gates when thresholds are breached and phase rehabilitation based on monitored extraction-to-flow ratios. - Coordinate with Jowhar barrage releases once the barrage is commissioned.	PIU / Hirshabelle E&S Officer / canal committees	- Monthly flow monitoring at at least 2 downstream gauges; quarterly household-access survey; annual fish/wetland survey. - Quarterly Downstream Impact Monitoring Report disclosed to FMS and AfDB.	Monitoring equipment within USD 15,000 PIU line; technical assistance under PIU budget
Operation and maintenance	Irrigation intensification may increase pesticide misuse, exposure, water contamination and non-target impacts.	- Implement the project-level Integrated Pest and Vector Management Plan. - Prioritise prevention, cultural and biological controls; use only approved pesticides as a last resort. - Train WUAs and farmers on safe storage, handling, application, PPE, buffers from water and container disposal. - Record and report pesticide incidents through the GRM and P/VMP monitoring system.	PIU P/VMP focal persons / extension services / WUAs	- P/VMP indicators and field forms; quarterly review of pesticide incidents and training records. - No banned products; 100% of project-supported users trained before pesticide use.	Covered under the separate project-level P/VMP budget; not duplicated here
OS4 - Community Health, Safety and Security					
Pre-construction	Mobilisation to locations with unacceptable security conditions may expose workers, communities and supervisors.	- Complete a security assessment for each of the 13 sites and update it before every construction phase. - Coordinate with Hirshabelle State security structures and Balcad District Administration. - Classify sites Green/Yellow/Red under the Security Management Plan; do not mobilise Red sites.	PIU / Contractor	- Signed security clearance per site; continuous incident tracking. - Defer mobilisation where clearance is absent or risk is Red.	USD 19,000 - PIU security risk management line
Construction	Community members, especially children, may enter hazardous work areas or encounter open excavations and unsafe crossings.	- Install physical barriers and Somali-language safety signs at 50 m intervals. - Provide at least one safe pedestrian crossing per 200 m of active works with flagmen at peak periods. - Give 7 days advance notice and deliver child-safety awareness in adjacent communities. - Leave no unguarded open canal or excavation at the end of the working day.	Contractor	- Daily site checks; Supervision weekly. - Barriers, signs and crossings maintained; community complaints and near-misses tracked.	Included in Contractor BoQ / C-ESMP

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Construction / transport	Material transport may cause road accidents, dust, disruption and security exposure through settled corridors.	• Use approved routes and delivery schedules agreed with Balcad District Administration. • Apply speed limits, driver codes of conduct, vehicle checks, dust suppression and safe loading. • Provide traffic marshals near settlements and canal crossings; notify communities of abnormal loads or temporary access changes.	Contractor / drivers	• Vehicle and driver checklists; traffic incidents and complaints reviewed monthly. • Correct unsafe routes or driving immediately; suspend non-compliant drivers.	Included in Contractor BoQ / traffic management plan
Construction	Worker presence may increase SEA/SH risk in canal communities.	• Require all workers to sign a Code of Conduct and complete Day 1 SEA/SH induction plus quarterly refreshers. • Operate a confidential channel managed by the PIU GBV Specialist; do not route cases through male-dominated canal committees. • Provide a female CLO for all 13 canal communities and document survivor-centred referral pathways to Balcad Health Centre and Jowhar Hospital. • Apply sanctions and survivor-centred response without retaliation.	Contractor trains; PIU GBV Specialist oversees	• Monthly verification of codes/training; confidential case monitoring. • All cases referred safely; no unresolved SEA/SH cases in routine GRM statistics.	USD 9,000 service mapping + USD 25,101 female CLO; contractor training in BoQ
All phases	Security incidents may interrupt supervision or harm workers and communities.	• Implement the district-specific Security Management Plan, communication check-ins and defined halt thresholds. • Test evacuation arrangements before mobilisation and avoid attention-attracting project branding. • Require security personnel codes of conduct, proportionality and use-of-force controls. • Suspend or relocate works and undertake PIU-authority review before resumption after a serious incident.	PIU coordinates; Contractor implements	• Continuous reporting; immediate notification and quarterly security summary. • Serious incidents trigger immediate halt and SMP review.	USD 19,000 - PIU security line; contractor obligations in BoQ
Operation and maintenance	Children may drown or suffer injury near operational canals and crossings.	• Maintain fencing at crossings and high-risk sections and inspect safety signs quarterly. • Report and repair hazards within 30 days; conduct annual community water-safety awareness. • Report near-misses and drowning incidents immediately to the Hirshabelle E&S Officer.	Canal committees; PIU verifies	• Quarterly safety inspection report; near-miss and incident log. • Any defect repaired within 30 days; drowning triggers immediate investigation.	PIU / canal committee resources; included in maintenance arrangements
Construction / operation	Stagnant pools, blocked minor channels and borrow pits may increase Anopheles breeding and malaria risk.	• Restore positive drainage, eliminate standing pools and backfill/contour borrow pits within 7 days. • Maintain flow through minor channels and clear excessive margin vegetation. • Train WUA/canal-committee vector focal persons; report increased malaria cases to Balcad District Health Office. • Use WHO-approved Bti only where persistent stagnant water cannot feasibly be drained.	Contractor during works; canal committees / District Health during O&M	• Weekly breeding-site/larval checks during Gu; monthly otherwise. • Number of breeding sites, trained focal persons and reported malaria trends.	PIU P/VMP/vector line and MoH support; contractor restoration in BoQ

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All phases	Delayed or uncoordinated response to accidents, floods, drowning, fire, security events or other serious incidents.	• Maintain emergency contacts, evacuation routes, first aid, rescue equipment and incident forms at every active site. • Notify the PIU immediately under the approved incident protocol; notify AfDB within the binding timeframe in the Financing Agreement/Bank protocol. • Investigate incidents, identify root causes, implement corrective actions and communicate relevant lessons to workers and communities.	Contractor / PIU / Supervision Consultant	• Emergency drill records; incident register and investigation reports. • Zero overdue corrective actions; serious incidents trigger work suspension where necessary.	Included in Contractor BoQ; PIU monitoring/audit budget
OS5 - Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement (Precautionary)					
Pre-construction	Unconfirmed access corridors may cause disputes, crop damage or restriction of access to farmland.	• Confirm the access route, working width and reinstatement protocol in writing with farmers and the canal committee before mobilisation to each reach. • Map temporary access, lay-down, spoil, borrow and storage areas and identify owners, tenants, sharecroppers and seasonal users. • Do not start works where access remains disputed.	Contractor; PIU documents	• Written access confirmation for 13/13 canals before works. • Hirshabelle E&S Officer checks land/access records during site-readiness review.	Contractor BoQ; PIU engagement line
Construction	Project-caused crop, asset or livelihood losses may affect landowners, tenants and sharecroppers.	• Register, verify and value losses at full replacement cost before or promptly after the impact in accordance with the agreed protocol. • Compensate the person who actually bears the loss, including tenant/sharecropper where applicable, with the basis documented. • Process verified claims within 30 days and provide access to the GRM and appeal route.	PIU / Contractor; canal committee supports verification	• Claims register, valuation record, payment evidence and resolution time. • 100% of verified claims paid within 30 days.	USD 30,000 Government counterpart compensation contingency
Construction / close-out	Temporary occupation or access routes may continue to restrict farming after works.	• Limit occupation to the agreed footprint and duration. • Reinstatement access corridors, topography, drainage and productive land immediately after each reach is completed. • Obtain farmer/canal-committee confirmation before reach handover.	Contractor	• Reach-by-reach restoration and handover checklist. • Zero unresolved access or reinstatement grievances at handover.	Included in Contractor BoQ / C-ESMP
All phases	Unanticipated land acquisition, physical displacement, significant economic displacement or access restrictions outside the assessed footprint.	• Stop the affected activity immediately and refer the impact to the PIU and AfDB for OS5 screening and determination. • Do not resume until the required avoidance, compensation, livelihood-restoration or RAP/ARAP measures have been prepared, cleared and implemented.	PIU / AfDB determination	• Incident/referral record and written clearance before resumption. • No works proceed on an unassessed or uncompensated impact.	To be determined if triggered; not included in current estimate
OS6 - Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources (Precautionary)					

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Pre-construction	Final work footprints may disturb riparian vegetation, aquatic habitat or ecosystem services not adequately captured at screening.	• Confirm canal-by-canal excavation extents, riparian vegetation and sensitive aquatic features before mobilisation. • Avoid any natural or critical habitat, protected area or material biodiversity feature identified during verification. • Mark no-go areas and integrate restoration requirements into method statements.	PIU / Hirshabelle E&S Officer / qualified ecologist as needed	• Site screening and photo record before mobilisation. • 100% of active reaches with confirmed footprint/no-go areas.	PIU site-readiness/technical assistance line
Construction	Unnecessary vegetation clearance and bank works may reduce riparian habitat and accelerate erosion.	• Confine works to existing canal footprints and clear only the minimum vegetation required. • Retain riparian buffers where safe; stabilise banks using bioengineering and seed disturbed surfaces within 5 days. • Use hard protection only at hydraulically stressed points where justified by design.	Contractor	• Daily footprint checks; restoration coverage at close-out. • No clearance outside approved footprint; 100% of disturbed bank surfaces stabilised/revegetated.	Included in Contractor BoQ / C-ESMP
Construction / operation	Sediment release, pollution and reduced dry-season flows may affect aquatic habitat, fisheries and floodplain ecosystem services.	• Apply sediment containment, pollution controls and water-quality monitoring. • Enforce ecological-flow floors and adaptive abstraction controls. • Prohibit spoil disposal in riparian/floodplain habitat and restore disturbed margins.	Contractor during works; PIU/canal committees during O&M	• Daily construction water-quality checks; monthly river-flow monitoring. • Annual fish and floodplain-wetland survey in partnership with FAO SWALIM.	Contractor BoQ; PIU monitoring equipment/technical assistance
Construction close-out	Borrow pits, depressions and poorly restored temporary areas may degrade habitat and create vector breeding sites.	• Backfill or contour pits within 7 days, restore drainage and revegetate disturbed areas. • Verify that no stagnant water, waste or contaminated soil remains before handover.	Contractor	• Supervision close-out inspection; photo evidence. • 100% of temporary areas restored and free of standing water.	Included in Contractor BoQ / C-ESMP
Operation and maintenance	Poor maintenance may reduce riparian condition, aquatic function and downstream ecosystem services.	• Maintain positive canal flow, manage margin vegetation without unnecessary habitat removal and repair erosion promptly. • Use annual ecological observations and downstream monitoring to adjust water allocation or maintenance practices where impacts emerge.	Canal committees / PIU / FAO SWALIM	• Annual ecological survey and canal-condition inspection. • Corrective action where fish, wetland or riparian indicators show project-related decline.	PIU monitoring/technical assistance lines
OS7 - Vulnerable Groups					
Pre-construction	Works may disrupt irrigation without adequate participation of tail-end farmers, tenants, sharecroppers, women and other vulnerable users.	• Hold a consultation for each canal to agree timing, duration, partial-flow arrangements, advance notice and compensation procedures. • Document a signed disruption schedule; do not mobilise without agreement. • Use accessible Somali-language information and targeted sessions for women, tenants, IDPs, minority communities and persons with disabilities.	PIU / Balcad District Administration / canal committees	• Signed schedule for 13/13 canals; participation records disaggregated by sex and stakeholder category. • Reconsult where the schedule or design changes.	Community engagement USD 19,000 + disclosure materials USD 9,000

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Construction / operation	Restored flows may be captured by head-end users or landowners, excluding tail-end users, tenants and women.	- Establish an inclusive committee at each canal with head-end and tail-end representation and at least 30% female membership. - Include tenant/sharecropper voice and publicly post allocation rules and schedules. - Undertake PIU oversight visits at 3, 6 and 12 months after commissioning and annually thereafter.	PIU / Hirshabelle E&S Officer; canal committees manage	- Committee composition, monthly meeting records and allocation-grievance trends. - At least 30% female membership and evidence of equitable allocation.	USD 17,500 canal-committee capacity building
All phases	Vulnerable groups may face barriers to information, grievance channels, employment and project benefits.	- Maintain a differentiated engagement and benefit-access plan for women, female-headed households, IDPs, minority communities, landless workers, tenants and persons with disabilities. - Provide female liaison, accessible meeting times/locations, confidential channels and disaggregated monitoring. - Track who participates, receives employment and benefits, raises grievances and receives compensation.	PIU / Hirshabelle E&S Officer / female CLO	- Quarterly disaggregated engagement, employment, GRM and benefit indicators. - Corrective outreach where a group is underrepresented or excluded.	Female CLO USD 25,101; engagement/disclosure lines
Construction	Local youth and women may be excluded from employment, creating conflict and lost development benefits.	- Publish transparent recruitment criteria before mobilisation. - Prioritise qualified local labour for unskilled and semi-skilled roles and women for suitable administrative, liaison and supervisory roles. - Prohibit discrimination and use the GRM/worker GRM to address recruitment concerns.	Contractor / PIU oversight	- Monthly recruitment statistics by sex, age group, skill and community. - Recruitment grievances reviewed and resolved under published criteria.	Included in Contractor contract administration
Construction	Compensation may be captured by landowners although tenants or sharecroppers bear the crop loss.	- Identify the actual bearer of the crop or livelihood loss and document tenure/use arrangements. - Record agreement between owner and tenant/sharecropper and pay the eligible affected person at full replacement cost. - Provide confidential and accessible appeal channels.	PIU / Contractor / canal committee supports verification	- Claimant category recorded; payment evidence and grievance outcome. 100% of verified claims paid to the eligible affected party.	USD 30,000 compensation contingency
OS8 - Cultural Heritage (Precautionary)					
Pre-construction / construction	Earthworks may encounter previously unknown archaeological, religious or culturally important material.	- Brief workers on the Chance Finds Procedure and post it at every site. - Stop work immediately; secure a 20 m radius and photograph the find in situ. - Notify the PIU within 4 hours and the responsible cultural authority within 24 hours. - Do not remove, disturb or resume work until written clearance is issued.	Contractor; PIU coordinates the authority	- Induction records and chance-find register. - All finds protected and works resumed only after written clearance.	Included in Contractor BoQ / Appendix 9.4 procedure
OS9 - Financial Intermediaries					

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Not applicable	The Hirshabelle component is a public-sector irrigation infrastructure operation and does not involve a financial intermediary.	No OS9-specific mitigation or monitoring measures are required. Continue to screen any future design or financing changes for relevance.	PIU	Confirm continued non-applicability during project changes.	No cost
OS10 - Stakeholder Engagement and Information Disclosure					
Pre-construction	Stakeholders may not receive timely, understandable information or may be unable to influence works timing and mitigation.	• Implement the project-level SEP and the Hirshabelle engagement schedule across all 13 canals. • Disclose project scope, timing, risks, mitigation, land-access arrangements, GRM channels and water-allocation rules in Somali and accessible formats. • Document notices, meetings, attendance, issues raised, project responses and commitments.	PIU / Hirshabelle E&S Officer / female CLO	• Consultation and disclosure records; participation disaggregated by sex and group. • Engagement before mobilisation and whenever design/schedule changes.	USD 19,000 community engagement + USD 9,000 disclosure materials
Pre-construction	No accessible grievance channel before works or confidential pathway for sensitive complaints.	• Establish and test a hotline, suggestion boxes, community liaison contacts and canal-committee/village-elder intake at all 13 canals. • Publicise procedures and timelines; confirm confidential SEA/SH channel managed by the PIU GBV Specialist and female CLO. • Do not mobilise until the GRM is operational.	PIU / Hirshabelle E&S Officer	• Operational-channel test, awareness records and grievance database. • All grievances acknowledged within 48 hours; standard cases resolved within 30 days.	USD 10,000 GRM operation; female CLO and SEA/SH lines separate
Construction	Unannounced works or deviations from agreed disruption schedules may damage livelihoods and erode trust.	• Provide written notice at least 2 weeks before canal disruption and 7 days before each active work reach. • Communicate daily flow status to the canal committee and hold bi-monthly community meetings plus quarterly district coordination meetings. • Record and explain any change to schedule, access or mitigation; restore partial flow immediately after an unplanned interruption.	Contractor / PIU / canal committees	• Daily flow communication log; meeting minutes and notice records. • Zero unplanned disruptions; deviations corrected within 24 hours.	Contractor BoQ; PIU engagement line
Operation and maintenance	Community complaints, water-allocation disputes or maintenance concerns may remain unresolved after handover.	• Maintain GRM channels throughout O&M and review cases monthly. • Resolve water-allocation complaints within 15 working days and escalate unresolved cases to PIU governance structures. • Report GRM performance quarterly to AfDB without disclosing confidential SEA/SH details.	Hirshabelle E&S Officer / PIU / canal committees	• Number, type, resolution rate and average closure time. • At least 80% resolved within 30 days; all allocation cases within 15 working days.	USD 10,000 GRM line supports project-life operation

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Operation and maintenance	Opaque water-allocation decisions and downstream monitoring may fuel conflict or exclude affected users.	- Publicly post canal allocation rules, operating schedules and committee contacts at each intake. - Disclose quarterly downstream-flow and community water-access monitoring summaries in accessible form. - Use feedback and grievance trends to revise schedules and targeted engagement.	PIU / canal committees / Hirshabelle E&S Officer	- Posted rules verified during oversight visits; disclosure records and grievance-trend analysis. - Corrective consultation where monitoring shows inequity or flow-floor breach.	Committee capacity USD 17,500; monitoring/disclosure lines
All phases	Incomplete engagement and grievance records may prevent accountability and evidence-based corrective action.	- Maintain a stakeholder register, consultation log, commitments register, grievance database and evidence of feedback to stakeholders. - Include engagement, grievance, compensation and vulnerable-group indicators in monthly PIU and quarterly AfDB reports. - Protect personal and sensitive information and keep SEA/SH case data confidential.	PIU / Hirshabelle E&S Officer	- Monthly record review; quarterly performance reporting and annual audit. - No overdue commitments or unresolved record gaps.	PIU engagement/GRM/audit budget lines

TABLE 3: CONSOLIDATED INDICATIVE ESMP BUDGET

COST ITEM	TOTAL (USD)	FUNDING SOURCE
Community engagement - 13 canal sites	19,000	PIU (AfDB-financed)
GRM operation - hotline, suggestion boxes and database	10,000	PIU (AfDB-financed)
Pre-works hydrological and geotechnical assessment	15,000	PIU (AfDB-financed)
Canal committee capacity building and training	17,500	PIU (AfDB-financed)
Water quality monitoring	10,000	PIU (AfDB-financed)
Emergency maintenance fund - Shabelle flood damage	32,000	Government counterpart
Female Community Liaison Officer - Hirshabelle	25,101	PIU (AfDB-financed)
Crop/livelihood compensation contingency	30,000	Government counterpart
Disclosure and consultation materials	9,000	PIU (AfDB-financed)
Annual E&S audit and independent verification	20,000	PIU (AfDB-financed)
Security risk management and implementation support	19,000	PIU (AfDB-financed)
SEA/SH service mapping and referral pathway	9,000	PIU (AfDB-financed)
Monitoring equipment - gauges, meters, GPS and field kits	15,000	PIU (AfDB-financed)
Subtotal	230,601	
Contingency (10%)	23,061	

COST ITEM	TOTAL (USD)	FUNDING SOURCE
TOTAL INDICATIVE ESMP BUDGET	253,662	Excludes contractor ESHS BoQ costs and separate project-level P/VMP costs

9.3.4. Land Access Protocol

While OS5 is not triggered based on screening (no involuntary land acquisition or physical displacement anticipated), a Land Access Protocol applies to all Hirshabelle canal sites: all temporary land access arrangements confirmed in writing before works; access corridor width agreed with farmers and canal committee; any project-caused crop damage compensated at full replacement cost within 30 days; land-related grievances resolved within 15 working days through the GRM; and any activity resulting in physical displacement or greater than 10% loss of a household's productive capacity triggers immediate PIU referral for OS5 determination and works suspension pending AfDB determination. Given the prevalence of tenancy and sharecropping in Balcad, compensation processes must identify and compensate the party actually bearing the crop loss — tenant or owner — with both parties' agreement documented.

9.3.5. SEA/SH prevention and response

Given the heightened risk of SEA/SH in construction environments near farming communities and the existing GBV vulnerability in Hirshabelle, the following specific measures apply to all 13 Hirshabelle canal sites:

- All workers — including drivers, security staff, and subcontractors — sign an individual Code of Conduct before commencing work, explicitly prohibiting SEA/SH with defined disciplinary consequences (immediate suspension pending investigation; dismissal if substantiated; reporting to law enforcement for criminal acts).
- A dedicated, confidential SEA/SH reporting channel is established before mobilisation, managed exclusively by the PIU Social/GBV Specialist. No disclosure to the Contractor, canal committees, Balcad District Administration, or Hirshabelle State authorities.
- A female Community Liaison Officer is assigned at Hirshabelle state level, physically accessible to all 13 canal communities and contactable by mobile phone throughout the project.
- Survivor-centred response procedures are in place before mobilisation: referral pathways to Balcad District Health Centre (primary) and Jowhar Hospital (tertiary referral) documented and shared with the female CLO; pathways confirmed operational before mobilisation.
- The PIU GBV Specialist reviews the SEA/SH GRM channel monthly. Any confirmed SEA/SH incident triggers: immediate investigation; disciplinary action per Code of Conduct; referral of survivor to support services; AfDB notification within 24 hours.
- Male-dominated community structures (including canal committees and traditional leaders) must not be involved in handling SEA/SH complaints — all SEA/SH cases are handled exclusively through the PIU confidential channel.
- Worker accommodation (if required) must be located away from community residential areas to reduce contact-related risk; contractor accommodation standards include separation of sleeping quarters by gender and secure personal storage.

9.4. Environmental and social clauses for procurement and contracts

The environmental and social obligations in this ESMP are given contractual force through the procurement documents and works contracts, so that compliance is a condition of payment and of continued engagement rather than a matter of goodwill. The following clauses and requirements are incorporated.

- Contractor ESMP requirement. A Contractor ESMP (C-ESMP) is required for each works contract or lot, with canal- and site-specific annexes and activity-specific plans, submitted to and approved by the PIU in writing before any on-site activity. Any revision during works requires re-approval. A non-conforming C-ESMP is rejected and returned, and no works proceed until PIU and Bank clearance is given.
- Required contractor plans. The C-ESMP must be accompanied by activity method statements for high-risk tasks; an occupational health and safety plan including the water-safety protocol, flood-alert protocol with defined gauge locations and per-canal suspension thresholds, work suspension criteria, emergency evacuation plan and emergency contacts; a waste management and spill prevention plan; a community health and safety plan; Labour Management Procedures including a worker register, age verification, written contracts and a Workers' GRM; a SEA/SH Code of Conduct and training plan with documented referral pathways; a Security Management Plan; and the Chance Finds Procedure.
- Mobilisation conditions. No mobilisation authorisation is issued for a canal until the PIU site-readiness checklist for that canal is signed off, including agreed and signed disruption schedule, written land access confirmation, security clearance, completed pre-works hydrological and geotechnical assessment, and an operational grievance mechanism.
- Labour and worker protection clauses. Written contracts in a language the worker understands; verified minimum age; a functioning Workers' GRM; day-one induction covering occupational health and safety, water safety, SEA/SH prevention and the Code of Conduct, with signed induction records per worker; local hiring preference for unskilled and semi-skilled roles with transparent, locally advertised recruitment criteria; and welfare provision including drinking water, shade, sanitation and first aid at every work front.
- Code of Conduct. An individual Code of Conduct signed before commencing work by all workers, including drivers, security staff and subcontractors, expressly prohibiting SEA/SH, with defined disciplinary consequences including immediate suspension pending investigation, dismissal if substantiated, and referral to law enforcement for criminal acts.
- Performance and suspension clauses. Defined work-suspension thresholds tied to flood-gauge readings; prohibition on works at any reach without written access confirmation and a signed disruption schedule; prohibition on leaving an unguarded open canal at the end of the working day; and the right of the Supervision Consultant and PIU to issue corrective actions and to suspend works for non-compliance.

- Incident reporting clauses. Contractor reporting of moderate incidents to the PIU within 24 hours and of serious incidents within 4 hours, with written follow-up, cooperation in investigation, and implementation of the resulting corrective action plan.
- Flow-down to subcontractors and suppliers. All of the above obligations, including the Code of Conduct and Labour Management Procedures, flow down to subcontractors and to labour engaged at borrow, spoil and lay-down sites; and no associated facility or support site may be used until it has been screened, permitted, agreed with landowners or communities, and covered by an approved site-specific management plan.
- Reinstatement and handover. Demobilisation of temporary facilities, reinstatement of access corridors to the agreed protocol, backfilling or contouring of borrow pits within seven days, and Supervision Consultant approval of each canal reach before handover to the canal committee.

9.5. Environmental, occupational health and safety requirements (ESHS hold points)

No physical works may begin at any of the 13 Hirshabelle canal sites until all of the following have been submitted to and approved by the PIU in writing:

- Contractor ESMP (C-ESMP) covering all canal work activities at Hirshabelle sites.
- Activity method statements for high-risk tasks: canal earthworks and desilting, bank excavation and stabilisation, control structure installation, culvert works, flood alert monitoring.
- OHS plan including: water safety protocol (life jackets, non-swimmer assessment, rescue drills), flood alert protocol with defined gauge locations and suspension thresholds, work suspension criteria, emergency evacuation plan, and emergency contacts for all 13 sites.
- Waste management plan and spill prevention plan.
- Community health and safety plan (barriers, safety signage, safe pedestrian crossings, community notification protocol).
- Labour management measures per LMP: worker register, age verification, written contracts, Workers' GRM.
- SEA/SH Code of Conduct and training plan; GBV referral pathways documented (Balcad Health Center; Jowhar Hospital).
- Security Management Plan coordinated with Hirshabelle State and Balcad District security structures.
- Chance Finds procedure posted on-site and covered in worker induction.
- Canal disruption schedule agreed with canal committee — signed by committee chairperson.
- Flood alert monitoring protocol with defined gauge locations and suspension thresholds per canal.
- Land access corridor confirmed in writing with farmers and canal committee.

9.6. Stakeholder-engagement measures

The ESIA and ESMP will be disclosed in English and in Somali-language summary form, disseminated through Hirshabelle State authorities, the Balcad District Administration, canal committees, and community

leaders, and posted at project information boards along the canal corridors. Ongoing engagement during construction will include canal committee meetings before and during works on each canal, bi-monthly community meetings at district level, quarterly coordination meetings involving the district administration and community representatives, and continuous access to the GRM for all community members. The Stakeholder Engagement Plan for Hirshabelle is summarised at Appendix 9.1.

9.7. Project-level grievance redress mechanism

A multi-channel Grievance Redress Mechanism (GRM) will be established for the Hirshabelle component before construction commences. Uptake channels will include: community liaison contacts at all thirteen canal sites; a dedicated project hotline accessible by mobile phone; suggestion boxes; and reporting through canal committees and village elders to the district E&S focal point. The escalation pathway follows four levels:

- **Level 1 — Site-level resolution:** contractor and community liaison officer resolve minor issues within 5 business days.
- **Level 2 — PIU and District Authority review:** issues involving repeated safety concerns, access disputes, disruption-schedule deviations, or service complaints are escalated and addressed within 10 business days.
- **Level 3 — Hirshabelle State-level escalation:** disputes requiring administrative decisions are referred to state level within 15 business days.
- **Level 4 — National-level escalation:** unresolved disputes may be referred to PIU governance structures and AfDB recourse options, including the Independent Recourse Mechanism (IRM).

Water allocation complaints follow a dedicated track resolved within 15 working days. SEA/SH complaints are handled exclusively through a confidential channel managed by the PIU's Social/GBV Specialist, using survivor-centred principles and documented referral pathways to Balcad District Health Centre and Jowhar Hospital. GRM performance is tracked monthly by the HIR E&S Officer and reported quarterly to the PIU and AfDB. Full GRM procedures are available on a separate instrument.

9.8. Monitoring and reporting plan

Table 12: Monitoring Plan — Hirshabelle (13 canal sites, construction and O&M phases)

PARAMETER	INDICATOR / METHOD	FREQUENCY	RESPONSIBLE	REPORTING	THRESHOLD / ACTION
Construction ESHS compliance — all 13 sites	ESMP compliance checklist; OHS statistics (LTIFR, fatalities, near-misses); GRM case log	Weekly (Supervision); monthly PIU audit	Supervision / HIR E&S Officer	Monthly to PIU; quarterly to AfDB	Non-compliance triggers corrective action within 48 hours; serious incidents trigger immediate PIU notification and AfDB notification within 24 hours
Flood stage monitoring — active canal works	Shabelle River stage at defined gauge; canal water level at each active work reach	Twice daily during Gu season at all active sites	Contractor with Supervision oversight	Immediate halt trigger if threshold reached	Pre-defined halt stage per hydrological assessment; record all readings in site log
Canal irrigation supply continuity — all 13 canals	Daily flow status vs agreed disruption schedule; crop damage claims log	Daily during active works on each canal	Contractor; canal committee verifies daily	Daily log; deviation triggers corrective action within 24 hours	Zero unplanned disruptions beyond agreed schedule; all disruptions logged
Canal bank condition — during works	Visual inspection of bank stability; evidence of slumping or seepage	Daily during earthworks at each canal reach	Contractor site supervisor	Weekly summary to Supervision; immediate notification of instability	Any bank instability triggers immediate work suspension and engineer assessment before resuming

PARAMETER	INDICATOR / METHOD	FREQUENCY	RESPONSIBLE	REPORTING	THRESHOLD / ACTION
Downstream water quality — during desilting	Turbidity check 500 m downstream of active works; visual observation	Daily during desilting on each canal	Contractor; Supervision spot-checks	Site log; exceedances to PIU within 24 hours	Sustained visible turbidity plume triggers work-method review and corrective action within 24 hours
OHS incidents and near-misses	Number of LTIs; near-misses; fatalities; LTIFR; heat illness incidents; water safety incidents	Continuous; reported within 24 hours	Contractor; Supervision verifies	Immediate PIU notification for serious incidents; monthly summary	Zero fatalities; LTIFR target <5; all incidents investigated within 7 days
GRM performance — construction and O&M	Grievances received; resolution rate; average resolution time; SEA/SH referrals	Monthly case tracking throughout project	HIR E&S Officer	Monthly GRM summary to PIU; quarterly to AfDB	≥80% resolved within 30 days; zero unresolved SEA/SH cases; all allocation complaints resolved within 15 working days
Canal committee inclusivity — post-commissioning	% female membership; attendance records; allocation dispute log; meeting frequency	PIU oversight visits at 3, 6, 12 months; annually thereafter	PIU / HIR E&S Officer	Oversight report per visit; quarterly AfDB report	≥30% female membership; equitable allocation evidenced by GRM trends; monthly meetings held
Canal condition — O&M phase	Sediment depth; bank condition; control structure function; estimated conveyance capacity as % of design	Annual post-Gu season inspection	Canal committee primary; PIU technical oversight	Annual inspection report; desilting triggered at <75% capacity	Structural defects repaired within 30 days; major desilting when triggered
Child safety near canals — O&M	Canal fencing and signage condition; near-miss or drowning incidents	Quarterly inspection by canal committee; PIU verification	Canal committee; PIU verifies	Quarterly safety inspection report	Any defect repaired within 30 days; drowning triggers immediate investigation and PIU notification
Water quality — O&M	Bacteriological (E. coli, total coliforms); basic chemical; turbidity	Visual monthly; laboratory annually or on complaint	Canal committee observes; PIU commissions lab tests	Test results to PIU and Balcad District Water Dept	Any E. coli detection triggers investigation within 14 days
Security incidents	Type and number of incidents affecting project activities; work suspensions	Continuous; reported as they occur	Contractor; PIU	Immediate PIU notification; quarterly security summary to AfDB	Serious incidents trigger immediate halt and SMP review
Downstream river flow and community water access	Shabelle flow at ≥2 automated gauge stations below the intake zone; e-flow compliance vs seasonal threshold; quarterly household water-access survey (~200 downstream households, disaggregated by gender and age); annual fish and floodplain-wetland survey	Monthly flow; quarterly household survey; annual ecological survey — in partnership with FAO SWALIM	PIU Social Safeguards & Water Management Specialists; FAO SWALIM	Quarterly Downstream Impact Monitoring Report to FMS and AfDB; publicly disclosed	Flow below the seasonal e-flow floor triggers abstraction reduction / gate closure under the adaptive-management protocol and immediate PIU notification

The following numeric performance standards and thresholds apply across the mitigation and monitoring matrices above. They are derived from the project's technical studies and from national standards and Good International Industry Practice (GIIP) — principally the IFC/World Bank Group Environmental, Health and Safety (EHS) Guidelines, the WHO Guidelines for Drinking-water Quality, and the AfDB ISS 2023. Site-specific values (flood-suspension stage, bank batter, and canal allocation shares) are fixed in the detailed design and canal-specific studies and will be transcribed into each Contractor ESMP.

Table 13: Numeric Performance Standards and Thresholds — Hirshabelle

PARAMETER	NUMERIC THRESHOLD / STANDARD	BASIS / SOURCE
Downstream environmental flow	≥20% of mean flow at all times; ≥30% Apr–Oct; ≥40% Jan–Mar dry season	Tennant/Tessmann method; §8.6
In-stream turbidity (desilting)	Increase ≤10% over upstream background (indicative ≤25 NTU above background) 500 m downstream	GIIP surface-water guidance
Camp / works effluent	pH 6–9; TSS ≤50 mg/L; BOD ₅ ≤30 mg/L; oil & grease ≤10 mg/L	IFC EHS General Guidelines
Domestic-use canal water	E. coli 0 CFU/100 mL; turbidity ≤5 NTU; pH 6.5–8.5	WHO Drinking-water Quality Guidelines
Community noise	≤55 dB(A) day / ≤45 dB(A) night at residential receptors	IFC EHS Guidelines
Dust (PM ₁₀)	24-hour mean ≤50 µg/m ³ at nearest receptor	WHO interim target
Flood work-suspension stage	Canal-specific gauge stage set by hydrological assessment; twice-daily reading in Gu	Site hydrology; Table 10
Excavated bank stability	Batter no steeper than geotechnically specified (≤1V:1.5H pending geotechnical output); max unsupported height per geotechnical assessment	Geotechnical study; GIIP
Occupational health & safety	LTI/FR <5 per 200,000 hours; zero fatalities; 100% PPE compliance	IFC EHS; Somali Labour Code 1972
Grievance resolution	≥80% resolved ≤30 days; allocation complaints ≤15 working days; SEA/SH acknowledged ≤24 h	AfDB ISS OS10; §9.4
Water allocation equity	Tail-end delivery ≥ design share; zero unresolved allocation disputes per irrigation cycle	8.4.1
Vector / larval control	Zero water-trapping depressions within 5 m of works at day's end; borrow pits backfilled ≤7 days; Bti only where undrainable	P/VMP; WHO
Spoil / waste setback	Spoil ≥10 m from canal edge; no spoil or waste in canal, drainage, or farmland	Table 10; EPMA 2024
Chance finds	Stop work; secure 20 m radius; notify PIU ≤4 h, authority ≤24 h	Appendix 9.4

These mitigation and monitoring matrices apply to every canal and works lot and to each project phase, and are transcribed - with canal-specific values (flood-suspension stage, bank batter, allocation shares, and disruption schedule) — into the Contractor ESMP for each lot. All measures, numeric thresholds, and monitoring requirements set out above shall be incorporated into the detailed engineering designs, technical specifications, Bills of Quantities (BoQ), bidding documents, and works contracts. Compliance with the ESMP and the approved C-ESMP is a condition of interim payment certification: the Supervision Consultant certifies ESHS compliance for each payment period, and non-compliance or unclosed corrective actions may result in withholding of the corresponding payment. Each cost is carried either in the ESMP budget (Table 17) or as a measured or lump-sum ESHS item in the contractor's BoQ.

9.9. Institutional arrangements

Table 14: Roles and Responsibilities — Hirshabelle ESMP

Actor	Key Responsibilities — Hirshabelle ESMP	Reporting
PIU (MoAI)	Overall ESMP ownership; approve Contractor C-ESMP and all pre-works plans; monthly audits; manage serious incidents (fatalities, SEA/SH, major flooding); consolidate quarterly safeguards reports to AfDB; coordinate with Hirshabelle State authorities; manage compensation framework for crop losses	Reports to AfDB; responsible to MoAI
Galmudug/Hirshabelle Officer (shared)	E&S Day-to-day oversight of all 13 canal sites; weekly site inspections; GRM management; canal committee oversight and support; security monitoring; disruption schedule compliance verification; monthly reports to PIU; coordinate with Balcad District Administration	Reports to PIU Environmental Specialist
Hirshabelle State Ministry of Agriculture	Environmental permits and regulatory oversight; joint monitoring missions; canal water allocation governance support; WUA/canal committee registration support	Independent oversight; coordinate with PIU
Balcad District Administration	Canal site access coordination; farmer and canal committee liaison; security coordination; flood alert communication support; local dispute resolution support	Coordinate with PIU and HIR E&S Officer
Contractors	Implement all construction-phase ESMP measures; dedicated ESHS officer for Hirshabelle; C-ESMP and all required plans submitted and approved before mobilisation; worker induction Day 1 (all workers); flood gauge monitoring twice daily; irrigation disruption management; incident reporting within 24 hours (moderate) or 4 hours (serious)	Reports to Supervision Consultant and PIU
Supervision Consultant	Weekly site inspections all 13 canals; flood alert monitoring and response verification; ESMP compliance verification; corrective action issuance and tracking; weekly reports to PIU; approve each canal reach before handover to canal committee	Reports to PIU
Canal Committees / WUAs (13 canals)	Day-to-day canal operation; water allocation per documented schedule; annual desilting; flood damage inspection and reporting; GRM complaint reporting; monthly meeting records; quarterly child safety inspection; malaria prevention	Supported by PIU; accountable to canal user communities
AfDB	Oversight and supervision missions; review quarterly safeguards reports; approve ESMP; require corrective action; IRM access for unresolved community grievances	External safeguards oversight

9.9.1. Incident management and reporting

Minor incidents: first aid cases, minor spills, minor GRM complaints — documented by the Contractor within 24 hours; resolved at site level with record in the site register; reported in the next monthly PIU safeguards summary.

Moderate incidents: medical treatment cases, significant spills, major GRM complaints, security incidents, unplanned irrigation supply disruptions beyond the agreed schedule, failed flood alert response — reported to the PIU within 24 hours by phone, followed by a written report within 48 hours; the PIU investigates and tracks corrective action to close-out.

Serious incidents: lost time injuries, fatalities, major pollution events, SEA/SH allegations, flooding of active work areas, serious canal bank collapses, serious security incidents — reported to the PIU immediately (within 4 hours); the PIU notifies AfDB within 24 hours; formal investigation commenced within 48 hours; corrective action plan submitted to AfDB within 10 business days.

All incidents are recorded in the Hirshabelle incident register maintained by the HIR E&S Officer and included in quarterly reporting to AfDB. Any unplanned canal irrigation supply disruption beyond the agreed schedule is treated as a Moderate incident and reported to the PIU within 24 hours.

Protocol alignment: the notification, investigation, and corrective-action timelines above are minimum commitments; where the Financing Agreement or the AfDB's final incident-reporting protocol sets shorter or more stringent requirements, those requirements prevail, and this section will be updated to align with the protocol issued for the project.

Security management: security arrangements follow a documented Security Management Plan that incorporates a security personnel code of conduct, pre-deployment and refresher training, and explicit proportionality and use-of-force provisions consistent with international good practice; the PIU monitors the conduct of security providers and records, reports, and investigates any security-related incident under the serious-incident procedure above.

9.10. Institutional capacity assessment

The capacity of the institutions responsible for implementing this ESMP has been assessed, because several of the arrangements at Section 9.9 depend on capability that is either newly created or currently shared.

Existing implementation capacity. MoAI is the borrower's implementing ministry and hosts the BBS PIU, which carries the project's safeguards function and has prepared the screening, assessment and management instruments for this component. AfDB provides external supervision, review and approval. The Supervision Consultant provides independent verification capability that does not depend on state resources. At community level, canal committees and water user groups exist in some form on most of the thirteen canals and already carry out annual desilting and day-to-day allocation, so the operational function being handed over is not wholly new.

Capacity limitations. First, state-level capacity in Hirshabelle for environmental permitting, inspection and enforcement is nascent and constrained by resources and security conditions, so only regulatory oversight can be relied upon as an independent check. Second, canal committees are in most cases informal, are not

uniformly inclusive of tail-end users, tenant farmers or women, and have no experience of operating documented allocation schedules, keeping meeting records or handling grievances — yet the durability of the project's principal benefit depends on them.

Required staffing and institutional strengthening. The arrangements provide for: a dedicated ESHS officer assigned by each contractor to the Hirshabelle works; a female Community Liaison Officer accessible to all thirteen canal communities, funded through the ESMP budget; a PIU Social/GBV Specialist managing the confidential SEA/SH channel; and weekly independent supervision. Where the shared Environmental and Social Officer arrangement proves insufficient once multiple work fronts are active, the PIU should provide dedicated Hirshabelle coverage. Institutional strengthening is delivered through the training plan at Section 9.11 — committee governance and operation and maintenance training at all thirteen canals before commissioning with six-month refreshers, GRM operation training for the Environmental and Social Officer and district focal points, and ESMP implementation training for PIU, supervision and contractor ESHS staff — and through joint monitoring missions with the Hirshabelle State Ministry of Agriculture, which build state-level exposure to ISS 2023 practice.

Technical assistance. Specialist technical assistance is procured for the pre-works hydrological and geotechnical assessment across all thirteen canals, for the annual independent environmental and social audit, and, as recommended at Section 7.5, for a scheme-level water-accounting study. Given the assessed capacity limitations, the budget at Section 9.13 deliberately prioritises capacity building and independent supervision over other lines.

9.11. Capacity development and training

Table 15: Capacity Building and Training Plan — Hirshabelle

Training Topic	Target Participants	Key Content	Frequency	Responsible
ESMP implementation and reporting	PIU, HIR E&S Officer, Supervision, Contractor ESHS officers	ESMP obligations, hold points, reporting templates, corrective action tracking, canal-specific protocols, flood alert system	Start-up; quarterly refreshers	PIU with Supervision
Water safety and drowning prevention	All canal workers; supervisors	Non-swimmer assessment procedure, life jacket fitting and use, throw rope and lifebuoy operation, emergency rescue drill, flood alert response, no-lone-working protocol	Day 1 induction; monthly refresher; repeated pre-each canal phase	Contractor; Supervision verifies
Flood alert and emergency response	Contractor supervisors, HIR E&S Officer, Supervision	Gauge reading and recording, work suspension thresholds per canal, evacuation routes, equipment removal from canal at end of day, emergency contacts, incident reporting	Before Gu season works; repeat pre-Deyr	Contractor; PIU validates protocol
Canal bank excavation safety	Excavation crew and supervisors	Bank slope stability theory, phased cutting procedure, compaction requirements, maximum unsupported face height, emergency bank repair, geotechnical assessment interpretation	Before bank works at each canal	Contractor; Supervision verifies
OHS — heat stress and site safety	All construction workers	Heat stress prevention, 3L water rule, PPE requirements, first aid, incident reporting procedure, emergency response plan and hospital routes	Day 1 induction; monthly toolbox talks	Contractor
SEA/SH prevention and response	All workers; CLO; PIU GBV Specialist	Code of Conduct, SEA/SH definitions, confidential reporting channel, survivor-centred response, referral pathways to Balcad Health Center and Jowhar Hospital	Day 1 induction; quarterly refreshers	PIU GBV Specialist
Canal committee governance and O&M	Canal committee members (all 13); Balcad District water focal points	Inclusive allocation rules, control structure operation schedule, annual desilting protocol, flood damage reporting, child safety inspection, GRM operation, monthly meeting recording, malaria prevention	Before commissioning each canal; 6-month refresher	PIU with district support
GRM operation and grievance handling	HIR E&S Officer, district focal points, community liaison officers	GRM channels, intake procedure, documentation, timelines, escalation process, allocation complaint track, SEA/SH confidential handling	Start-up; quarterly refreshers	PIU
Security awareness for field teams	PIU, Supervision, contractor supervisors	Security assessment process, incident reporting protocol, communication check-ins, halt threshold criteria, coordination with Hirshabelle security structures	Start-up; update before each phase	PIU
Malaria prevention near canals	Canal committee members; construction workers in O&M training	Identifying stagnant water breeding sites, vegetation management at canal margins, mosquito lifecycle awareness, reporting protocol to district health, community health messaging	Before commissioning; annual O&M review	PIU with Balcad District Health Office

9.12. Implementation schedule

Table 16: Implementation Schedule and Reporting Calendar — Hirshabelle

Activity	Timing / Trigger	Responsible	Output
Pre-works hydrological and geotechnical assessment — all 13 canals	At least 6 weeks before mobilisation	PIU / Technical Consultant	Assessment report per canal cluster
Security assessment — all 13 sites	Before issuing mobilisation authorisation	PIU / Contractor	Signed security clearance per site
Canal disruption schedule consultation — all 13 canals	Before any mobilisation on each canal	PIU / District Admin / Canal Committee	Signed disruption schedule per canal
Contractor ESHS plans approved	Before any on-site mobilisation	PIU reviews; approves in writing	Written approval notification
GRM establishment — Hirshabelle	Before mobilisation in Balcad District	PIU / HIR E&S Officer	Operational GRM with confirmed channels; female CLO confirmed
Worker induction — OHS, water safety, SEA/SH, Code of Conduct	Day 1 of employment for each worker	Contractor; Supervision verifies	Signed induction records per worker
Flood gauge installation — all active canal sites	Before works begin in Gu season window	Contractor	Gauges installed; baseline readings commenced
Weekly site inspections — all active canal sites	Weekly during all active construction	Supervision Consultant	Weekly site inspection report to PIU
Monthly PIU audit — Hirshabelle	Monthly during construction	PIU / HIR E&S Officer	Monthly safeguards audit report
Canal committee formation and training — each canal	Before commissioning of each canal	PIU / HIR E&S Officer	Committee records and training documentation
Commissioning inspection and sign-off — each canal	Before handover to canal committee	Supervision Consultant / PIU	Commissioning report per canal
Quarterly safeguards reports to AfDB	Quarterly throughout project	PIU compiles	Quarterly safeguards report
Canal committee oversight visits	3, 6, 12 months after commissioning; annually	PIU / HIR E&S Officer	Oversight visit report per visit
Annual canal condition inspection — O&M	Post-Gu season annually	Canal committee with PIU oversight	Annual canal inspection report

9.13. Cost estimates and sources of financing

The indicative ESMP budget for the Hirshabelle component is presented below, updated to the 13-canal scope. The Galmudug/Hirshabelle E&S Officer budget is shared 50/50 between Galmudug and Hirshabelle. Contractor ESHS costs (C-ESMP, ESHS officer, OHS plan, water safety equipment, life jackets, rescue gear, flood gauges, PPE, waste management) are funded through works contracts and are additional to the amounts below.

Table 17: Indicative ESMP Budget — Hirshabelle (USD)

Cost Item	Year 1	Year 2	Year 3	Year 4	Total	Funding Source
Community engagement — Balcad District (13 canal sites)	6,000	5,000	4,000	4,000	19,000	PIU (AfDB-financed)
GRM operation — Hirshabelle (hotline, suggestion boxes, database)	3,500	2,500	2,000	2,000	10,000	PIU (AfDB-financed)
Pre-works hydrological and geotechnical assessment — 13 canals	15,000	—	—	—	15,000	PIU (AfDB-financed)
Canal committee capacity building and training — 13 committees	9,000	4,500	2,500	1,500	17,500	PIU (AfDB-financed)
Water quality monitoring — 13 canals × annual sampling	2,500	2,500	2,500	2,500	10,000	PIU (AfDB-financed)
Emergency maintenance fund — Shabelle flood damage	8,000	8,000	8,000	8,000	32,000	Government counterpart
Female CLO — Hirshabelle (partial cost)	6,000	6,180	6,365	6,556	25,101	PIU (AfDB-financed)

Cost Item	Year 1	Year 2	Year 3	Year 4	Total	Funding Source
Crop compensation contingency — project-caused crop and livelihood losses	12,000	10,000	4,000	4,000	30,000	Government counterpart
Information disclosure and consultation materials (translation, printing, radio)	3,000	2,000	2,000	2,000	9,000	PIU (AfDB-financed)
Annual E&S audit and independent verification	5,000	5,000	5,000	5,000	20,000	PIU (AfDB-financed)
Security risk management and implementation support	6,000	5,000	4,000	4,000	19,000	PIU (AfDB-financed)
SEA/SH service mapping and survivor referral pathway	4,000	2,000	1,500	1,500	9,000	PIU (AfDB-financed)
Monitoring equipment (flow gauges, EC meters, GPS, field kits)	10,000	2,000	1,500	1,500	15,000	PIU (AfDB-financed)
Subtotal	90,000	54,680	43,365	42,556	230,601	
Contingency (10%)	9,000	5,468	4,337	4,256	23,061	
TOTAL (indicative)	99,000	60,148	47,702	46,812	253,662	

All amounts are indicative and expressed in United States dollars (USD), the project's operating currency; unit rates and quantities for each line will be fixed against the detailed-design Bill of Quantities, with Somali shilling equivalents applied at the prevailing rate at the time of expenditure. The funding-source classification distinguishes PIU (AfDB-financed) lines from Government counterpart lines (crop compensation and emergency flood maintenance) and is indicative pending confirmation in the Financing Agreement; Contractor ESHS costs are carried separately in the works-contract Bills of Quantities and are additional to this table.

9.14. ESMP implementation matrix

The ESMP implementation matrix consolidates the mitigation, monitoring, institutional and budget provisions of this ESMP into a single tracking instrument, assigning to each measure a unique code, the impact addressed, the measure, the deadline, the cost and funding source, the key performance indicator, the implementing party and the monitoring party. It is maintained by the Hirshabelle Environmental and Social Officer, reviewed at each monthly PIU audit, and reported in the quarterly safeguards report to AfDB. The matrix below records the principal measures; the full measure set is given in the mitigation matrices at Sections 9.3.1 to 8.3.3 and the monitoring matrix at Section 9.8, from which the matrix is populated and to which each code refers.

Table 18: ESMP Implementation Matrix — Hirshabelle

Code	Impact	Measure	Deadline	Cost / source	KPI	Implementation	Monitoring
HIR-01	Mobilisation without confirmed readiness	PIU site-readiness checklist signed for each canal (access, signed disruption schedule, security	Before mobilisation on each canal	PIU line — engagement	100% of canals mobilised only after signed checklist	PIU / HIR E&S Officer	PIU monthly audit

Code	Impact	Measure	Deadline	Cost / source	KPI	Implementation	Monitoring
		clearance, pre-works assessment, approved C-ESMP)					
HIR-02	Works without hydraulic or geotechnical basis	Pre-works hydrological and geotechnical assessment — design flows, flood-stage thresholds, low-flow window, bank soils per canal	At least 6 weeks before mobilisation	USD 15,000 — PIU (AfDB)	Assessment report completed for 13/13 canals	PIU / Technical Consultant	Supervision Consultant
HIR-03	Irrigation supply disruption to downstream farmers	Signed canal-specific disruption schedule; partial flows via cofferdam/bypass; 2 weeks written notice; compensation at full replacement cost within 21–30 days	Schedule before mobilisation; flows throughout works	Contractor BoQ; USD 30,000 compensation contingency	100% of canals with signed schedule; zero unplanned disruptions; 100% claims paid within 30 days	Contractor / PIU	Daily verification; Supervision weekly
HIR-04	Sediment release during desilting	Cofferdam or flow bypass at active reaches; spoil on high ground ≥ 10 m from canal edge; daily downstream turbidity checks	Throughout desilting	Contractor BoQ	100% of desilting days with turbidity check recorded	Contractor	Supervision weekly; PIU monthly
HIR-05	Canal bank collapse during excavation	Per-canal geotechnical assessment; phased bank cutting to defined maximum unsupported face; immediate compaction; seeding within 5 days	Before and during bank works at each canal	Contractor BoQ	Zero bank collapse incidents; seeding within 5 days at 100% of reaches	Contractor	Supervision weekly
HIR-06	Flooding of active work areas	Earthworks confined to low-flow windows; flood gauges at every active reach; twice-daily readings in Gu; per-canal suspension thresholds; end-of-day equipment removal	Throughout construction	Contractor BoQ (gauges)	100% of active reaches with twice-daily readings; zero unsuspended threshold exceedances	Contractor	Supervision weekly; PIU monthly
HIR-07	Worker drowning	Non-swimmer assessment; life jackets within 3 m of active	Before and during canal-adjacent works	Contractor BoQ	Zero drownings; 100% of canal-adjacent workers assessed	Contractor	Supervision weekly

Code	Impact	Measure	Deadline	Cost / source	KPI	Implementation	Monitoring
		canals; throw rope and lifebuoy at every work front; no lone working; rescue drills each canal phase					
HIR-08	Occupational heat stress and site hazards	3 L water per worker per hour; no heavy work 11:00–15:00; shaded rest; PPE; daily toolbox talks; trained first responders; documented hospital routes	Throughout construction	Contractor BoQ	LTIFR; zero fatalities; zero heat-stress hospitalisations	Contractor	Supervision weekly; quarterly OHS report
HIR-09	Community safety near works	Barriers at open sections; Somali signage at 50 m; safe crossings every 200 m with flagmen; 7-day advance notice; school awareness sessions; no unguarded open canal overnight	Throughout construction	Contractor BoQ	Zero community safety incidents; 100% reach compliance at weekly inspection	Contractor	Supervision weekly
HIR-10	SEA/SH risk from worker presence	Individual Codes of Conduct; day-1 induction and quarterly refreshers; confidential channel via PIU GBV Specialist; female CLO; survivor-centred referral pathways; accommodation away from residential areas	Channel before mobilisation; measures throughout	USD 9,000 — PIU (AfDB)	100% workers signed CoC; 100% SEA/SH cases via confidential channel	Contractor / PIU GBV Specialist	PIU GBV Specialist monthly
HIR-11	Land access and crop disturbance	Written access corridor agreement with farmer and canal committee before mobilisation; reinstatement protocol; compensation at replacement cost within 30 days	Before works on each reach	Contractor BoQ; compensation contingency	100% of reaches with written access confirmation	Contractor / PIU	Supervision weekly; PIU monthly
HIR-12	Inequitable water allocation in operation	Inclusive canal committee at each canal — head-end/tail-	Before commissioning of each canal	USD 17,500 — PIU (AfDB)	13/13 committees formed, verified and	PIU / HIR E&S Officer	Oversight visits at 3, 6, 12 months and annually

Code	Impact	Measure	Deadline	Cost / source	KPI	Implementation	Monitoring
		end representation, minimum 30% female membership; documented allocation schedule posted at intake; 15-working-day allocation grievance track			trained before commissioning		
HIR-13	Dry-season downstream flow reduction	Environmental-flow floors — 20% of natural flow at all times, 30% April–October, 40% January–March; rotational abstraction scheduling; calibrated flumes; dry-season abstraction monitoring; category revalidation trigger	From commissioning; monitoring each dry season	PIU line — monitoring equipment	Dry-season abstraction within applicable e-flow floor	PIU / canal committees	PIU with FAO SWALIM; quarterly report
HIR-14	Canal re-sedimentation and flood damage	Annual post-Gu inspection and desilting by committee; major-desilting trigger below 75% of design conveyance; post-flood inspection within 5 days; emergency repair fund activated within 14 days	Annually and after flood events	USD 32,000 — government counterpart	Annual inspection completed on 13/13 canals	Canal committees / PIU	PIU annual oversight
HIR-15	Malaria risk near canal water	WUA Vector Management Focal Person; monthly canal-margin inspection; source reduction and positive drainage; borrow pits backfilled within 7 days; Bti only where drainage infeasible; district health coordination	Monthly; weekly in Gu peak	PIU line — capacity building	Number of breeding sites eliminated; 100% borrow pits backfilled within 7 days	Canal committees / Contractor	HIR E&S Officer monthly; quarterly P/VMP report
HIR-16	Grievances unresolved or inaccessible	Four-level GRM with hotline, suggestion boxes, liaison contacts	Operational before mobilisation	USD 10,000 — PIU (AfDB)	Percentage of grievances closed within timeline	PIU / HIR E&S Officer	Monthly tracking; quarterly report to AfDB

Code	Impact	Measure	Deadline	Cost / source	KPI	Implementation	Monitoring
		at all 13 canals; 5/10/15 business-day timelines; separate confidential SEA/SH channel					
HIR-17	Security incidents affecting implementation	Per-site security assessment and Green/Yellow/Red classification before mobilisation; coordination with state and district structures; defined halt thresholds; SMP with use-of-force provisions; UXO/ERW clearance before excavation	Before mobilisation; updated each phase	USD 19,000 — PIU (AfDB)	100% of sites with valid security clearance before mobilisation	PIU / Contractor	PIU monthly; escalation as required
HIR-18	Weak assurance of ESMP performance	Weekly Supervision Consultant inspection of all 13 canals; monthly PIU audit; quarterly safeguards report to AfDB; annual independent E&S audit	Weekly, monthly, quarterly, annually	USD 20,000 — PIU (AfDB)	100% of scheduled inspections, audits and reports completed on time	Supervision Consultant / PIU	AfDB supervision missions

9.15. Environmental monitoring matrix

The environmental monitoring matrix for the Hirshabelle component is the monitoring plan presented at Section 9.8, which specifies for each parameter the indicator and method, the frequency, the responsible party and the reporting route, together with the numeric performance standards and thresholds against which results are assessed. It is reproduced in consolidated form at Appendix 8 as the project's Environmental and Social Monitoring Plan.

The environmental parameters monitored are: downstream turbidity during desilting, checked daily at active reaches; canal water quality, tested annually in the laboratory on each canal for bacteriological and basic chemical parameters and on complaint; Shabelle flood stage, read twice daily at gauges on all active canal reaches during the Gu season against defined per-canal suspension thresholds; dry-season flow and abstraction at the offtakes against the environmental-flow floors of 20% of natural flow at all times, 30% during April–October and 40% during January–March; canal bank condition and stability, inspected weekly during works and annually post-Gu in operation; sediment depth and conveyance capacity, inspected annually post-Gu with a major-desilting trigger below 75% of design; spoil placement and

waste management compliance, verified at weekly site inspection; fuel and chemical storage containment, verified at weekly site inspection; larval counts and breeding sites, inspected monthly and weekly in the Gu peak season; and reinstatement of borrow pits, access corridors and temporary facilities, verified at close-out before handover of each reach.

9.16. Risk-management matrix

The risk-management matrix records the residual risks to successful ESMP implementation — as distinct from the environmental and social impacts of the project, which are addressed in the mitigation matrices — together with their likelihood, consequence, treatment and owner. It is reviewed at each monthly PIU audit and updated as risks materialise or close.

Table 19: ESMP Implementation Risk-Management Matrix — Hirshabelle

Implementation risk	Likelihood	Consequence	Risk treatment	Owner
Programme pressure erodes flood-alert discipline and low-flow scheduling	Medium	Worker and works exposure to rapid Shabelle rise; potential fatality and works damage	Suspension thresholds constituted as contractual hold points, not guidance; twice-daily gauge records verified at weekly inspection; unsuspended exceedance treated as a serious incident	PIU / Supervision Consultant
Signed disruption schedules not honoured once works are underway	Medium	Crop loss and livelihood harm to downstream and tail-end farmers; loss of community confidence	Daily verification of supply continuity against the signed schedule; unplanned disruption reported as a moderate incident within 24 hours; funded compensation at replacement cost within 30 days	HIR E&S Officer
Canal committees formed but not genuinely inclusive	High	Head-end and landowner capture of restored flows; tenant farmers and women excluded from benefits	Composition verified against head-end/tail-end and 30% female membership criteria before commissioning; allocation schedules posted publicly; grievance trend analysis by complainant category	PIU / HIR E&S Officer
Shared Environmental and Social Officer capacity insufficient across 13 dispersed sites	High	Reduced inspection frequency and slower grievance response; non-compliance detected late	Weekly independent Supervision Consultant inspection as a second line; escalation to dedicated Hirshabelle coverage once multiple work fronts are active	PIU
Contractor ESHS capability below the standard required	Medium	Non-compliant works; safety and pollution incidents	C-ESMP approval as a condition precedent to mobilisation; non-conforming plans rejected; corrective action and suspension rights exercised; ESHS officer named in the contract	PIU / Supervision Consultant
Security conditions interrupt supervision continuity	Medium	Unverified compliance during access restrictions; slippage in engagement calendar	Per-site security classification with defined halt thresholds; canal committee reporting and GRM as complementary information channels; catch-up inspection on access restoration	PIU

Implementation risk	Likelihood	Consequence	Risk treatment	Owner
SEA/SH complaints routed through community structures	Medium	Disclosure, retaliation and non-reporting; survivor harm	Confidential channel managed exclusively by PIU GBV Specialist; explicit prohibition on committee or elder involvement; monthly channel review; AfDB notification within 24 hours of confirmed incident	PIU GBV Specialist
Dry-season abstraction remains above the environmental-flow floor	High	Downstream domestic supply, flood-recession farming and fisheries affected; High residual impact persists	Rotational abstraction scheduling and gate-closure protocols; dry-season monitoring with FAO SWALIM; phasing to prioritise lower-extraction canals; category revalidation; Jowhar Barrage commissioning tracked as reassessment trigger	PIU / AfDB
Rehabilitated canals not maintained after handover	Medium	Renewed siltation, loss of conveyance and of the project benefit within a few seasons	Committee training, O&M manual in Somali and tool kits before commissioning; desilting trigger below 75% of design; PIU oversight visits at 3, 6 and 12 months and annually	PIU / canal committees
Compensation and access commitments made with landowners rather than cultivators	Medium	Tenant farmers and sharecroppers bear uncompensated losses	Eligibility defined by loss suffered rather than title held; tenant participation recorded separately in the consultation log; land grievances resolved within 15 working days	PIU / HIR E&S Officer

9.17. Key ESMP implementation indicators

The following indicators are used to track ESMP implementation performance. They are compiled by the Hirshabelle Environmental and Social Officer, reviewed at monthly PIU audit, and reported quarterly to AfDB.

- Readiness and compliance: percentage of canals mobilised only after a signed PIU site-readiness checklist (target 100%); percentage of canals with a signed disruption schedule before mobilisation (100%); percentage of reaches with written land access confirmation before works (100%); number of Contractor ESMPs approved before mobilisation; number of corrective actions issued, and percentage closed within the specified period.

- Irrigation continuity and livelihoods: percentage of days on which agreed partial flows were maintained on active canals; number of unplanned supply disruptions beyond the agreed schedule (target zero); number of verified crop-loss claims, and percentage compensated at full replacement cost within 30 days (100%).
- Worker health and safety: number of workers inducted before commencing work as a percentage of workers engaged (100%); percentage of canal-adjacent workers who have completed non-swimmer assessment (100%); lost time injury frequency rate; number of fatalities (target zero); number of heat-stress incidents; percentage of work fronts with rescue equipment verified present at weekly inspection (100%).
- Flood-alert discipline: percentage of active reaches with twice-daily gauge readings recorded during the Gu season (100%); number of work suspensions triggered by threshold exceedance, and number of threshold exceedances at which work was not suspended (target zero); percentage of days on which equipment was removed from the canal at end of day (100%).
- Community safety and health: number of community safety incidents at or near works (target zero); percentage of active reaches with barriers, Somali-language signage at 50 m intervals and safe crossings at least every 200 m (100%); number of school safety awareness sessions delivered; number of canal sites under active vector and vegetation management; malaria case incidence reported in canal communities during transmission season.
- Environmental performance: percentage of desilting days with downstream turbidity checks recorded (100%); number of spoil-placement non-compliances; number of spills and percentage contained; percentage of borrow pits backfilled or contoured within seven days of works completion (100%); dry-season abstraction as a percentage of natural flow against the applicable environmental-flow floor.
- Stakeholder engagement and grievance: number of grievances received by uptake channel and complainant category; percentage resolved within the applicable timeline — 5 business days at Level 1, 10 at Level 2, 15 at Level 3, and 15 working days for allocation complaints; percentage of SEA/SH cases handled exclusively through the confidential channel (100%); number of community meetings held against the engagement calendar.
- Inclusion and governance: percentage of canal committees formed and trained before commissioning (100%); percentage of committees with verified minimum 30% female membership (100%); percentage with verified head-end and tail-end representation (100%); percentage of engagement and training events with gender-disaggregated attendance records (100%).
- Reporting and assurance: percentage of quarterly safeguards reports submitted to AfDB on time (100%); number of monthly PIU audits completed against plan; number of weekly Supervision Consultant inspections completed against plan; completion of the annual independent environmental and social audit.

9.18. Integration of the ESMP into project design, planning, procurement, budget and implementation

The ESMP is effective only to the extent that its requirements are embedded in the instruments that actually govern the project. Integration is achieved as follows.

- **Design.** The environmental and social measures listed at Section 4.3 are design parameters, not construction-phase controls: climate-adjusted embankment, culvert and freeboard specifications, geotechnically determined bank profiles, engineered schedule-operable control structures, selective lining, kiosks and troughs, culverts and safe crossings, and positive drainage. The findings of the pre-works hydrological and geotechnical assessment are incorporated into the detailed design of each canal before mobilisation.
- **Planning.** The ESMP determines the construction programme rather than following it: earthworks are confined to Shabelle low-flow windows, works are sequenced so that canals sharing an intake are not disrupted simultaneously, and mobilisation on any canal is conditional on the site-readiness checklist. The implementation schedule and reporting calendar at Section 9.12 is the project's safeguards programme and is aligned with the works programme.
- **Procurement.** The obligations at Section 9.4 are written into the bidding documents and works contracts, including the Contractor ESMP requirement, the required contractor plans, labour and Code of Conduct clauses, suspension and corrective-action rights, incident reporting timelines, and flow-down to subcontractors and site labour. Contractor ESHS costs are priced within the works contracts, and the ESHS hold points at Section 9.5 are conditions precedent to mobilisation under the contract.
- **Budget.** PIU-delivered measures are budgeted at Section 9.13 with named funding sources across the four-year period, distinguishing AfDB-financed PIU lines, government counterpart lines for crop compensation and emergency maintenance, and the cost-shared Environmental and Social Officer. Contractor ESHS costs sit within the works contracts and are additional. Unit rates and quantities for each line are fixed against the detailed-design Bill of Quantities.
- **Implementation and supervision.** Responsibilities are assigned at Section 9.9 and verified through weekly Supervision Consultant inspection, monthly PIU audit, quarterly reporting to AfDB and an annual independent audit. Measures and numeric thresholds are transcribed, with canal-specific values for flood-suspension stage, bank batter, allocation shares and disruption schedule, into the Contractor ESMP for each lot, so that the obligation reaching the work front is site-specific rather than generic.
- **Operation and handover.** Operation-phase obligations pass to canal committees through commissioning, conditional on committee formation, verified inclusivity and completed training, supported by operation and maintenance manuals in Somali, tool kits, and PIU oversight visits at 3, 6 and 12 months and annually thereafter.

The ESMP is a living document. It will be updated if significant changes to project scope, site conditions or risk context require adjustment, and where any inconsistency arises between this ESMP and project-wide provisions, the more protective provision applies.

9.19. Associated management plans

The following management plans and instruments support this ESMP. Each is required by the assessed risks of the project and by the applicable Operational Safeguards; those appended to this report are cross-referenced, and those maintained as standalone project instruments are identified as such.

- Stakeholder Engagement Plan (SEP) —Required under OS10. Sets out stakeholder identification, engagement methods, the disclosure approach and the engagement calendar for the thirteen canal sites.
- Grievance Redress Mechanism procedures —Required under OS10 and OS4. Sets out uptake channels, process steps, timelines, the four-level escalation pathway, the dedicated water-allocation track and the separate confidential SEA/SH track.
- Gender and Social Inclusion measures — Appendix 9.1. Required under OS7 and OS10. Sets out the baseline position, project commitments on committee membership, female liaison, kiosk siting and employment, and the associated monitoring.
- Chance Finds Procedure — Appendix 9.2. Required under OS8. Applies to all earthworks at all thirteen sites; posted on site and covered in worker induction.
- Environmental and Social Monitoring Plan — Appendix 8. Required under OS1. Consolidates monitoring parameters, indicators, frequencies, responsibilities, thresholds and reporting routes.
- Environmental, Social and Capacity Building Training Plan — Appendix 9.3. Required under OS1, OS2 and OS4. Consolidates the training framework summarised at Section 9.11.
- Climate Risk Assessment — Appendix 7.2. Required under the AfDB Climate Safeguards System. Sets out hazard ratings, projected trends and the project response for Middle Shabelle.
- Labour Management Procedures (LMP) — standalone contractor instrument required under OS2. Covers the worker register, age verification, written contracts, working conditions, welfare provision and the Workers' GRM; submitted with the Contractor ESMP before mobilisation.
- Contractor Environmental and Social Management Plan (C-ESMP) — standalone contractor instrument required under OS1, with canal- and site-specific annexes and activity method statements for high-risk tasks; approved in writing by the PIU before any on-site activity.
- Occupational Health and Safety Plan — standalone contractor instrument required under OS2, incorporating the water-safety protocol, flood-alert protocol with per-canal suspension thresholds, work suspension criteria, emergency evacuation plan and emergency contacts.
- Waste Management and Spill Prevention Plan and Community Health and Safety Plan — standalone contractor instruments required under OS3 and OS4.
- Security Management Plan (SMP) — standalone project and contractor instrument required under OS4. Incorporates per-site security assessment and Green/Yellow/Red classification, a security personnel code of conduct, pre-deployment and refresher training, proportionality and use-of-force provisions, and monitoring of security provider conduct.

- Integrated Pest and Vector Management Plan (P/VMP) — standalone project instrument required under OS3 and OS4.
- Land Access Protocol — Section 9.3.4. Applied under OS5 on a precautionary basis, governing written temporary-access agreements, compensation at full replacement cost within 30 days, and the suspension and OS5 determination trigger.

No Resettlement Action Plan, Livelihood Restoration Plan or Biodiversity Management Plan is required for this component: no permanent land acquisition, physical displacement or involuntary resettlement arises, and no natural or critical habitat is affected. Should the OS5 trigger at Section 9.3.4 be activated at any reach, works are suspended and the requirement for a resettlement instrument is determined at that point.

CHAPTER 10: CONCLUSION AND RECOMMENDATIONS

10.1. Conclusion

The Environmental and Social Impact Assessment (ESIA) for the Hirshabelle State component of the Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project concludes that the proposed rehabilitation of the thirteen irrigation canals in Balcad District is environmentally and socially viable. The project is strategically aligned with Hirshabelle's development priorities, addressing severe canal deterioration in one of Somalia's most productive irrigated agricultural corridors along the Middle Shabelle.

While the assessment identified several potential impacts — most notably sediment release during desilting, bank collapse and worker water-safety hazards, flood inundation of work areas, irrigation supply disruption to downstream farmers during the dry period, and post-rehabilitation water allocation conflict between head-end and tail-end users — these are localized and manageable. The implementation of the Environmental and Social Management Plan (ESMP), supported by the Stakeholder Engagement Plan (SEP), Labour Management Procedures (LMP), signed canal disruption schedules, and the Security Management Plan, provides a sufficient framework to mitigate these risks to acceptable levels.

The long-term socio-economic benefits — restored irrigation reliability for an estimated 2,200–3,800 farming households, improved water distribution equity, reduced flood risk from restored canal conveyance, safer canal infrastructure, local employment, and strengthened inclusive water governance — significantly outweigh the temporary and minor-to-moderate adverse impacts associated with the construction phase.

10.2. Recommendations

To ensure the sustainable implementation of the project and full compliance with the African Development Bank (AfDB) Integrated Safeguards System (ISS) 2023, the following recommendations are made:

- **Strict ESMP adherence:** the Contractor must develop a site-specific Contractor ESMP (C-ESMP) covering each of all 13 canals, reflecting canal-specific hydrological and geotechnical findings, including the extended Farax Galoolay alignment.
- **Disruption schedule discipline:** no mobilisation on any canal without a signed disruption schedule; partial flows and the compensation framework must be implemented meticulously — this is the single most livelihood-sensitive commitment in the ESMP.
- **Flood alert compliance:** gauge monitoring, suspension thresholds, and end-of-day equipment removal must be enforced without exception during the Gu season, and works confined to confirmed low-flow windows.
- **Canal committee capacity building:** intensive training should be provided to all 13 canal committees to ensure equitable head-end/tail-end water distribution, documented allocation rules, and conflict-free operation of control structures, with tenant farmer and female representation verified before commissioning.

- **Local hiring and inclusion:** contractors should adhere to the local hiring preference for unskilled labour from Balcad canal communities to foster ownership and mitigate social tensions.
- **UXO/ERW verification:** given regional conflict history, a formal clearance confirmation must be obtained from the relevant security authorities or a recognized demining agency before excavation begins at any canal reach not previously worked.
- **Continuous monitoring:** the PIU and HIR E&S Officer must conduct regular field audits to verify water-safety, heat stress, sediment, and community safety measures, with particular attention during desilting operations.
- **Grievance redress:** the four-level GRM, the 15-working-day allocation complaint track, and the confidential SEA/SH channel must be fully functional and publicized at each canal prior to mobilization.
- **Downstream flow protection:** Adopt and enforce mandatory minimum ecological-flow thresholds (20% of mean flow at all times, rising to 40% in the January–March dry season) at the Shabelle offtakes, supported by calibrated flumes, rotational abstraction scheduling, and gate-closure protocols, and phase rehabilitation to prioritise lower-extraction canals until dry-season flow monitoring is established.
- **Downstream community safeguards:** Extend consultation, the GRM, and flow and household water-access monitoring (with FAO SWALIM) to river communities below the intakes who are not direct project beneficiaries, and formally track commissioning of the Jowhar Natural Storage Barrage as the trigger to reassess dry-season extraction risk.
- **Contractor ESMP (C-ESMP) per contract and lot:** a C-ESMP is required for each works contract or lot, with canal- and site-specific annexes and activity-specific plans covering hydrology and flood, water safety, excavation and bank stability, desilting and spoil, traffic, labour and camp management (including a Workers' GRM), community health and safety, water quality, the Integrated Pest and Vector Management Plan (P/VMP), SEA/SH and child protection, emergency response, security, and chance finds. The C-ESMP follows a defined approval chain — contractor preparation, Supervision Consultant review, PIU approval, and AfDB review and clearance — and no mobilisation on any canal is permitted before the relevant ESHS hold points are completed and signed off in writing.
- **Serious-incident and security protocols:** align serious-incident initial-notification, investigation, and corrective-action timelines with the Financing Agreement and the AfDB's final incident-reporting protocol; security management must include a security code of conduct, personnel training, proportionality and use-of-force provisions, and ongoing monitoring.
- **Indexed evidence annexes and authorization:** compile a stable, indexed annex set containing all screening, GIS, design, hydrology, flood and environmental-flow, geotechnical, water-quality, land and OS5, biodiversity, consultation, security and UXO/ERW, and permit evidence, and complete all signatures and national and state authorizations before disclosure.

- Disclosure and quality assurance: produce a redacted public version and a Somali-language summary of the ESIA for disclosure, and complete final technical, legal, and editorial quality assurance prior to finalization.

APPENDICES

Appendix 1. List of ESIA preparers and contributors

This ESIA was prepared for the Ministry of Agriculture and Irrigation (MoAI) of the Federal Republic of Somalia, under the BBS Irrigation Project Implementation Unit, with financing from the African Development Bank. Preparation, review and clearance responsibilities are as recorded on the Declaration Page at the front of this report.

- Prepared by: Yussuf Abdi Maalim, Environmental and Social Safeguards Specialist, MoAI, Somalia — lead author;
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- Reviewed by: BBS Preparatory Team Leader, MoAI / Federal Government of Somalia — Ahmed Keynan

The following other colleagues contributed the draft of the ESIA document;

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2	Mohamed Musa Aden	Director – Crop Production, Food Security & Cooperatives	MoAI
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4	Mohamud Isse Mohamed	Director – Irrigation, Land Management & Agro-Metrology	MoAI

Contributors to the assessment include the MoAI Research team, who prepared the environmental and social screening for all thirteen canal sites; the field verification team who conducted the site visits of December 2025 and January 2026 and the Hirshabelle State Ministry of Agriculture, the Hirshabelle state water authorities, the Balcad District Administration and the Balcad District Health Office, whose staff supported site access, consultation and data provision.

The canal committees, farming households, women's groups, elders and youth representatives of the thirteen canal corridors contributed the consultation inputs recorded at Appendix 3.

Appendix 2. References

- African Development Bank. (2023). Integrated Safeguards System: Operational Safeguards. Abidjan: AfDB.
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Appendix 3. Stakeholder-engagement and consultation records

Appendix 3.1. Consultations conducted

Stakeholder engagement for the Hirshabelle component was conducted during field verification visits in December 2025 and January 2026, with a supplementary consultation round to confirm the expanded 13-site scope recorded in the Master List. The engagement covered all thirteen canal sites in Balcad District. Consultation activities included:

Table 20: Consultations Conducted

Stakeholder Group	Location / Coverage	Key Topics Discussed
Hirshabelle State Ministry of Agriculture	Jowhar	Project scope and canal priorities; institutional coordination; environmental permitting requirements
Hirshabelle State water authorities	Jowhar / Balcad	Shabelle canal system governance; intake management; allocation policy; flood history
Balcad District Administration	Balcad	Site access; community readiness; security conditions; local employment expectations; flood alert communication
Canal committees and water user groups	All 13 canals	Canal condition and desilting history; disruption scheduling; allocation rules; maintenance responsibilities; committee formation readiness
Community leaders and elders	Busley, Kurshaale, Maqaar Careys, Halgan, Weberi, Farax Galoolay	Customary water access rules; land ownership and tenancy patterns; project expectations; conflict resolution mechanisms
Farming households (incl. tenant farmers and sharecroppers)	All canal corridors	Irrigation reliability; head-end/tail-end distribution; crop disturbance and compensation; access corridors
Women's groups and female household representatives	Balcad canal-corridor villages	Women's water use and safety; desired participation in canal committees; kiosk placement; GBV and reporting concerns
Youth representatives	Balcad canal-corridor villages	Employment opportunities; concerns about outsiders being hired; skills development potential

Stakeholder Group	Location / Coverage	Key Topics Discussed
Balcad District Health Office	Balcad	Malaria surveillance near canals; referral pathways; emergency response capacity

Appendix 3.2. Key issues raised and how they were addressed

Table 21: Key Issues Raised and How They Were Addressed

Theme	Issue Raised	Response / ESMP Measure
Water equity	Tail-end farmers fear head-end users will capture restored flows; tenant farmers fear exclusion from allocation decisions	Inclusive canal committee at each canal with head-end and tail-end representation; documented allocation rules publicly posted at intakes; GRM allocation-complaint track resolved within 15 working days
Disruption during works	Farmers fear crop losses if canals are closed during works	Signed canal-specific disruption schedules before mobilisation; partial flows maintained via bypass; 2-week written notice; compensation at full replacement cost within 21–30 days
Women's participation	Women expressed desire to participate in canal governance but expected cultural resistance	Minimum 30% female membership in canal committees; female CLO at Hirshabelle level; targeted engagement with women in committee formation
Employment	Strong expectation that local youth will be prioritized; fear that outside workers will take all roles	Local hiring preference for unskilled and semi-skilled roles; transparent recruitment criteria communicated before mobilization; contractor obligation to advertise locally
Flooding	Communities recalled flood events causing major crop losses; concern that works could worsen flooding	Low-flow window scheduling; flood gauges and suspension thresholds; climate-adjusted design (1-in-25-year embankments, +0.5 m freeboard); restored flood conveyance as project benefit
Safety	Parents raised child drowning risk at canals; workers' safety near water questioned	Canal fencing at crossings; safety signage; school awareness sessions; full worker water-safety regime (life jackets, rescue equipment, non-swimmer assessment)

Theme	Issue Raised	Response / ESMP Measure
Maintenance sustainability	Frustration with previous projects that rehabilitated infrastructure and left it unmaintained	Canal committee capacity building and O&M training before handover; O&M manual in Somali; annual desilting responsibility with PIU technical oversight; emergency repair fund
Compensation and land access	Farmers requested clear, written arrangements for access corridors and crop damage	Land Access Protocol: written corridor agreements before mobilisation; compensation at full replacement cost within 30 days; land grievances resolved within 15 working days
Security	District administration and communities raised security conditions affecting implementation	Security Management Plan; per-site security assessments before mobilization; Green/Yellow/Red classification; coordination with Hirshabelle security structures; no attention-attracting branding
Transparency	Communities requested regular updates and clarity on project scope	Community information boards; advance notification protocols; Somali-language project summaries; dedicated CLO coverage of all 13 canals

Appendix 3.3. Consultation log — Hirshabelle

Table 22: Consultation Log Summary (December 2025 – June 2026)

Date / Period	Location	Participants	Key Outcomes
December 2025	Balcad town	Balcad District Administration; sector focal points	Access and security coordination agreed; district flood alert communication role confirmed
December 2025	Busley; Kurshaale	Canal committees, farmers, elders (Busley 1 & 2; Caday, Danwadaag, Sagaarey)	Canal condition histories documented; disruption scheduling principles agreed; employment expectations recorded
December 2025 – January 2026	Maqaar Careys; Halgan; Weberi	Canal user groups (Faragaab, Shoobe, Suufi; Yaxaasow 1–3; Mashruuca); women's groups	Tail-end allocation concerns documented; women's committee participation demand recorded; kiosk placement preferences noted

Date / Period	Location	Participants	Key Outcomes
January 2026	Jowhar	Hirshabelle State Ministry of Agriculture; state water authorities	Permitting pathway confirmed; canal system governance roles agreed; joint monitoring arrangement outlined
January 2026	Balcad	Balcad District Health Office	Malaria surveillance protocol and GBV/emergency referral pathways documented
June 2026	Farax Galoolay	Farax Galoolay canal users, elders, and landholders (supplementary verification)	13th site scope confirmed; alignment walked and access corridors discussed; screening completed; disruption scheduling principles agreed

Detailed minutes, attendance records (disaggregated by gender), and photographs for each consultation are maintained in the project consultation repository by the HIR E&S Officer.

Appendix 4. Stakeholder consultation materials

Stakeholder consultation materials for the Hirshabelle component are maintained by the PIU as part of the project consultation record and are available on request and for AfDB supervision. They comprise: notices and invitations issued for each consultation round, including advance notification to canal committees and village leadership; presentation and information materials used in consultations, including Somali-language project summaries and the information posted at community information boards along the canal corridors; attendance records for each consultation, disaggregated by gender and by stakeholder category so that the participation of tenant farmers, women, tail-end users and youth can be verified; meeting minutes recording issues raised, responses given and commitments made; and photographs and other evidence of consultation, retained subject to privacy requirements and to the consent of those photographed.

Appendix 5. Baseline data tables

Baseline data supporting Section 5 is presented in the body of this report at the point of use, and is drawn from the primary and secondary sources listed at Section 5.2. The principal tabulated and mapped baseline material is: the site locations table for all thirteen canals with alignment start and end coordinates (Section 4.3.1); the national climate, hazard and vulnerability figures for Somalia, including livelihood zones, humanitarian needs, rainfall and temperature trends, projected temperature and precipitation change, heavy rainfall and dry-day frequency, natural hazard statistics, and drought and flood vulnerability mapping (Section 5.5.1); the climate hazard ratings for Middle Shabelle under CORDEX RCP8.5 and CMIP6 (Appendix 7.2); and the environmental and social screening records for each of the thirteen canal sites (Appendix 7.1).

Appendix 6. Maps

Maps supporting this ESIA are presented in the body of the report: the BBS Project map showing the national distribution of project sites (Chapter A, Figure 1); the Hirshabelle State canal locations map showing the geographic distribution of the thirteen canal rehabilitation sites along the Middle Shabelle corridor in Balcad District, based on field-verified coordinates from the June 2026 BBS Master List (Section 4.12, Figure 4); the canal cross-section drawing for a representative Balcad canal (Section 3.1.1, Figure 3); the Middle Shabelle regional map showing project locations and surrounding administrative boundaries (Section 5.5.2, Figure 19); and the national livelihood zone, humanitarian needs, climate trend, climate projection, natural hazard and drought and flood vulnerability maps at Section 5.5.1 (Figures 5 to 18).

Appendix 7. Technical studies and supporting assessments

This appendix contains the technical studies and supporting assessments prepared for the Hirshabelle component: **DESIGN DRAWINGS & BOQs** ATTACHED SEPARATELY

Appendix 7.1. Environmental and social screening forms (Hirshabelle State)

Controlled Screening Reconciliation Register

This register maps original screening evidence to the final ESIA site scope. 'Reconciliation required' means the original form contains a legacy name, coordinate, activity type or other field that must not override the controlled final site register.

Final Site / Asset	Final Typology	Original Screening Form	Original Activity / GPS / Cat.	Status	Control Note
Busley 1 Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Busley 1.docx	Rehabilitation of Existing Canal 2.360038, 45.400689 Cat. 2	Matched	
Busley 2 Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Busley 2.docx	Rehabilitation of Existing Canal 2.360079, 45.398990 Cat. 2	Matched	
Caday Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Caday Canal.docx	Rehabilitation of Existing Canal 2.378031, 45.415000 Cat. 2	Matched	
Danwadaag Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Kurshale - Dan-Wadaag.docx	Rehabilitation of Existing Canal 2.369949, 45.405423 Cat. 2	Matched	
Faragaab Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Faragaab Canal.docx	Rehabilitation of Existing Canal 2.378031, 45.415000 Cat. 2	Reconciliation required	Form GPS duplicates the Caday reference point; final controlled site register governs.

Final Site / Asset	Final Typology	Original Screening Form	Original Activity / GPS / Cat.	Status	Control Note
Mashruuca Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Mashruuca Canal.docx	Rehabilitation of Existing Canal 2.364177, 45.389823 Cat. 2	Reconciliation required	Form GPS duplicates the Yaxaasow reference point; final controlled site register governs.
Sagaarey Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Kurshale - Sagaarey.docx	Rehabilitation of Existing Canal 2.378823, 45.414329 Cat. 2	Matched	
Shoobe Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Shobe Canal.docx	Rehabilitation of Existing Canal 2.378031, 45.415000 Cat. 2	Reconciliation required	Form GPS duplicates Caday; final controlled site register governs.
Suufi Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Suufi Canal.docx	Rehabilitation of Existing Canal 2.378031, 45.415000 Cat. 2	Reconciliation required	Form GPS duplicates Caday; final controlled site register governs.
Yaxaasow 1 Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Yahasow 1 Canal.docx	Rehabilitation of Existing Canal 2.364177, 45.389823 Cat. 2	Matched with legacy coordinate	Final Master List controls the alignment.
Yaxaasow 2 Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Yahasow 2 Canal.docx	Rehabilitation of Existing Canal 2.364177, 45.389823 Cat. 2	Matched with legacy coordinate	Final Master List controls the alignment.

Final Site / Asset	Final Typology	Original Screening Form	Original Activity / GPS / Cat.	Status	Control Note
Yaxaasow 3 Canal	Irrigation canal rehabilitation	AfDB E&S Screening form - Yahasow 3 Canal.docx	Rehabilitation of Existing Canal 2.364061, 45.390631 Cat. 2	Matched	
Farax Galoolay Canal	Irrigation canal rehabilitation	No separate screening form located	— — Cat. —	Missing	No separate form located in the pooled archive; ESIA records supplementary verification. Complete/place a controlled screening record on file before mobilisation if not held elsewhere.

Screening coverage summary: 13 controlled final sites are listed. Separate screening forms were not located for 1 final sites in the reviewed pooled screening archive. Original forms are supplied in the accompanying sorted screening folder.

The E&S screening forms for the 13 canal sites in Balcad District under the BBS Project, are available in the google drive link below;

1. Busley 1 Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Busley 1
GPS Coordinates (lat, long)	2.360038, 45.400689
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals run through farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		The canals are already serving the farms as source of irrigation
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		

Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			

Does the project involve new or existing dam(s) requiring safety assessments?		X		
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		

Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		The canal is already existing and farmers agree on its use
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		The farms are owned by known individuals and the land tenure goes through inheritance and buying or leasing the land with know and agreed terms of conditions
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			

Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



2. Busley 2 Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	22/12/2025
District/Region	Bal'ad
Village/Community	Busley 2
GPS Coordinates (lat, long)	2.360079, 45.398990
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals run through farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		The canals are already serving the farms as source of irrigation
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		According to the farmers that use the canal, the rehabilitation

				will not cost a significant change rather than increase in water availability for the farms further away from the river
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		

OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			Local government is responsible for the security in the area
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		

Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		The farms are owned by known individuals and the land tenure goes through inheritance and buying or leasing the land with know and agreed terms of conditions
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			

Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



3. Caday Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Caday
GPS Coordinates (lat, long)	2.378031, 45.415000
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals run through farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		No other projects going on in the same area/catchment
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		According to the farmers that use the canal, the rehabilitation

				will not cost a significant change rather than increase in water availability for the farms further away from the river
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		

OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			Local government is responsible for the security in the area
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		

Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		The canal distributes irrigation water needed by the farmers to grow crops. Due to bad condition the canal cannot bring water down to the farms
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			

Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



4. Faragaab Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Faragaab
GPS Coordinates (lat, long)	2.378031, 45.415000
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals run through farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		No other projects going on in the same area/catchment
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		According to the farmers that use the canal, the rehabilitation

				will not cost a significant change rather than increase in water availability for the farms further away from the river
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		

OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		

Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			

Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



5. Kurshale – Dan-Wadaag Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	24/12/2025
District/Region	Bal'ad
Village/Community	Kurshale, Dan-Wadaag Canal
GPS Coordinates (lat, long)	2.369949, 45.405423
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals run through farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		No other projects going on in the same area/catchment
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		According to the farmers that use the canal, the rehabilitation

				will not cost a significant change rather than increase in water availability for the farms further away from the river
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		

OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		

Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		Although smallholder farmers can be considered as vulnerable however they are part of the canal community
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			

Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



6. Kurshale – Sagarey Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Kurshale - Sagarey
GPS Coordinates (lat, long)	2.378823, 45.414329
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals in the area run through the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		

Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			

Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		

Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			

Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



7. Mashruca Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	18/12/2025
District/Region	Bal'ad
Village/Community	Mashruca
GPS Coordinates (lat, long)	2.364177, 45.389823
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		This is an existing canal, runs through the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		No other projects going on in the same area/catchment
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		According to the farmers that use the

				canal, the rehabilitation will not cost a significant change rather than increase in water availability for the farms further away from the river
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			

Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		

Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		Although the most smallholder farmers can be considered as vulnerable however they are part of the canal community and equally access the irrigation water
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				

Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



8. Shoobe Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Shoobe
GPS Coordinates (lat, long)	2.378031, 45.415000
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals in the area run through the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		

Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			

Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		

Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			

Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



9. Suufi Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	23/12/2025
District/Region	Bal'ad
Village/Community	Suufi
GPS Coordinates (lat, long)	2.378031, 45.415000
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canals in the area run through the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canals are dug in the farms and no sensitive areas are close
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		

Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			

Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		

Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			

Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



10. Yaxasow 1 Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	17/12/2025
District/Region	Bal'ad
Village/Community	Yaxasow 1
GPS Coordinates (lat, long)	2.364177, 45.389823
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		The canal was previously dug in and it's within the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canal is already existing and functioning, no concerns were observed. Although parts of the canal runs nearby a new IDP settlement but has no negative impact

Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			

Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		

Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			

Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



11. Yaxasow 2 Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	29/12/2025
District/Region	Bal'ad
Village/Community	Yaxasow 2
GPS Coordinates (lat, long)	2.364177, 45.389823
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		Existing canal within the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canal is already existing and functioning, no concerns were observed.
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		

Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		
Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			

Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		
Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		

Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		
Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			

Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



12. Yaxasow 3 Canal

PART 1: RISK CATEGORIES (ISS 2023)

Risk Category	Definition (per ISS 2023 Glossary)	Examples
Category 1: High Risk	Operations likely to cause significant and/or irreversible adverse environmental and/or social impacts on a large scale, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive. This includes projects classified as high risk under national legislation or moderate-risk projects financed by the Bank in a low E&S implementation capacity or fragile context.	Large-scale infrastructure (dams, highways); significant involuntary resettlement; projects affecting critical habitats; projects in conflict-affected or fragile states; major GHG emitters.
Category 2: Moderate Risk	Operations likely to cause adverse E&S impacts that are lower than in Category 1, medium-scale, easily reversible, and readily minimized by applying appropriate management and mitigation measures, or incorporating internationally recognized design criteria and standards. This includes projects classified as moderate risk under national legislation, or low-risk projects financed by the Bank in a lack of E&S implementation capacity or fragile context.	Rehabilitation of existing infrastructure with limited land acquisition; medium-scale agro-processing; projects with temporary labour influx; localized community impacts.
Category 3: Low Risk	Operations that do not directly or indirectly adversely affect the environment and that are unlikely to induce adverse social impacts. This category does not require a formal ESA, although E&S mitigation or maximization measures may be included/recommended in the project design.	Capacity building/training with no physical works; minor repairs within existing footprint; activities with no land acquisition, habitat conversion, or significant resource use.

PART 2: GENERAL INFORMATION

Screening Date	29/12/2025
District/Region	Bal'ad
Village/Community	Yaxasow 3
GPS Coordinates (lat, long)	2.364061, 45.390631
Type of Activity (new construction, rehabilitation, other)	Rehabilitation of Existing Canal
E&S Safeguards Officer	Yusuf Hassan Mohamed
Proposed AfDB E&S Category (1, 2, or 3)	2

PART 3: DETAILED OPERATIONAL SAFEGUARD SCREENING

Instructions: Answer each question without considering magnitude of impact at this stage. Mark Yes, No, or Don't Know. Add comments to clarify responses.

Screening Question	Yes	No	Don't Know	Comments
OS1 - ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
Is the subproject located in or near environmentally sensitive areas (e.g., wetlands, riverbanks, steep slopes, protected areas)?		X		Existing canal within the farms
Is the subproject located in or near socially sensitive areas (e.g., dense settlements, IDP/refugee sites, conflict zones)?		X		The canal is already existing and functioning, no concerns were observed.
Does the project context (conflict, security, governance, human rights) require a Contextual Risk Assessment?		X		
Does the project require a Climate Change Vulnerability and Adaptation Assessment?		X		
Is there a risk of cumulative impacts with other past, present, or reasonably foreseeable projects?		X		
Could the project significantly alter local water regimes or cause significant landscape-level land-use change?		X		
Have gender-specific and vulnerability-disaggregated baseline data been collected?	X			
Has the mitigation hierarchy (avoid, minimize, restore, compensate/offset) been applied in project design?	X			Will need to be addressed in the ESMP
Does the project require an Environmental and Social Management System (ESMS) or Environmental and Social Management Plan (ESMP)?	X			
Is the Borrower's E&S implementation capacity adequate, or is capacity strengthening required?	X			
OS2 - LABOUR AND WORKING CONDITIONS				
Will contractors/sub-contractors employ workers, creating labour management responsibilities?	X			
Are Labour Management Procedures (LMPs) required covering terms of employment, non-discrimination, and worker protections?	X			
Is there a risk of child labour in any project activity or supply chain?	X			
Is there a risk of forced labour, modern slavery, or human trafficking in any project activity or supply chain?		X		
Will there be a labour influx creating potential risks of social tension or pressure on local services?		X		
Are specific measures required to prevent and respond to Sexual Exploitation, Abuse and Harassment (SEAH) by project workers?	X			
Are Occupational Health and Safety (OHS) measures required, including provision of PPE and safe working conditions?	X			
Is a confidential and accessible worker grievance mechanism required?	X			
Has the project screened primary suppliers for child labour, forced labour, or serious safety issues?	X			
OS3 - RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
Will the project be a significant consumer of energy requiring energy efficiency measures?		X		
Will the project be a significant consumer of water or affect water quality?		X		

Will the project be a significant consumer of raw materials?		X		
Will construction or operations generate significant pollution (dust, noise, vibration, waste) affecting communities or sensitive receptors?	X			
Is there a risk of soil or water contamination from hazardous materials, spills, or inadequate waste management?		X		
Will the project require management of hazardous materials or hazardous waste?		X		
Has the waste management hierarchy (avoid, minimize, reuse, recycle, treat, dispose) been applied?		X		Will be needed through ESMP
Will the project lead to increased use of pesticides or agro-chemicals requiring a Pest Management Plan?		X		
Has the project assessed and committed to managing its greenhouse gas (GHG) emissions?	X			
Could the project significantly affect environmental flows for downstream ecosystems and communities?		X		
OS4 - COMMUNITY HEALTH, SAFETY AND SECURITY				
Will the project create physical hazards for communities (e.g., open excavations, increased traffic, unsafe structures)?		X		
Is a traffic and road safety assessment required for project-related vehicle movements?	X			
Does the project involve new or existing dam(s) requiring safety assessments?		X		The canal is already existing and farmers agree on its use
Does the project require an Emergency Preparedness and Response Plan (EPRP)?		X		
Is there a risk of project-related conflict over resources?		X		
Will the project use private or public security personnel requiring a Security Management Plan?	X			
Could the project affect ecosystem services (provisioning/regulating) on which communities depend?		X		
Is there a risk of community exposure to communicable diseases due to labour influx?		X		
Has a specific SEA/H and Gender-Based Violence (GBV) risk assessment been conducted for community members?	X			Will be needed through ESMP
Is a Labour Influx Management Plan required?		X		
OS5 - LAND ACQUISITION, RESTRICTIONS ON ACCESS TO LAND AND LAND USE, AND INVOLUNTARY RESETTLEMENT				
Will the project cause physical displacement (relocation, loss of residential land or shelter)?		X		
Will the project cause economic displacement (loss of land, assets, access to assets, income sources, or livelihoods)?		X		
Are there existing land disputes, unclear tenure, or complex customary land rights in the project area?		X		
Will the project restrict access to natural resources, protected areas, or common property resources?		X		
Has the project committed to avoiding forced eviction under all circumstances?	X			
Will compensation be provided at full replacement cost for all affected assets?		X		
Is a Resettlement Action Plan (RAP) required?		X		
Is a Livelihood Restoration Plan required?		X		

Has an assessment of impacts on host communities receiving displaced persons been conducted?		X		
Is a resettlement-specific grievance mechanism required for affected persons?		X		
OS6 - HABITAT AND BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
Is the project located in or near critical natural habitats?		X		
Is the project located in or near protected areas or Key Biodiversity Areas (KBAs)?		X		
Could the project lead to the conversion or degradation of natural habitat?		X		
Could the project lead to measurable adverse impacts on critical habitat?		X		
Will the project significantly affect ecosystem services on which communities depend?		X		
Is there a risk of introducing or spreading invasive alien species?		X		
Has the mitigation hierarchy (avoid, minimize, restore, offset) been applied to biodiversity impacts?	X			
Are biodiversity offsets required to achieve no net loss or net gain for critical habitat?		X		
Has the project screened primary suppliers for significant biodiversity conversion or degradation?		X		
Does the project involve sustainable management of living natural resources (forestry, fisheries, agriculture)?		X		
OS7 - VULNERABLE GROUPS				
Are there vulnerable or marginalized groups in the project area of influence?	X			
Could project impacts fall disproportionately on vulnerable or marginalized groups?		X		There is an irrigation committee that represents the users of the canals
Could project benefits be inaccessible to, or not shared equitably with, vulnerable groups?		X		
Are there Highly Vulnerable Rural Minorities (HVRM), including Indigenous Peoples, in the project area?		X		
Do project circumstances warrant Free, Prior, and Informed Consent (FPIC)?		X		
Is a standalone Vulnerable Groups Plan required?		X		
Is a Gender Action Plan required?		X		
Is an Indigenous Peoples Plan required?		X		
Are culturally appropriate and accessible consultation methods required for vulnerable groups?		X		
Have differentiated measures been designed to ensure vulnerable groups benefit from the project?	X			
OS8 - CULTURAL HERITAGE				
Are known tangible cultural heritage features (archaeological sites, historic structures, monuments) present in the project area?		X		
Could the project affect intangible cultural heritage (practices, knowledge, traditions)?		X		
Are there areas of cultural or spiritual significance to local communities in the project area?		X		

Is there a chance that works may uncover previously unknown cultural resources?		X		
Is a Chance Finds Procedure required?		X		
Does the project involve commercial use of cultural heritage requiring benefit-sharing?		X		
Is a Cultural Heritage Management Plan required?		X		
Has consultation with communities on cultural heritage impacts been conducted?	X			
OS10 - STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE				
Is a Stakeholder Engagement Plan (SEP) required?	X			
Has stakeholder identification and analysis been conducted, including disadvantaged or vulnerable stakeholders?	X			
Has project information been disclosed in accessible formats and local languages?	X			
Has information been disclosed in a timely manner to allow stakeholders to provide meaningful input?	X			
Have meaningful consultations (free from coercion, with sufficient time to respond) been conducted?	X			
Is a project-level grievance mechanism required?	X			
Is the grievance mechanism accessible, culturally appropriate, and trusted by stakeholders?	X			
Has a reprisal risk assessment been conducted for stakeholders and project complainants?		X		
Are measures in place to protect stakeholders from retaliation for raising concerns?	X			
Is ongoing stakeholder engagement planned throughout the project lifecycle?	X			

PART 4: SITE PHOTOS



Appendix 7.2. Climate Risk Assessment — Hirshabelle

This annex summarises the climate risk assessment for the Hirshabelle component per the AfDB Climate Safeguards System.

Table 23: *Climate Hazard Ratings — Middle Shabelle (CORDEX RCP8.5 / CMIP6)*

Hazard	Current Exposure	Projected Trend (to 2040)	Rating	Project Response
Riverine flooding (Shabelle)	Recurrent flood events; historical crop losses exceeding 50% in affected canal areas	10–20% increase in extreme rainfall intensity in the basin; increased flood magnitude and frequency	Very High	1-in-25-year embankment design; +0.5 m intake freeboard; restored canal flood conveyance; flood gauges and suspension thresholds during works; post-flood inspection and emergency repair fund in O&M
Heat stress	Temperatures regularly exceeding 30–35°C year-round; humid riverine microclimate	+1.0°C mean temperature by 2040; more frequent extreme heat days	High	OHS heat regime: no heavy work 11:00–15:00; 3L water/worker/hour; shaded rest areas; heat illness monitoring
Drought / low flows	High inter-annual rainfall variability; recurrent drought cycles	Continued high variability; Moderate–High drought risk	Moderate–High	Restored conveyance efficiency reduces losses per unit delivered; documented allocation rules manage scarcity equitably; committee governance of low-flow rationing
Extreme rainfall (local)	Bimodal Gu/Deyr with intense events	Increased intensity of extreme events	High	Culverts sized for 1-in-25-year design rainfall; bank stabilisation and seeding within 5 days; works scheduled outside peak seasons

Residual climate risk is dominated by flood events exceeding the 1-in-25-year design standard, assessed as Moderate and acceptable given the O&M response arrangements (Section 6.25.4).

Appendix 8. Environmental and social monitoring information

The consolidated monitoring framework is presented in Table 12 (parameters, indicators, frequencies, responsibilities, reporting lines, and thresholds/actions). Supplementary monitoring records maintained by the HIR E&S Officer include: the flood gauge reading log per active canal; the daily irrigation supply continuity log against signed disruption schedules; the crop damage claims and compensation register; the Associated Facilities and Support-Sites Register; the waste and spoil disposal record; the worker induction and training register; the GRM database; and the Hirshabelle incident register. All records are available to the Supervision Consultant, PIU, and AfDB supervision missions, and inform the quarterly safeguards reports.

Appendix 9. List of associated reports and plans

This appendix contains the management plans and instruments prepared for the Hirshabelle component and appended to this ESIA. The complete list of associated management plans, including the standalone contractor and project instruments not reproduced here — the Contractor ESMP, Labour Management Procedures, Occupational Health and Safety Plan, Waste Management and Spill Prevention Plan, Community Health and Safety Plan, Security Management Plan and Integrated Pest and Vector Management Plan — is at Section 8.19, which identifies for each instrument the safeguard it responds to and the point at which it must be in place.

Appendix 10. Environmental and Social Management Plan matrices

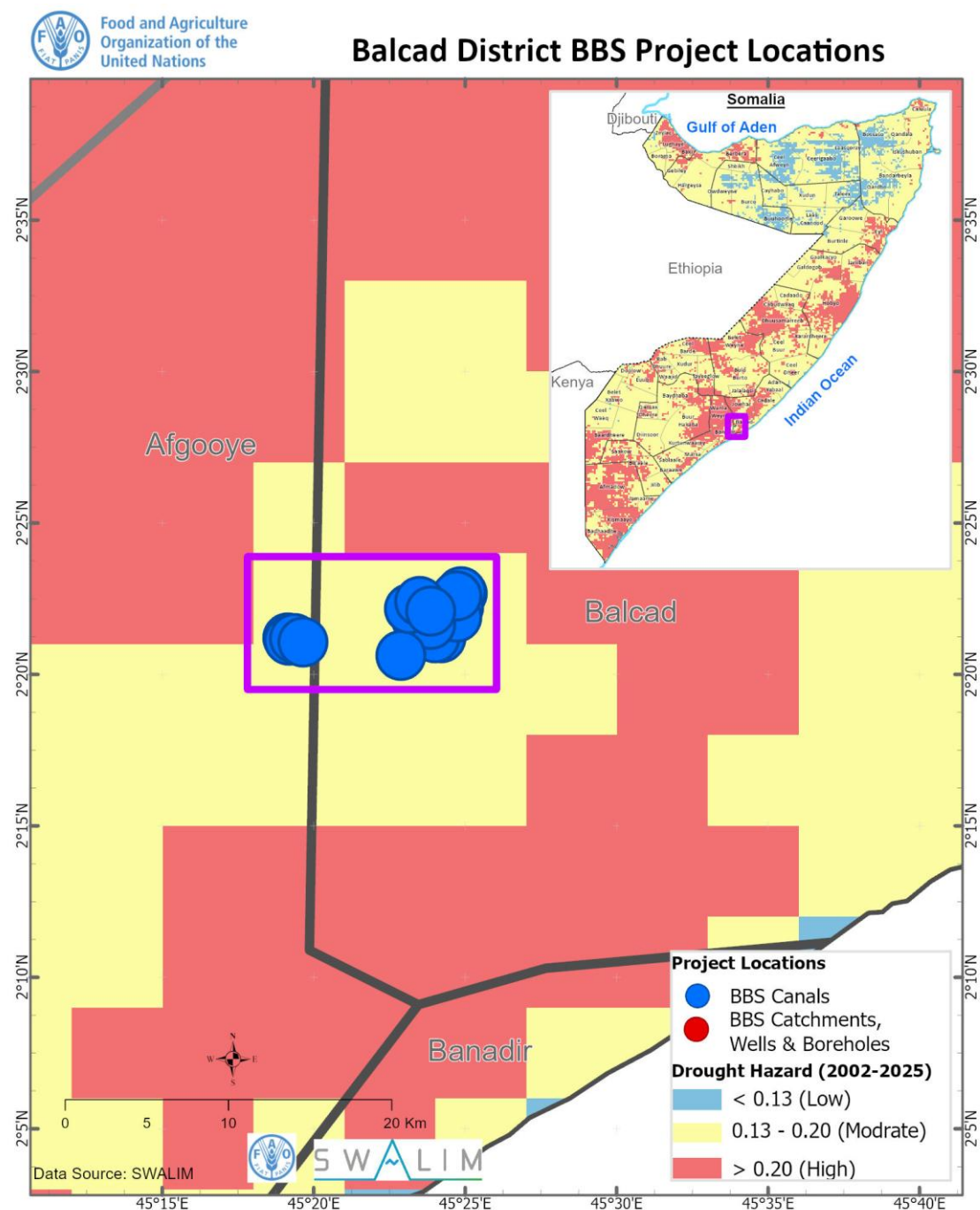
The Environmental and Social Management Plan matrices for the Hirshabelle component are presented in the body of this report and are not duplicated here.

Supplementary Annex: Technical Drawings, Maps, Photographs and Supporting Project Records Register

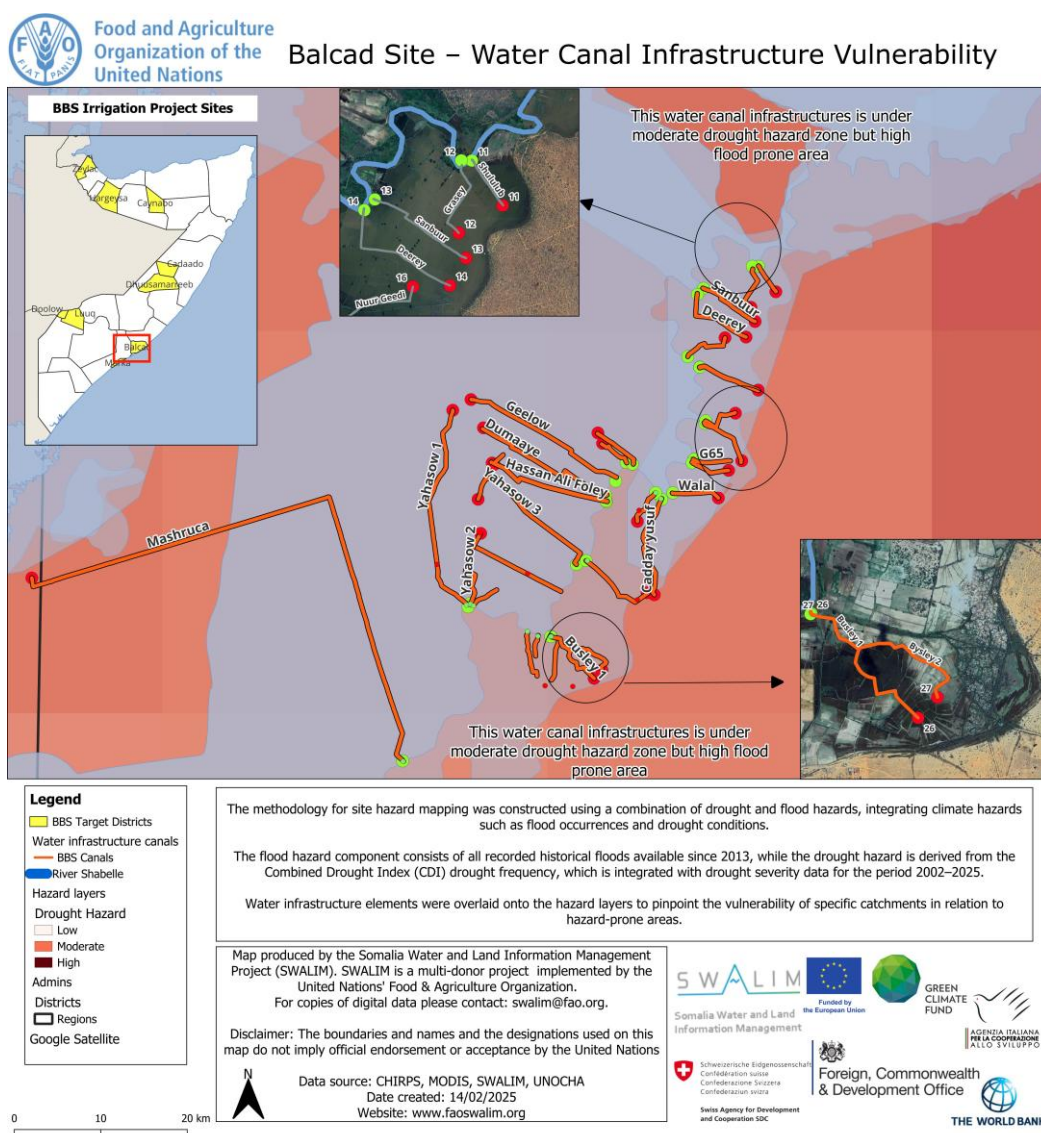
The register identifies project records located during the appendix review. A generic or legacy drawing is not treated as a site-specific approved construction drawing. The controlled site register and approved engineering package govern construction.

Evidence Group	Record / Folder	Relevance	Control / Use
Balcad canal engineering package	Irrigation canal & Pipelines archive	Canal profiles, BoQs and structures for Balcad canals.	Use approved canal-by-canal drawings; final site register controls.
Balcad canal mapping	Water Canals archive	Balcad project map (JPEG/PDF).	Supporting map.
Balcad climate-hazard map	Project Concept Note annexes	Som_Balcad_BBS_Project_Climate_Hazard.jpg	Supporting climate-risk evidence.

Selected Supporting Maps / Climate-Hazard Figures



Supporting record: Annex 1 - 5 Som_Balcad_BBS_Project_Climate_Hazard.jpg



Supporting record: *balcad_2002206.jpeg*

Project-Wide Supporting Studies Relevant to this ESIA

Study / Instrument	Record Location	Use in State ESIA
Project Concept Note / PCN	Project Concept Note BBS archive	Project rationale, components and implementation arrangements.
BBS Master List / Water Infrastructure Costing & Benefit Ranking	PCN annex 3-1b / assessment matrix	Controls final site selection and supports prioritisation.
Project Fragility and Resilience Assessment Note	PCN annex 3-2	Fragility, security, climate and vulnerability context.
Gender Empowerment Plan	PCN annex 3-3	Project-wide gender commitments.
MoAI Capacity Assessment	PCN annex 4-4b	Institutional capacity context.
Project Implementation Plan	PCN annex 4-3	Implementation phasing and institutional arrangements.
Project Monitoring Plan	PCN annex 4-1	Project monitoring framework.
Risk Matrix	PCN annex 4-2	Programme risk context.

Study / Instrument	Record Location	Use in State ESIA
Crop Value Chain and Gender Analysis	Production & Markets archive	Qualitative production, market, gender and youth evidence.
FGD and KII Summary	Production & Markets archive	Qualitative stakeholder/livelihood evidence.
Economic/Financial Analysis	PCN + Production & Markets archives	Economic/financial context; not a substitute for E&S due diligence.

Pre-Construction / C-ESMP Evidence-Control Register

Control Item	Required Evidence / Action	Responsible
Controlled site identity	Link final site name, verified coordinate, infrastructure type, screening record, approved drawing and BoQ in one signed register before mobilisation.	PIU / Technical Consultant
Screening gaps / legacy records	Complete missing site-specific screening and reconcile legacy/mismatched fields without altering original evidence records.	PIU / State E&S Officer
Land and access	Document actual users, access arrangements and temporary land requirements; apply OS5 pathway if impacts exceed screening assumptions.	PIU / District / Contractor
Security	Update site-specific security assessment before mobilisation and apply SMP/stop-work controls where indicated.	PIU / Contractor
Technical design	Use approved site-specific design. Generic/reference drawings do not establish construction dimensions.	PIU / Engineer
C-ESMP	Incorporate site-specific E&S findings, technical thresholds, methods, OHS, community H&S, waste, SEA/SH and emergency controls before works.	Contractor / PIU approval
Commissioning	Apply approved water-quality, structural/safety, WUA/O&M and monitoring readiness checks before use/handover.	PIU / Supervision / WUA