



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

JUBALAND STATE

**Luuq & Dollow Districts (Gedo Region) and Kismayo District (Lower Juba Region) - 13
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 sites: 9 piped irrigation canal rehabilitation sites - Aytimirow, Jaziira One, Buulo Yaxaas, Horseed, Liimooy and Buulo Muusley (Luuq District) and Quracleey, Buulo Qaloc and Garaash (Dollow District) - and 4 water catchment rehabilitation sites - Hadaafow, Dalsan, Bilicsan and Dabaylwayne (Kismayo District)

DECLARATION PAGE

This Environmental and Social Impact Assessment (ESIA) Report has been prepared for the Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project in Jubaland State, covering nine piped irrigation canal rehabilitation sites in Luuq and Dollow Districts (Gedo Region) and four water catchment rehabilitation sites in Kismayo District (Lower Juba 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	Organisation	Date & Signature
Prepared by	Yussuf Abdi Maalim — ESS Specialist	MoAI, Somalia	
Cleared by	Eng Mohamed Hassan Abdulle Director General (DG)	MoAI / FGS	



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 at a Glance

Item	Summary
Project	Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project – Jubaland State Component
Proponent / Borrower	Ministry of Agriculture and Irrigation (MoAI), Federal Republic of Somalia
Financier	African Development Bank (AfDB)
AfDB E&S Categorization	Category 2 for the Jubaland component under the AfDB Integrated Safeguards System (ISS 2023).
Geographic Scope	Luuq and Dollow Districts, Gedo Region; Kismayo District, Lower Juba Region
Project Sites	13 rehabilitation sites: 9 piped irrigation systems and 4 water catchments
Piped Irrigation Sites	Luuq: Aytimirow (Timirow), Jaziira One, Buulo Yaxaas, Horseed, Liimooy and Buulo Muusley. Dollow: Quracleey, Buulo Qaloc and Garaash.
Water Catchment Sites	Kismayo: Hadaafow, Dalsan, Bilicsan and Dabaylwayne.
Field Verification	December 2025 – January 2026, with subsequent scope confirmation against the June 2026 BBS Master List
Indicative Safeguards Budget	USD 259,610 over four years, exclusive of contractor ESHS costs funded through works contracts.

2. Project Background and 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 project responds to recurrent droughts and floods, chronic water and food insecurity, climate variability, institutional fragility, and long-term underinvestment in productive water infrastructure. The Jubaland component focuses on two distinct operating environments: the Juba River corridor in Luuq and Dollow, where riverine agriculture and domestic water supply depend on functioning diversion and conveyance infrastructure; and the Kismayo coastal hinterland, where peri-urban and agro-pastoral communities depend on rainfall-runoff water catchments whose capacity has been reduced by sedimentation and structural deterioration.

The revised Jubaland ESIA covers all 13 sites in the confirmed project scope. Nine existing piped systems in Luuq and Dollow will be rehabilitated to restore reliable conveyance of Juba River water through buried pipelines to irrigation users, community water points and livestock facilities. Four existing water catchments in Kismayo will be rehabilitated through desilting, embankment and bund repairs, improvement of inlet/outlet and spillway arrangements, selective lining where required, and associated access and livestock-watering improvements. The project is expected to improve water reliability, agricultural productivity, drought resilience and local water governance. The ESIA estimates approximately 1,800–3,000 beneficiary households; this figure should remain indicative until site-level beneficiary counts are confirmed in final project records.

3. Purpose, Scope and Approach of the ESIA

The ESIA has been prepared to support AfDB and Borrower decision-making by identifying and evaluating the environmental and social risks and impacts associated with the Jubaland component, defining measures to avoid, minimise, restore and, where necessary, compensate for adverse effects, and establishing an implementable Environmental and Social Management Plan (ESMP). The assessment covers pre-construction and mobilisation, construction, commissioning, operation and maintenance, and demobilisation of temporary works.

The assessment combines environmental and social screening, field verification, review of the June 2026 BBS Master List and technical information, stakeholder consultation, baseline analysis, significance evaluation and management planning. Impact significance is considered in terms of magnitude, duration, geographic extent, receptor sensitivity, reversibility and likelihood, using Negligible, Minor, Moderate and Major ratings. The ESIA also treats unresolved technical information as pre-mobilisation hold points rather than assuming facts that are not yet confirmed.

4. Project Components and Principal Activities

4.1 Piped Irrigation Systems – Luuq and Dollow

The nine piped irrigation interventions involve rehabilitation of existing buried HDPE conveyance systems connected to the Juba River. Activities may include route confirmation, trench excavation and shoring, replacement or repair of pipeline sections, certified pipe jointing, hydraulic pressure testing before backfill, construction or rehabilitation of riverbank intake structures, manifolds and control valves, community kiosks, livestock troughs, access-track reinstatement and associated civil works. In-river or river-edge intake activities are restricted to appropriate low-flow windows confirmed by site-specific hydrological assessment. At Dollow, the ESIA applies a precautionary bank-side-only approach and prohibits mid-stream structures unless cross-border implications have been separately assessed and addressed.

4.2 Water Catchments – Kismayo

The four Kismayo interventions involve rehabilitation of existing rainfall-runoff harvesting structures. Works may include basin desilting and reshaping, embankment and bund repair, compaction and stabilisation, selective installation or repair of geomembrane liners where needed, improvement of silt traps and inlet/outlet structures, spillway rehabilitation, livestock troughs, access improvements and perimeter vegetation reinstatement. Final quantities and site-specific design parameters are to be confirmed through pre-works condition assessments and approved design documentation.

4.3 AfDB Environmental and Social Requirements

The Jubaland component is treated as an AfDB Category 2 operation. The ESIA identifies OS1, OS2, OS3, OS4, OS7 and OS10 as applicable Operational Safeguards. OS5, OS6 and OS8 are treated on a precautionary basis through land-access controls, minimum-footprint and reinstatement measures at riparian areas, and a Chance Finds Procedure. The project must also comply with relevant Federal Government of Somalia requirements and applicable Jubaland State and district-level administrative processes.

Safeguard	Application to Jubaland
OS1 – Assessment and Management of E&S Risks and Impacts	Overall ESIA/ESMP, alternatives, design controls, flood and climate risk, cumulative/downstream effects, adaptive management.
OS2 – Labour and Working Conditions	Worker terms and conditions, OHS, trench and confined-space safety, in-river safety, heat stress, worker GRM and emergency response.
OS3 – Resource Efficiency and Pollution Prevention	Water efficiency, pipe integrity, water quality, erosion and sediment control, fuels, wastes, spoil, materials and operational maintenance.
OS4 – Community Health, Safety and Security	Open-trench and catchment safety, first-use water safety, traffic/access, security, emergency preparedness and SEA/SH risk management.
OS7 – Vulnerable Groups	Protection of IDPs, refugees/cross-border populations, tail-end users, poor households, minority clans, female-headed households and other vulnerable users.
OS10 – Stakeholder Engagement and Information Disclosure	Consultation, disclosure, GRM, disruption schedules, water-allocation engagement and ongoing community participation.
OS5 / OS6 / OS8 – Precautionary controls	Land Access Protocol and displacement trigger; riparian footprint and reinstatement controls; Chance Finds Procedure.

5. Policy, Legal and Institutional Context

The project is subject to the Federal Republic of Somalia's constitutional and policy framework for environmental protection, water resources, climate resilience, agriculture, land access, labour, gender, public health and local administration, together with Jubaland State and district administrative requirements. The ESIA also recognises relevant international obligations relating to climate change, desertification, biodiversity, women's rights and refugee protection. Because the Juba River forms the Ethiopia–Somalia boundary at Dollow, the ESIA applies additional precaution to works on the boundary reach and requires escalation of any cross-border water issue through the PIU and Jubaland State authorities.

Implementation responsibilities are distributed across the MoAI PIU, the SWS/Jubaland Environmental and Social Officer, Jubaland State agriculture/water authorities, Luuq, Dollow and Kismayo District Administrations, contractors, the Supervision Consultant, WUAs and AfDB. The PIU retains overall accountability for safeguards compliance and reporting to AfDB.

6. Analysis of Alternatives and Design Rationale

The alternatives analysis considered the no-project option, site/siting choices, design and technology alternatives, and construction sequencing. The no-project option was rejected because continued deterioration would further reduce irrigation reliability, domestic supply and catchment storage, increase losses and deepen water-access pressures. The selected rehabilitation approach is preferred because it uses existing infrastructure corridors and footprints, limits new land take and targets facilities that are deteriorated but capable of rehabilitation.

Design / Implementation Issue	Preferred Approach
Conveyance in Gedo	Buried HDPE conveyance preferred over open canals because it reduces evaporation, contamination exposure, access conflicts and open-water safety hazards, while requiring strict trench-safety controls.
Dollow intake position	Bank-side intakes preferred; no mid-stream structures without separate cross-border assessment.
Pipe jointing	Certified butt/electrofusion welding, with mechanical coupling where specified, supported by mandatory pressure testing before backfill.
Supply during rehabilitation	Section-by-section replacement with partial supply and contingency arrangements preferred over full system shutdown.
Kismayo catchment lining	Selective geomembrane lining where infiltration losses justify it, subject to final condition assessment and design.
Catchment desilting	Combined mechanical and labour-based methods where technically suitable, balancing efficiency, local employment and protection of structures.
Community water access	Dedicated kiosks and livestock troughs preferred to uncontrolled direct access at intakes/catchments for safety and hygiene reasons.

7. Environmental and Social Baseline

7.1 Physical and Environmental Setting

Luuq and Dollow lie on flat to gently undulating terrain along the Juba River corridor in Gedo Region. The riverine environment comprises fertile but locally unstable alluvial soils, floodplain drainage, irrigated plots, settlement clusters, livestock routes and access tracks. Dollow is a border town with significant cross-border movement, displacement and humanitarian activity. Kismayo's project sites lie in a low-relief coastal-hinterland setting where ephemeral runoff feeds communal rainwater-harvesting catchments serving agro-pastoral and peri-urban communities.

The ESIA characterises Jubaland as hot and semi-arid with bimodal Gu and Deyr rainfall and high variability. It identifies High–Very High flood risk on the Juba, High heat-stress risk and Moderate–High drought risk. Riparian vegetation at intake areas has local ecological value, but screening did not identify protected areas or critical habitat within the 13 project footprints. No known cultural heritage sites were identified during screening and field verification; nevertheless, chance-find controls apply to all earthworks.

7.2 Juba River Hydrology and Downstream Context

The Juba River is the principal source for the nine piped systems. At the Luuq reference gauge, the ESIA reports mean monthly flows ranging from approximately 26 m³/s in February to approximately 396 m³/s in October. Aggregate design withdrawal for the nine systems is reported at about 0.357 million m³/month, representing less than 0.6% of mean monthly river flow in all months and peaking at about 0.57% in February. On this basis, the ESIA rates the project's direct over-abstraction effect on downstream Juba flow as Negligible, while retaining precautionary monitoring of river flow, actual abstraction and downstream community water access.

7.3 Social Baseline and Vulnerability

Livelihoods include riverine irrigated agriculture, agro-pastoralism, livestock production, cross-border trade and mobility at Dollow, and peri-urban and port-linked livelihoods around Kismayo. Water infrastructure performance is closely linked to food security, household income and dry-season costs. Vulnerable groups include poor agro-pastoral households, IDPs in Dollow and Kismayo, refugees and cross-border populations near Dollow, tail-end users in piped systems, female-headed households, minority clan groups and youth seeking employment opportunities. The project therefore requires conflict-sensitive and protection-sensitive participation, non-discriminatory water allocation and accessible grievance channels.

8. Stakeholder Engagement and Disclosure

Stakeholder engagement was undertaken during field verification and subsequent scope confirmation. Participants included Jubaland State authorities; Luuq, Dollow and Kismayo District Administrations; existing water committees and user groups; farming and agro-pastoral households; women; youth; IDP and refugee representatives; elders; health authorities; and humanitarian actors in Dollow. Key concerns related to supply continuity during pipe replacement, equitable allocation, trench and child safety, women's participation and kiosk location, employment access, crop disturbance and compensation, cross-border sensitivities at Dollow, water quality, catchment access and long-term maintenance.

The revised safeguards framework addresses these concerns through signed community disruption schedules, inclusive WUAs and posted allocation rules, maintained community crossings, protection-sensitive consultation, local hiring preferences, the Land Access Protocol, commissioning water-quality controls, WUA training, ongoing disclosure and a multi-channel grievance mechanism. ESIA/ESMP information should be disclosed in accessible formats, including a Somali-language summary, through state, district, WUA and community channels before works.

9. Key Environmental and Social Risks, Impacts and Residual Significance

The following table summarises the principal impact significance ratings applied in this ESIA. Residual ratings assume full implementation of the ESMP and the relevant C-ESMP requirements; they are not unconditional predictions.

Risk / Impact	Pre-Mitigation	Residual	Key Control Basis
Trench collapse / confined-space hazards	Major	Minor	Mandatory shoring, atmospheric testing where applicable, rescue readiness and daily verification.
In-river intake works: flood, drowning, riparian disturbance	Major	Minor–Moderate	Low-flow scheduling, hydrological assessment, cofferdam/rescue controls, flood-stage monitoring, limited riparian disturbance.
Disruption to existing water/irrigation supply	Moderate–Major	Moderate	Signed disruption schedule, partial supply, contingency water and compensation for verified crop loss.
Accidental damage to existing pipes	Moderate	Minor	Pre-works pipe-route survey and controlled/manual excavation near confirmed services.
Pipe joint quality / system integrity	Moderate	Negligible–Minor	Certified jointing and pressure-test sign-off before backfill.

Risk / Impact	Pre-Mitigation	Residual	Key Control Basis
Erosion / sedimentation and reinstatement	Minor–Moderate	Negligible–Minor	Spoil control, rapid reinstatement, dry-season catchment earthworks, silt and erosion controls.
Worker OHS: heat, trench, machinery and river hazards	Major	Minor–Moderate	Approved OHS plan, heat-stress measures, PPE, first aid, rescue and emergency response.
Community safety at trenches and catchments	Moderate	Minor	Barriers, signage, maintained crossings, rapid closure/reinstatement and community/school awareness.
SEA/SH, including Dollow displacement/border context	Moderate	Minor–Moderate	Codes of Conduct, confidential channel, survivor-centred referral, female CLO and workforce training.
Security risk affecting implementation	High	Moderate	District-specific SMPs, site security assessments, halt thresholds and coordinated access planning.
Water allocation conflict in O&M	Moderate–Major	Moderate	Inclusive WUAs, posted schedules, GRM, PIU oversight and adaptive allocation.
Cross-border water tensions at Dollow	Moderate	Minor–Moderate	Domestic allocation discipline, documented withdrawals, district/state liaison and no mid-stream structures without assessment.
Juba River over-abstraction	Minor	Negligible	Low project abstraction ratio, seasonal allocation schedules and precautionary downstream monitoring.

10. Positive Impacts and Development Benefits

Subject to equitable access and effective operation, the Jubaland component is expected to generate significant positive impacts: restored irrigation reliability and water delivery; reduced conveyance losses; improved domestic and livestock water access; restored catchment storage; reduced dry-season water-purchasing and trucking pressures around Kismayo; improved conditions for agricultural production and household food security; temporary local employment; strengthened WUA capacity; and more transparent water-allocation and grievance arrangements. These benefits are particularly important in displacement-affected and water-insecure communities, but their distribution depends on deliberate inclusion of tail-end users, women, displaced households and minority groups.

11. Climate, Cumulative and Downstream Considerations

The most material climate risks are extreme Juba flooding, increasing heat stress and multi-season drought. Climate resilience is integrated through the use of buried conveyance, flood-aware intake design and construction sequencing, low-flow work windows, post-flood inspection and repair arrangements, and restoration of catchment storage. The design basis refers to a 1-in-25-year flood/design event and +0.5 m freeboard for intakes; these parameters should be confirmed against the approved final engineering design before procurement and construction.

Cumulative effects include simultaneous operation of several intakes along the Luuq/Dollow corridor, possible intensification of cultivation, increased input use and settlement concentration around improved water points. The Downstream River Impact Assessment concludes that aggregate Juba abstraction is too small to produce a material downstream-flow reduction. Actual withdrawals, downstream reference conditions and water-access grievances shall nevertheless be monitored and managed through the ESMP.

12. Mitigation Hierarchy and Key Management Measures

The project applies the mitigation hierarchy through design avoidance, controlled construction methods, restoration of disturbed areas, compensation for verified project-caused crop or asset damage, and operational governance. The most important management commitments are summarised below:

- No mobilisation without written PIU confirmation of site readiness, land/access arrangements, community notification, security clearance and approved contractor management plans.
- Existing pipe-route surveys before trenching at all nine piped sites; controlled/manual excavation near confirmed live services.
- Site-specific hydrological assessment before works at each Juba intake, including confirmation of low-flow construction window, flood halt threshold, scour risk and temporary works arrangements.
- Pre-works condition assessment at each Kismayo catchment to confirm sediment depth, embankment/spillway condition, liner requirements and downstream erosion risk.
- Strict excavation and trench safety, including shoring, access control, rescue preparedness and atmospheric testing where the approved OHS plan requires it.
- Section-by-section pipe replacement, agreed disruption schedules, maintained partial supply and contingency water before any unavoidable full isolation.
- Certified pipe jointing and witnessed hydraulic pressure testing before backfill.
- Controls for erosion, spoil, fuel, waste, construction water, temporary facilities and complete reinstatement.
- Community safety barriers, maintained crossings, access to homes/markets/water points and child-safety awareness.
- Inclusive WUA formation, documented and publicly posted water-allocation rules and specific protection of tail-end, displaced and minority users.
- Worker Codes of Conduct, confidential SEA/SH reporting, survivor-centred referral pathways and protection-sensitive Dollow measures.
- District-specific Security Management Plans and site-specific security assessments with authority to suspend works where conditions are unacceptable.
- Chance Finds Procedure for all excavation and catchment earthworks.

13. Environmental and Social Management Plan

Chapter 9 of the ESIA provides the operational ESMP for all 13 sites. It converts the assessment into contractual and supervisory requirements for the PIU, contractors, Supervision Consultant, WUAs and government counterparts. Contractor ESHS obligations are to be incorporated into bidding documents, contracts, method statements, work programmes and payment/corrective-action mechanisms. No physical works should commence until the applicable ESHS hold points are closed in writing.

14. Monitoring and Reporting

The monitoring framework combines routine construction compliance, issue-specific verification and O&M performance tracking. Supervision conducts weekly compliance inspections and daily verification of active trench controls; the PIU conducts monthly audits; quarterly safeguards reports are submitted to AfDB. Pipe pressure tests are documented per section before backfill, river stage is monitored during in-river works against site-specific halt thresholds, water-supply continuity is tracked daily during active rehabilitation, commissioning water quality must meet the approved drinking-water standard, and WUA governance, infrastructure condition, GRM performance, incidents and downstream conditions are monitored through operation.

Institutional Responsibilities

Actor	Principal ESMP Role
MoAI PIU	Overall ESMP ownership; approval of C-ESMPs and plans; audits; incident management; compensation framework; coordination with Jubaland State and AfDB; Dollow cross-border escalation.
SWS/Jubaland E&S Officer	Day-to-day oversight of the 13 sites; inspections; GRM; WUA support; security and disruption verification; reporting; participation in pressure-test witnessing/verification.
Jubaland State Agriculture / Water Authorities	Permitting/administrative coordination, water allocation coordination, joint oversight and Dollow cross-border support.
District Administrations	Access, community liaison, security and local dispute resolution; Dollow also supports IDP/refugee and border-sensitive engagement.
Contractors	Implement C-ESMP and method statements; provide ESHS personnel; OHS, waste, community safety, SEA/SH and security controls; incident reporting and corrective action.
Supervision Consultant	Weekly safeguards verification, daily trench checks at active works, pressure-test sign-off, intake/flood and catchment-work verification, reporting to PIU.
WUAs	O&M, allocation rules, leak/intake/catchment maintenance, kiosk/trough hygiene, incident/grievance reporting and community accountability.
AfDB	Safeguards oversight, review of periodic reports, corrective-action requirements and recourse/IRM availability.

15. Stakeholder Engagement, GRM and SEA/SH Arrangements

A multi-channel GRM must be operational before mobilisation in Luuq, Dollow and Kismayo. Channels include community liaison contacts, hotline, suggestion boxes and WUA/community structures, with protection-sensitive access for displaced populations. The escalation framework moves from site-level resolution to PIU/district review, Jubaland State-level escalation and, where necessary, national/AfDB recourse. Water-allocation complaints are handled through a dedicated accelerated track. SEA/SH allegations are excluded from ordinary community or WUA handling and are managed exclusively through a confidential PIU channel using survivor-centred principles and pre-confirmed referral pathways.

16. Land Access and Livelihood Protection

The project is expected to remain within existing pipeline corridors and catchment footprints and does not anticipate permanent land acquisition or physical displacement. A Land Access Protocol nevertheless applies to all sites. Working

areas and access corridors must be agreed and documented before mobilisation; project-caused crop or asset damage must be verified and compensated at full replacement cost; and land grievances must be handled through the GRM. Any activity that would cause physical displacement or material loss of productive capacity beyond the screening assumptions triggers suspension and formal OS5 determination before works continue.

17. ESMP Budget and Financing

The ESMP provides an indicative four-year safeguards budget of USD 259,610 for the Jubaland component. This includes the Jubaland share of the joint SWS/Jubaland E&S Officer, community engagement, GRM operation, pipe-route surveys, intake hydrological assessments, Kismayo catchment condition assessments, water-quality monitoring, WUA training, emergency repair funding, Dollow cross-border coordination and a female CLO, plus contingency. Contractor ESHS costs are additional and shall be included in the works contracts.

18. Conditions for Mobilisation, Commissioning and Operation

18.1 Before Mobilisation

- Approved C-ESMP and activity-specific method statements for the relevant work package.
- Approved OHS, waste/spill, community health and safety, labour, SEA/SH and district-specific security arrangements.
- Confirmed land/access agreements and signed community disruption schedule.
- Operational GRM, confidential SEA/SH channel and confirmed referral pathways.
- Pipe-route survey for piped sites; site-specific intake hydrological assessment for Juba intakes; condition assessment for Kismayo catchments.
- Worker induction, Code of Conduct and competency verification for high-risk activities.
- UXO/ERW clearance confirmation where excavation will occur in previously unworked or uncertain ground.

18.2 Before Commissioning / Handover

- Pressure-test and functional sign-off for piped systems, complete flushing, and compliant water-quality results under the final approved water-quality standard.
- Post-works structural and safety inspection of Kismayo catchments.
- Complete reinstatement and closure of temporary facilities and disturbed access areas.
- WUA established and trained, with documented and publicly posted allocation rules and adequate female representation.
- O&M manuals, repair arrangements, GRM and monitoring responsibilities handed over and understood.

18.3 During Operation and Ongoing Oversight

- Operate piped intakes and distribution valves to documented allocation schedules, with particular attention to head-end/tail-end equity and displaced or minority users.
- Maintain monthly WUA checks of pipe routes and intakes, prompt leak reporting and repair, and post-flood inspection of river-intake infrastructure.

- Maintain Kismayo catchments through post-rainfall silt-trap clearing, periodic condition inspection, desilting when storage loss warrants it, and continued safety controls at community access points.
- Continue kiosk/trough hygiene and periodic water-quality verification under the approved O&M monitoring plan.
- Continue downstream-flow and community water-access monitoring as a precautionary measure, with adaptive reduction or rotational intake operation if monitoring identifies a material adverse trend.
- Keep the GRM, SEA/SH confidential channel, security coordination, WUA records and periodic PIU oversight operational throughout O&M.

19. C-ESMP and Pre-Construction Confirmation Requirements

The following requirements are assigned to the C-ESMP, pre-construction technical assessments and commissioning process. They do not prevent ESIA submission or clearance because Chapter 9 establishes binding hold points that must be closed before the affected activity proceeds.

Requirement	C-ESMP / Pre-Construction Action
AfDB categorisation	The Jubaland component shall be managed as Category 2. Contractor and supervision documents shall use this classification consistently; site-level screening notation shall not be treated as a separate project categorisation.
Piped-system operating configuration	Before mobilisation of each piped-system work package, the approved engineering design and BoQ shall confirm the operating configuration. The C-ESMP shall identify any pumping/solar equipment, temporary or operational energy requirements, maintenance implications and associated E&S controls.
Heat-stress management	The C-ESMP OHS Plan shall define the potable-water provision, acclimatisation, work/rest regime, shade, heat triggers and emergency response consistent with GIIP and the approved OHS standard. No provisional litres-per-worker threshold is adopted by this ESIA.
Commissioning water-quality criterion	The C-ESMP commissioning plan shall specify the approved project/national drinking-water acceptance criteria and accredited laboratory method. Community use shall not be authorised until compliant results are confirmed.
Juba intake design and construction parameters	Each intake-specific hydrological assessment shall confirm the design event, freeboard, scour protection, safe construction window and flood-stage suspension threshold. The approved values shall be reflected in the final engineering documents and C-ESMP method statement.
Beneficiary monitoring baseline	The 1,800-3,000 household estimate remains indicative for ESIA purposes. WUA/user registers shall establish the verified beneficiary and inclusion baseline before commissioning and shall be used for benefit monitoring.

20. Overall Conclusion

The ESIA concludes that the Jubaland component of the BBS Irrigation Project is environmentally and socially viable and consistent with the risk profile of a Category 2 operation, provided that the project is implemented within the confirmed 13-site rehabilitation footprint and the ESMP is fully integrated into design, procurement, construction supervision, commissioning and operation. The principal residual risks are manageable but depend on disciplined implementation, particularly trench safety, supply continuity, river-intake safety, security, equitable water allocation, SEA/SH prevention and sustained O&M governance.

AfDB and Borrower acceptance should therefore be linked to implementation of the ESMP, closure of the defined pre-mobilisation hold points, approval of the relevant C-ESMP and activity-specific plans, adequate financing of safeguards measures, functioning stakeholder and grievance arrangements, and continuing monitoring and reporting throughout implementation.

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CHAPTER 1: INTRODUCTION AND SCOPING

1.1 Background and Project Context

Somalia continues to face recurrent water and food insecurity associated with drought, flooding, climate variability, institutional fragility and long-term underinvestment in productive infrastructure. Within Jubaland State, the BBS Project addresses two distinct water-infrastructure settings: riverine systems along the Juba River in Luuq and Dollow Districts of Gedo Region, and rainwater-harvesting catchments serving peri-urban and agro-pastoral communities in Kismayo District of Lower Juba Region.

The Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project is an initiative of the Ministry of Agriculture and Irrigation (MoAI) of the Federal Republic of Somalia, financed by the African Development Bank (AfDB). The Jubaland component comprises 13 rehabilitation sites: nine buried piped irrigation systems in Luuq and Dollow and four water catchments in Kismayo. The ESIA records the component as an AfDB Category 2 operation under the Integrated Safeguards System (ISS 2023).

The two intervention typologies create materially different environmental and social pathways. The Gedo works involve buried HDPE conveyance, Juba River intake structures, trenching through settled and cultivated corridors, distribution manifolds, community kiosks and livestock troughs. The Kismayo works involve desilting and rehabilitation of existing rainfall-runoff catchments, embankments, inlet and outlet structures, and associated livestock watering facilities. Dollow also requires particular attention because of its border location, displacement and humanitarian context, and the Juba River boundary reach.

Table 1-1: Jubaland Component at a Glance

Item	Jubaland component
Project component	BBS Irrigation Project - Jubaland State
Proponent	Ministry of Agriculture and Irrigation (MoAI), Federal Republic of Somalia
Financier	African Development Bank (AfDB)
Overall AfDB classification in ESIA	Category 2
Geographic scope	Luuq and Dollow Districts, Gedo Region; Kismayo District, Lower Juba Region
Site scope	13 sites: 9 piped irrigation-system rehabilitation sites and 4 water-catchment rehabilitation sites
Field verification recorded in source	December 2025 - January 2026

1.2 Purpose and Objectives of the ESIA

The purpose of this ESIA is to provide the environmental and social assessment required to support informed decision-making, project design and implementation for the Jubaland component. It identifies material risks and impacts associated with the 13 sites, establishes the framework for avoiding and managing those risks, and provides the basis for the later ESMP and associated instruments.

- confirm the Jubaland component scope, areas of influence and project phases to be assessed;
- establish the applicable environmental and social assessment framework and the issues requiring detailed analysis;

- provide a structured basis for the project alternatives, design measures, baseline, impact assessment and management planning presented in subsequent chapters;
- identify material environmental, social, occupational health and safety, community health and safety, climate, security, land-access, inclusion and stakeholder issues relevant to the two intervention typologies;
- document the approach to stakeholder engagement and differentiated consideration of vulnerable and displaced groups; and
- identify data gaps and pre-works verification requirements that must be closed before relevant activities proceed.

1.3 Scope of the ESIA

1.3.1 Geographic and Intervention Scope

The ESIA covers the full 13-site Jubaland portfolio. Six piped systems are in Luuq District, three are in Dollow District, and four catchments are in Kismayo District. The detailed site register and coordinates are presented once in Chapter 5 to avoid repetition.

1.3.2 Spatial Area of Influence

The area of influence is defined according to the nature of the intervention rather than by a single uniform buffer. It comprises:

- direct work footprints: pipeline trenches, intake and cofferdam work areas, manifolds, kiosks and troughs, catchment basins and embankments, access corridors, spoil-placement areas, and temporary storage or lay-down areas;
- immediate surrounding areas where construction noise, dust, traffic, open-trench hazards, temporary access restrictions or water-supply disruption may affect communities; and
- broader hydraulic and livelihood areas, including the distribution command areas of the piped systems, catchment user areas, and—at Dollow—the boundary-river and cross-border-adjacent context relevant to project water use and stakeholder perceptions.

1.3.3 Temporal Scope and Project Phases

The assessment covers pre-construction and mobilisation, construction, commissioning, operation and maintenance, and demobilisation of temporary works. Seasonal conditions are material: the ESIA identifies Juba low-flow windows for in-river intake works and recommends scheduling catchment earthworks outside peak Gu and Deyr rainfall periods. Detailed construction sequencing is presented in Chapter 5; mitigation commitments are reserved for Chapters 8 and 9.

1.4 ESIA Methodology

The ESIA methodology integrates review of project preparation and technical information, environmental and social screening, field verification, stakeholder consultation, baseline establishment, impact-pathway analysis and management planning. Field verification was undertaken during December 2025 and January 2026, followed by confirmation of the June 2026 project scope.

Impact significance is based on magnitude, duration, geographic extent, receptor sensitivity, reversibility and likelihood, using the significance classes Negligible, Minor, Moderate and Major. Detailed ratings are presented in Chapter 7.

1.5 Environmental and Social Scoping

1.5.1 Scoping Purpose and Inputs

Scoping establishes which issues require detailed assessment, the extent of the area of influence, the project phases to be covered and the depth of analysis appropriate to each issue. The scoping assessment was informed by the updated site list and alignments, site screening, field verification, district and community consultations, humanitarian engagement in Dollow and available design information.

1.5.2 Priority Issues by Intervention and Location

Table 1-2: Scoping by Intervention and Location

Assessment context	Issues carried forward
Luuq piped systems	Trench and confined-space safety; protection of existing buried pipes; continuity of irrigation and domestic supply; Juba intake hydrology and flood safety; pipe integrity and water quality; equitable distribution; land access and crop disturbance; community safety and security.
Dollow piped systems	All piped-system issues plus the boundary-river context, cross-border sensitivity, significant IDP/refugee and humanitarian presence, protection-sensitive engagement, and heightened security and SEA/SH considerations.
Kismayo catchments	Desilting and erosion; embankment and spillway integrity; catchment access; child and community safety around open water; livestock/domestic-use separation; land and livelihood access; sediment management; climate variability and security.

1.5.3 Cross-Cutting Issues

- labour and working conditions, worker welfare, heat stress, emergency response and occupational health and safety;
- community health and safety, including safe access across active works and first-use water safety;
- social inclusion and equitable water allocation, including tail-end users, female-headed households, minority groups, poor agro-pastoral households, IDPs, refugees and cross-border-adjacent populations;
- land access, temporary cultivation disturbance and grievance management;
- SEA/SH prevention and confidential reporting pathways;
- water quality, pollution prevention, spoil and waste management;
- security and access conditions across Luuq, Dollow and Kismayo;
- chance finds during subsurface works; and
- climate risks, especially Juba flooding, heat stress and drought variability.

1.5.4 Issues of Limited Relevance and Verification Triggers

The scoping assessment identifies several issues as limited in significance under the assumed project footprint: critical habitat and protected-area effects; involuntary resettlement; material Juba River over-abstraction; and large-scale air-quality impacts. These issues are not removed from safeguards control. They remain subject to verification of actual site

conditions, footprint limits, documented land access, and the final intake operating regime. If conditions differ materially from screening assumptions, the relevant assessment and safeguard determination must be revisited.

1.5.5 Scoping Outputs

The principal outputs of scoping are the issue register carried into Chapter 7, the area-of-influence definition used for baseline and stakeholder coverage, the life-cycle phase structure applied throughout the report, and the pre-works information requirements carried into design confirmation and the ESMP. These include pipe-route surveys, intake hydrological assessments, catchment condition assessments and site security assessments.

1.6 Stakeholder Engagement Approach During ESIA Preparation

The ESIA records engagement with Jubaland State authorities; Luuq, Dollow and Kismayo District Administrations; existing water committees and users; farming and agro-pastoral households; women; youth; IDP and refugee representatives; and humanitarian actors in Dollow. The approach is intended to support scoping, validate infrastructure condition and local use patterns, identify disruption and allocation concerns, and inform later mitigation and management measures. Detailed consultation records and responses should remain in the dedicated stakeholder documentation rather than be repeated in this chapter.

1.7 Assessment Constraints, Data Gaps, and Treatment of Uncertainty

The ESIA identifies several material limitations. These are retained explicitly because they affect design confirmation and the level of certainty of later findings:

- detailed stage-flow and scour information is incomplete at the nine Juba intake locations; per-intake hydrological assessments are therefore required before intake works;
- as-built records for the existing buried pipe systems are largely unavailable; route and existing-service surveys are therefore required before trenching;
- condition and capacity information for the four Kismayo catchments is not complete at detailed-design level; catchment condition assessments are required before mobilisation;
- security and access constraints limited the timing and depth of verification at some sites;
- community-level socioeconomic data are limited, particularly for mobile, displaced and cross-border populations in Dollow; and
- corridor-scale climate data are limited and the assessment relies on national and regional datasets and Juba basin information.

1.8 Structure of the Revised ESIA

Table 1-3: Revised ESIA Chapter Structure

Chapter	Content
Chapter 1	Introduction and Scoping
Chapter 2	Legal and Institutional Framework
Chapter 3	Analysis of Alternatives

Chapter	Content
Chapter 4	Design Measures
Chapter 5	Project Description
Chapter 6	Project Baseline
Chapter 7	Environmental and Social Risks and Impacts
Chapter 8	Mitigation Measures
Chapter 9	Environmental and Social Management Plan (ESMP)
Chapter 10	Conclusion and Recommendations

CHAPTER 2: LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 Purpose and Approach

This chapter presents the policy, legal, institutional, international and AfDB safeguard framework relevant to the Jubaland component. It distinguishes the Federal Government of Somalia framework from Jubaland State and district-level implementation roles, while recognising the particular water-governance and cross-border considerations associated with the Juba River at Dollow. Detailed mitigation and monitoring requirements are reserved for Chapters 8 and 9.

2.2 Federal Policy, Legal and Regulatory Framework

The legal and policy instruments below are presented using the titles contained in the project documentation. Formal gazette references and permit procedures shall be confirmed by the PIU with the competent authorities where required for implementation.

Table 2-1: Federal Policy and Regulatory Framework Identified in the ESIA

Instrument / policy area	Lead institution in source	Project relevance
Provisional Federal Constitution (Articles 43, 44, 45)	Federal Government of Somalia	Principles for sustainable management of land, natural resources and the environment.
National Transformation Plan (2025–2029)	Ministry of Planning, Investment and Economic Development	National resilience, productive-sector and service-delivery priorities.
National Climate Change Policy and related instruments	Ministry of Environment and Climate Change	Climate resilience, adaptation and risk management relevant to irrigation and flood risk.
National Adaptation Plan (NAP)	Ministry of Environment and Climate Change	Priority adaptation needs for water security and resilient infrastructure.
Nationally Determined Contribution (NDC)	Ministry of Environment and Climate Change	National climate commitments relevant to resilient water systems.
Environmental permitting and EIA regulations	Ministry of Environment and Climate Change	Environmental assessment, permitting and civil-works compliance.
National Water Policy / Water Sector Strategy	Ministry of Energy and Water Resources	Water-resource development, allocation and governance of the Juba system, including transboundary considerations.
National Gender Policy	Ministry of Family and Human Rights	Gender equality in participation, benefit distribution and grievance systems.
Agriculture Sector Strategy and Plan	Ministry of Agriculture and Irrigation	Irrigation rehabilitation, climate-smart agriculture and sector roles.
National Food Security and Nutrition Policy	Ministry of Agriculture and Irrigation	Food-security and nutrition objectives relevant to irrigation-supported production and vulnerable households.
National Pesticide Policy	Ministry of Agriculture and Irrigation	Integrated pest management and safe pesticide handling where irrigation supports intensified production.
National Fertilizer Policy	Ministry of Agriculture and Irrigation	Nutrient-runoff management and safe fertilizer storage if use increases.

Instrument / policy area	Lead institution in source	Project relevance
Labor and Employment Laws and Regulations	Ministry of Labor and Social Affairs	Worker protection and welfare, supplemented by AfDB OS2 and the project LMP.
Public Health and Communicable Disease Control Regulations	Ministry of Health and Human Services	Public health, kiosk water quality, sanitation and vector-control requirements.
Land Administration and Local Government Instruments	Relevant federal and local authorities	Land access, use restrictions and documentation.

2.3 Jubaland State and Local Institutional Framework

The ESIA describes Jubaland State as exercising practical functions over resource management, land administration, environmental oversight and public infrastructure within the federal system, subject to federal law. It also records limited state-level environmental and social regulatory and enforcement capacity, which makes the AfDB ISS and project-specific procedures particularly important for implementation.

Table 2-2: Jubaland State and Local Institutional Framework

Institution / structure	Role relevant to the project
Jubaland State Ministry of Agriculture / Water	Project counterpart; environmental-permit coordination; water-allocation coordination; joint oversight; support for Dollow cross-border coordination.
Luuq District Administration	Site access, community liaison, security coordination and local dispute resolution.
Dollow District Administration	Border-site access; cross-border-adjacent, IDP and refugee community liaison; security coordination; WUA support; coordination with humanitarian actors.
Kismayo District Administration	Catchment access, peri-urban community liaison, security coordination, local dispute resolution and WUA support.
Community WUAs / water-management structures	Operation and maintenance, documented allocation arrangements, leak and damage reporting, catchment management and community-level grievance interface.
Traditional/community leadership and humanitarian actors where relevant	Community legitimacy, local communication and conflict-sensitive/protection-sensitive engagement, especially in Dollow.

2.4 International Conventions and Shared-Water Considerations

The ESIA identifies Somalia's obligations under the United Nations Framework Convention on Climate Change and Paris Agreement, the United Nations Convention to Combat Desertification, the Convention on Biological Diversity and the Convention on the Elimination of All Forms of Discrimination Against Women as relevant to the project context. It also identifies the 1951 Refugee Convention and 1967 Protocol as contextually relevant to protection-sensitive engagement with refugee populations in Dollow.

Dollow requires additional care because the Juba River forms the Ethiopia–Somalia boundary in the project area. The ESIA applies a precautionary approach to shared-water issues: bank-side intakes are preferred, and no mid-stream structure is to be introduced on the boundary reach without the appropriate cross-border assessment and coordination. This ESIA does not independently determine international water rights; it records the project control stated in the project documentation.

2.5 African Development Bank Integrated Safeguards System 2023

The ESIA classifies the Jubaland component as Category 2 under the AfDB ISS 2023. The following Operational Safeguards are identified as triggered:

Table 2-3: AfDB Operational Safeguards Identified as Triggered

OS	Title	Jubaland relevance
OS1	Assessment and Management of Environmental and Social Risks and Impacts	Overall assessment and management framework; intake flood/hydrology risk; climate integration; cumulative effects.
OS2	Labor and Working Conditions	Trench, confined-space, heat, equipment and in-river worker safety; worker terms and grievance procedures.
OS3	Resource Efficiency and Pollution Prevention	Pipe integrity, kiosk water quality, sediment/spoil management, fuel and waste management and sustainable water use.
OS4	Community Health, Safety and Security	Trench and catchment safety, first-use water safety, SEA/SH prevention, security management and river-work safety.
OS7	Vulnerable Groups	IDP/refugee households, tail-end users, female-headed households, poor agro-pastoral households and minority groups.
OS10	Stakeholder Engagement and Information Disclosure	Consultation, disclosure, disruption schedules, ongoing engagement and project GRM.

The ESIA records OS5 (Land Acquisition), OS6 (Biodiversity) and OS8 (Cultural Heritage) as screened but not triggered, subject to precautionary controls. Those controls include a Land Access Protocol, minimum-footprint and reinstatement requirements at river intakes, and a Chance Finds Procedure. If project changes create impacts outside the screened assumptions, the relevant safeguard applicability must be reassessed before proceeding.

2.6 Institutional Responsibilities for Safeguards Implementation

Safeguards implementation relies on coordinated responsibilities rather than on a single institution. The PIU retains overall accountability for compliance and AfDB reporting. The ESIA identifies a shared South West State/Jubaland E&S Officer for day-to-day Jubaland oversight, including field inspection and pressure-test witnessing. Contractors are responsible for implementing approved C-ESMP requirements through dedicated ESHS personnel, while the Supervision Consultant verifies works and safeguards performance. District administrations support access, community liaison and security coordination, and WUAs assume operational responsibilities after handover.

2.7 Permits, Clearances and Pre-Works Compliance Requirements

The exact permit titles and issuing procedures must be confirmed through the competent federal and Jubaland authorities before mobilisation. Based on the ESIA, the compliance pathway must at minimum address environmental clearance, Juba River intake and water-allocation coordination, access agreements for pipe corridors and catchment work areas, security clearance, and approvals of contractor safeguards plans and high-risk method statements.

Table 2-4: Indicative Compliance and Approval Pathway

Requirement	Responsible / coordinating parties	Timing
Environmental assessment / project clearance	Federal environmental authority and Jubaland counterpart, as applicable	Before commencement of works under the approved project process.

Requirement	Responsible / coordinating parties	Timing
Juba intake / water-use coordination	Relevant federal/Jubaland water authorities; Dollow district/state coordination for boundary reach	Before intake works and before operation of the rehabilitated intakes.
Land and temporary access documentation	PIU, district administration, WUA, landowners/users	Before opening any work corridor or catchment work area.
Security clearance	PIU / Jubaland and district security coordination	Before mobilisation to each site and updated as conditions change.
C-ESMP and high-risk method statements	PIU, with Supervision input	Before contractor mobilisation and before each high-risk activity.
Commissioning evidence	PIU / Supervision / accredited testing as applicable	Before community use: pressure tests, system flushing, water-quality confirmation, WUA readiness and catchment completion checks.

2.8 Gap Review: Borrower/Jubaland Framework and AfDB ISS 2023

Table 2-5: Jubaland-Specific Gap Review

Topic	Identified gap / limitation	Project response
Environmental permitting and oversight	State-level capacity described as limited and regulatory framework as nascent.	Apply the AfDB ISS 2023 and approved ESIA/ESMP as minimum project standard, with documented oversight and reporting.
Juba intake hydrology and gauging	Systematic intake-reach gauging and site-specific stage-flow/scour information are incomplete.	Pre-works hydrological assessment for every intake; defined low-flow work windows and suspension criteria; downstream monitoring proportionate to risk.
Boundary reach at Dollow	Source states no domestic framework specifically governs boundary-reach works.	Bank-side intake approach; no mid-stream works without cross-border assessment/coordination; conflict-sensitive disclosure and escalation.
Drinking-water quality at kiosks	Source states systematic enforcement is limited.	Project commissioning and O&M water-quality testing and documented acceptance criteria.
Labour and OHS	National framework does not by itself provide the full project-specific controls for trench, confined-space, river and heat hazards.	AfDB OS2, LMP, C-ESMP, OHS plan, competent supervision and activity-specific method statements.
Land access and economic disturbance	No project-specific involuntary acquisition anticipated, but pipe corridors can affect crops and access.	Precautionary Land Access Protocol, written access, reinstatement and compensation procedures; reassess OS5 if assumptions change.
Grievance and vulnerable-group protection	Formal procedures not standardised at district level; Dollow has displacement and refugee sensitivities.	Accessible GRM, confidential SEA/SH channel, protection-sensitive engagement, and differentiated inclusion of displaced and marginalised users.

2.9 Compliance Hierarchy and Implications for the ESIA

The Project must comply with applicable Somali law and the requirements of the financing agreement and AfDB ISS 2023. Where project-specific AfDB requirements are more protective than the available domestic or state framework, the project safeguard requirement provides the implementation standard. This does not waive any applicable national or state permit or approval. Detailed responsibilities, monitoring thresholds, contractor clauses and management plans are consolidated in Chapter 9.

CHAPTER 3: ANALYSIS OF ALTERNATIVES

3.1 Purpose and Decision Framework

The analysis of alternatives identifies practicable options for meeting the project objective while avoiding or reducing environmental and social risk. The ESIA considers the no-project alternative, location and siting choices, design and technology alternatives, construction scheduling and work-front alternatives, and specific avoidance choices related to the Juba River boundary reach, supply continuity and land disturbance.

3.2 Evaluation Criteria

The ESIA evaluates alternatives against technical feasibility, environmental impact, social benefit, cost and operational sustainability. For this ESIA, those criteria are presented in a single decision framework to avoid repeating the same rationale in later design and project-description chapters.

Table 3-1: Alternatives Evaluation Criteria

Criterion	Application to alternatives
Technical feasibility	Ability to rehabilitate existing infrastructure safely and achieve reliable hydraulic/storage performance.
Environmental performance	Avoidance of unnecessary land disturbance, open-water hazards, evaporation losses, pollution, erosion and riverbank impacts.
Social performance	Continuity of water access, equitable distribution, safety, land/livelihood effects, inclusion of vulnerable groups and community acceptability.
Climate resilience	Performance under Juba floods, drought variability, heat and Kismayo rainfall variability.
Operational sustainability	Maintainability, durability, availability of skills and materials, and practicality of community-based O&M.
Cost and implementation practicality	Ability to deliver within available resources and supervision capacity without creating disproportionate safeguards risk.

3.3 No-Project Alternative

Under the no-project alternative, the nine deteriorated piped systems would remain affected by damaged pipes, blocked intakes and non-functional valves, while the four Kismayo catchments would continue to lose storage through sedimentation and structural deterioration. The ESIA concludes that this would prolong unreliable irrigation and domestic water access, maintain avoidable water losses and dry-season hardship, and provide no financed mechanism for restoring the priority systems. The no-project alternative is therefore not preferred.

3.4 Location and Siting Alternatives

3.4.1 Selection of the 13 Sites

The ESIA states that site selection combined government prioritisation, community demand, infrastructure condition and rehabilitability, feasibility assessment and environmental and social screening. The selected package concentrates the piped works within the Luuq and Dollow Juba River corridor and the catchment works at four existing Kismayo structures.

3.4.2 Deprioritised or Screened-Out Sites

The ESIA states that additional sites were screened out or deprioritised because of severe security constraints, infrastructure beyond economic rehabilitation, unresolved land or water disputes, Dollow intake concepts requiring mid-stream boundary-river structures, or catchments considered unsuitable for viable restoration. The supplied ESIA does not identify those sites or provide comparative scores. This ESIA therefore does not invent site names, rankings or cost comparisons; any detailed selection matrix should be annexed only if supported by the underlying screening records.

3.4.3 Micro-Siting and Footprint Adjustment

Within the selected sites, the preferred approach is to remain within existing infrastructure corridors and catchment footprints as far as practicable. Micro-siting of trenches, manifolds, kiosks, troughs, access routes and temporary areas should avoid unnecessary cultivated-land disturbance, maintain community access and, at intakes, minimise riverbank and riparian disturbance. At Dollow, bank-side intake arrangements are preferred rather than new mid-stream structures.

3.5 Design and Technology Alternatives

Table 3-2: Design and Technology Alternatives

Design issue	Alternative A	Alternative B	Preferred approach / source rationale
Conveyance type - Gedo corridor	Open canal rehabilitation	Buried HDPE piped system	Buried HDPE retained in the source design because it reduces evaporation and contamination exposure and avoids open-water safety/access hazards, while introducing trench risks managed through construction controls.
Pipe jointing	Mechanical couplings throughout	Certified butt/electrofusion welding, with mechanical coupling where specified	Certified welding on main runs is preferred in the source because of joint integrity; each section is pressure-tested before backfill.
Dollow intake position	Mid-stream structure	Bank-side intake	Bank-side approach preferred to avoid unnecessary boundary-river implications; no mid-stream works without cross-border assessment.
Supply during replacement	Full shutdown	Section-by-section replacement with partial supply and contingency	Sectional approach preferred to protect domestic and irrigation continuity.
Kismayo catchment lining	Compacted soil only	Geomembrane where infiltration losses justify it	Selective lining preferred; final extent depends on catchment condition and detailed design.
Catchment desilting	Mechanical excavation only	Combined mechanical and manual approach	Combined approach preferred to balance bulk excavation, local employment and protection of structures/liners.
Community water access	Direct draw from intake/catchment	Kiosks and dedicated livestock troughs	Dedicated points preferred for hygiene, safety and separation of domestic and livestock use; kiosk siting informed by women's consultation.

3.6 Construction and Implementation Alternatives

3.6.1 Seasonal Scheduling

The ESIA compares year-round in-river intake construction with restricting in-river works to Juba low-flow windows. Low-flow scheduling is preferred because it reduces exposure to rapid flow changes, inundation and drowning risk. Similarly, Kismayo catchment earthworks are preferably scheduled outside peak Gu and Deyr rainfall to reduce erosion and improve compaction conditions. Final timing remains subject to the pre-works hydrological and catchment assessments.

3.6.2 Work-Front Organisation

The ESIA prefers district-based work fronts for Luuq, Dollow and Kismayo rather than one sequential team across all 13 sites. The rationale is to reduce programme duration and avoid prolonging disruption across multiple flood and rainfall seasons. This approach remains conditional on adequate ESHS staffing, supervision, security access and community liaison for each active work front.

3.6.3 Mechanised and Labour-Based Methods

Bulk trenching and catchment desilting require mechanised equipment, while manual methods are appropriate for finishing, work close to existing services, reinstatement and sensitive locations. The ESIA specifically requires hand digging within one metre of confirmed existing pipes. The combined approach is therefore preferred rather than an exclusively mechanised or exclusively labour-based method.

3.7 Environmental and Social Risk-Avoidance Alternatives

- use buried conveyance rather than open canal rehabilitation along the Gedo corridor to reduce evaporation, contamination exposure and open-water hazards;
- keep works within existing corridors and catchment footprints to avoid unnecessary new land take;
- use bank-side intakes at Dollow and prohibit mid-stream works unless the necessary cross-border assessment is undertaken;
- replace pipe sections progressively while maintaining agreed partial supply rather than impose avoidable full-system shutdowns;
- survey existing buried services before trenching to avoid damage and unplanned supply interruption;
- use dedicated kiosks and troughs to separate domestic collection and livestock use from hazardous intake/catchment edges; and
- sequence high-risk activities according to hydrological, rainfall and security conditions rather than programme pressure alone.

3.8 Stakeholder and Inclusion Considerations in Alternatives Selection

The preferred alternatives respond to issues recorded through consultation: water-supply continuity during pipe replacement; equitable valve-controlled allocation; safe and convenient kiosk siting for women and girls; protection-sensitive access for IDP and refugee communities in Dollow; transparent local employment; and clear catchment access rules in Kismayo. Detailed commitments are not repeated here because they are addressed in Chapters 8 and 9.

3.9 Climate Resilience and Operational Sustainability

Climate considerations favour buried conveyance in the Gedo corridor because it reduces evaporation and is less exposed than open channels, low-flow scheduling for in-river works, intake design informed by flood conditions, and restoration of Kismayo catchment storage. Operational sustainability also favours pressure-tested pipework, accessible valves and manifolds, maintainable kiosks and troughs, and community WUA arrangements before handover.

3.10 Preferred Alternative

The preferred alternative is the rehabilitation of the nine existing buried piped irrigation systems in Luuq and Dollow with bank-side Juba River intakes, pressure-tested conveyance, distribution infrastructure, kiosks and livestock troughs, together with rehabilitation of the four existing Kismayo catchments through desilting, embankment repair, selective lining where justified and improvement of inlet/outlet and livestock-water facilities. Delivery is through district work fronts, with seasonally appropriate sequencing and continued community water access. This conclusion reflects the ESIA; final design parameters remain subject to the verification requirements in Chapter 4.

CHAPTER 4: DESIGN MEASURES

4.1 Purpose and Design Status

This chapter consolidates the design features that are relevant to environmental and social performance. It does not reproduce the project description in Chapter 5 or the mitigation measures in Chapter 8. The ESIA indicates that detailed engineering has established, or will confirm before mobilisation, site-specific parameters for the piped systems and Kismayo catchments. Where the ESIA provides only a design requirement rather than an approved dimension, this chapter retains that distinction.

4.2 Design Principles Applied to the Jubaland Component

- rehabilitate existing infrastructure and use existing corridors/footprints as the default, minimising new disturbance;
- use buried conveyance in the Gedo corridor to reduce evaporation, contamination exposure and open-water hazards;
- confirm hydraulic and structural parameters through site-specific design and pre-works assessment rather than applying generic dimensions to every site;
- integrate worker and community safety into trench, intake, kiosk, trough and catchment design;
- provide maintainable infrastructure and access for inspection and O&M;
- incorporate flood, erosion, sedimentation and drought considerations into intake and catchment design; and
- integrate community use patterns, equitable access and women's input into the siting of distribution points.

4.3 Piped Irrigation-System Design - Luuq and Dollow

4.3.1 Alignment, Trench and Buried HDPE Conveyance

The nine systems use buried HDPE conveyance. The final alignment, pipe diameter and pressure class are to follow the hydraulic design for each system. The ESIA describes typical trench depths of approximately 0.6–1.5 m, with deeper excavations possible at intakes and manifolds. Bedding and backfill specifications are to be confirmed in the design package, and the ESIA requires compacted backfill in 200 mm layers and reinstatement of roads, tracks and agricultural surfaces.

The ESIA also distinguishes a construction safety trigger from the typical geometry: trench shoring is required for sections deeper than 1.2 m. This is an execution control, not a justification for assuming a uniform trench depth. Existing service routes must be surveyed before excavation because as-built records are incomplete.

4.3.2 Juba River Intake Structures

The ESIA requires each intake design to be informed by a site-specific hydrological assessment covering low-flow construction timing, design flow, scour, sediment management and flood-stage suspension criteria. It states that intake structures are designed for a 1-in-25-year flood event with 0.5 m freeboard. Intake screens, sediment traps and scour protection are to be confirmed for each site through detailed design.

At Dollow, bank-side intake arrangements are the preferred design approach. The ESIA applies a standing precaution that no mid-stream structure should be introduced on the boundary reach without the appropriate cross-border

assessment and coordination. Any cofferdam or temporary diversion is a construction-stage arrangement and must be designed for the actual intake conditions rather than copied generically from another site.

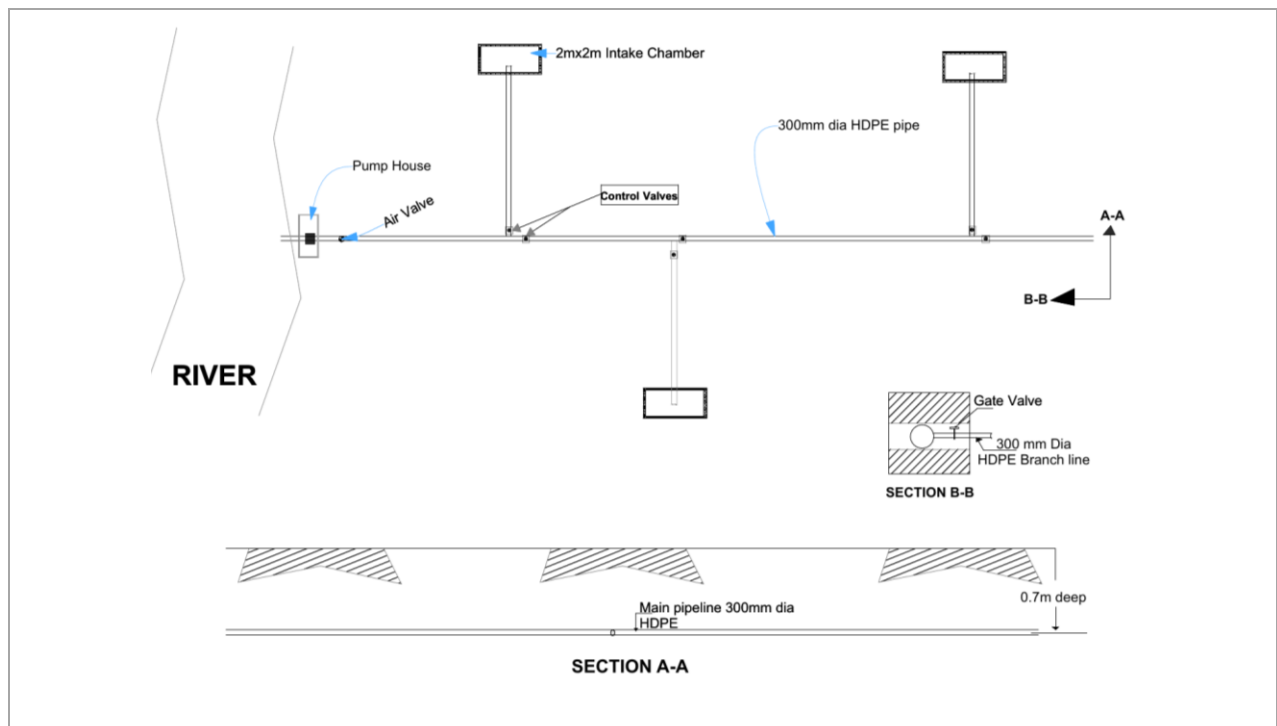


Figure 4-2: Typical Luuq Irrigation Pipeline and Juba River Intake Arrangement

4.3.3 Distribution Manifolds, Valves and Offtakes

Distribution manifolds and control valves regulate flow from the main conveyance to community and irrigation users. The ESIA requires the manifold and valve specifications to be derived from the hydraulic design and the operational allocation arrangement. Valve accessibility for safe inspection and operation is essential because equitable allocation during O&M depends on transparent, schedule-based operation.

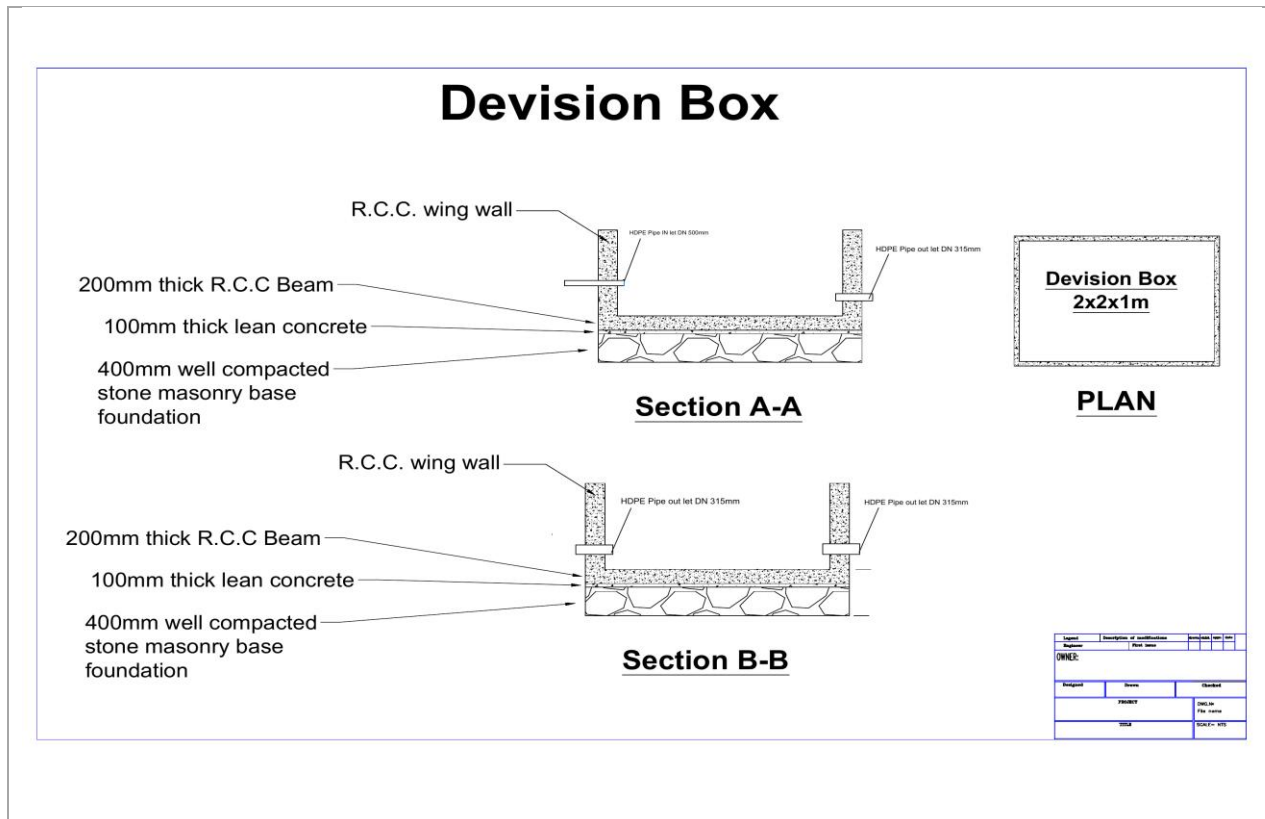


Figure 4-3: Typical Luuq Division Box and Distribution Arrangement

4.3.4 Community Water Kiosks and Livestock Troughs

The preferred design separates domestic collection and livestock watering through dedicated kiosks and troughs. Kiosks are to include drainage and hygiene-oriented details and are to be located with reference to community use patterns. The ESIA specifically records that kiosk siting should be informed by women's focus groups. Trough placement and drainage should avoid creating unsafe access or persistent standing water.

4.3.5 Pipe Jointing, Pressure Testing and System Integrity

The ESIA identifies certified butt/electrofusion welding as the preferred main-run jointing approach, with mechanical coupling where specified by design or manufacturer requirements. Every pipe section is to undergo hydraulic pressure testing before backfill is authorised, with failures re-jointed or replaced and retested. The detailed test pressure, duration and acceptance criteria must come from the approved engineering specification; they are not stated in the supplied ESIA and are therefore not invented here.

4.4 Kismayo Water-Catchment Design

The four Kismayo sites are rehabilitation of existing rainfall-runoff harvesting structures. The final design at each catchment is to be based on a pre-works condition assessment covering storage geometry and sediment depth, embankment and bund integrity, liner requirements, inlet/outlet condition, spillway performance and downstream erosion risk.

Table 4-1: Kismayo Catchment Design Measures

Design element	Design measure / confirmation requirement
Basin and storage	Desilting and reshaping to restore usable storage; final geometry and desilting quantity determined from condition assessment and design.
Embankments and bunds	Repair, reinforcement, compaction and stabilisation based on identified defects and geotechnical suitability of material.
Lining	Geomembrane only where infiltration losses and design assessment justify it; no assumption that all four catchments require lining.
Inlets, silt traps and spillways	Improve runoff entry, sediment control, safe overflow and erosion protection based on site hydrology.
Controlled outlets and livestock troughs	Provide safe managed access and separate livestock use where included in final design.
Perimeter / disturbed areas	Reinstate vegetation and stabilise disturbed surfaces to reduce erosion after earthworks.

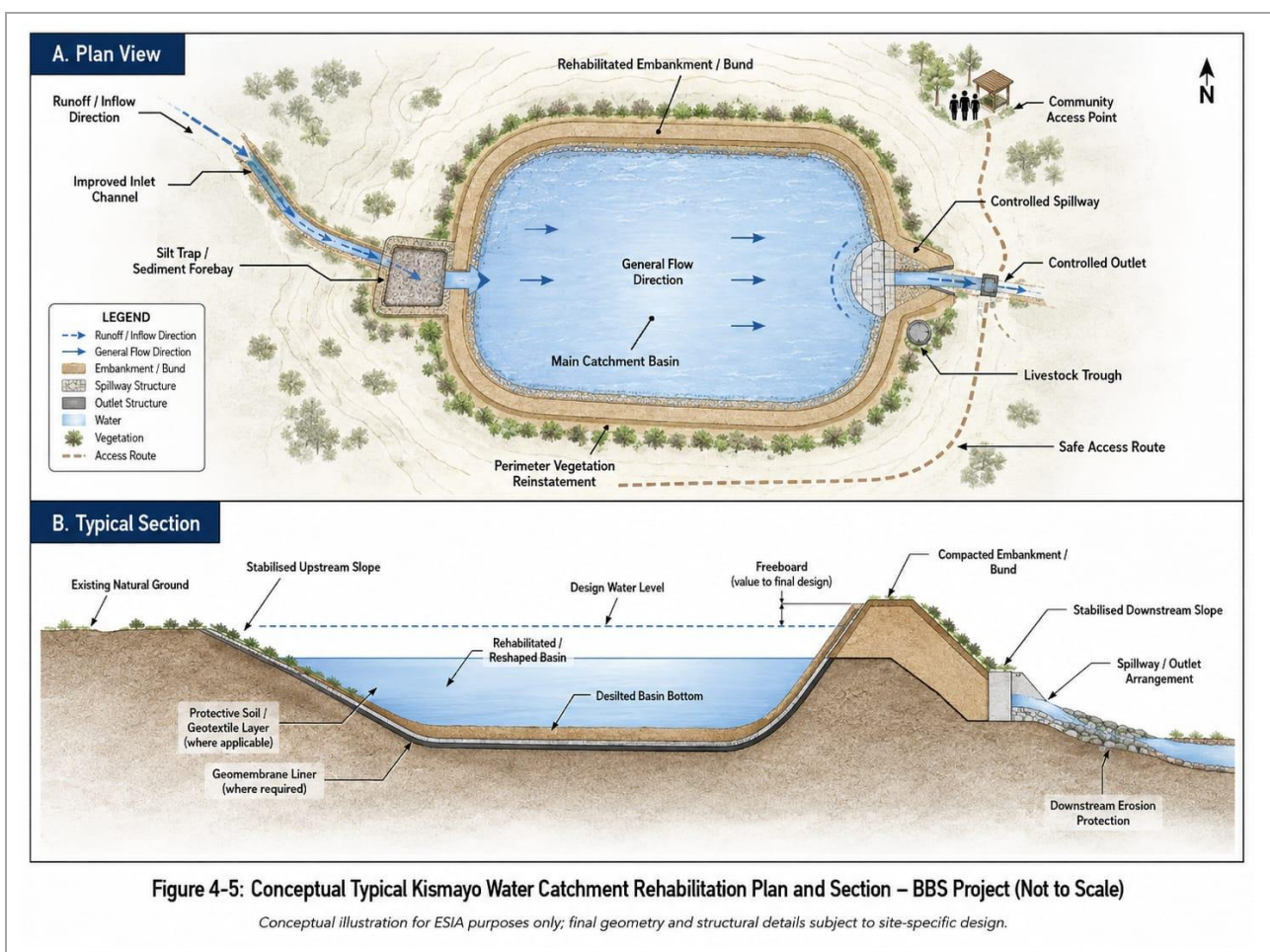


Figure 4-5: Conceptual Typical Kismayo Water Catchment Rehabilitation Plan and Section - BBS Project (Not to Scale)

Conceptual illustration for ESIA purposes. Final geometry, capacity, embankment dimensions, liner extent, spillway and outlet details shall be confirmed through the approved site-specific condition assessment and engineering design and reflected in the C-ESMP.

4.5 Climate-Resilient Design Measures

The ESIA identifies High–Very High Juba flood risk, High heat-stress risk and Moderate–High drought risk. Design responses include flood-informed intake structures, freeboard, scour and sediment protection, buried conveyance that

reduces evaporation, and catchment storage rehabilitation. Catchment spillways are also described as designed for a 1-in-25-year design rainfall event. These ESIA values should be checked against the final engineering design basis before procurement rather than treated as a substitute for signed design calculations.

4.6 Environmental and Social Design Integration

Table 4-2: Environmental and Social Requirements to be Reflected in Final Design

Design consideration	Integration into design
Land and livelihood disturbance	Use existing pipe corridors and catchment footprints; micro-site temporary areas and distribution points to minimise cultivation and access disruption.
Community access and safety	Design trench crossings during construction; site kiosks/troughs for safe access; maintain barriers/fencing and safe access around catchments.
Water continuity	Design and sequence sectional replacement so existing supply can be maintained where practicable and isolation can be limited.
Equitable distribution	Provide operable valves/manifolds and transparent allocation points that can be managed under WUA schedules.
Women and vulnerable users	Use women's consultation in kiosk siting; account for displaced, minority and tail-end users in distribution and access arrangements.
Pollution and water quality	Use closed conveyance, pressure testing, drainage and first-use flushing/testing; design spoil/sediment and fuel controls in temporary facilities.
O&M maintainability	Ensure inspection access, maintainable valves/screens, repairability of pipe systems and practical access to catchment silt traps and embankments.

4.7 Design Confirmation Before Procurement and Mobilization

Table 4-3: Design Confirmation Register

Design package	Required confirmation
All nine piped systems	Final alignment, diameter, pressure class, trench/bedding and reinstatement specification; route survey and existing-service mapping; manifold/valve/kiosk/trough details.
All nine intakes	Per-intake hydrological assessment; design flow; flood and scour basis; bank/riverbed conditions; screen/sediment trap; flood suspension stage; Dollow boundary-reach confirmation.
All pipe systems	Approved jointing specification and pressure-test procedure/acceptance criteria.
Four Kismayo catchments	Condition survey; storage and sediment quantities; embankment/liner/spillway/inlet/outlet requirements; erosion protection and safe access details.
Temporary and support sites	Locations, land/use agreements, drainage, waste/fuel controls and reinstatement requirements.
All sites	Final land/access footprint, community interface, security classification, emergency access and O&M arrangements.

CHAPTER 5: PROJECT DESCRIPTION

5.1 Project Overview

The Jubaland component of the BBS Irrigation Project comprises rehabilitation of 13 existing water and irrigation infrastructure sites in three districts. Nine sites are buried piped irrigation systems associated with the Juba River in Luuq and Dollow Districts, Gedo Region. Four sites are rainfall-runoff water catchments in Kismayo District, Lower Juba Region. This chapter defines the physical project once, so that later baseline, impact and management chapters can refer to the project without repeating its full description.

Table 5-1: Jubaland Project Scope by Intervention Type

Intervention type	Sites	Districts	Principal works
Piped irrigation-system rehabilitation	9	Luuq (6) and Dollow (3)	Buried HDPE conveyance, Juba River intakes, distribution manifolds/offtakes, kiosks and livestock troughs.
Water-catchment rehabilitation	4	Kismayo	Desilting/reshaping, embankment and bund repair, selective lining where required, inlet/outlet and silt-control structures, troughs and reinstatement.

5.2 Geographic Setting

The nine piped systems are clustered along the Juba River corridor in Gedo Region. Luuq is a riverine agricultural centre and crossing point; Dollow lies on the Ethiopia–Somalia border, where the Juba River forms part of the boundary and where the project operates in a significant humanitarian, displacement and cross-border movement context. The four Kismayo catchments are in the Lower Juba coastal hinterland and serve peri-urban and agro-pastoral users. Detailed baseline conditions are presented in Chapter 6 rather than repeated here.

5.3 Project Site Register

Table 5-2: Piped Irrigation-System Sites - Luuq and Dollow

System	District	Village / area	Start (Lat, Long)	End (Lat, Long)
Aytimirow	Luuq	Timirow	3.753883, 42.546907	3.754903, 42.553222
Liimooy	Luuq	Liimooy	3.801399, 42.561775	3.796688, 42.562469
Jaziira One	Luuq	Jaziira One	3.802236, 42.555546	3.804395, 42.555276
Horseed	Luuq	Horseed	3.821121, 42.533770	3.816170, 42.538112
Buulo Yaxaas	Luuq	Buulo Yaxaas	3.769218, 42.548529	3.770443, 42.548394
Buulo Muusley	Luuq	Buulo Muusley	3.790001, 42.548836	3.790001, 42.548836
Quracleey	Dollow	Quracleey	4.149618, 42.147521	4.144784, 42.143795
Buulo Qaloc	Dollow	Buulo Qaloc	4.157868, 42.137301	4.152138, 42.132412
Garaash	Dollow	Garaash	4.153757, 42.142889	4.144962, 42.136617

Table 5-3: Water-Catchment Sites - Kismayo District

Site	District	Latitude	Longitude	Type	Source screening category
Hadaafow	Kismayo	-0.275419	42.481068	Water catchment	Cat. 2
Bilicsan	Kismayo	-0.301147	42.402547	Water catchment	Cat. 2
Dalsan	Kismayo	-0.336470	42.380495	Water catchment	Cat. 2
Dabaylwayne	Kismayo	-0.243190	42.525848	Water catchment	Cat. 2

Coordinate-control note: Buulo Muusley is recorded with identical start and end coordinates. Before trenching, the contractor shall verify the full pipeline alignment through the required route and buried-service survey and include the verified alignment in the approved C-ESMP and setting-out records.

5.4 Project Map and Visual Records

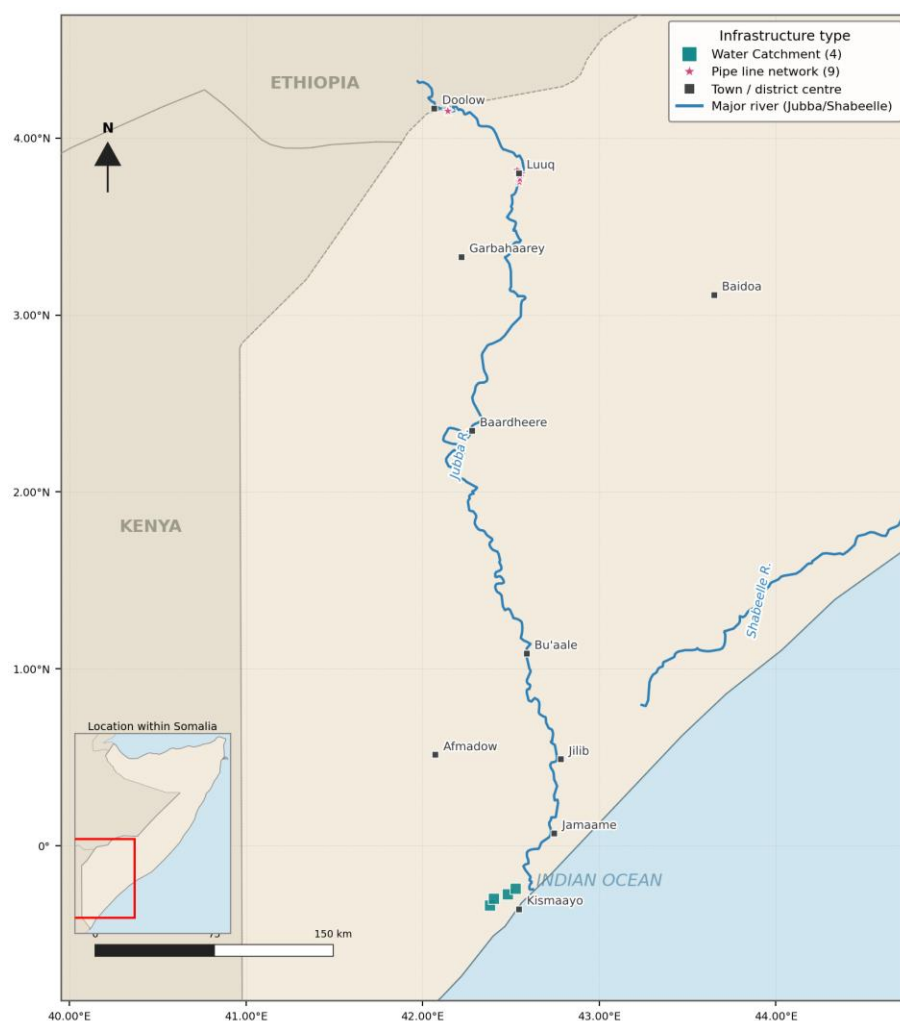


Figure 5-1: Jubaland State - BBS Irrigation Project Site Locations (13 sites)

5.5 Piped Irrigation-System Rehabilitation Works

The nine piped systems convey Juba River water through buried HDPE pipelines to distribution areas. Principal rehabilitation activities, subject to the approved engineering design and site-specific C-ESMP method statements, include:

- excavation of the existing/new rehabilitation trench along the confirmed pipeline route, with manual finishing near structures and existing services;
- placement and jointing of HDPE pipe in accordance with the approved specification and manufacturer requirements;
- hydraulic pressure testing of each completed section before backfill;
- compacted backfill and reinstatement of roads, tracks, access routes and agricultural surfaces;
- rehabilitation or construction of bank-side intake components, with temporary cofferdam/diversion arrangements where required by the approved intake method;
- installation or rehabilitation of distribution manifolds, control valves and irrigation offtakes;
- construction or rehabilitation of community water kiosks and livestock troughs; and
- minor access-track works where necessary, followed by reinstatement.

5.6 Water-Catchment Rehabilitation Works - Kismayo

The four Kismayo sites are existing rainfall-runoff harvesting structures. Works may include desilting and basin reshaping, repair and reinforcement of embankments and bunds, installation of geomembrane liners where required, improvement of silt traps, spillways and inlet/outlet structures, construction or rehabilitation of livestock troughs, minor access improvement, and reinstatement of vegetation on disturbed perimeter areas. Final quantities and structural requirements are to be determined by the pre-works condition assessment and detailed design.

5.7 Construction Phasing and Sequencing

The ESIA envisages district-based work packages for Luuq, Dollow and Kismayo. Mobilisation to a site is conditional on completion of the relevant readiness requirements. Construction sequencing is intended to minimise high-risk exposure and maintain community water access.

Table 5-4: Construction Sequencing Principles

Work package / activity	Sequencing principle
Piped systems	Confirm route/access, existing services, intake hydrology, security and disruption arrangements before mobilisation; limit open-trench lengths; backfill inactive sections promptly and complete surface reinstatement after pipe installation; maintain agreed partial supply where practicable.
Juba intake works	Undertake in the low-flow window established by the per-intake hydrological assessment; apply intake-specific flood monitoring and work-suspension criteria.
Kismayo catchments	Schedule major earthworks outside peak Gu and Deyr rainfall where practicable and according to condition assessment/design requirements.
All districts	Coordinate community notification, access, traffic, security, worker welfare, emergency response and environmental controls with each active work front.

The ESIA gives indicative durations of approximately 6–12 weeks per piped system and 8–14 weeks per Kismayo catchment, depending on final scope. These are planning estimates rather than contractual durations and should be updated when the works programme and BoQ are finalized.

5.8 Construction Support Activities, Materials and Temporary Facilities

Materials identified in the ESIA include HDPE pipe and fittings, valves and metalwork, cement, aggregate, reinforcement, geomembrane liner, geotextile and shoring materials. The ESIA envisages sourcing from established suppliers, with local borrow materials used only where suitable and environmentally screened. Final ESIA locations are not fixed in the supplied ESIA and should therefore be recorded in the Associated Facilities and Support-Sites Register once selected.

Temporary support needs include lay-down and pipe-storage areas, tool/equipment storage, fuel and chemical storage, worker welfare and sanitation, drinking water, shade, first aid, communications and activity-specific rescue equipment. Borrow areas, spoil-disposal locations, construction-water abstraction points, worker accommodation (if any), temporary access routes and lay-down areas are not automatically approved by this ESIA; each must be screened, permitted/authorised as applicable, supported by land-use agreements and reinstated after use.

5.9 Workforce and Labour Profile

The ESIA estimates approximately 15–40 workers per active site depending on scope. Skilled roles include equipment operators, certified HDPE welders and masons, while unskilled labour is required for trenching support, backfill, reinstatement and catchment earthworks. The ESIA records a preference for local hiring from Luuq, Dollow and Kismayo for unskilled and semi-skilled roles, including access for unemployed youth and displaced communities, while recognising that specialised skills may need to be sourced from outside the districts. Detailed labour conditions and targets belong in the LMP and ESMP.

5.10 Resource Requirements and Energy

5.10.1 Construction Water and Materials

Construction water is required for concrete, compaction, dust control, hydraulic testing, flushing and worker welfare. The ESIA identifies the Juba River or existing systems as potential sources for the piped works, subject to arrangements that protect community supply continuity. The Kismayo catchments rely on rainfall runoff during operation. Detailed volumes for construction are not provided in the ESIA and are therefore not estimated here.

5.10.2 Energy and Operational Configuration

Construction equipment, welding units and small site generators require temporary energy and fuel. The final operating configuration of each piped system shall be confirmed from the approved engineering design, hydraulic calculations and BoQ before mobilisation. The C-ESMP shall identify any pumping or solar equipment, temporary and operational energy requirements, fuel or electrical hazards, maintenance needs and associated E&S controls. No unverified operating-energy assumption is adopted in this ESIA.

5.11 Operation and Maintenance Concept

The ESIA envisages handover of all 13 sites to community WUAs or strengthened water-management structures, supported by district and Jubaland authorities. For piped systems, O&M includes operation of intakes and valves under documented allocation arrangements, route inspection for leaks, intake screen and sediment-trap maintenance, and kiosk/trough cleaning. For Kismayo catchments, O&M includes silt-trap clearing, embankment/spillway/liner

inspection and periodic desilting as required. The ESIA also provides for O&M training, Somali-language manuals, repair kits and PIU follow-up visits after commissioning. Detailed frequencies, indicators and responsibilities are consolidated in Chapter 9.

5.12 Land Requirements and Access

The project is described as rehabilitation within existing infrastructure corridors and catchment footprints, on land held under private, communal and customary arrangements. No permanent land acquisition or physical displacement is anticipated in the ESIA. Temporary working corridors and catchment work areas must nevertheless be documented in writing with relevant landowners/users and WUAs, with access, working width and reinstatement arrangements agreed before works. Any unexpected impact that would cause physical displacement or materially alter livelihood access must be referred for safeguards reassessment rather than treated as covered by the existing screening assumption.

CHAPTER 6: PROJECT BASELINE

6.1 Purpose and Approach to Baseline Characterisation

This chapter establishes the environmental and social conditions against which the Jubaland component is assessed. It provides the receptor context needed for Chapter 7 and does not repeat the project description in Chapter 5, the legal framework in Chapter 2, or mitigation measures that belong in Chapters 8 and 9.

The baseline is based on the ESIA records of field verification undertaken in December 2025 and January 2026, consultations with district authorities, water committees, communities and humanitarian actors in Dollow, and secondary information including FAO SWALIM hydrological and land datasets, population estimates, food-security and livelihood information, displacement data and regional climate projections. Site coordinates and attributes were checked against the BBS Master List cited in the ESIA.

6.2 Geographic and Agro-Ecological Setting

The Jubaland component spans two distinct geographic settings. The nine piped irrigation systems are located along the Juba River corridor in Luuq and Dollow Districts, Gedo Region. The four water catchments are located in the low-relief coastal hinterland of Kismayo District, Lower Juba Region. This separation is important because the Gedo sites are controlled by perennial river hydrology, floodplain soils, settlement and irrigated agriculture, while the Kismayo catchments depend on episodic rainfall-runoff and are embedded in peri-urban and agro-pastoral land use.

Table 6-1: District-Level Baseline Context

District / setting	Physical setting	Project interface	Baseline sensitivities
Luuq District - Gedo	Juba River corridor; flat to gently undulating floodplain and riverine agricultural setting.	Six buried piped irrigation systems with Juba River intakes.	River flow and flood risk; trench stability; irrigated land and settlement crossings; supply continuity.
Dollow District - Gedo	Border river corridor at the Ethiopia-Somalia boundary; dense peri-urban and humanitarian setting.	Three buried piped irrigation systems with Juba River intakes.	Flood and river safety; cross-border sensitivity; IDP/refugee and host-community inclusion; security and access.
Kismayo District - Lower Juba	Low-relief coastal hinterland with peri-urban and agro-pastoral land use.	Four rainfall-runoff water catchments.	Ephemeral runoff, sedimentation, embankment condition, communal access, child safety and drought reliability.

6.3 Physical Environment

6.3.1 Topography and Drainage

The Luuq and Dollow project areas occupy flat to gently undulating plains along the Juba River at approximately 150-300 m elevation according to the ESIA. Local drainage follows the floodplain and adjacent lowlands may be inundated during high river stages. Pipeline trenches therefore intersect floodplain terrain, while intake works are located at the river bank. In Dollow, the river also forms the international boundary.

The Kismayo catchments lie in a low-relief coastal hinterland where ephemeral runoff follows local drainage paths into natural low points. Catchment performance is therefore controlled by contributing runoff, inlet sediment loads, storage

geometry, embankment integrity, spillway function and downstream erosion. The ESIA does not provide site-specific surveyed catchment capacities or sediment depths; these are pre-works confirmation items.

6.3.2 Climate, Seasonality and Climate Hazards

The ESIA characterizes the project area as hot and semi-arid, with rainfall generally occurring in the Gu and Deyr seasons and with high inter-annual variability. It reports annual rainfall in the broad project regions at approximately 400-600 mm and temperatures regularly above 30-35 degrees C. Heat exposure is therefore a material worker-health receptor condition.

The Juba River flow regime is influenced by rainfall in the Ethiopian highlands as well as rainfall within Somalia. Flood risk is significant at intake locations during high-flow periods, with Dollow identified as particularly flood-prone during major El Nino events. The climate assessment identifies High to Very High flood risk on the Juba, High heat-stress risk and Moderate to High drought risk, and reports a projected temperature increase of about 1.0 degree C by 2040. These projections are retained as source-derived regional climate information rather than site-specific forecasts.

6.3.3 Soils, Erosion and Geotechnical Context

Along the Juba River corridor, the ESIA describes deep, fertile alluvial soils that support irrigated agriculture but may be poorly consolidated near the river. This condition is important for excavation stability and is the basis for strict trench-support requirements. Away from the immediate river corridor, sandy to sandy-loam soils are reported to predominate and to drain relatively quickly.

At the Kismayo catchments, soils are susceptible to erosion where embankments are degraded or concentrated runoff cuts unprotected surfaces. The ESIA does not provide site-specific geotechnical test results for the catchment embankments or riverbed materials. Intake scour and catchment structural conditions are therefore to be confirmed through the specified pre-works technical assessments.

6.3.4 Land Use and Landscape

Land use along the Gedo pipeline corridors includes riverine irrigated plots, homestead gardens, settlement clusters, tracks and access routes, and livestock movement corridors. Dollow adds dense peri-urban settlement, displacement sites and cross-border movement. The pipe alignments therefore pass through working agricultural and community-use landscapes rather than undeveloped land.

Around Kismayo, the catchments serve agro-pastoral grazing areas, peri-urban smallholdings and communal domestic and livestock water users. These patterns make water-point access, livestock/domestic separation, safe community access and maintenance governance important social and physical baseline considerations.

6.3.5 Juba River Hydrology and Water Availability

The Juba River is the primary water source for the nine piped systems. The Luuq gauging station is used as the principal hydrological reference for the Luuq and Dollow intakes. Mean monthly flow ranges from about 26 m³/s in February to about 396 m³/s in October. Aggregate design withdrawal for the nine systems is estimated at approximately 0.357 million m³/month, representing less than 0.6% of mean monthly flow in every month and peaking at approximately 0.57% in February.

Table 6-2: ESIA Juba River Flow and Project Withdrawal Ratios

Month	Mean flow (m3/s)	Monthly volume (MCM)	BBS withdrawal (MM3/month)	% extracted
Jan	45	120	0.36	0.30%
Feb	26	63	0.36	0.57%
Mar	35	94	0.36	0.38%
Apr	135	350	0.36	0.10%
May	280	750	0.36	0.05%
Jun	199	516	0.36	0.07%
Jul	176	471	0.36	0.08%
Aug	231	619	0.36	0.06%
Sep	274	710	0.36	0.05%
Oct	396	1061	0.36	0.03%
Nov	315	816	0.36	0.04%
Dec	116	311	0.36	0.12%

Basis: Juba River hydrology and project withdrawal data applied in the assessment.

The project-scale risk of material downstream flow reduction is assessed as Negligible. This conclusion does not remove the requirement for intake-specific hydrological assessment, low-flow construction planning, actual withdrawal recording, downstream observation and conflict-sensitive engagement at Dollow. The final operating configuration of the piped systems shall be confirmed before mobilisation and incorporated into the relevant C-ESMP.

6.3.6 Kismayo Rainfall-Runoff Catchments

The four Kismayo sites - Hadaafow, Dalsan, Bilicsan and Dabaylwayne - depend on episodic rainfall-runoff rather than perennial river flow. The ESIA reports substantial loss of storage capacity due to sedimentation and structural deterioration. It does not provide final surveyed storage volumes, sediment quantities, liner requirements or spillway capacities for each site. Those values must come from the pre-works catchment condition and engineering assessment rather than be inferred in this baseline chapter.

6.3.7 Water Quality

The ESIA identifies water quality at community kiosks as a public-health receptor and requires testing before commissioning and during operation. However, the baseline chapter does not provide a complete site-by-site pre-project water-quality dataset for the nine piped systems or the four catchments. This is a data limitation. The final commissioning acceptance criterion must be taken from the approved project water-quality standard; the numeric E. coli threshold stated elsewhere in the ESIA should be reconciled before procurement and is not restated here as a final regulatory standard.

6.3.8 Biodiversity, Riparian Vegetation and Habitat

The ESIA describes the project areas as modified agricultural and agro-pastoral landscapes. Riparian vegetation along the Juba River provides local ecological value at intake sites, but no designated protected areas or critical habitats were identified at the thirteen project sites during screening and field verification. Vegetation disturbance is therefore expected to be localised, with the Juba riverbank requiring particular minimum-footprint protection and reinstatement.

6.3.9 Cultural Heritage

No known cultural heritage sites, graves or archaeologically sensitive locations were identified along the pipeline corridors or at the catchments during the ESIA screening and field verification. Because trenching and desilting disturb subsurface material, chance-find potential remains. This is treated as a precautionary receptor condition rather than evidence of a known heritage impact.

6.4 Social and Socioeconomic Baseline

6.4.1 Settlement, Population and Mobility

The ESIA reports Gedo Region as having an estimated population of approximately 500,000 people and identifies Luuq as an important river crossing and Dollow as a major border and humanitarian hub. Dollow has substantial cross-border movement and significant IDP and refugee populations. Kismayo, the Jubaland State capital and principal Lower Juba port, also hosts a large displaced population, with peri-urban settlement extending into areas served by the catchments. Community-level population counts for each of the thirteen project sites are not provided in the ESIA and are not inferred here.

6.4.2 Livelihoods and Dependence on Water Infrastructure

Livelihoods in the Gedo corridor include riverine irrigated agriculture, agro-pastoral production and cross-border trade and mobility at Dollow. The ESIA specifically identifies maize, sesame, vegetables and fruit among riverine crops. Around Kismayo, livelihoods include agro-pastoral production, peri-urban activities and port-linked economic activity. Water infrastructure performance directly affects cultivated area, livestock watering, household water costs and drought coping.

6.4.3 Vulnerable and Disadvantaged Groups

The ESIA identifies poor agro-pastoral households, IDP households in Dollow and Kismayo, refugees and cross-border populations near Dollow, tail-end users in piped systems, female-headed households, minority clan groups and youth as groups requiring differentiated attention. Their vulnerability is linked to insecure access, limited bargaining power, displacement, poverty, gender norms and employment expectations. These groups are therefore high-sensitivity social receptors in the impact assessment.

6.4.4 Gender and Social Inclusion

The ESIA identifies gendered barriers to land, finance, mobility and water-governance decision making, together with heightened GBV exposure in displacement settings. Women are important domestic water users and the stakeholder consultations record requests for safe and convenient kiosk placement and meaningful participation in water governance. The baseline therefore supports differentiated engagement, safe water-point design, confidential complaint

channels and female representation in management structures. Detailed gender statistics reported in the source are not repeated here because they are not required to define the project receptors and are based on broader datasets rather than site-specific surveys.

6.4.5 Health, Emergency Response and Protection Services

Luuq District Hospital, Dollow District Health Centre and the MSF facility in Dollow, and Kismayo General Hospital are identified as relevant emergency-response facilities for the three work areas. Dollow also has UNHCR and partner protection services relevant to displaced and cross-border populations. Contractors shall verify actual travel routes, contact details and referral availability before mobilisation and include these arrangements in the C-ESMP Emergency Response Plan and SEA/SH referral pathway.

6.4.6 Education and Child-Sensitive Receptors

School access is affected by poverty, displacement and seasonal livelihood demands. In pipeline settlements, schools and school routes are particularly sensitive to open-trench hazards and temporary access restrictions. At Kismayo catchments, children are sensitive receptors around open water and earthworks. The ESIA therefore treats school-route access and child safety as material community-health-and-safety considerations.

6.4.7 Land Tenure, Access and Customary Use

Land along the pipeline corridors and around catchments is held through a mixture of private, communal and customary arrangements. Pipe routes and catchment perimeters intersect cultivation, grazing and access routes. The ESIA anticipates no permanent land acquisition or physical displacement, but temporary access and crop disturbance remain possible. Displaced households without formal tenure may also use project resources and must not be excluded from access arrangements or water allocation because of tenure status.

6.4.8 Security, Fragility and Border Context

The ESIA describes the Jubaland operating environment as complex, citing insurgent activity, clan conflict, cross-border tension at Dollow and displacement dynamics. Dollow has an additional border-security and humanitarian-coordination dimension, while Kismayo hinterland access can be affected by insecurity. Security conditions are dynamic and cannot be treated as a fixed baseline. The ESIA requires site-specific security assessment before mobilisation and a Green/Yellow/Red classification, with Red sites not mobilised until conditions improve.

6.4.9 Water Governance and Existing User Structures

Existing water committees and user groups are reported at the project sites and provide a foundation for formalised Water User Associations. Baseline governance concerns include unequal distribution between head-end and tail-end users, potential clan or elite influence over valves and allocation, host/displaced community relations, maintenance responsibility and transparency of water turns. These governance conditions are central to operation-phase social risk even though they are not physical baseline parameters.

6.5 District-Specific Baseline Profiles

Table 6-3: District-Specific Baseline Profiles

District	Setting	Key baseline receptors	Implications for assessment
Luuq	Riverine agricultural corridor with six piped systems.	Juba hydrology and floodplain soils; irrigated plots; settlement and track crossings; existing supply dependence; multiple systems drawing on the same river reach.	Hydrology/intake condition, trench stability, live-pipe location, supply continuity, equitable allocation and coordinated abstraction.
Dollow	Three piped systems in a border town and humanitarian/displacement context.	Juba boundary reach; flood exposure; cross-border movement; IDP/refugee and host communities; security and humanitarian actors.	All Luuq-type risks plus border sensitivity, protection-sensitive engagement, cross-border perception/tension and enhanced security coordination.
Kismayo	Four water catchments in peri-urban and agro-pastoral Lower Juba.	Ephemeral runoff, erodible catchment surfaces, sedimentation, communal livestock/domestic use, peri-urban and displaced populations.	Catchment condition, erosion/sediment control, embankment safety, open-water child safety, access rules, drought reliability and O&M capacity.

Basis: field verification, stakeholder consultation and baseline assessment.

6.6 Baseline Sensitivity and Receptor Summary

Table 6-4: Baseline Receptor Sensitivity

Receptor	Sensitivity	Baseline basis
Workers in trenches and at intakes	High	Poorly consolidated alluvium, river proximity, heat and potentially delayed emergency response create serious consequence pathways.
Existing water and irrigation users	High	Communities depend on the systems being rehabilitated; temporary interruption can affect domestic use, crops and livestock.
IDP, refugee, minority and tail-end users	High	Displacement, weak tenure or bargaining power and historic allocation inequalities can increase exclusion risk.
Women and girls	High	Domestic water responsibilities, limited decision-making power and GBV/SEA-SH exposure create differentiated risks and design needs.
Children and school-route users	High at active works	Open trenches, work traffic and catchment open water create direct safety pathways.
Juba River / riparian zone at intake works	Moderate-High locally	Perennial flow and local riparian value; intake works face flood, scour and riverbank disturbance even though project withdrawal is small relative to flow.
Kismayo catchment soils and embankments	Moderate-High	Existing degradation and sedimentation make erosion and structural performance sensitive to construction and maintenance quality.
Community water governance systems	High	Allocation, valve operation and maintenance depend on institutional behaviour rather than engineering alone.

Basis: field verification, stakeholder consultation and baseline assessment.

6.7 Baseline Information to be Confirmed through the C-ESMP and Pre-Construction Process

Table 6-5: Baseline Data Gaps and Required Confirmation

Information to be confirmed	Current assessment basis	C-ESMP / Pre-Construction Requirement
Juba intake hydrology	Site-specific stage-flow, scour and local construction flood thresholds are incomplete.	Complete a hydrological assessment for each intake and incorporate the approved work window, flood halt stage, scour controls and temporary works requirements into the C-ESMP.
Existing buried pipe locations	As-built records are largely unavailable.	Pipe-route and buried-service survey with marked-up drawings before trenching.
Kismayo catchment condition	Site-specific storage, sediment depth, liner condition and spillway performance are not fully quantified.	Complete a condition assessment for each catchment and incorporate the confirmed earthworks, liner, spillway, inlet/outlet, erosion and access controls into the C-ESMP.
Water quality	Complete site-by-site baseline data are not provided.	The C-ESMP commissioning plan shall specify the approved drinking-water acceptance criteria, sampling locations, accredited laboratory method and response to non-compliance.
Community-level socioeconomic data	Regional and consultation data are stronger than household-level quantitative baselines.	Use site consultations, WUA/user records and monitoring to establish operational baselines without inventing household statistics.
Land/crop exposure	Temporary corridor widths and affected crops are not fixed until contractor setting-out.	Written access agreements, crop/asset verification and reinstatement records before and during works.
Security	Conditions are dynamic and site access can change.	Pre-mobilisation and phase-specific security assessment, with no mobilisation to Red sites.
Piped-system energy configuration	Final operating configuration is to be confirmed from the approved engineering design and BoQ.	The C-ESMP shall document the confirmed pumping/solar/energy configuration and the corresponding E&S and O&M controls before mobilisation.

Basis: baseline information review and pre-construction verification requirements.

6.8 Baseline Conclusion

The Jubaland baseline shows two distinct but linked risk environments: a Juba River corridor where floodplain hydrology, trench stability, supply dependence, irrigated livelihoods and Dollow border/displacement dynamics dominate; and Kismayo catchments where sedimentation, embankment condition, episodic runoff, communal access and drought reliability dominate. The most sensitive receptors are workers at high-risk tasks, existing water users, vulnerable and displaced households, women and girls, children, the local riverbank environment and community water-governance systems. These sensitivities form the basis for the impact significance determinations in Chapter 7.

CHAPTER 7: ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

7.1 Impact Assessment Scope and Method

This chapter evaluates the environmental and social risks and impacts of the Jubaland component by linking the activities defined in Chapter 5 to the receptors and sensitivities established in Chapter 6. It applies the significance ratings used throughout this ESIA. Detailed mitigation measures are consolidated in Chapter 8, while implementation responsibilities, monitoring and C-ESMP requirements are defined in Chapter 9.

7.1.1 Impact Identification

The principal pathways are trench excavation and confined-space hazards; Juba River intake works and flood exposure; interruption of existing water and irrigation supply; accidental damage to existing buried services; pipe joint quality and leakage; community access and child safety; erosion, sedimentation and reinstatement; worker heat and water-safety hazards; SEA/SH; land and crop disturbance; security; commissioning water quality; operation-phase allocation conflict, leakage, intake sedimentation, kiosk hygiene and catchment deterioration; and Dollow cross-border water sensitivity. Cumulative and climate-related effects are assessed separately.

7.1.2 Significance Determination

The assessment uses four significance classes - Negligible, Minor, Moderate and Major - based on consequence and likelihood, with sensitivity increasing significance where vulnerable groups or stressed resources are affected. Ratings are assigned to material pathways supported by the available evidence; unranked support-site or administrative pathways are managed through the ESMP and C-ESMP without inventing unsupported ratings.

7.2 Impact Pathways by Project Phase

Table 7-1: Impact Pathways by Project Phase

Phase	Principal impact pathways	Key receptors
Pre-construction and mobilisation	Mobilisation without confirmed access, disruption agreements, pipe-route survey, intake hydrology, catchment condition assessment, security clearance or approved contractor plans.	Land users, existing water users, workers, communities, vulnerable groups.
Construction	Trenching, pipe laying/jointing, intake works, catchment earthworks, traffic, worker presence, fuel/waste, supply interruption and temporary access constraints.	Workers, residents, children, farms, riverbank vegetation, water users and displaced/border communities.
Commissioning	Hydraulic failure, contaminated first-use water, unresolved defects, commissioning before WUA and allocation readiness.	Domestic users, irrigation users, WUAs and community health.
Operation and maintenance	Allocation conflict, leakage, intake sedimentation/flood damage, kiosk contamination, catchment sedimentation and safety, downstream perception and cross-border tensions.	Water users, tail-end users, vulnerable groups, downstream communities and WUAs.
Demobilisation / reinstatement	Incomplete backfill, abandoned spoil/waste, unreinstated access and temporary facilities.	Landholders, road/track users, drainage pathways and communities.

Basis: project activities, baseline receptors and impact-pathway assessment.

7.3 Pre-Construction and Mobilisation Risks

Pre-construction risks arise primarily from beginning work before the information needed for safe and socially acceptable implementation is available. At piped sites, the absence of reliable as-built records creates a risk of damaging live pipes. At intakes, incomplete local hydrology and scour information creates a risk of unsafe or poorly timed river works. At Kismayo catchments, incomplete condition information can result in unsuitable desilting or embankment work. Across all sites, inadequate land-access documentation, disruption planning, security assessment, grievance arrangements or contractor ESHS planning can transfer avoidable risks into construction.

The ESIA treats these issues mainly as pre-mobilisation hold points rather than assigning separate significance ratings. This ESIA follows that approach: failure to close a required hold point is a reason not to mobilise, not a reason to create an unsupported numerical or qualitative impact rating.

7.4 Construction-Phase Environmental Risks and Impacts

7.4.1 In-River Intake Works - Flood, Drowning and Riparian Disturbance

Intake construction adjacent to or within the Juba River exposes workers to rapidly changing water levels, drowning, inundation and riverbank instability, and can disturb riparian vegetation. The impact is assessed as Major before mitigation and Minor-Moderate after low-flow scheduling, intake-specific hydrological assessment, cofferdam and rescue arrangements, gauge-based suspension, minimum vegetation clearing and reinstatement. At Dollow, bank-side works are the preferred approach, with no mid-stream structures unless the required cross-border assessment and approvals are completed.

7.4.2 Erosion, Sediment Mobilisation and Surface Reinstatement

Trench spoil and disturbed surfaces can erode or block drainage, while Kismayo catchment desilting can mobilise sediment and destabilise earthworks. The ESIA rates trench/catchment erosion impacts Minor-Moderate before mitigation and Negligible-Minor after appropriate spoil placement, compacted backfill, rapid reinstatement, dry-season catchment scheduling, silt control, embankment compaction and vegetation reinstatement.

7.4.3 Riparian Habitat Disturbance

Riverbank clearing and temporary intake works can disturb local riparian vegetation. The impact is assessed as Minor-Moderate before mitigation and Minor after minimum-footprint working, limited clearing and post-works reinstatement. No designated critical habitat was identified at the assessed sites, so the risk is local rather than landscape-scale.

7.4.4 Construction Waste, Fuel and Pollution

Pipe offcuts, packaging, spoil, used fluids, fuel and chemicals can contaminate soil, drainage paths and water if poorly managed. The ESIA ESMP specifies segregation, secondary containment, spill kits, regular removal and controls on spoil placement.

7.5 Construction-Phase Occupational Health and Safety Risks

7.5.1 Trench Collapse and Confined-Space Hazards

Trenching through poorly consolidated alluvium creates collapse risk and deeper or enclosed excavations can create hazardous atmospheres. The ESIA rates this Major before mitigation and Minor after mandatory shoring for trenches deeper than 1.2 m, atmospheric testing for deeper/enclosed excavations, rescue readiness, limits on workers in deep trenches, no lone working and daily supervision verification.

7.5.2 Heat, Machinery and River-Work Hazards

Heat stress compounds excavation, machinery and water hazards. The overall OHS impact is assessed as Major before mitigation and Minor-Moderate after implementation of heat-stress controls, PPE, toolbox talks, trained first response, documented emergency routes and the trench and river-safety controls. The C-ESMP Heat Stress Management Plan shall define the final hydration and work/rest requirements in accordance with GIIP and the approved OHS standard.

7.6 Construction-Phase Community and Social Risks

7.6.1 Temporary Disruption to Existing Water and Irrigation Supply

Pipe replacement can interrupt domestic and irrigation supply and can cause crop loss where interruption extends beyond agreed periods. The ESIA rates this Moderate-Major before mitigation and Moderate residual even after signed disruption schedules, maintained partial supply, alternative water arrangements, advance notice and compensation. It therefore remains one of the most important management-dependent construction impacts.

7.6.2 Accidental Damage to Existing Pipes and Services

Incomplete as-built information creates a risk of damaging live buried pipes during excavation. The ESIA rates the impact Moderate before mitigation and Minor after pipe-route survey, marked-up drawings, operator briefings and hand digging near confirmed existing services.

7.6.3 Community Access and Child Safety at Open Trenches

Open trenches can block access to homes, markets, schools and water points and can endanger children. The ESIA rates community access and trench-safety impacts Moderate before mitigation and Minor after barriers, signage, maintained crossings, advance notice, rapid backfill and school/community safety awareness.

7.6.4 Land Access and Crop Disturbance

Temporary access corridors can affect cultivated land, tracks and other uses. The residual-effects assessment rates land access and crop disturbance Moderate before mitigation and Minor after written access confirmation, replacement-cost compensation for verified project-caused crop damage and timely reinstatement. No permanent land acquisition or physical displacement is anticipated in the ESIA screening.

7.6.5 SEA/SH and Protection Risks

Worker-community interaction creates SEA/SH risk, with heightened sensitivity among IDP, refugee and cross-border populations in Dollow and displaced communities around Kismayo. The ESIA rates the risk Moderate before mitigation

and Minor-Moderate residual after worker Codes of Conduct, training, confidential survivor-centred reporting, female liaison support, referral pathways and separation of worker accommodation from residential and displacement areas.

7.6.6 Employment, Clan and Host/Displaced Community Grievances

Local employment expectations, perceived hiring unfairness, crop-damage disputes, clan-based resource sensitivities and host/displaced community relations can generate grievances. The ESIA rates these social and conflict-related risks Moderate before mitigation and Minor residual after transparent recruitment, local hiring preference, access agreements, prompt compensation, conflict-sensitive engagement and an accessible GRM.

7.6.7 Security Risk

Security incidents can affect workers, communities, supervision continuity and contractor behaviour across Luuq, Dollow and Kismayo. The residual-effects assessment records security incidents affecting implementation as High before mitigation and Moderate residual, making security the highest residual construction risk in the assessment. This risk is dynamic and cannot be reduced solely through engineering controls.

7.7 Pipe Quality, Commissioning and First-Use Risks

7.7.1 Pipe Joint Quality and System Integrity

Poor HDPE jointing can create leakage and delivery failure after backfill. The ESIA rates this Moderate before mitigation and Negligible-Minor residual after certified jointing, section-by-section hydraulic pressure testing and Supervision sign-off before backfill.

7.7.2 First-Use Water Quality and Hydraulic Commissioning

System failure or contaminated water at first use can affect public health and trust in the rehabilitated systems. The combined commissioning pathway is assessed as Moderate-Major before mitigation and Negligible-Minor residual after pressure testing, flushing, laboratory water-quality clearance, test operation and site commissioning certification. The C-ESMP commissioning plan shall specify the approved project and applicable drinking-water acceptance criteria and shall prevent community use until compliant results are confirmed.

7.7.3 Management Readiness at Handover

Commissioning before water-allocation rules and WUA management capacity are in place can trigger immediate conflict or system misuse. The ESIA rates this pathway Moderate before mitigation and Minor residual after WUA formation, female representation, documented allocation rules and operational training before handover.

7.8 Operation and Maintenance Risks and Impacts

Table 7-2: Operation and Maintenance Impact Significance Summary

Operation-phase risk	Pre-mitigation	Residual	Assessment basis
Water allocation conflict - piped systems and catchments	Moderate-Major	Moderate	Tail-end, displaced and minority users remain sensitive to elite or head-end capture; requires continuing WUA and PIU oversight.

Operation-phase risk	Pre-mitigation	Residual	Assessment basis
Pipe leakage and system deterioration	Moderate	Minor-Moderate	Depends on routine route inspection, reporting and timely repair.
Intake sedimentation and flood damage	Moderate	Minor-Moderate	Requires inspection after floods, sediment removal and structural repair.
Kiosk water quality and hygiene	Moderate	Minor	Requires cleaning, drainage maintenance and approved periodic water-quality testing.
Catchment re-sedimentation / embankment deterioration	Moderate	Minor-Moderate	Requires silt-trap maintenance, condition inspection and desilting/repair triggers.
Child safety at catchments and water points	Moderate	Minor	Requires maintained fencing/signage and community awareness.
Cross-border water tensions - Dollow	Moderate	Minor-Moderate	Requires transparent intake schedules, volume records, district/state liaison and prohibition on unassessed mid-stream structures.
Juba River over-abstraction	Minor	Negligible	Source DRIA finds project withdrawal less than 0.6% of mean monthly flow at Luuq in all months.

7.9 Cumulative and Induced Impacts

Cumulative effects arise from several piped systems sharing the Juba corridor, aggregate intake operation, restoration-driven changes in cropping intensity and possible concentration of settlement and water use around improved kiosks and catchments. The ESIA assesses these residual cumulative and induced effects as Minor-Moderate where allocation schedules, corridor-level sequencing and O&M monitoring are implemented.

The Downstream River Impact Assessment concludes that the nine Luuq and Dollow systems together withdraw approximately 0.357 million m³/month, less than 0.6% of mean monthly flow at the Luuq gauge in all months. On that basis, material downstream flow reduction is assessed as Negligible. The relevant residual concern for Jubaland is therefore less the volume of abstraction than construction-stage riverbank impacts, allocation governance, drought-period perception and conflict sensitivity, and the need to observe actual withdrawals and downstream conditions.

7.10 Differential Impacts on Vulnerable Groups

Table 7-3: Differential Impact Pathways for Vulnerable and Disadvantaged Groups

Group	Differentiated impact pathway	Management priority
Women and girls	Supply interruptions, distant alternative water points, unsafe access and exclusion from allocation decisions can increase time burden and safety risk.	Priority access to safe alternatives during disruption; kiosk co-design; WUA representation; confidential GBV/SEA-SH referral.
IDP and refugee households	May lack formal tenure, political influence or equal access to recruitment, water allocation and complaint systems.	Protection-sensitive engagement; non-discriminatory WUA access; recruitment access; low-literacy GRM channels.
Tail-end and minority users	Valve control can favour head-end or dominant groups.	Public allocation schedules; transparent valve operation; dedicated allocation-grievance track; PIU review of inequity trends.
Pastoral / agro-pastoral users	Temporary or operational water-access changes can affect livestock and cropping decisions.	Maintain alternative supply; protect livestock trough access; conflict-sensitive allocation and O&M rules.

Group	Differentiated impact pathway	Management priority
Children	Open trenches and catchment water create direct injury/drowning pathways.	Barriers, crossings, fencing, signage and school/community safety awareness.
Youth	Construction employment expectations can create grievance if recruitment appears unfair.	Transparent local recruitment, skills opportunities and accessible employment grievance channels.

Basis: vulnerability analysis, impact assessment and stakeholder consultation.

7.11 Climate Risk and Interaction with Project Impacts

Climate change acts as a risk multiplier for the Jubaland component. High to Very High Juba flood risk increases construction and O&M exposure at intakes; rising heat increases worker stress; drought can reduce water availability and increase allocation pressure; and intense rainfall can damage catchment earthworks or overwhelm design assumptions. The ESIA identifies residual climate risk as Moderate after climate-adjusted design, low-flow work scheduling, flood monitoring, post-flood inspection, buried conveyance and drought-period governance.

7.12 Positive Impacts and Development Opportunities

Table 7-4: Positive Impacts and Development Opportunities

Positive impact pathway	Expected benefit
Improved irrigation reliability	Rehabilitation of damaged pipes, blocked intakes and valves can restore more reliable delivery to riverine farms.
Improved domestic and livestock water access	Kiosks, troughs and restored catchments can reduce reliance on unsafe or costly alternatives.
Reduced conveyance losses	Buried pipe systems reduce leakage when properly jointed and reduce evaporation relative to open conveyance.
Local employment and skills	Trenching, welding, masonry, earthworks and O&M create local work and skills-development opportunities.
Stronger water governance	Inclusive WUAs, documented schedules and transparent grievance systems can improve accountability.
Reduced dry-season coping costs at Kismayo	Restored catchment storage can reduce water trucking and purchasing pressure when rainfall is sufficient.
Climate resilience	Rehabilitated storage and more efficient conveyance improve resilience to drought variability, subject to O&M and allocation discipline.

Basis: project development objectives and impact assessment.

7.13 Residual Impact Profile and Management Priorities

Table 7-5: Residual Impacts Requiring Particular Management Attention

Residual priority	Residual significance	Why continuing attention is required
Security affecting implementation	Moderate	Dynamic context requires district-specific assessment, halt thresholds and supervision continuity.
Supply continuity during pipe replacement	Moderate	Residual depends on signed schedules, partial supply, alternative water and prompt compensation.

Residual priority	Residual significance	Why continuing attention is required
Water allocation conflict	Moderate	Governance- and behaviour-dependent; needs WUA capacity, public schedules, GRM and PIU oversight.
In-river intake works	Minor-Moderate	Residual remains due to flood and water-safety exposure even with low-flow scheduling and rescue controls.
OHS - heat, trench and river work	Minor-Moderate	Depends on sustained safety discipline and emergency readiness.
SEA/SH	Minor-Moderate	Requires functioning confidential response and protection-sensitive Dollow arrangements.
Pipe leakage / intake damage / catchment deterioration	Minor-Moderate	Depends on routine O&M, monitoring and timely repair.
Cross-border water tension - Dollow	Minor-Moderate	Perception and governance risk persists despite negligible project-scale flow reduction.

Basis: residual impact assessment.

7.14 Impact Determinations to be Confirmed through the C-ESMP and Commissioning Process

Table 7-6: Data-Dependent Impact Determinations

Impact topic	Required confirmation	C-ESMP / Decision Requirement
Intake flood/scour and safe construction window	Intake-specific hydrological assessment.	The approved hydrological parameters shall govern the intake method statement and C-ESMP, including the work window, flood halt stage and scour/temporary works controls.
Existing buried services	Pipe-route survey and marked-up drawings.	Determines safe excavation route and hand-digging zones.
Kismayo catchment works	Condition assessment - embankment, sediment depth, liner, spillway and erosion.	The condition assessment shall define the rehabilitation scope and the controls to be included in the C-ESMP and earthworks method statement.
Water quality	Approved laboratory testing before commissioning.	The commissioning plan shall specify the approved acceptance criteria and shall block community use until compliant laboratory results are confirmed.
Land/crop exposure	Written access and verified crop/asset records.	Confirms compensation and reinstatement obligations.
Security	Site-specific security assessment and district SMP.	Determines mobilisation, halt and supervision arrangements.
Dollow cross-border interface	Confirmation that final intake design is bank-side and does not require unassessed mid-stream works.	Prevents cross-border implications outside the assessed project scope.
Piped-system technical configuration	Approved design, hydraulic calculations and BoQ.	The approved operating configuration shall be incorporated into the C-ESMP before mobilisation, including any pumping/solar/energy-related E&S controls.

7.15 Overall Impact Assessment Conclusion

The Jubaland component has a manageable but management-intensive risk profile. The most serious construction risks before mitigation are trench collapse, in-river intake work and the combined OHS profile. Supply continuity, security and social allocation risks remain important because they depend on behaviour, governance and dynamic operating conditions rather than engineering alone. The ESIA concludes that, with the specified controls, most residual impacts are Negligible to Moderate and acceptable for a Category 2 operation. Chapter 8 consolidates the measures needed to achieve those residual outcomes without duplicating the later ESMP implementation matrices.

CHAPTER 8: MITIGATION MEASURES

8.1 Purpose and Mitigation Hierarchy

This chapter consolidates the environmental and social mitigation measures required for the Jubaland component. It is organised around the mitigation hierarchy - avoid, minimise, restore and, where unavoidable, compensate - and is intended to bridge the impact assessment in Chapter 7 and the implementation arrangements in the ESMP. Responsibilities, detailed monitoring frequencies, reporting and costs are therefore reserved for Chapter 9 to avoid duplication.

8.2 Pre-Construction Avoidance and Readiness Measures

- No site should mobilise without written PIU readiness approval confirming access, community notification, applicable pre-works technical assessment, security clearance and approved contractor ESHS documentation.
- Complete an existing pipe-route and buried-service survey at each of the nine piped sites before trenching; provide marked-up drawings and brief operators before excavation.
- Complete an intake-specific hydrological assessment for each Juba River intake before intake works, including the safe construction window, flood suspension threshold, scour implications and final intake method.
- Complete a condition assessment for each Kismayo catchment covering embankment integrity, sediment depth, liner requirement, spillway/inlet/outlet condition and downstream erosion risk.
- Agree and sign community disruption schedules before pipe-replacement mobilisation, including maintained supply, alternative water arrangements and advance notice.
- Confirm written land-access arrangements for pipeline corridors, catchment work areas and temporary support sites, including how verified crop or asset damage will be recorded and compensated.
- Complete site-specific security assessment for all thirteen sites, with particular attention to Dollow; do not mobilise to sites classified as unacceptable under the approved security system.
- Establish the community GRM, confidential SEA/SH channel and protection-sensitive Dollow referral arrangements before mobilisation.
- Before mobilisation, the C-ESMP shall incorporate the confirmed engineering configuration, Category 2 safeguards requirements, approved OHS and water-quality standards, and site-specific technical parameters applicable to the work package.

8.3 Mitigation for Piped Irrigation Systems - Luuq and Dollow

8.3.1 Trench Excavation and Confined-Space Safety

- Install shoring before worker entry to all trench sections deeper than 1.2 m, consistent with the ESIA.
- Prohibit workers from entering unsupported trenches that meet the shoring threshold.
- Undertake atmospheric testing before entry to deeper or enclosed excavations in accordance with the approved OHS method statement; maintain rescue equipment and competent standby arrangements.
- Prohibit lone working in deep trenches and maintain safe access/egress.

- Keep open-trench lengths as short as practicable and backfill sections not actively worked within the time requirement.
- Inspect active trenches daily and stop work immediately if shoring, access, atmosphere or rescue readiness is inadequate.

8.3.2 Juba River Intake Works

- Confine in-river or river-edge intake works to the safe low-flow window confirmed by the intake-specific hydrological assessment rather than relying only on a generic seasonal assumption.
- Install any approved cofferdam or temporary water-control arrangement before exposing workers to the active river work area.
- Provide life jackets and appropriate river rescue equipment for workers exposed to drowning risk; maintain trained rescue capability at the intake work front.
- Monitor river level/stage during intake works and apply the intake-specific halt threshold immediately when reached.
- Limit riverbank vegetation clearing to the minimum construction footprint and reinstate disturbed riparian vegetation after works.
- At Dollow, maintain the precautionary approach of bank-side intakes only; no mid-stream structure should proceed without a separate cross-border assessment and approval.

8.3.3 Pipe Laying, Jointing and Quality Assurance

- Use certified or otherwise approved HDPE jointing methods consistent with manufacturer and final design specifications.
- Hydraulically pressure-test each completed section before backfill and obtain Supervision sign-off; failed sections must be corrected and retested before burial.
- Protect pipes from damage during storage, handling and placement and keep trench bedding free of material that could damage the pipe.
- Use the pre-works buried-service survey to avoid live pipes; hand dig within the approved proximity to confirmed existing services.

8.3.4 Backfill, Surface Restoration and Access

- Place excavated material safely on one side of the trench and away from the trench edge, drainage paths and cultivated land unless the land user agrees to its use.
- Backfill and compact in layers and restore roads, tracks, agricultural land and access ways to their pre-works condition or better.
- Complete reinstatement promptly after pipe installation and document before/after condition where land or crops could be affected.
- Maintain pedestrian and vehicle crossings in settlement areas and protect priority access routes agreed with the community.

8.4 Mitigation for Kismayo Water Catchments

- Schedule major catchment earthworks outside peak rainfall periods where practicable and use the site-specific condition assessment to determine the sequencing of desilting, embankment, liner, inlet/outlet and spillway works.
- Undertake phased desilting and place suitable material only where technically appropriate for embankment reinforcement; remove or place unsuitable spoil at approved locations.
- Maintain silt-control measures during works and prevent spoil from entering natural drainage channels or neighbouring land.
- Compact repaired embankments promptly and protect spillways and downstream discharge areas against erosion in accordance with the approved design.
- Reinstall disturbed perimeter vegetation and temporary access areas after works.
- Install or maintain barriers, signage and safe community access around active earthworks and open water, with particular attention to children.
- Keep livestock and domestic access arrangements functionally separated where the approved design provides troughs and domestic collection points.

8.5 Supply Continuity, Livelihood and Land-Access Measures

- Maintain agreed partial supply from the existing system until replacement sections are operational wherever technically feasible.
- Confirm alternative water access before any unavoidable full isolation and activate the agreed contingency when supply cannot be maintained.
- Provide advance notice in the form and lead time agreed with each community and documented in the disruption schedule.
- Verify project-caused crop or asset damage and compensate in accordance with the approved project replacement-cost and land-access procedures; do not rely on verbal arrangements alone.
- Reinstall access corridors, farm surfaces and tracks promptly after works.
- If physical displacement or other impacts outside the screened assumptions emerge, stop the relevant works and refer the matter for OS5 determination before proceeding.

8.6 Community Health and Safety

- Use robust barriers and Somali-language warning signs at open trenches and active catchment works; apply enhanced barriers in dense settlement areas.
- Provide safe pedestrian and vehicle crossings at appropriate intervals and maintain routes to homes, schools, markets, health services and water points.
- Do not leave unprotected open trenches in community areas after the workday where the approved C-ESMP or contractor method statement requires closure or backfill.
- Provide school and community safety awareness before trenching and catchment works.

- Manage vehicle speeds, reversing, loading/unloading and traffic interfaces through an approved traffic-management arrangement.
- Flush and test piped systems before first use; do not authorise community use until the water satisfies the approved project drinking-water acceptance standard.
- Maintain safe drainage at kiosks and troughs to prevent ponding, contamination and vector breeding.

8.7 Occupational Health, Welfare and Emergency Response

- Implement task-specific OHS plans for trenching, confined spaces, intake works, HDPE jointing, machinery, catchment earthworks and heat exposure.
- Provide adequate potable water, shade, rest, acclimatisation and work-rest controls through a Heat Stress Management Plan included in the C-ESMP. The plan shall define temperature/workload triggers, hydration arrangements, emergency response and supervision requirements consistent with GIIP and the approved OHS standard.
- Provide and enforce appropriate PPE, including water-safety PPE for river work.
- Conduct worker induction before work and daily toolbox talks for active high-risk tasks.
- Maintain trained first responders, task-appropriate rescue equipment and verified emergency transport and referral routes for Luuq, Dollow and Kismayo.
- Stop work during unsafe river, weather, security or excavation conditions and only resume after the relevant competent person confirms readiness.

8.8 Pollution Prevention, Waste and Resource Management

- Segregate construction waste and store it in labelled, secure locations before removal to approved disposal points.
- Maintain spill kits and secondary containment at fuel and chemical storage locations; keep storage away from sensitive water and drainage receptors in accordance with the approved contractor plan.
- Prevent trench spoil and catchment sediment from blocking drains, access routes or cultivated land.
- Reuse suitable excavated material only where technically and environmentally appropriate; dispose of surplus or unsuitable material at approved sites.
- Screen and document borrow areas, disposal sites, construction-water points, camps, lay-down areas and temporary access routes before use and reinstate them after closure.
- Use water for construction in a manner that does not undermine agreed community supply continuity.

8.9 Social Inclusion, WUA Governance and Conflict Sensitivity

- Establish or strengthen inclusive WUAs before commissioning and ensure the minimum female representation requirement is reflected in the approved project governance arrangements.
- Agree, document and publicly communicate water-allocation schedules and valve/intake operating rules before first distribution.

- Provide specific protection for tail-end users, displaced households, minority groups and other users with limited bargaining power.
- Ensure IDP and refugee households can access consultation, water allocation, recruitment information and complaint mechanisms without discrimination based on tenure or displacement status.
- At Dollow, use conflict-sensitive communication and coordinate with district/state authorities and appropriate humanitarian actors on protection and border-related concerns.
- Monitor allocation grievances and adjust schedules where trends show persistent inequity or elite capture.
- Keep the community GRM accessible through oral and low-literacy channels and maintain a dedicated category for water-access and allocation complaints.

8.10 SEA/SH Prevention and Response

- Require all workers, drivers, security personnel and subcontractors to sign and understand the project Code of Conduct before deployment.
- Use a Dollow-specific worker briefing addressing respectful interaction with displaced, refugee and cross-border communities.
- Provide SEA/SH induction and periodic refresher training and maintain a confidential, survivor-centred reporting channel managed independently from ordinary community dispute structures.
- Confirm referral pathways and available services before mobilisation for Luuq, Dollow and Kismayo, including the protection-service interface in Dollow.
- Ensure women have access to a female liaison contact and to reporting mechanisms that do not require disclosure to male-dominated WUA or traditional structures.
- Locate any worker accommodation away from residential and displacement areas and provide appropriate welfare and security arrangements.

8.11 Security Risk Management

- Prepare and maintain district-specific Security Management Plans for Luuq, Dollow and Kismayo, informed by site-level assessments.
- Do not mobilise or continue work where the approved security classification or halt threshold requires suspension.
- Coordinate security information with Jubaland State and district authorities and, at Dollow, with relevant humanitarian security networks where appropriate.
- Use flexible sequencing and supervision arrangements where access conditions change, without waiving environmental, social or OHS hold points.
- Report serious security incidents through the project incident system and review the relevant SMP before resuming work.
- Avoid project branding or site practices that could unnecessarily increase attention in locations identified as security-sensitive by the approved security assessment.

8.12 Commissioning and Operation-Phase Measures

- Pressure-test and flush each piped system, complete approved water-quality testing at community kiosks and issue a commissioning certificate before community use.
- For Kismayo catchments, inspect embankments, liners where present, silt traps, spillways, troughs, access controls, fencing and signage before handover.
- Do not commission a site until the WUA is operational, trained and has documented allocation and O&M rules.
- During O&M, conduct routine pipe-route inspection, intake screen/sediment inspection, kiosk/trough cleaning and catchment condition inspection and repair.
- Record leaks and repair them within the response periods specified in the approved O&M plan, with faster action where supply is lost.
- Maintain catchment fencing/signage and community child-safety awareness.
- Continue water-quality monitoring at kiosks at the approved frequency and investigate any non-compliant result promptly.
- Maintain the GRM and allocation-complaint process throughout operation, with PIU oversight visits during the early O&M period.

8.13 Downstream Flow Protection and Dollow Cross-Border Measures

Although the Downstream River Impact Assessment rates Juba over-abstraction as Negligible at the project scale, precautionary monitoring and adaptive management remain appropriate because actual operations, drought conditions and stakeholder perceptions can change. The following measures shall therefore be retained:

- Operate intakes to documented seasonal and community water-allocation schedules and avoid unnecessary simultaneous peak abstraction by adjacent systems.
- Record actual withdrawal volumes and compare them with the approved design and allocation schedule.
- Observe downstream river conditions and water-access complaints in coordination with the PIU and available SWALIM information.
- If monitoring or credible complaints indicate material downstream stress, reduce or rotate intake operation, verify actual abstraction, undertake technical review and provide emergency supply where required by the approved adaptive-management protocol.
- Disclose proposed Dollow intake operating arrangements to relevant downstream users in a conflict-sensitive and low-literacy-accessible form.
- Maintain the prohibition on unassessed mid-stream structures at the Dollow boundary reach and escalate any cross-border dispute to the appropriate PIU and Jubaland State level.

8.14 Climate-Resilience Measures

- Use the final approved flood-resilient intake design and site-specific hydrological assessment for Juba River works.
- Confine high-risk intake construction to safe flow conditions and apply gauge/stage-based suspension criteria.
- Inspect intakes promptly after major floods and repair flood or scour damage before normal operation resumes.

- Maintain buried conveyance and leak control so that restored water is delivered efficiently during drought periods.
- Maintain Kismayo catchment silt traps, embankments, spillways and storage so that rainfall-runoff capture is not progressively lost through poor O&M.
- Use drought-period allocation rules that protect vulnerable users and avoid unmanaged competition when supply is constrained.
- Update heat-stress and security arrangements as climate and operating conditions evolve.

8.15 Enhancement Measures

Positive outcomes can be strengthened through local skills development, transparent recruitment, WUA financial and technical training, women and youth participation, kiosk hygiene education, crop-water scheduling, prompt leak repair, catchment maintenance and conflict-sensitive water governance. These are enhancement measures and do not substitute for the mandatory risk controls above.

8.16 C-ESMP and Pre-Construction Confirmation Requirements

Table 8-1: C-ESMP and Pre-Construction Confirmation Requirements

Requirement	Assessment Position	C-ESMP / Pre-Construction Action
Piped-system operating configuration	The exact operating configuration is to be confirmed from the approved engineering design, hydraulic calculations and BoQ.	The C-ESMP shall identify the confirmed pumping/solar/energy configuration, temporary and operational energy requirements, electrical/fuel hazards, maintenance requirements and associated E&S controls before mobilisation.
AfDB environmental and social categorisation	The Jubaland component is Category 2 under the AfDB ISS 2023.	All contractor, supervision and C-ESMP documentation shall apply the Category 2 safeguards requirements consistently. Site-level screening notation shall not be used as a separate project categorisation.
Heat-stress management	Heat exposure is a material worker-health risk; a fixed provisional hydration quantity is not adopted as an ESIA standard.	The C-ESMP OHS Plan shall include a competent Heat Stress Management Plan covering potable water, acclimatisation, work/rest regime, shade, heat triggers, first aid and emergency response in accordance with GIIP.
Commissioning water-quality criterion	Water intended for community use must comply with the approved project and applicable drinking-water standard before commissioning.	The C-ESMP commissioning plan shall define the approved microbiological and physical acceptance criteria, sampling points, accredited laboratory method, retesting and response to non-compliance.
Juba intake design and construction parameters	Final hydrological and structural parameters are site-specific.	Each intake hydrological assessment shall confirm the design event, freeboard, scour protection, safe construction window and flood-stage suspension threshold. The approved parameters shall be incorporated into the final engineering documents and C-ESMP method statement.
Beneficiary and inclusion baseline	The overall household estimate is indicative and does not substitute for site-level user records.	WUA/user registers shall establish the verified beneficiary and vulnerable-group baseline before commissioning and shall be used for benefit and inclusion monitoring.

Basis: design, baseline and impact-assessment requirements.

8.17 Mitigation Summary by Priority Risk

Table 8-2: Mitigation Summary for Priority Risks

Priority risk	Core mitigation strategy	Residual Significance
Trench collapse / confined space	Avoid unsupported entry; shore; test atmosphere where required; rescue readiness; daily verification.	Major -> Minor
In-river intake flood / drowning	Intake hydrology; low-flow window; cofferdam/rescue; stage monitoring; Dollow bank-side only.	Major -> Minor-Moderate.
Supply interruption	Signed disruption schedule; partial supply; alternative water; advance notice; crop-loss compensation.	Moderate-Major -> Moderate.
Security	Site/district assessment; SMP; halt thresholds; flexible sequencing; incident review.	High -> Moderate.
Water allocation conflict	Inclusive WUA; public schedules; valve discipline; GRM; PIU oversight.	Moderate-Major -> Moderate.
SEA/SH	Code of Conduct; training; confidential survivor-centred channel; female liaison; referrals.	Moderate -> Minor-Moderate.
Kismayo catchment deterioration	Condition-based rehabilitation; erosion/silt control; fencing; O&M inspection and desilting.	Moderate -> Minor-Moderate in O&M.
Juba over-abstraction	Documented schedules; actual withdrawal records; downstream observation; adaptive triggers.	Minor -> Negligible.

Basis: impact assessment and residual significance ratings; detailed implementation is provided in Chapter 9.

8.18 Pre-Mobilisation Verification and Adaptive Management

The mitigation strategy is evidence-led. A site is not ready for construction merely because it appears in the Master List. The PIU should close the applicable technical, access, security, contractor-plan, grievance and community-disruption hold points before authorising mobilisation. During implementation, monitoring results, incident findings, complaints, actual river conditions, actual abstraction, leakage, catchment performance and security changes should be used to adjust work sequencing, intake operation, maintenance or social-management measures. These adaptive arrangements are translated into responsibilities, indicators, reporting and hold points in the ESMP chapter.

9. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Project code	P-SO-A00-003	AfDB category	Category 2
Location	Luuq and Dollow Districts, Gedo Region; Kismayo District, Lower Juba Region	Project sites	13 sites — 9 piped irrigation systems and 4 water catchments
Applicable safeguards	OS1, OS2, OS3, OS4, OS7 and OS10	Precautionary safeguards	OS5, OS6 and OS8; OS9 not applicable
Basis	Jubaland ESIA (July 2026), 13-site BBS Master List	Indicative ESMP budget	USD 259,610 plus contractor ESHS costs in works contracts

9.1. ESMP objectives and scope

This ESMP defines the environmental and social management measures, monitoring requirements, institutional arrangements and budget for the Jubaland component of the BBS Project. It is the operational instrument through which the environmental and social commitments identified in this ESIA are translated into actionable requirements for the PIU, contractors, the Supervision Consultant, Jubaland State counterparts, the Luuq, Dollow and Kismayo District Administrations, Water User Associations (WUAs), Community Liaison Officers (CLOs), and other implementation partners.

It applies to all thirteen project sites — six piped irrigation systems in Luuq District, three piped irrigation systems in Dollow District, and four water catchments in Kismayo District — and to associated temporary facilities and support sites used by the works. It covers pre-construction and mobilisation, construction and rehabilitation, commissioning and handover, operation and maintenance, and demobilisation/reinstatement of temporary works.

The ESMP is a living management instrument. Any material change in site, alignment, intake configuration, water source, construction method, land requirement, security context or operational regime must be screened before implementation and the C-ESMP/ESMP updated where required. Where formally approved project safeguards documents contain different requirements, the approved and more protective requirement applies.

Several technical parameters are intentionally confirmed at the pre-construction stage because they depend on the approved engineering design, site condition or contractor method. These requirements are assigned to the C-ESMP, activity-specific method statements, hydrological/catchment assessments and commissioning plan and do not prevent ESIA submission.

9.2. Summary of environmental and social risks and impacts

This ESMP responds to the environmental and social risks and impacts assessed in Chapter 7 and the mitigation hierarchy established in Chapter 8. It translates those requirements into implementation, monitoring, C-ESMP and contractual controls.

Risks arising from project activities.

Construction and commissioning risks include trench collapse and confined-space exposure; flood and drowning risk during Juba River intake works; riparian disturbance; temporary interruption of existing domestic and irrigation supply; accidental damage to live buried pipes; poor HDPE joint quality; community exposure to open trenches and severed

access; erosion and sediment mobilisation from trenching and Kismayo catchment earthworks; heat stress, machinery and other occupational hazards; worker-community SEA/SH risk; waste, spoil, fuel and chemical contamination; chance finds; and security incidents across three district contexts. Operation generates risks of inequitable allocation within valve-controlled systems and communal catchments, pipe leakage and system deterioration, intake sedimentation and flood damage, kiosk water-quality failure, catchment re-sedimentation and structural deterioration, child safety around water infrastructure, and cross-border water tensions at Dollow.

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 may create vegetation/soil disturbance, erosion, drainage blockage, fuel or chemical contamination, traffic/dust impacts, water-use pressure, land/access disputes, worker-welfare deficiencies and SEA/SH exposure. These are controlled through screening, access/permit documentation, the Associated Facilities and Support-Sites Register, site-specific management requirements and close-out/reinstatement.

Cumulative impacts.

The principal cumulative issues are aggregate operation of the nine Luuq/Dollow intakes on the same river system, corridor-wide cropping and water-use changes as supply reliability improves, and induced settlement or livelihood concentration around kiosks and catchments. The Downstream River Impact Assessment estimates aggregate BBS abstraction at approximately 0.357 million m³/month and less than 0.6% of mean monthly flow at the Luuq reference gauge; over-abstraction is therefore assessed as Negligible. Precautionary flow and access monitoring remains mandatory because operating behaviour, drought conditions and stakeholder perceptions can change.

Risks to vulnerable individuals and groups.

IDP and refugee households in Dollow, displaced households in Kismayo, poor agro-pastoral households, tail-end users, female-headed households, minority clans, women and girls, and youth face differentiated exposure to water-access decisions, disruption, recruitment, SEA/SH, security and grievance accessibility. Measures therefore require inclusive WUAs, protection-sensitive engagement, accessible complaint channels, transparent local recruitment, documented allocation rules and gender-/stakeholder-disaggregated monitoring.

Involuntary resettlement.

Permanent land acquisition and physical displacement are not anticipated under the screened scope. Temporary pipe-corridor access and catchment work areas are managed through written agreements and reinstatement. If a proposed activity causes physical displacement or a material livelihood loss inconsistent with screening assumptions, the affected activity is suspended and referred for OS5 determination before proceeding.

9.3. Mitigation, compensation and enhancement measures

The measures below operationalise the mitigation hierarchy and make the ESIA commitments auditable through assigned responsibilities, evidence, monitoring and corrective-action triggers.

9.3.1. Pre-construction and mobilisation phase

Table 9: AfDB Operational Safeguards Applicability and ESMP Cross-Reference — Jubaland

AFDB OPERATIONAL SAFEGUARDS APPLICABILITY AND ESMP CROSS-REFERENCE	APPLICABILITY	MAIN ISSUES ADDRESSED IN THE ESMP
OS1 — Assessment and Management of Environmental and Social Risks and Impacts	Applicable	Overall ESIA and ESMP; readiness/hold points; pipe-route, hydrological and catchment condition assessments; associated-facility screening; cumulative/downstream monitoring; change management.
OS2 — Labour and Working Conditions	Applicable	Worker terms, age verification and Workers' GRM; trench/confined-space, river, heat, plant and emergency OHS; induction and competency.
OS3 — Resource Efficiency and Pollution Prevention and Management	Applicable	Pipe integrity and leakage; water quality; Juba abstraction monitoring; sediment/spoil; waste, fuel/chemical handling; catchment/intake maintenance.
OS4 — Community Health, Safety and Security	Applicable	Open-trench and catchment safety; in-river work; first-use water safety; SEA/SH; security; emergency response and traffic/access.
OS5 — Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement	Precautionary	Temporary pipe-corridor/catchment access; crop/asset compensation at replacement cost; stop-work/OS5 determination if screened assumptions are exceeded.
OS6 — Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources	Precautionary	Minimum-footprint works and riparian clearing at intakes; reinstatement; reassessment if unexpected sensitive habitat occurs.
OS7 — Vulnerable Groups	Applicable	IDP/refugee and displaced-user inclusion; tail-end equity; women's participation; minority-clan and poor-household access; protection-sensitive consultation.
OS8 — Cultural Heritage	Precautionary	Chance Finds Procedure for all earthworks and excavation.
OS9 — Financial Intermediaries	Not applicable	No financial-intermediary structure in the Jubaland component.
OS10 — Stakeholder Engagement and Information Disclosure	Applicable	SEP implementation, disclosure, signed disruption schedules, GRM, downstream consultation, WUA engagement and reporting.

Use note: the applicable Operational Safeguards are carried through the sector header bands in the comprehensive matrix below. Numeric or technical parameters that depend on site-specific confirmation shall be established through the approved engineering design, C-ESMP, hydrological/catchment assessments or commissioning plan before the affected activity proceeds.

9.3.2. Construction phase

Table 10: Comprehensive ESMP Implementation Matrix — Jubaland (all 13 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 — all 13 sites	Works commence without confirmed access, community arrangements, security clearance or safeguards readiness	PIU site-readiness checklist: scope/site confirmed; access documented; community notification; WUA formation/strengthening initiated; disruption arrangement where applicable; security clearance; technical assessments; approved contractor ESHS plans; GRM/SEA-SH channel operational. Written PIU authorisation required.	PIU / JUB E&S Officer	Once per site before mobilisation; 13/13 written releases.	PIU safeguards administration
Pre-construction — 9 piped sites	Existing buried services damaged; unplanned supply interruption	Survey and mark existing pipe routes/buried services; marked-up drawings; operator briefing; hand-dig within 1 m of confirmed live pipes; stop and assess unexpected services.	PIU / Technical Consultant / Contractor	Route survey before trenching; work-front check; service strikes tracked.	USD 6,000 pre-works pipe-route surveys
Pre-construction — 9 Juba intakes	Flood/scour risk or inappropriate intake work window/design basis	Intake-specific hydrological assessment defining low-flow work window, flood-stage suspension threshold, design flow, scour risk and cofferdam requirements. Dollow: bank-side works only; no mid-stream structure without cross-border assessment.	PIU / Technical Consultant	Approved assessment at least 6 weeks before intake works; halt-stage basis recorded.	USD 9,500 intake hydrological assessment
Pre-construction — 4 Kismayo catchments	Earthworks based on incomplete sediment/embankment/liner/spillway information	Condition assessment covering sediment depth/desilting volume, embankment/bund condition, liner need, spillway/inlet/outlet function, downstream erosion and access/safety; findings incorporated in design/method statement.	PIU / Technical Consultant	4/4 approved assessments before mobilisation.	USD 4,000 catchment condition assessment
All phases	Material design/site/security change creates unassessed impacts	Screen change before implementation; update design/C-ESMP/ESMP and obtain PIU/AfDB clearance where required before changed works proceed.	PIU / Design / Contractor	Change register monthly; zero material changes without screening.	PIU / project administration
Construction close-out	Temporary areas left disturbed or unsafe	Remove temporary facilities/waste; reinstate pipe corridors, access, lay-down, borrow/spoil areas and catchment work zones; close residual safety hazards before handover.	Contractor	Supervision close-out inspection and photos.	Works contract
OS2 — Labour and Working Conditions					
Pre-construction / construction	Child/forced labour, unclear terms, wage/working-time grievance	Apply LMP to all contractors/subcontractors: worker register, age verification, written employment terms, wage/working-hour records, non-discrimination, Workers' GRM and Code of Conduct.	Contractor	Monthly labour audit; 100% workers registered and age-verified.	Works contract

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Pre-construction	Workers not competent/inducted for high-risk tasks	Mandatory induction on ESMP, OHS, trench/confined-space, water safety, heat, emergency response, SEA/SH, GRM and Chance Finds; task competency for excavation, welding/jointing, intake/cofferdam and plant work.	Contractor; Supervision verifies	100% induction before work; competency records maintained.	Works contract
Construction — trenches/manifold pits	Collapse, falls and hazardous atmosphere	Shore every section deeper than 1.2 m before worker entry; no unsupported entry; source requires atmospheric testing before entry >1.5 m or enclosed excavation; rescue tripod/harness; max two workers in deep trench; no lone work; inactive trenches backfilled/secured within 24 h.	Contractor	Daily trench inspection; unsupported worker exposure triggers immediate suspension.	Works contract
Construction — Juba intakes	Drowning and water-safety exposure	Approved low-flow method/cofferdam; life jackets and rescue equipment; twice-daily river-stage readings; competent supervision; safe access; no lone work near river; halt at intake-specific threshold.	Contractor	Every active intake / twice daily stage log; rescue readiness checks.	Works contract
Construction — all sites	Heat illness and remote emergency delay	Implement approved heat-stress/work-rest/hydration regime, potable water, shade, PPE, first-aider per work front, emergency communication/transport and verified referral routes. Source numeric hydration value must be technically reconciled before contractual adoption.	Contractor	Daily toolbox/OHS checks; heat illness and LTIFR trends; zero fatalities.	Works contract
OS3 — Resource Efficiency and Pollution Prevention and Management					
Construction — pipe laying	Poor joints cause leakage and service failure	Certified HDPE welding or approved mechanical coupling; protect materials; document joints; pressure-test every pipe section before backfill; failed section re-join/replace and retest.	Contractor	100% pipe sections pressure-tested and Supervision-signed before backfill.	Works contract
Construction — trench/spoil	Erosion, subsidence, blocked drainage/farmland	Spoil on one side minimum 0.5 m from trench edge; no spoil in drainage/farmland without agreement; compact backfill in 200 mm layers; reinstate road/tracks/topsoil; ESMP target reinstatement within 48 h of pipe laying.	Contractor	Daily work-front checks; reinstatement/photo record before advance.	Works contract
Construction — Kismayo catchments	Sediment release, erosion, embankment instability	Phase desilting; work outside peak Gu/Deyr rain where practicable; silt controls; suitable spoil only where assessment supports reinforcement; immediate compaction; perimeter reinstatement; protect inlet/outlet/spillway/liner.	Contractor	Weekly and after significant rain; instability/sediment discharge triggers method review within 24 h.	Works contract

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Construction — waste/fuel/chemicals	Land/water contamination and drainage obstruction	Segregated/labeled waste; approved disposal; fuel/chemicals in secondary containment; spill kits; remove containers; no uncontrolled discharge; maintain waste/spill record.	Contractor	Weekly Supervision; monthly PIU review; zero uncontrolled disposal/spill.	Works contract
O&M — nine intakes	Unexpected downstream stress or abstraction deviation	Operate to documented allocation schedule; record actual withdrawal volumes; track reference river flow/stage and downstream water-access feedback; implement adaptive-management triggers if stress is detected.	PIU Water Engineer / WUA	Monthly flow/withdrawal tracking; quarterly downstream-access check/report.	Monitoring within PIU/O&M resources
O&M — pipes/intakes	Leakage, intake sedimentation/flood damage	Monthly pipe-route visual survey; report leaks within 5 days; source repair targets 30 days non-urgent/7 days supply-loss; monthly intake screen/sediment-trap inspection; post-flood inspection within 5 days; annual intake function test.	WUA / PIU	Monthly O&M records; annual system review.	Emergency repair fund USD 20,000 over 4 years
O&M — kiosks/catchments	Water-quality deterioration and poor drainage/sedimentation	Weekly kiosk/trough cleaning and drainage; semi-annual bacteriological testing; post-rainfall silt-trap clearing; annual Kismayo catchment inspection; desilt/repair as condition requires.	WUA / PIU	Semi-annual quality results; annual catchment condition report.	Water-quality line USD 20,000 + O&M resources
OS4 — Community Health, Safety and Security					
Construction — settlements	Children/residents exposed to open trenches and blocked access	Barriers and Somali-language signs; double barriers in dense areas; safe pedestrian/vehicle crossings at max 50 m spacing; ≥7 days advance trench notice; no unguarded open trench overnight in community areas; school/community safety awareness.	Contractor / CLO	Daily access/barrier checks; complaints and incidents logged.	Works contract
Construction — existing supply	Domestic hardship/crop loss from interruption	Signed disruption schedule; maintain agreed partial supply where feasible; confirm alternative source/tanker before full isolation; advance notice; restore within agreed period; verified project-caused crop loss compensated at full replacement cost.	Contractor / PIU / WUA	Daily continuity log; zero unplanned interruption beyond agreed schedule.	Works contract / compensation provisions
Construction / commissioning	Unsafe first-use water	Flush and test systems; minimum 72-hour source test operation; sample each kiosk to approved physical/bacteriological criteria before use. Source E. coli value requires reconciliation with approved drinking-water standard.	Contractor / PIU / accredited lab	Commissioning blocked until laboratory pass and PIU release.	Water-quality monitoring budget

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Construction / O&M	Security incident or unsafe oversight	District-specific SMPs; per-site assessment; coordination with Jubaland/Luuq/Dollow/Kismayo authorities and Dollow humanitarian networks; defined halt/evacuation thresholds; security review before remote oversight visits.	PIU / Contractor	Valid clearance; continuous security log; serious events trigger halt/SMP review.	Security within project/works resources
OS5 — Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement					
Pre-construction / construction	Temporary access/crop damage; informal/displaced users overlooked	Written corridor/catchment working-area agreements with actual users; identify party bearing loss including informal/displaced users; reinstate land; verified project-caused crop/asset loss at full replacement cost within specified 30 days; land grievances through 15-working-day track.	PIU / Contractor / District	100% access documented; compensation register; reinstatement verification.	Project compensation / works as applicable
All phases	Physical displacement or material productive-capacity loss emerges	Suspend affected activity and refer for PIU/Bank OS5 determination and any additional instrument before proceeding.	PIU	Zero unassessed displacement; formal decision record.	PIU safeguards
OS6 — Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources					
Construction — Juba intake/riparian areas	Unnecessary riparian clearing/habitat disturbance	Minimum work footprint; limit clearing; protect vegetation outside works; restore riparian vegetation after works; no support-site expansion into unexpected sensitive habitat without screening.	Contractor	Intake footprint/reinstatement inspection; unexpected sensitivity triggers reassessment.	Works contract
Construction — Kismayo/support sites	Unnecessary vegetation clearance	Keep works/support sites within approved footprint; reinstate perimeter vegetation and close borrow/spoil areas; avoid new tracks where existing access is adequate.	Contractor	Monthly footprint inspection; zero clearance outside approved area.	Works contract
OS7 — Vulnerable Groups					
Pre-construction / O&M	Tail-end, IDP/refugee, female-headed or minority users excluded	Inclusive WUAs; documented non-discriminatory membership/allocation; ≥30% female membership; displaced/refugee voice where present; head-/tail-end representation; accessible/low-literacy consultation and GRM.	PIU / WUA / JUB E&S Officer	Membership/allocation records before commissioning; 3/6/12-month and annual oversight; GRM trend analysis.	WUA training budget USD 14,000; engagement resources
Construction	Displaced youth/other groups excluded from jobs	Transparent local recruitment, non-discrimination and workers/employment grievance access; ensure displaced youth can access recruitment channels.	Contractor / PIU	Monthly workforce records and grievance trends.	Works contract
OS8 — Cultural Heritage					

PROJECT PHASE	E&S RISKS AND IMPACTS	MITIGATION / MANAGEMENT MEASURES	IMPLEMENTATION RESPONSIBILITY	MONITORING RESPONSIBILITY / INDICATORS / FREQUENCY	INDICATIVE COST (USD) / FUNDING SOURCE
Construction — all earthworks	Damage to unknown cultural heritage	Stop work; secure minimum ~20 m radius; record photo/GPS; notify PIU within source 4-hour requirement; PIU notifies competent federal cultural authority within 24 h; no resume until written clearance.	Contractor / PIU	Chance-find register; induction; clearance evidence.	Works contract
OS10 — Stakeholder Engagement and Information Disclosure					
Pre-construction / construction	Communities unaware of works, disruption, safety or entitlements	Site-level disclosure of scope/timing, trench/access arrangements, signed supply-disruption plan, recruitment, safety, land/crop procedure and GRM; Somali/oral low-literacy communication; Dollow protection-sensitive engagement.	PIU / CLO / Contractor	Meeting records and attendance; issues/action log.	Community engagement USD 17,000
All phases	Grievances unresolved or inaccessible	Multi-channel GRM: CLO/site contacts, hotline, suggestion boxes, WUAs, elders/district focal points; log/acknowledge/track; allocation and land/crop tracks; confidential SEA/SH pathway; no retaliation.	PIU / JUB E&S Officer	Monthly GRM review; ≥80% within 30 days; allocation complaints within 15 working days.	GRM budget USD 10,000
O&M / downstream	Perception or conflict over Dollow/boundary-reach water use	Disclose proposed operating seasons/withdrawal arrangements through appropriate channels; record intake volumes; keep Dollow District informed; make GRM accessible to downstream/cross-border-adjacent communities; escalate disputes to PIU/Jubaland State.	PIU / WUA / Dollow District	Downstream engagement and complaint records; quarterly review.	Dollow coordination USD 10,000

9.3.3. Commissioning and operation and maintenance phase

Commissioning is a safeguards hold point. Piped systems are not released for community use until hydraulic testing, flushing, test operation and approved water-quality verification are complete. Kismayo catchments are not handed over until embankment, liner where present, silt trap, spillway, inlet/outlet, trough, access and safety defects are closed. All thirteen sites require a functioning and trained WUA or equivalent management structure, documented allocation/access rules and active GRM arrangements before handover.

Commissioning controls — Jubaland

Control	Requirement / Risk	Management Requirement	Responsible	Evidence / Hold Point
Hydraulic commissioning — 9 piped systems	System failure or contaminated first-use water	Full-system pressure test, flushing and minimum 72-hour test operation; approved physical/bacteriological sampling at each kiosk before community use; source E. coli criterion reconciled before contractual use.	Contractor / PIU / accredited laboratory	Pressure test, lab certificate, commissioning certificate
Kismayo catchment commissioning — 4 sites	Unsafe/defective structures handed over	Post-works structural/safety inspection; embankment, liner where present, silt traps, spillway, inlet/outlet, troughs, safe access, fencing/signage; close defects.	Supervision / PIU	Inspection and commissioning certificate
WUA readiness — all 13	Management capacity not ready	Establish/strengthen WUA, ≥30% female membership, O&M/record/GRM training and PIU readiness confirmation.	PIU / JUB E&S Officer	WUA register, training and readiness confirmation
Water allocation at first use	Conflict/exclusion	Agree, document and publicly post allocation/turn schedule and operate valves/intakes according to approved schedule from Day 1.	WUA / PIU	Posted schedule and commissioning observation

During operation and maintenance, WUAs conduct routine pipe-route, intake, kiosk/trough and catchment checks; maintain allocation records; keep the GRM operational; and report leaks, water-quality issues, structural defects, security events and allocation grievances. The PIU provides technical support and post-handover oversight at 3, 6 and 12 months and annually thereafter.

9.3.4. Land Access Protocol

The ESIA does not anticipate permanent land acquisition or physical displacement, but a precautionary Land Access Protocol applies at all thirteen sites. Pipe-corridor access areas and catchment work perimeters are confirmed in writing with affected landowners/users, including customary and informal users; the working width, temporary restrictions and reinstatement obligations are recorded. The party actually bearing any project-caused loss must be identified, including displaced households cultivating or using land through informal arrangements.

Verified project-caused crop or asset damage is compensated at full replacement cost within the specified 30 days. Land-related grievances use the dedicated 15-working-day track. Any physical displacement or material productive-capacity loss inconsistent with screening triggers immediate work suspension and PIU/Bank OS5 determination.

9.3.5. SEA/SH prevention and response

- All workers, including drivers, security staff and subcontractors, sign an individual Code of Conduct before work. The Dollow version explicitly prohibits exploitation linked to displacement, refugee status or border crossing.
- A dedicated confidential SEA/SH channel is operational before mobilisation and managed exclusively by the PIU Social/GBV Specialist; contractor, WUA, elders and district structures do not mediate sensitive cases.

- A female CLO is available to project communities and reachable throughout construction and O&M.
- Survivor-centred referral pathways shall be confirmed before mobilisation for Luuq, Dollow and Kismayo, including the identified Luuq District Hospital, MSF/UNHCR-linked services in Dollow and Kismayo General Hospital or other verified service providers.
- Worker induction and quarterly refreshers cover prohibited conduct, reporting, survivor-centred response and Dollow-specific protection sensitivity.
- Worker accommodation, where required, is located away from residential/displacement areas with appropriate welfare/privacy.
- SEA/SH allegations are treated as serious incidents and notified/managed under the controlling project/Bank incident procedure.

9.4. Environmental and social clauses for procurement and contracts

- Approved C-ESMP and site/activity-specific method statements before mobilisation, including trenching/shoring, confined-space, intake/cofferdam, pipe jointing/pressure testing, Kismayo catchment earthworks and traffic/access.
- The site-readiness checklist and ESHS hold points in Section 9.5 as conditions precedent to mobilisation, high-risk work, backfill, commissioning and handover.
- OHS Plan covering trench/confined-space, river/drowning, heat stress, machinery/electrical, rescue, first aid and emergency response, including a competent Heat Stress Management Plan defining hydration and work/rest controls consistent with GIIP.
- Community H&S requirements for barriers/crossings, supply continuity, safe water commissioning, school/community awareness and catchment access.
- LMP requirements including worker register, age verification, written terms, non-discrimination, Workers' GRM and Code of Conduct, flowed down to subcontractors.
- Waste/spill prevention, fuel containment, spoil management, support-site screening and full reinstatement obligations.
- SEA/SH prevention and confidential referral arrangements, including the Dollow-specific Code of Conduct.
- District-specific security controls, incident reporting, stop-work/evacuation rights and Dollow boundary-reach coordination.
- Pressure-test certification for every pipe section before backfill and commissioning certificates before community use.
- Corrective-action, suspension and rejection/withholding mechanisms for unsafe or non-compliant works.
- The C-ESMP and method statements shall apply the final technical thresholds established by the approved engineering design, hydrological assessments, OHS Plan and commissioning water-quality protocol.

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

ESHS hold points — Jubaland

Hold Point	Applies To	Evidence Required	Release Authority
HP-1 Site readiness	All 13 sites	Access/community arrangements; security clearance; GRM/CLO readiness; approved C-ESMP/plans; applicable technical studies.	PIU
HP-2 Pipe-route survey	9 piped sites	Marked-up pipe/service survey and operator briefing before excavation.	PIU / Supervision
HP-3 Intake hydrology / Dollow boundary control	9 intake sites	Intake hydrology, approved work window/halt stage/cofferdam basis; Dollow bank-side approach and cross-border assessment requirement resolved.	PIU / Technical lead
HP-4 Kismayo catchment condition	4 catchments	Condition assessment: sediment, embankment, liner, spillway, inlet/outlet and erosion-control needs.	PIU / Technical lead
HP-5 Land/disruption arrangements	Affected sites/corridors	Written access/working-area records; signed disruption schedule; alternative supply and compensation process.	PIU / District Administration
HP-6 High-risk work release	Trenching, confined-space, intake, catchment earthworks	Approved task method, competent crew, rescue/equipment, current security clearance and permit/task briefing.	Supervision / PIU
HP-7 Pipe backfill release	Each pipe section	Pressure-test pass certificate witnessed/signed by Supervision.	Supervision Consultant
HP-8 Water-use commissioning	Each kiosk/piped system	System flushed/tested; approved water-quality criteria passed; lab certificate reviewed.	PIU
HP-9 Catchment commissioning	Each Kismayo catchment	Post-works structural/safety inspection passed; defects closed; safe access/fencing/signage.	PIU / Supervision
HP-10 Handover readiness	All 13 sites	WUA operational/trained; allocation/access rules posted; O&M tools/manuals and GRM in place.	PIU / JUB E&S Officer
HP-11 Technical reconciliation	Before final contract/affected activity	Approved record resolves power configuration, categorisation labels, heat/hydration standard, water-quality criterion and intake design parameters.	PIU / Design and E&S teams

9.6. Stakeholder-engagement measures

Stakeholder engagement continues under the Jubaland SEP and is integrated with work sequencing, water-supply continuity, allocation governance, land access, security and grievance management. It must remain accessible to women, displaced/refugee households, minority and tail-end users, youth, pastoral/agro-pastoral households and downstream users who may not be represented through formal land or WUA structures.

Before works at each site, disclose the work programme, trench/access arrangements, signed supply-disruption schedule, alternative water arrangements, employment process, safety controls, GRM channels and land/crop procedures. Dollow intake operating seasons and withdrawal arrangements should be communicated through low-literacy, conflict-sensitive channels and coordinated with district and relevant humanitarian structures. During O&M, WUA meetings, posted allocation schedules, downstream-access feedback and PIU oversight visits provide the primary engagement platform.

9.7. Project-level grievance redress mechanism

The GRM applies throughout construction and O&M. Uptake channels include CLO/site contacts, project hotline, suggestion boxes, WUAs, elders and district focal points, with protection-sensitive referral options in Dollow. Complaints are logged, acknowledged, assigned and tracked to closure. Complainants retain access to judicial remedies and AfDB recourse.

Step	Action	Responsible	Timeline
1 — Site level	Minor construction, access, nuisance or service issues	Contractor / CLO	Within 5 business days
2 — PIU and District review	Repeated safety, access, disruption or service issues unresolved at site level	JUB E&S Officer / PIU / District	Within 10 business days
3 — Jubaland State escalation	State administrative disputes, including cross-border water issues at Dollow	PIU / Jubaland State	Within 15 business days
4 — National / AfDB recourse	Unresolved matter referred to PIU governance/national mechanism/AfDB IRM	PIU / MoAI / AfDB as applicable	Per applicable mechanism
Water-allocation track	Valve/turn schedule or downstream access complaint	WUA / JUB E&S Officer / PIU	Within 15 working days
Land/crop track	Verified access/crop loss	PIU / District	Grievance within 15 working days; payment within specified 30 days
SEA/SH confidential track	No mediation by WUA/elders/contractor/district; survivor-centred PIU handling	PIU Social/GBV Specialist	Immediate response; Bank notification per incident protocol

The ESMP monitoring framework targets at least 80% of grievances resolved within 30 days and water-allocation complaints within 15 working days. GRM performance shall be reviewed monthly and included in quarterly safeguards reporting. SEA/SH information shall be reported only in non-identifying aggregate form.

9.8. Monitoring and reporting plan

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

Parameter	Indicator / Method	Frequency	Responsible	Reporting	Threshold / Action
Construction ESHS compliance	ESMP/C-ESMP checklist; OHS statistics; GRM log	Weekly Supervision; monthly PIU audit	Supervision / JUB E&S Officer	Monthly to PIU; quarterly to AfDB	Non-compliance corrected within 48 h; serious incidents per controlling protocol
Trench safety	Shoring >1.2 m; unsupported-entry and atmospheric-test records	Daily every active trench	Contractor / Supervision	Daily record; weekly summary	Unsupported >1.2 m worker exposure = immediate suspension
Pipe pressure testing	Pass/fail hydraulic test per section	Every pipe section before backfill	Contractor / Supervision	Test certificate	Failed section re-joined/replaced and retested
Supply continuity	Partial/alternative supply; disruption vs signed schedule	Daily during replacement	Contractor / WUA	Daily log; deviations to PIU	Zero unplanned disruption beyond agreed schedule
Pre-commissioning water quality	Approved bacteriological/physical parameters at kiosk	Before commissioning	PIU / accredited lab	Lab certificate	No commissioning until pass; source E. coli value reconciled before contract
O&M kiosk water quality	Bacteriological / physical condition	Semi-annually	PIU / accredited lab	Results to PIU/water authority	Non-compliance triggers immediate investigation/corrective action
In-river flood monitoring	Juba stage at relevant gauge/reference	Twice daily during intake works	Contractor / Supervision	Stage log / halt record	Stop at intake-specific halt stage
Kismayo catchment construction	Silt controls; compaction; reinstatement; erosion	Weekly and after significant rain	Contractor / Supervision	Weekly summary	Sediment discharge/instability → method review within 24 h
WUA governance/inclusivity	Female membership; meeting records; allocation disputes; GRM trends	3, 6, 12 months then annually	PIU / JUB E&S Officer	Oversight report	≥30% female membership; persistent inequity → governance review
Pipe/system O&M	Wet patches/subsidence; leaks; intake/kiosk function	Monthly visual; annual system assessment	WUA / PIU	Monthly/annual record	Leak ESMP targets: report ≤5 days; repair ≤30 days or ≤7 days supply-loss
Catchment O&M	Storage/sediment; embankment/liner/spillway; trough; safety	Post-rainfall + annual	WUA / PIU	Annual condition report	Desilt when storage loss requires; immediate defect reporting
GRM	Cases, acknowledgement, resolution, allocation track, sensitive referrals	Monthly	JUB E&S Officer	Monthly to PIU; quarterly AfDB	≥80% ≤30 days; allocation ≤15 working days
OHS incidents	Fatalities, LTIFR, near misses, trench/water/heat incidents	Continuous; immediate for serious	Contractor / Supervision	Immediate serious notice; monthly summary	Zero fatalities; source LTIFR target <5
Security	Incidents, work suspension, Dollow border events	Continuous	Contractor / PIU	Immediate PIU; quarterly AfDB	Serious event → halt/SMP review; Dollow event → State escalation

Parameter	Indicator / Method	Frequency	Responsible	Reporting	Threshold / Action
Downstream river flow/access	Reference flow/stage; withdrawal records; access check; GRM trend	Monthly flow; quarterly access	PIU Water Engineer / JUB E&S Officer / SWALIM support	Quarterly downstream-impact note	Sustained reduction/no-flow/excess abstraction/rising complaints → adaptive action

Downstream flow and adaptive-management monitoring. The nine Luuq/Dollow systems account for less than 0.6% of mean monthly Juba flow at the Luuq reference gauge.

Monitoring is precautionary and verifies that actual operation remains within the documented allocation while providing an early response to unexpected physical or social stress.

Trigger Condition	Monitoring Point	Required Management Action	Responsible Party
Observed downstream reduction attributable to project intakes, or stage below approved low-flow reference	Designated Luuq/Dollow downstream point	Reduce/rotate adjacent intake openings; verify operation against allocation schedule; document review	PIU Water Engineer / WUAs
Five consecutive days with no observable flow at downstream community water point	Community-designated point	Temporarily close/reduce relevant intake(s), investigate and provide emergency water if required	MoAI / PIU emergency protocol
Downstream access complaints exceed alert level or sustained trend	GRM / engagement records	Independent technical review within 14 days and mediated allocation review; disclose outcome	JUB E&S Officer / PIU Social
Monthly abstraction exceeds documented allocation volume	Intake-flow records / monitoring	Notify Jubaland State water authority; inter-WUA coordination; adjustment plan	PIU / Jubaland State

Table 13: Numeric Performance Standards and Thresholds — Jubaland

Parameter	Numeric Threshold / Standard	Implementation Basis
Trench shoring	All trench sections >1.2 m shored before worker entry; unsupported exposure triggers immediate suspension.	ESMP construction and monitoring requirement
Atmospheric testing	Atmospheric testing and entry controls shall be applied where required by the approved excavation/confined-space method statement and competent OHS assessment.	C-ESMP excavation/confined-space method statement
Pipe pressure test	100% pipe sections pass and are signed before backfill.	ESMP quality hold point
Supply continuity	Zero unplanned interruption beyond signed schedule.	ESMP supply-continuity requirement
Crossings in settlements	Maximum 50 m spacing during open-trench works.	ESMP community-safety requirement
Reinstatement	Reinstatement shall be completed promptly after pipe installation in accordance with the approved work programme and method statement.	C-ESMP reinstatement method statement
Pre-commissioning water quality	Water intended for community use shall meet the approved project and applicable drinking-water acceptance criteria before commissioning.	C-ESMP commissioning and water-quality protocol
Female WUA participation	At least 30% female membership.	Source OS7/WUA target
Leak response	Report within 5 days; repair within 30 days non-urgent or 7 days supply-loss.	ESMP O&M requirement
GRM	≥80% resolved within 30 days; water allocation ≤15 working days.	ESMP monitoring and GRM target
OHS	Zero fatalities; LTIFR and other OHS indicators monitored against the approved project OHS KPI framework.	C-ESMP OHS Plan / project OHS KPI framework
Post-flood intake inspection	Within 5 days of major Juba flood event.	ESMP O&M requirement
Heat work/rest/hydration	The C-ESMP Heat Stress Management Plan shall define potable-water provision, acclimatisation, work/rest regime, shade, heat-trigger criteria, first aid and emergency response consistent with GIIP and the approved OHS standard.	C-ESMP Heat Stress Management Plan
Dollow mid-stream works	No mid-stream infrastructure without cross-border assessment.	Boundary-river precautionary control
Downstream no-flow trigger	Five consecutive days with no observable flow at a community point.	Adaptive-management trigger
Chance finds	Stop; secure ~20 m; PIU ≤4 h; competent federal authority ≤24 h.	Chance Finds Procedure

9.9. Institutional arrangements

Table 14: Roles and Responsibilities — Jubaland ESMP

Actor	Key Responsibilities — Jubaland ESMP	Reporting / Interface
PIU (MoAI)	Overall ESMP ownership; approve plans/hold points; monthly audits; serious incidents; quarterly AfDB reporting; Jubaland coordination; compensation/access; Dollow boundary matters.	Reports to AfDB / MoAI
JUB E&S Officer / shared SWS-Jubaland post	Day-to-day 13-site oversight; inspections; GRM; WUA support; supply-disruption/security monitoring; pressure-test verification; monthly report.	Reports to PIU safeguards specialists
PIU Water / Technical Engineer	Review intake hydrology, pipe routes/design, pressure tests, allocation, abstraction and downstream adaptive action.	Works with E&S, Supervision, WUAs and State water authorities
PIU Social / GBV Specialist	Protection-sensitive engagement, confidential SEA/SH channel/referrals, sensitive incidents, social inclusion and grievance oversight.	Confidential PIU safeguards interface
Jubaland agriculture / water authorities	State counterpart; water allocation and permitting/coordination; joint oversight; Dollow support.	Coordinate with PIU
Luuq District Administration	Access, liaison, security and local dispute resolution.	PIU/JUB E&S interface
Dollow District Administration	Border access, cross-border community liaison, security, IDP/refugee context and WUA support.	PIU/JUB E&S interface
Kismayo District Administration	Catchment access, peri-urban liaison, security, dispute resolution and WUA support.	PIU/JUB E&S interface
Contractors	Implement C-ESMP; ESHS officer; trench/water/catchment controls; incident and monthly reporting; subcontractor compliance.	Report to Supervision and PIU
Supervision Consultant	Weekly site verification; daily active-trench safety checks; pressure-test sign-off; intake/catchment compliance; corrective-action close-out.	Reports to PIU
WUAs	O&M, allocation schedules, monthly pipe/intake inspections, kiosk/catchment maintenance, GRM reporting and meeting records.	Accountable to users; supported by PIU
AfDB	External safeguards oversight, report review, supervision and corrective-action requirements.	External financier oversight

9.9.1. Incident management and reporting

The ESIA classifies minor incidents for site recording and monthly summary; moderate incidents for PIU notification within 24 hours and written follow-up; and serious incidents — fatalities, lost-time injury, major pollution, SEA/SH allegation, trench collapse injury, in-river flood incident or serious security event — for immediate/within 4-hour PIU notification, AfDB notification within 24 hours, investigation within 48 hours and corrective-action plan within 10 business days. Any more stringent Financing Agreement or current Bank incident-reporting requirement prevails.

All incidents shall be recorded in the Jubaland incident register and included in quarterly safeguards reporting. Any unplanned water-supply interruption beyond the agreed schedule shall be managed as a Moderate incident under the ESMP incident-classification framework; Dollow border-related security incidents shall additionally be escalated to Jubaland State authorities.

9.10. Institutional capacity assessment

The institutional arrangement is workable but requires field capacity proportionate to the dispersion and risk profile of the thirteen sites. The shared SWS/Jubaland E&S Officer provides day-to-day coverage, while the PIU Water/Technical Engineer, PIU Social/GBV Specialist and Supervision Consultant provide specialised review and independent construction verification. Luuq, Dollow and Kismayo District Administrations are important for access, security, community liaison and dispute resolution.

The principal capacity constraints include limited state-level safeguards and environmental enforcement capacity; incomplete intake-specific hydrological and buried-service records; limited systematic Juba gauging at the intake reaches; inconsistent community-kiosk water-quality enforcement; non-standardised formal grievance procedures; protection-sensitive complaint needs in Dollow; and the logistical/security burden of supervising simultaneous dispersed work fronts.

Capacity strengthening therefore requires adequate field mobility and communications, specialised hydrological/engineering support, competent contractor ESHS staff, independent Supervision, functioning CLO/GRM networks, protection-sensitive social/GBV capability, WUA O&M support and post-handover technical follow-up. If simultaneous active work fronts exceed verified safeguards supervision capacity, the PIU should add field support or limit concurrent mobilisation.

9.11. Capacity development and training

Table 15: Capacity Building and Training Plan — Jubaland

Training Topic	Target Participants	Key Content	Frequency	Responsible
ESMP implementation and reporting	PIU, JUB E&S Officer, Supervision, Contractor ESHS	ESMP obligations, hold points, reporting, corrective actions, piped/catchment protocols	Start-up; quarterly refreshers	PIU / Supervision
Trench safety/confined space	Excavation crews/supervisors	Shoring, entry, atmospheric testing, no lone work, rescue and emergency response	Before trenching; monthly refresher	Contractor / Supervision
In-river intake safety	Intake workers	Cofferdam, life jacket/rescue, flood gauge, halt threshold and evacuation	Before intake works each site	Contractor / Supervision
Pipe laying and pressure testing	Pipe crews/supervisors	HDPE welding/coupling, bedding, pressure-test documentation, failure/retest and sign-off	Before pipe work; competency	Contractor / Supervision
Kismayo catchment earthworks	Earthworks crews/supervisors	Phased desilting, compaction, liner protection, silt control, erosion/reinstatement	Before catchment works	Contractor / Supervision
OHS — heat/trench/river	All construction workers	Heat prevention, approved hydration/work-rest, PPE, drowning prevention, first aid and emergency contacts	Day 1; toolbox talks	Contractor
SEA/SH — Jubaland/Dollow	All workers, CLO, PIU GBV	Code of Conduct, Dollow protection sensitivity, confidential reporting, referrals	Day 1; quarterly refreshers	PIU GBV Specialist
WUA piped/catchment O&M	WUA members all 13 sites; district water focal points	Valve/intake allocation, kiosk hygiene, leak inspection/repair kit, catchment O&M, records and GRM	Before commissioning; 6-month refresher	PIU Technical / district
Water-allocation governance	WUAs/community leaders	Head/tail equity, displaced-user inclusion, schedules, conflict de-escalation, Dollow/catchment access	Before commissioning; annual	PIU / Districts
GRM handling	JUB E&S Officer, district focal, CLO	Channels, logging, timelines, escalation, SEA/SH confidential handling	Start-up; quarterly	PIU
Security awareness	PIU, Supervision, contractor supervisors	Assessment, communication, incident reporting, halt/evacuation and Dollow border coordination	Start-up; update each phase	PIU

9.12. Implementation schedule

Table 16: Implementation Schedule and Reporting Calendar — Jubaland

Activity	Timing / Trigger	Responsible	Output
Pipe-route surveys — 9 piped sites	At least 4 weeks before trenching	PIU / Technical Consultant	Marked-up route drawings
Intake hydrological assessment — 9 Juba intakes	At least 6 weeks before intake works	PIU / Technical Consultant	Assessment per intake
Kismayo catchment condition assessment — 4	Before mobilisation each catchment	PIU / Technical Consultant	Condition assessment
Security assessments — all 13	Before mobilisation authorisation; updated by phase	PIU / Contractor	Security clearance / SMP
Community disruption schedule	Before mobilisation at affected site	PIU / District / WUA	Signed schedule
C-ESMP and ESHS plans	Before on-site mobilisation	Contractor / PIU	Written approval
GRM/CLO/SEA-SH channel	Before mobilisation in each district	PIU / JUB E&S Officer	Operational channels/referrals
Worker induction	Day 1 before assignment	Contractor / Supervision	Signed records
Weekly site inspections	Weekly during construction	Supervision	Weekly report
Pipe pressure-test sign-off	Before backfill each section	Supervision	Test certificate
Water-quality commissioning	Before community use	PIU / accredited lab	Lab certificate / pass
WUA formation/training	Before commissioning each site	PIU / JUB E&S Officer	WUA/training records
Quarterly safeguards reports	Quarterly	PIU	Report to AfDB
WUA oversight visits	3, 6, 12 months then annually	PIU / JUB E&S Officer	Oversight report
Annual system/catchment review	Annually during O&M	WUA / PIU technical	Condition report

9.13. Cost estimates and sources of financing

The ESIA provides a reconciled indicative ESMP budget of USD 259,610 over four years. It includes the Jubaland share of the shared SWS/Jubaland E&S Officer and project-delivered safeguards activities. Contractor ESHS costs — including trench shoring, water-safety and rescue equipment, flood gauges, confined-space testing equipment, PPE, C-ESMP preparation and contractor ESHS staffing — are additional and financed through works contracts.

Table 17: Indicative ESMP Budget — Jubaland (USD)

Cost Item	Year 1	Year 2	Year 3	Year 4	Total
SWS/Jubaland E&S Officer — Jubaland share (50%)	24,000	24,720	25,462	26,226	100,408
Community engagement — Luuq, Dollow and Kismayo	5,500	4,500	3,500	3,500	17,000
GRM operation — hotline, boxes, database	3,500	2,500	2,000	2,000	10,000
Pre-works pipe-route surveys — 9 sites	6,000	—	—	—	6,000
Pre-works intake hydrological assessment — 9 intakes	9,500	—	—	—	9,500
Pre-works Kismayo catchment condition assessment — 4	4,000	—	—	—	4,000
Water-quality monitoring — commissioning + semi-annual O&M	5,000	5,000	5,000	5,000	20,000
WUA capacity building and training — 13 sites	7,500	3,500	2,000	1,000	14,000
Emergency repair fund — pipes and catchments	5,000	5,000	5,000	5,000	20,000
Dollow cross-border coordination — transport and liaison	3,500	2,500	2,000	2,000	10,000

Cost Item	Year 1	Year 2	Year 3	Year 4	Total
Female CLO — Jubaland (partial cost)	6,000	6,180	6,365	6,556	25,101
Subtotal	79,500	53,900	51,327	51,282	236,009
Contingency (10%)	7,950	5,390	5,133	5,128	23,601
TOTAL (indicative)	87,450	59,290	56,460	56,410	259,610

All amounts are indicative and should be reconciled with annual work plans and procurement packages. No safeguards activity should be removed solely because a contractor obligation is not separately itemised in the PIU budget; contractor obligations must be adequately priced within works contracts.

9.14. ESMP implementation matrix

Table 18: ESMP Implementation Matrix — Jubaland

Code	Impact / Risk	Measure / Activity	Management Measure	Deadline	Cost / Source	KPI	Implementation	Monitoring
JUB-01	Unready mobilisation	Site readiness	PIU release only after applicable hold points	Before mobilisation	ESMP / works	13/13 written releases	PIU / JUB E&S	Monthly PIU audit
JUB-02	Live pipe/service damage	Pipe-route survey	Survey/mark, brief operators, hand-dig near confirmed services	Before trenching	USD 6,000	9/9 route surveys	PIU / Contractor	Supervision
JUB-03	Flood/scour/intake risk	Intake hydrology	Per-intake hydrology, work window, halt stage, cofferdam; Dollow boundary condition	Before intake works	USD 9,500	9/9 approved assessments	PIU / Technical	Supervision/PIU
JUB-04	Catchment design uncertainty	Kismayo condition assessment	Sediment, embankment, liner, spillway/inlet/outlet and erosion assessment	Before catchment mobilisation	USD 4,000	4/4 assessments	PIU / Technical	PIU
JUB-05	Trench collapse/confined space	Trench safety	Shoring >1.2 m, testing >1.5 m/enclosed, rescue, no lone work	Construction	Works contract	Zero unsupported entry	Contractor	Daily Supervision
JUB-06	River drowning/flood	Intake safety	Low-flow/cofferdam, life jackets/rescue, twice-daily stage, halt threshold	Construction	Works contract	Zero unprotected river work	Contractor	Supervision/PIU
JUB-07	Pipe leakage/failure	Joint QA / pressure testing	Certified joining; 100% pressure-test/sign-off before backfill	Each pipe section	Works contract	100% pass certificates	Contractor	Supervision
JUB-08	Supply interruption/crop loss	Continuity plan	Signed schedule, partial/alternative supply, notice, replacement-cost crop process	Before/during rehab	Works/compensation	Zero unplanned outage	Contractor / PIU / WUA	Daily log
JUB-09	Community injury	Barriers/access/traffic	Signs/barriers, crossings ≤50 m, no unguarded trench overnight, safety awareness	Construction	Works	Zero unguarded high-risk trench	Contractor / CLO	Daily

Code	Impact / Risk	Measure / Activity	Management Measure	Deadline	Cost / Source	KPI	Implementation	Monitoring
JUB-10	OHS / heat	OHS Plan	Approved heat/work-rest/hydration, PPE, first aid, rescue, emergency routes	Construction	Works	Zero fatalities; source LTIFR <5	Contractor	Supervision/PIU
JUB-11	SEA/SH	CoC/referral	100% CoC, Dollow protection clauses, confidential PIU channel, female CLO, referrals	All phases	Works / female CLO budget	100% CoC; pathway active	Contractor / PIU GBV	Monthly confidential review
JUB-12	Waste/fuel/spoil pollution	Pollution control	Containment, spill kits, approved waste/spoil, support-site screening	Construction	Works	Zero illegal dumping/uncontrolled spill	Contractor	Weekly/monthly
JUB-13	Security	SMP / site assessment	District SMPs, clearance, halt/evacuation, Dollow coordination	All phases	Project/works	Valid clearance; incidents tracked	PIU / Contractor	Continuous
JUB-14	Land/access loss	Land Access Protocol	Written access, actual user identification, reinstatement, replacement-cost compensation, OS5 trigger	Before/during	Compensation/works	100% access records	PIU / Contractor	GRM / verification
JUB-15	Inequitable allocation	Inclusive WUA	≥30% women; head/tail and displaced inclusion; posted schedule; GRM	Before commissioning/O&M	USD 14,000 training	13/13 WUA readiness	PIU / WUA	3/6/12m + annual
JUB-16	Water-quality failure	Testing/hygiene	Commissioning lab pass; semi-annual bacteriology; weekly kiosk/trough hygiene	Commissioning/O&M	USD 20,000 monitoring	100% pass before use	PIU / WUA	Lab/O&M

Code	Impact / Risk	Measure / Activity	Management Measure	Deadline	Cost / Source	KPI	Implementation	Monitoring
JUB-17	Leak/intake/catchment deterioration	O&M maintenance	Monthly system checks, post-flood intake inspection, annual catchment review and repairs	O&M	USD 20,000 emergency + O&M	Annual condition records	WUA / PIU	PIU technical
JUB-18	Downstream stress	Adaptive monitoring	Reference flow/stage, withdrawal records, access complaints and trigger actions	O&M	PIU monitoring	No trigger without documented action	PIU / WUA	Quarterly note
JUB-19	GRM failure	Multi-channel GRM	Monthly review; $\geq 80\%$ ≤ 30 days; allocation ≤ 15 working days; SEA/SH separate	All phases	USD 10,000	Resolution KPI met	JUB E&S / PIU	Quarterly AfDB
JUB-20	Uncontrolled project change	Change screening	Screen and approve material change before implementation	All phases	PIU admin	100% material changes screened	PIU / Design	Safeguards review

9.15. Environmental monitoring matrix

The environmental and social monitoring matrix is provided at Section 9.8 and is the controlling monitoring schedule for construction and O&M. It defines parameter, indicator/method, frequency, responsible party, reporting route and threshold/action. Supplementary records maintained by the JUB E&S Officer include the daily trench-safety log, pipe pressure-test register, intake flood-stage logs, supply-continuity logs, crop-damage/compensation records, Associated Facilities Register, waste/spoil record, worker induction/training register, GRM database and Jubaland incident register.

9.16. Risk-management matrix

Table 19: ESMP Implementation Risk-Management Matrix — Jubaland

Implementation Risk	Rating	Consequence	Management Response	Owner
Juba flood rises during intake works	High	Drowning, work loss, riverbank damage	Intake hydrology, low-flow window, stage monitoring, cofferdam, halt threshold and rescue	PIU / Contractor
Trench safety discipline lapses	High	Fatal/serious injury	Daily Supervision; shoring hard trigger; competent excavation method; stop work	Contractor / Supervision
Buried service records incomplete	High	Supply interruption / pipe damage	Pipe-route survey; marked drawings; hand digging; stop on unexpected service	PIU / Technical / Contractor
Supply continuity not maintained	High	Domestic hardship, crop loss, conflict	Signed disruption plan, partial/alternative supply and compensation process	PIU / Contractor / WUA
Dollow protection/border risk	Moderate-High	Conflict, SEA/SH, security or water-use perception	Protection-sensitive engagement, district/humanitarian coordination, bank-side works, cross-border assessment trigger	PIU / Dollow District
WUA capture / tail-end exclusion	Moderate-High	Persistent allocation conflict	Inclusive WUA, public schedules, GRM, PIU oversight and schedule adjustment	PIU / WUA
Security limits supervision	High	Weak compliance verification	District SMPs, per-site clearance, active-work-front sequencing and added field support where needed	PIU / Contractor / Supervision
Contractor ESHS underperformance	Moderate-High	OHS/pollution/community harm	Competent ESHS staff, weekly supervision, CAPs, hold/suspension mechanisms	PIU / Supervision
Water-quality standard remains unresolved	Moderate	Incorrect commissioning criterion	Reconcile final approved drinking-water criterion before tender/commissioning	PIU / Water / E&S
Source power/design descriptions conflict	Moderate	Incorrect technical/ESHs assumptions	Final design-safeguards reconciliation before contract issue	PIU / Design
Drought/low flow differs from assessment	Moderate	Unexpected downstream access stress	Flow/withdrawal/access monitoring and adaptive reduction/closure/emergency response	PIU Water / WUA

9.17. Key ESMP implementation indicators

- 13/13 sites have written PIU readiness authorisation before mobilisation.
- 9/9 piped sites have approved route/service surveys before trenching.
- 9/9 Juba intakes have approved intake-specific hydrological assessments before in-river works.

- 4/4 Kismayo catchments have approved condition assessments before earthworks.
- 100% of active trenches comply with the shoring/entry requirements; no unsupported worker entry >1.2 m.
- 100% of pipe sections have Supervision-signed pressure-test pass certificates before backfill.
- Zero unplanned supply interruption beyond signed disruption arrangements.
- 100% of water intended for potable community use is released only after approved laboratory pass.
- 13/13 WUAs are established/strengthened and trained before handover, with ≥30% female membership and documented allocation rules.
- GRM performance meets ≥80% resolution within 30 days; allocation complaints within 15 working days.
- Zero fatalities; LTIFR monitored against the approved project OHS KPI; serious incidents investigated/corrected.
- All active intake works maintain the required river-stage log and halt at the approved threshold.
- All associated/support sites are screened/approved before use and formally closed/reinstated.
- WUA/PIU post-handover oversight visits completed at 3, 6 and 12 months and annually.
- Quarterly safeguards reports to AfDB include OHS, GRM, water quality, supply continuity, downstream monitoring, security and corrective-action status.
- The approved C-ESMP and associated pre-construction records confirm the operating configuration, Category 2 requirements, heat-stress controls, commissioning water-quality criteria and intake/catchment technical parameters before the affected activity begins.

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

- Design: route surveys, intake hydrology, catchment condition, water-quality and access/security findings are reflected in final drawings/specifications and method statements.
- Planning: works are sequenced by readiness, Juba low-flow windows, catchment rainfall conditions, supply-continuity needs, security and safeguards supervision capacity.
- Procurement: Sections 9.3–9.5 are inserted into tender/contract documents, including ESHS staffing, training, records, reinstatement, quality hold points, incident and stop-work provisions.
- Budget: project-delivered safeguards are financed through the USD 259,610 indicative ESMP budget; contractor ESHS obligations are priced/funded through works contracts.
- Implementation: no activity passes a hold point without written release; non-compliance is managed through corrective action and suspension where necessary.
- Supervision/reporting: daily/weekly controls, monthly PIU audits and quarterly AfDB reports create the audit trail and drive adaptive management.
- Handover: commissioning includes technical tests, water-quality/safety checks, reinstatement, WUA readiness, O&M arrangements and GRM functionality.
- O&M: allocation rules, monitoring schedules, maintenance response, downstream/adaptive management and GRM are transferred into O&M practice and oversight.

9.19. Associated management plans

- Stakeholder Engagement Plan (SEP) — Jubaland.
- Project-level Grievance Redress Mechanism procedures — Jubaland.
- Gender and Social Inclusion / vulnerable-group measures.
- Labour Management Procedures (LMP), including Workers' GRM.
- Contractor Environmental and Social Management Plan (C-ESMP) and activity-specific method statements.
- Occupational Health and Safety Plan, including trench/confined-space, river/water, heat and emergency-response controls.
- Waste Management and Spill Prevention Plan.
- Community Health and Safety / Traffic Management arrangements.
- SEA/SH Prevention and Response arrangements and Code of Conduct, including Dollow-specific protections.
- District-specific Security Management Plans.
- Land Access Protocol and compensation/access records.
- Chance Finds Procedure.
- Climate Risk Assessment — Jubaland.
- Environmental and Social Monitoring Plan — Jubaland.
- Environmental, Social and Capacity Building Training Plan — Jubaland.
- Associated Facilities and Support-Sites Register and close-out records.
- Downstream River Impact / adaptive-monitoring records for the Juba systems.

No standalone resettlement or biodiversity management plan is required under the screened footprint. If implementation changes trigger involuntary acquisition/displacement, material livelihood loss, or an unassessed biodiversity impact, the relevant additional instrument must be prepared and approved before the affected activity proceeds.

CHAPTER 10: CONCLUSION AND RECOMMENDATIONS

10.1 Overall Conclusion

The Environmental and Social Impact Assessment for the Jubaland State component of the Beero oo Barwaaqee Soomaaliya (BBS) Irrigation Project concludes that the proposed rehabilitation works can be implemented in an environmentally and socially acceptable manner provided the mitigation, management, monitoring and pre-works controls defined in this ESIA are implemented. The conclusion is conditional on completion of the required technical and safeguards verification before mobilisation, effective contractor and supervision performance during construction, and continued institutional and community management after handover.

The Jubaland component comprises 13 rehabilitation sites: nine piped irrigation systems in Luuq and Dollow Districts along the Juba River corridor and four water catchments in Kismayo District. The material risks differ by intervention and location. The piped systems require particular control of trench and confined-space safety, Juba River intake works, supply continuity, pipe integrity, community access and cross-border sensitivity at Dollow. The Kismayo catchments require control of erosion, sedimentation, embankment condition, water-point safety and maintenance. Across all sites, water allocation, vulnerable-group inclusion, SEA/SH prevention, security, land access, grievance management and long-term operation and maintenance remain important management requirements.

10.2 Basis for Environmental and Social Acceptability

The assessment finds that the principal adverse impacts are localized and manageable when the specified controls are applied. The most material pre-mitigation risks include trench collapse and confined-space hazards, in-river intake safety and flood exposure, temporary interruption of existing water and irrigation supply, worker heat and river hazards, SEA/SH risk in displacement-affected communities, water-allocation conflict, and security constraints. After mitigation, most residual effects are assessed as Negligible to Moderate; water-allocation governance, supply continuity, security, flood-related intake risk and cross-border sensitivity require continued management attention rather than a one-time construction response.

Environmental and social acceptability therefore rests on enforceable decision points throughout the project cycle: pipe-route and buried-service surveys before trenching; hydrological assessment before intake works; catchment-condition assessment before earthworks; written land-access and supply-disruption arrangements before mobilisation; approved C-ESMPs and task-specific method statements; daily trench and river-safety controls during construction; pressure testing and water-quality clearance before commissioning; WUA readiness before handover; and continued monitoring of allocation, pipe condition, intake performance, catchment condition, water quality, security and grievances during operation.

10.3 Conditions to be Satisfied Before Mobilisation

- Confirm the final approved 13-site register, site names, pipeline alignment coordinates, catchment coordinates, intervention status and applicable engineering design package for each works contract.

- Complete the existing pipe-route and buried-service survey for each of the nine piped systems and issue marked-up route information before any excavation begins.
- Complete the site-specific hydrological assessment for each of the nine Juba River intakes, including the construction low-flow window, flood-stage suspension threshold, scour considerations and intake-specific construction requirements.
- Complete a condition assessment for each of the four Kismayo catchments covering embankment and bund integrity, sediment depth, liner need, spillway and inlet/outlet condition, and downstream erosion risk.
- Confirm written access arrangements for pipe corridors, intake work areas, catchment footprints and temporary support areas; identify the persons actually bearing any crop or livelihood loss, including users without formal tenure.
- Agree and sign the community water-supply disruption schedule for each relevant site, including partial-supply arrangements, alternative water provision and the compensation process for verified project-caused crop losses.
- Complete the site-specific security assessment for all 13 sites, with district-specific Security Management Plans for Luuq, Dollow and Kismayo and the required Dollow border-specific coordination arrangements.
- Approve the Contractor ESMP, OHS plan, community health and safety plan, waste and spill controls, SEA/SH Code of Conduct and referral arrangements, Chance Finds procedure, labour measures and all high-risk activity method statements before mobilisation.
- Establish and test the GRM in Luuq, Dollow and Kismayo, including accessible channels for displaced populations and the confidential SEA/SH reporting pathway.

10.4 Conditions During Construction

- Enforce trench shoring for all sections deeper than 1.2 m before worker entry, atmospheric testing for deep or enclosed excavations as specified in the approved method statement, rescue readiness and the prohibition on lone working in deep trenches.
- Confine in-river intake works to the intake-specific low-flow window confirmed by the hydrological assessment; implement cofferdam, life-jacket, rescue and twice-daily river-stage monitoring requirements and stop work when the approved suspension threshold is reached.
- At Dollow, maintain the bank-side intake approach and do not introduce mid-stream structures unless the required cross-border assessment and approvals have been completed.
- Maintain the agreed partial water and irrigation supply during pipe replacement and activate the approved alternative-supply arrangement before any full isolation. Any unplanned disruption beyond the agreed schedule must be treated and reported in accordance with the ESMP.
- Require certified HDPE jointing or the approved coupling method, pressure-test every pipe section before backfill, and prohibit backfill until the Supervision Consultant has witnessed and signed the relevant test record.
- Maintain safe community crossings, trench barriers, Somali-language warnings and rapid backfill and reinstatement in settlements, with particular attention to children, schools, homes, markets and water-access routes.

- Implement the catchment-specific erosion, sediment, spoil, embankment, safety and reinstatement controls at the four Kismayo sites and programme earthworks around rainfall conditions as required by the approved method statement.
- Apply the approved heat-stress, PPE, first-aid, emergency-response, worker Code of Conduct, SEA/SH, local-hiring, security, waste, fuel and incident-management measures at every active work front.

10.5 Conditions for Commissioning and Operation

- Do not commission a piped system until pressure testing, flushing, the approved pre-use water-quality testing and the required test-operation period have been completed and documented in a commissioning certificate.
- Do not hand over a Kismayo catchment until the post-works inspection confirms the embankment, liner where applicable, silt traps, spillway, troughs, access points and safety measures are complete and fit for use.
- Confirm that the responsible WUA is established or strengthened, trained and operational before handover, with documented and publicly communicated water-allocation or catchment-access rules and the required representation of women and other relevant user groups.
- Operate intakes and distribution valves according to the approved allocation schedule, record abstraction or operating information required by the ESMP, and apply the downstream-flow adaptive-management triggers if monitoring identifies material stress or rising water-access complaints.
- Maintain the pipe-survey, leak-repair, intake-inspection, kiosk and trough hygiene, catchment-maintenance, water-quality and post-flood inspection regimes defined in Chapter 9.
- Maintain the GRM, protection-sensitive engagement, SEA/SH confidential channel, security coordination and PIU oversight after commissioning, with corrective action where inequitable access, repeated infrastructure failure, water-quality problems or unresolved grievances are identified.

10.6 C-ESMP and Pre-Construction Confirmation Requirements

The remaining site-specific and method-dependent matters are assigned to the pre-construction and C-ESMP process. They do not prevent ESIA submission because the ESMP establishes binding hold points that must be closed before the affected activity proceeds. The Jubaland component shall be implemented as an AfDB Category 2 operation, and all contractor and supervision documentation shall apply this classification consistently.

The operating configuration of each Luuq and Dollow piped system shall be confirmed from the approved engineering design, hydraulic calculations and BoQ before mobilisation. The C-ESMP shall document any pumping or solar equipment, temporary and operational energy requirements, associated electrical or fuel risks, and O&M controls.

The C-ESMP shall include a Heat Stress Management Plan defining potable-water provision, acclimatisation, work/rest arrangements, shade, heat triggers, first aid and emergency response in accordance with GIIP and the approved OHS standard. The C-ESMP commissioning plan shall also define the approved drinking-water microbiological and physical acceptance criteria, accredited laboratory method, retesting requirements and response to non-compliance. Community use shall not be authorised until compliant results are confirmed.

For each Juba intake, the site-specific hydrological assessment shall establish the final design event, freeboard, scour protection, safe construction window and flood-stage suspension threshold. Catchment capacities, liner requirements, spillway sizing, pipeline diameters, pressure classes and other site-specific technical parameters shall be taken from the approved engineering design and incorporated into the C-ESMP and relevant method statements before the affected works begin.

10.7 Recommendations

- Proceed with implementation only subject to full satisfaction of the Chapter 9 ESHS hold points and written PIU mobilisation authorisation for each work package.
- Give highest construction-stage management priority to trench safety, Juba River intake safety, continuity of existing water supply, pipe-joint quality and community access through settlement areas.
- Maintain conflict-sensitive and protection-sensitive implementation in Dollow, including the bank-side intake limitation, displaced and cross-border community engagement, accessible grievance channels and referral arrangements.
- Retain strong WUA formation and post-handover support so that allocation rules, leak detection, intake and catchment maintenance, water-point hygiene and grievance handling remain functional after construction.
- Use the downstream-flow, water-quality, system-condition, WUA-governance, grievance and security monitoring requirements in Chapter 9 as adaptive-management tools rather than as reporting-only obligations.
- Ensure the indicative ESMP budget and contractor ESHS costs remain available for the full implementation period and are not treated as optional or contingent expenditure.
- Require the approved C-ESMP and pre-construction records to confirm the operating configuration, heat-stress controls, commissioning water-quality criteria and site-specific engineering parameters before the affected activity begins.

10.8 Final Statement

Subject to implementation of the mitigation measures, ESHS hold points, monitoring requirements and associated safeguard instruments, the Jubaland State component is considered environmentally and socially manageable. This conclusion remains contingent on completion of the required pre-works technical and safeguards verification and on continued adaptive management during construction and operation. Where the final approved engineering design or site conditions differ materially from the assumptions assessed in this ESIA, the affected activity should be re-screened and the environmental and social requirements updated before works proceed.

APPENDICES VOLUME

JUBALAND

Document Control	Appendix Volume
Financier	African Development Bank (AfDB)
AfDB E&S Category	Category 2
Proponent	Ministry of Agriculture and Irrigation (MoAI), Federal Republic of Somalia
Geographic Scope	Luuq and Dollow Districts, Gedo Region; Kismayo District, Lower Juba Region
Project Scope	13 sites: 9 piped irrigation systems and 4 water catchments
Appendix Compilation	August 2026

DOCUMENT-CONTROL NOTE

Original screening forms are preserved verbatim as evidence of project preparation. They have not been rewritten to correct legacy names, coordinates, activity types or form-level category fields. The controlled final ESIA site register, approved engineering design and AfDB Category 2 classification govern implementation. Any unresolved site-specific information is a pre-construction/C-ESMP hold-point requirement and does not authorise assumptions.

Annex 1: E&S Screening Forms (Jubaland 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
Aytimirow / Timirow	Piped irrigation system	AfDB E&S Screening form - Luuq - Timiro.docx	Piped Canal 3.753870, 42.546915 Cat. 2	Matched	
Liimooy	Piped irrigation system	AfDB E&S Screening form - Luuq - Limoooy.docx	Piped Canal 3.965720, 42.558467 Cat. 2	Matched	
Jaziira One	Piped irrigation system	AfDB E&S Screening form - Luuq - Jazeera One Farm.docx	Piped Canal 3.804341, 42.555228 Cat. 2	Matched	
Horseed	Piped irrigation system	AfDB E&S Screening form - Luuq - Horseed.docx	Piped Canal 3.791591, 42.546533 Cat. 2	Reconciliation required	Screening GPS duplicates Buulo Muusley; verify the controlled alignment/site point.
Buulo Yaxaas	Piped irrigation system	AfDB E&S Screening form - Luuq - Bohal Yaxaas.docx	Piped Canal 3.784475, 42.547436 Cat. 2	Matched	
Buulo Muusley	Piped irrigation system	AfDB E&S Screening form - Luuq - Buula Musley.docx	Piped Canal 3.791591, 42.546533 Cat. 2	Matched	
Quracleey	Piped irrigation system	AfDB E&S Screening form - Dolow - Quracleey Village.docx	Piped Canal 4.149534, 42.147431 Cat. 2	Matched	
Buulo Qaloc	Piped irrigation system	AfDB E&S Screening form - Dolow - Bula Qaloc Village.docx	Piped Canal 4.157963, 42.137102 Cat. 2	Matched	
Garaash	Piped irrigation system	AfDB E&S Screening form - Dolow - Garash Village Dollow.docx	Piped Canal 4.153792, 42.142932 Cat. 2	Matched	
Hadaafow	Water catchment rehabilitation	No separate screening form located	— — Cat. —	Missing	No separate Kismayo screening form located.
Bilicsan	Water catchment rehabilitation	No separate screening form located	— — Cat. —	Missing	No separate Kismayo screening form located.
Dalsan	Water catchment rehabilitation	No separate screening form located	— — Cat. —	Missing	No separate Kismayo screening form located.

Final Site / Asset	Final Typology	Original Screening Form	Original Activity / GPS / Cat.	Status	Control Note
Dabaylwayne	Water catchment rehabilitation	No separate screening form located	— — Cat. —	Missing	No separate Kismayo screening form located.

Screening coverage summary: 13 controlled final sites are listed. Separate screening forms were not located for 4 final sites in the reviewed pooled screening archive. Original forms are supplied in the accompanying sorted screening folder.

Annex 2: Stakeholder Engagement Plan (SEP) — Jubaland State

This SEP is customized for the 13 sites in Luuq, Dollow, and Kismayo Districts under the BBS Project, aligned with AfDB ISS 2023 (OS10).

Project overview (Jubaland component): the component targets nine piped canal rehabilitation sites in a border-corridor setting with significant IDP, refugee, and cross-border populations, and four water catchments in a peri-urban agro-pastoral setting, with layered land arrangements, clan-based resource sensitivities, and pronounced head-end/tail-end allocation dynamics within valve-controlled systems.

Table 10: Stakeholder Identification — Jubaland Context

Stakeholder	Key Interests / Concerns in Jubaland
Farming households (piped systems)	Irrigation reliability; supply continuity during works; crop protection and compensation; valve operation fairness
Agro-pastoral households (Kismayo catchments)	Livestock watering access; catchment rules; dry-season storage reliability
Tail-end water users	Equitable allocation once systems are restored; enforcement of documented schedules
IDP households (Dollow, Kismayo)	Non-discriminatory water access; employment access; protection-sensitive complaint channels
Refugees and cross-border populations (Dollow)	Protection-sensitive engagement; safe access to kiosks; non-exploitation guarantees
WUAs and existing water committees	Governance mandate; training; maintenance responsibility; dispute resolution role
Women and female-headed households	Safe kiosk access and placement; WUA participation; confidential GBV reporting
Youth	Construction employment; transparent recruitment; skills development
Luuq, Dollow, and Kismayo District Administrations	Access coordination; security; dispute resolution; (Dollow) border and humanitarian coordination
Jubaland State ministries	Regulatory oversight; alignment with state plans; cross-border liaison at Dollow
Humanitarian actors (Dollow)	Referral pathways; conflict-sensitive engagement; security information sharing
Traditional elders	Conflict resolution between user groups; customary water rules

Engagement methods include site-by-site WUA meetings (disruption schedules, allocation rules), village-level public meetings, targeted women's, IDP, and refugee-community sessions, information boards at each site, Somali-language summaries, and the GRM. Engagement frequency: before mobilisation at each site; bi-monthly community meetings during construction; quarterly coordination meetings; and post-commissioning oversight visits at 3, 6, and 12 months. All engagement is documented in the consultation log (Annex 4).

Annex 3: Grievance Redress Mechanism (GRM) Procedures — Jubaland

The GRM provides accessible, predictable, and transparent channels for community members, workers, and other stakeholders to raise concerns related to the Jubaland component. Channels: community liaison contacts at all 13 sites; project hotline; suggestion boxes; WUAs and elders relaying to the district E&S focal point; protection-sensitive channels for displaced populations at Dollow coordinated with humanitarian actors; and the confidential SEA/SH channel to the PIU GBV Specialist.

Table 212: GRM Process Steps and Timelines

Step	Action	Timeline
1. Receipt and registration	Grievance received through any channel; logged in GRM database with unique reference	Within 24 hours of receipt
2. Acknowledgement	Complainant informed that grievance is registered and of expected timeline	Within 48 hours
3. Screening and assignment	Grievance categorized (standard / allocation / land access / SEA/SH / worker) and assigned to resolution level	Within 3 business days
4. Investigation and resolution — Level 1	Site-level resolution by contractor and CLO for minor issues	Within 5 business days
5. Escalation — Level 2	PIU and District Authority review for repeated safety, access, disruption-schedule, or service complaints	Within 10 business days
6. Escalation — Level 3	Jubaland State-level referral for administrative decisions, including any cross-border water issue at Dollow	Within 15 business days
7. Escalation — Level 4	PIU governance structures and AfDB recourse options (incl. IRM)	As required
8. Close-out and feedback	Resolution communicated to complainant; satisfaction recorded; case closed in database	Within 30 days for standard cases; 15 working days for allocation and land cases

SEA/SH cases follow a separate confidential track managed exclusively by the PIU GBV Specialist with survivor-centred principles; no case details are shared with contractors, WUAs, or local authorities. Workers' grievances follow the Workers' GRM under the LMP. GRM performance is reviewed monthly by the JUB E&S Officer and reported quarterly to AfDB.

Annex 4: Consultation Log — Jubaland

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

Date / Period	Location	Participants	Key Outcomes
December 2025	Kismayo	Jubaland State Ministry of Agriculture / Water; sector focal points	Institutional coordination confirmed; permitting pathway agreed; Dollow cross-border liaison arrangements outlined
December 2025	Luuq town and canal communities	Luuq District Administration; water committees and users at Timirow, Jaziira One, Buulo Yaxaas, Horseed, Liimooy, Buulo Muusley	System condition histories documented; disruption scheduling principles agreed; employment expectations recorded
December 2025 – January 2026	Dollow	Dollow District Administration; water committees at Quracleey, Buulo Qaloc, Garaash; IDP and refugee representatives; MSF and UNHCR focal points	Border and protection context documented; conflict-sensitive engagement approach agreed; referral pathways confirmed; bank-side intake approach endorsed

Date / Period	Location	Participants	Key Outcomes
January 2026	Kismayo catchment communities	Kismayo District Administration; catchment user groups at Hadaafow, Dalsan, Bilicsan, Dabaylwayne; women's groups	Catchment condition and access histories documented; livestock/domestic separation preferences recorded; kiosk and trough placement preferences noted
January 2026	Luuq, Dollow, Kismayo	District health authorities	Emergency response routes and GBV referral pathways documented per district
June 2026	All districts (follow-up)	District focal points; WUA representatives	13-site scope of the June 2026 Master List confirmed; corrected Liimooy alignment verified; catchment site inventory confirmed

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

Annex 5: Climate Risk Assessment — Jubaland

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

Table 33: Climate Hazard Ratings — Gedo and Lower Juba (CORDEX RCP8.5 / CMIP6)

Hazard	Current Exposure	Projected Trend (to 2040)	Rating	Project Response
Riverine flooding (Juba)	Significant flood risk at intake sites during peak Gu flows; Dollow particularly flood-prone during El Niño events	10–20% increase in extreme rainfall intensity in the basin; increased flood magnitude and frequency	High–Very High	1-in-25-year intake design; +0.5 m freeboard; in-river works confined to low-flow windows; twice-daily gauge monitoring with suspension stages; post-flood inspection and repair arrangements in O&M
Heat stress	Temperatures regularly exceeding 30–35°C year-round	+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 variability; recurrent drought cycles affecting Juba flows and catchment inflows	Continued high variability; Moderate–High drought risk	Moderate–High	Buried conveyance eliminating evaporation losses; restored catchment storage buffering dry seasons at Kismayo; documented allocation rules for scarcity; WUA governance of low-flow rationing
Extreme rainfall (local)	Bimodal Gu/Deyr with intense events; erosive runoff at Kismayo catchments	Increased intensity of extreme events	High	Catchment spillways sized for 1-in-25-year design rainfall; silt traps; embankment reinforcement; earthworks scheduled outside peak rainfall

Residual climate risk is dominated by flood events exceeding the 1-in-25-year design standard — particularly at Dollow — and multi-season drought, assessed as Moderate and acceptable given the O&M response arrangements (Chapter 8.4).

Annex 6: Gender and Social Inclusion — Jubaland

Baseline: women in the project districts are primary users of kiosk and catchment water for domestic purposes and major contributors to agricultural labour, yet are largely excluded from water governance; approximately 74% of women in Gedo lack access to formal financial services, over 60% have experienced GBV, labour force participation is around

28%, and mobility is often restricted. Displacement at Dollow and Kismayo heightens vulnerability. Tail-end users, IDP and refugee households, and minority clan groups face parallel exclusion from water decision-making.

Project commitments:

- Minimum 30% female membership in every WUA, verified before commissioning of each site.
- Female CLO at Jubaland level, accessible to all 13 project communities.
- Kiosk and trough placement decided with women's focus groups to ensure safe, convenient access.
- Head-end and tail-end representation, including displaced-household voice where present, in every WUA.
- Preference for women in contractor administrative, liaison, and supervisory roles; transparent local hiring with IDP community access.
- Confidential SEA/SH channel with Dollow-specific protections and survivor-centred referral pathways (Section 10.8).
- Gender-disaggregated attendance and participation records across all engagement and training.

Monitoring: WUA inclusivity indicators (Table 10-5), GRM trend analysis by complainant category, and oversight-visit verification at 3, 6, and 12 months post-commissioning.

Annex 7: Chance Finds Procedure

This procedure applies to all earthworks at all thirteen Jubaland sites and is posted at each site and covered in worker induction (OS8, precautionary).

- Stop work immediately: if any suspected item of cultural heritage (artefacts, human remains, graves, structures of historical character) is encountered, all work within the vicinity stops at once.
- Secure the area: demarcate and secure a minimum 20 m radius around the find; no removal, handling, or further disturbance of any material.
- Record: photograph the find in situ and record location (GPS), depth, and context in the site log.
- Notify: inform the PIU within 4 hours; the PIU notifies the Federal Ministry of Education, Culture, and Higher Education within 24 hours.
- Human remains: if remains are suspected, additionally notify the relevant District Administration and follow their direction alongside federal authority guidance; treat the area with appropriate cultural and religious respect.
- Resume only on clearance: works in the affected area do not resume until written clearance is issued by the PIU based on the responsible authority's determination.
- Records: all chance-find events, notifications, and clearances are recorded in the Jubaland incident register and reported in quarterly safeguards reports.

Annex 8: Environmental and Social Monitoring Plan — Jubaland

The consolidated monitoring framework is presented in Table 10-5 (parameters, indicators, frequencies, responsibilities, reporting lines, and thresholds/actions). Supplementary monitoring records maintained by the JUB E&S Officer include: the daily trench-safety inspection log per active excavation; the pipe pressure test certificate register; the flood gauge reading log per active intake site; the daily 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 Jubaland incident register. All records are available to the Supervision Consultant, PIU, and AfDB supervision missions, and inform the quarterly safeguards reports.

Annex 9: Environmental, Social, and Capacity Building Training Plan — Jubaland

The consolidated training framework is presented in Table 10-7, covering ESMP implementation, trench safety and confined space awareness, in-river intake works safety, pipe laying quality and pressure testing, catchment earthworks and erosion control, OHS, SEA/SH prevention with the Dollow cross-border module, WUA piped-system and catchment O&M, inclusive water allocation governance, GRM operation, and security awareness across the three district contexts. Training delivery is verified through signed attendance records (gender-disaggregated), induction registers checked by the Supervision Consultant, and quarterly reporting of training completion rates to the PIU and AfDB. Refresher cycles are enforced as hold points where indicated (e.g., trench-safety training before any trenching; in-river safety before each intake site; SEA/SH quarterly refreshers).

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

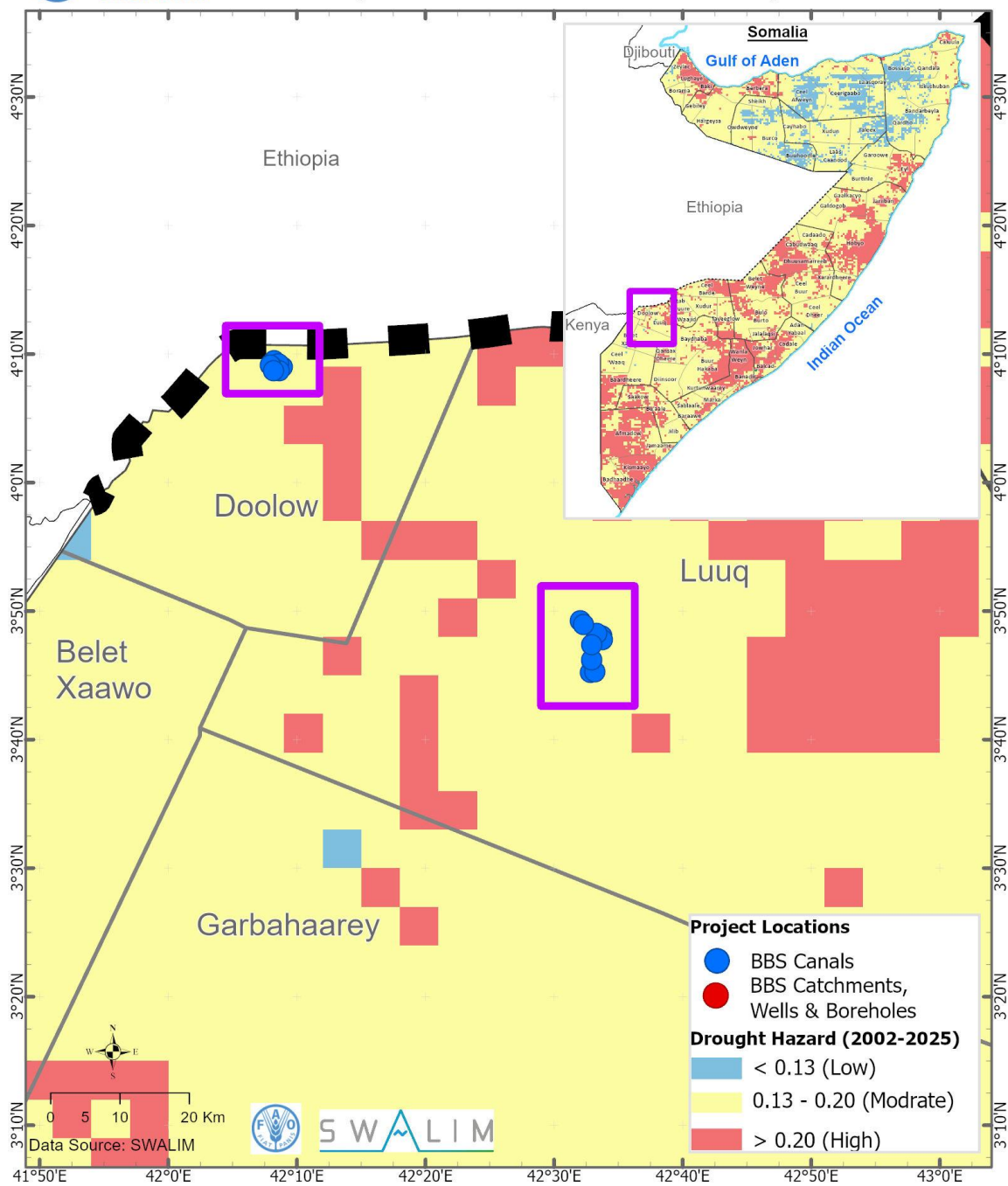
The register identifies project records located during the appendix review. A generic or legacy drawing is not treated as a site-specific approved construction drawing. The controlled site register and approved engineering package govern construction.

Evidence Group	Record / Folder	Relevance	Control / Use
Luuq irrigation pipeline layout	Irrigation canal & Pipelines / Luuq	Pipeline alignment, Juba intake/pump-house, valves and sections.	Project-specific Luuq record.
Luuq tank/pump/solar/division-box design	Irrigation canal & Pipelines / Luuq	Service reservoir, pump house, solar and division box details.	Project-specific Luuq engineering record.
Luuq and Dollow mapping	Water Canals archive	Luuq and Doolow map sheets.	Supporting map/hydraulic context.
Luuq/Dollow climate-hazard map	Project Concept Note	Som_Luuq_Doolow_BBS_Project_Climate_Hazard1.jpg	Supporting climate-risk evidence.
Kismayo catchment designs	Reviewed technical folders	No verified site-specific drawings found for the four final Kismayo catchments.	Confirm site-specific design before works.



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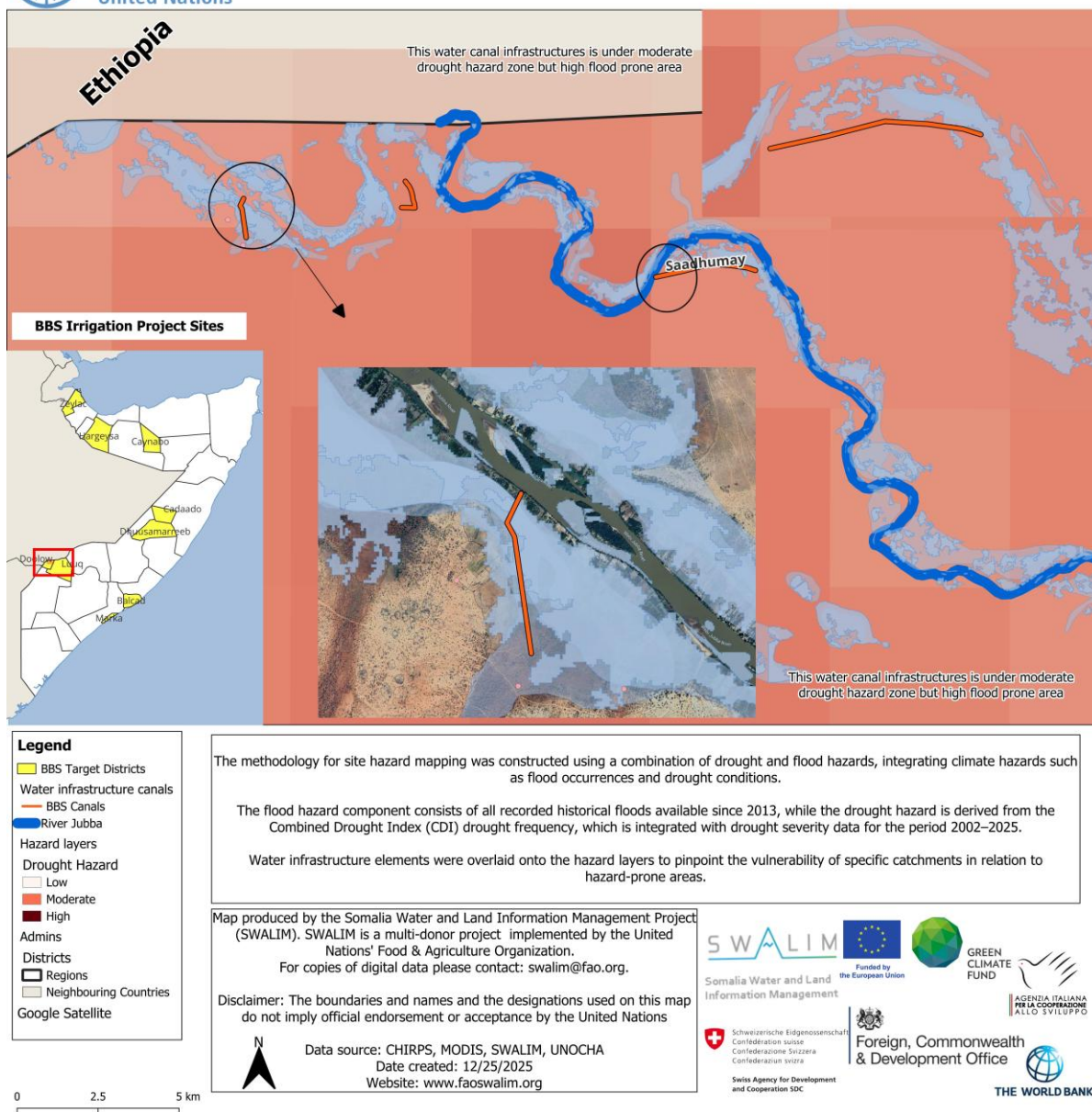
Luuq & Doolow District BBS Project Locations



Supporting record: Annex 1-5 Som_Luuq_Doolow_BBS_Project_Climate_Hazard1.jpg



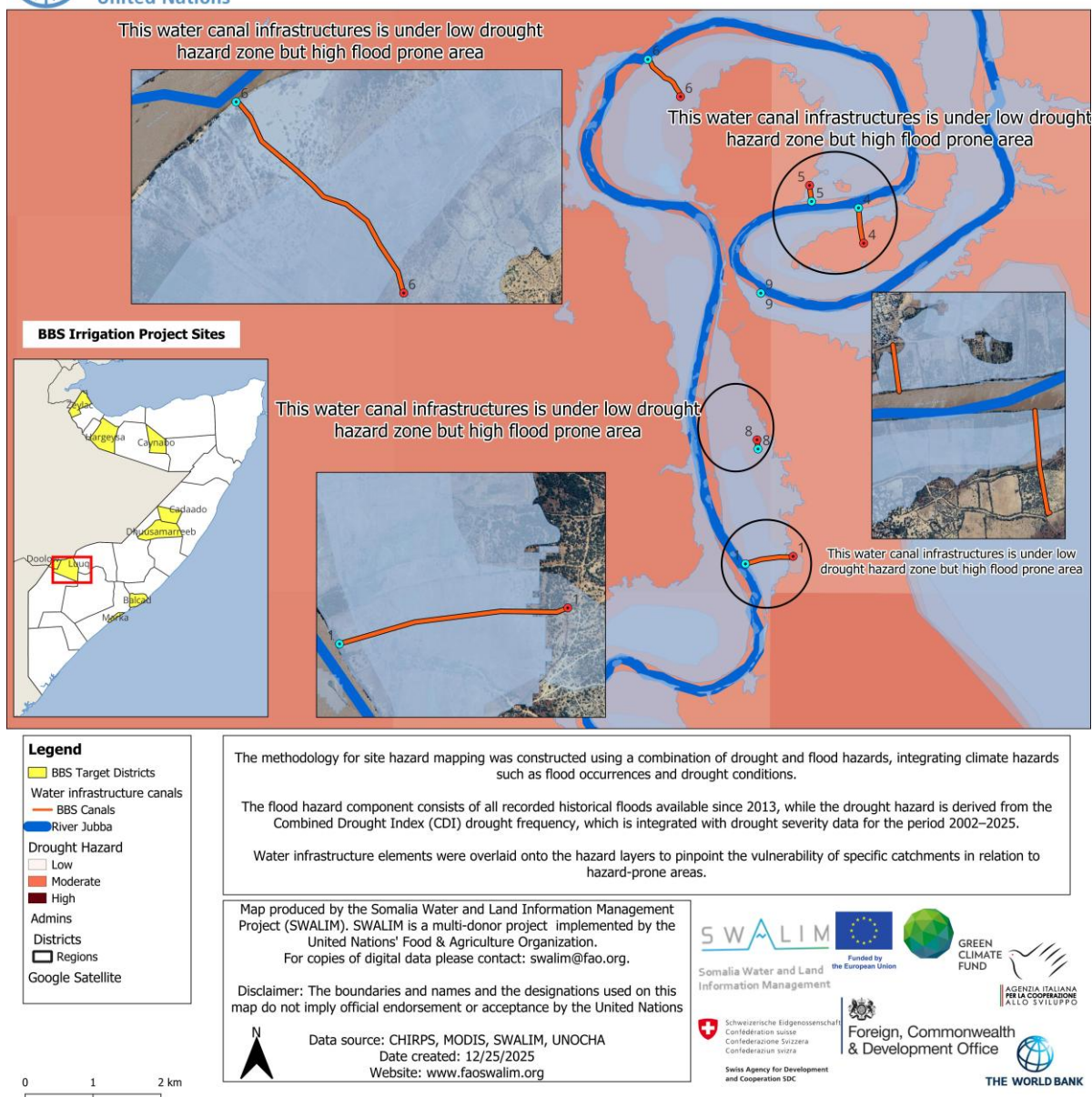
Doolow Site – Water Canal Infrastructure Vulnerability



Supporting record: *doolow_2002206.jpeg*



Luuq Site – Water Canal Infrastructure Vulnerability



Supporting record: [luuq_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.

Study / Instrument	Record Location	Use in State ESIA
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.
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