



FEDERAL REPUBLIC OF SOMALIA

MINISTRY OF AGRICULTURE AND IRRIGATION (MoAI)

BEERO OO BARWAAQEE SOOMAALIYA (BBS)

Revitalizing Irrigation Infrastructure and Climate-Smart Agriculture in Somalia

INTEGRATED PEST AND VECTOR MANAGEMENT PLAN (P/VMP)

DECLARATION

This Integrated Pest and Vector Management Plan (P/VMP) has been prepared for the Beero oo Barwaaqee Soomaaliya (BBS) Project — Revitalizing Irrigation Infrastructure and Climate-Smart Agriculture in Somalia — in accordance with the African Development Bank Integrated Safeguards System (ISS 2023) and the applicable laws and regulations of the Federal Republic of Somalia.

The undersigned confirm that the information contained in this Plan is, to the best of their knowledge, accurate and complete, and that this P/VMP constitutes the agreed framework for the management of pest and vector risks associated with the Project. The Plan shall be implemented, monitored, and updated as a binding safeguard instrument throughout the Project period.

Approved and adopted by:

Declaration and Signatures

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ABBREVIATIONS

Abbreviation	Full Form
AfDB	African Development Bank
BBS	Beero oo Barwaaqee Soomaaliya Project
C-ESMP	Contractor Environmental and Social Management Plan
FAO	Food and Agriculture Organization
FGS	Federal Government of Somalia
FMS	Federal Member States
GBV	Gender-Based Violence
GRM	Grievance Redress Mechanism
IPC	Integrated Phase Classification
IPM	Integrated Pest Management
ISS	Integrated Safeguards System (AfDB 2023)
MoAI	Ministry of Agriculture and Irrigation
MoECC	Ministry of Environment and Climate Change
NGO	Non-Governmental Organization
OHS	Occupational Health and Safety
OS	Operational Safeguard
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
P/VMP	Pest and Vector Management Plan
RVF	Rift Valley Fever
SEA/SH	Sexual Exploitation, Abuse and Sexual Harassment
SMP	Security Management Plan
SWALIM	Somalia Water and Land Information Management
WHOPES	WHO Pesticide Evaluation Scheme
WUA	Water User Association
WHO	World Health Organization

EXECUTIVE SUMMARY

This Integrated Pest and Vector Management Plan (P/VMP) has been prepared for the Beero oo Barwaaqee Soomaaliya (BBS) Project — Revitalizing Irrigation Infrastructure and Climate-Smart Agriculture in Somalia — as a mandatory safeguard instrument required under the African Development Bank’s Integrated Safeguards System (ISS 2023), specifically (OS3: Resource Efficiency and Pollution Prevention and Management) and OS4 (Community Health, Safety and Security), and is further informed by OS6 (Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources) and OS10 (Stakeholder Engagement and Information Disclosure).

The BBS project involves the construction and rehabilitation of irrigation canals, boreholes, water catchments, shallow wells, and piped distribution systems across 136 sites in five Federal Member States, Somaliland, and Northeastern districts. These interventions will substantially expand irrigated agricultural area, increase standing water in canal systems, and promote intensified crop production — all of which can increase the risk of agricultural pest infestations, vector-borne disease transmission, and misuse of agro-chemical pesticides if not proactively managed.

The project’s development objective is to strengthen food security and climate resilience through improved irrigation, climate-smart agriculture, and stronger institutions supporting resilient and sustainable agrifood systems, with particular emphasis on expanding water access for production, improving nutrition, and creating markets and jobs for women and youth. The project targets 64,000 households, of which 50 per cent women and 30 per cent youth. Expected results by Year 4 include increased agricultural productivity, reduced post-harvest losses, higher smallholder incomes, strengthened climate resilience, and more equitable participation in the agrifood economy. Components 1 and 2 are the primary sources of the pest and vector risks addressed in this P/VMP — expanded irrigated area and standing water, intensified cropping, and the promotion of pest management practices and inputs at scale — while Component 5 provides the safeguards, MEL and institutional capacity through which this Plan is implemented.

The P/VMP identifies five principal pest and vector risk categories across the BBS project area: (i) malaria-transmitting *Anopheles* mosquitoes associated with canal-side standing water; (ii) Rift Valley Fever (RVF) risk from floodwater *Aedes* mosquitoes in the Shabelle and Jubba floodplains; (iii) agricultural crop pests including Fall Armyworm, Desert Locust, and aphids/whitefly affecting staple and horticultural crops; (iv) livestock vector-borne diseases including trypanosomiasis and tick-borne infections in pastoral livestock using project water points; and (v) pesticide contamination risks from inappropriate agro-chemical use in irrigated farming zones.

The Plan adopts an Integrated Pest Management (IPM) framework as its core management philosophy, prioritising preventive and non-chemical interventions, biological control, cultural practices, and the targeted use of WHO-approved pesticides only as a last resort. Key management measures include: canal-side vegetation management to eliminate mosquito breeding habitats; community-based vector surveillance linked to district health authorities in all six states; a Positive Pesticide List approved by the PIU and MoAI; training of Water User Associations (WUAs), extension workers, and community health volunteers in IPM, safe pesticide handling, and vector identification; and coordination mechanisms with national pest and disease surveillance systems including FAO’s Emergency Centre for Transboundary Animal Diseases (ECTAD) and the Desert Locust Control Organisation for Eastern Africa (DLCO-EA).

Total estimated budget for P/VMP implementation over the five-year project period is approximately USD 285,000, covering training, surveillance equipment, biological control inputs, community mobilisation, and monitoring.

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A. INTRODUCTION

A.1 Background on the Project and Preparation of the Plan

The Beero oo Barwaaqee Soomaaliya (BBS) Project — Revitalizing Irrigation Infrastructure and Climate-Smart Agriculture in Somalia — is financed by an African Development Bank grant of USD 57.42 million to the Federal Government of Somalia and implemented by the Ministry of Agriculture and Irrigation (MoAI). The project rehabilitates and constructs irrigation and water infrastructure across 136 sites in the Federal Member States, Somaliland, and the northeastern districts, and supports climate-smart agriculture, seed systems, market development, social inclusion, and institutional strengthening. Decades of recurrent drought and flooding, combined with weak institutions and constrained access in parts of the country, have degraded irrigation infrastructure and reduced water reliability; the project responds by restoring water security for production while intensifying and diversifying crop production. Because the project expands irrigated area, increases the volume and permanence of standing water, and intensifies cropping, it will foreseeably alter both agricultural pest pressure and the habitat available to disease vectors, and will increase demand for agro-chemical inputs among project beneficiaries. Under the AfDB Integrated Safeguards System (ISS 2023), projects of this nature require a dedicated pest and vector management instrument. This P/VMP has accordingly been prepared as a mandatory standalone safeguard instrument under OS3 (Resource Efficiency and Pollution Prevention and Management) and OS4 (Community Health, Safety and Security), informed by OS6 (Habitat and Biodiversity Conservation) and OS10 (Stakeholder Engagement and Information Disclosure).

Preparation of the Plan drew on the project concept and design documentation, the state-level ESIA and ESMPs prepared for BBS investments, the master site register reconciling all 136 sites by state, district, and infrastructure type, and secondary data on malaria, Rift Valley Fever, livestock vector-borne disease, Fall Armyworm, and Desert Locust in the project districts, including WHO, FAO, FSNAU, and DLCO-EA sources. National policy and legal instruments were reviewed to establish the regulatory basis for pesticide controls (Section A.4). Institutional consultation covered MoAI and its Plant Protection Directorate, state ministries of agriculture, health, and livestock, the Ministry of Environment and Climate Change, and FAO Somalia, and community-level engagement was carried out through the project's stakeholder engagement process. The Plan is a living instrument: the Approved Pesticide List, risk register, and monitoring thresholds are subject to annual review and revision by the PIU in consultation with MoAI.

This P/VMP establishes the framework, procedures, responsibilities, and monitoring requirements for integrated management of agricultural pests and disease vectors associated with the BBS Irrigation Project across all project states and sites. It is prepared as a standalone safeguard document consistent with the AfDB's requirements for projects involving agricultural production intensification, irrigation infrastructure, and activities with potential to increase disease vector habitat.

The P/VMP covers: (i) all 136 BBS project sites across Somaliland (68 sites in Caynabo, Zeylac, Salaxlay, and Borama), Southwest State (22 sites), Hirshabelle State (13 canal sites in Balcad), Galmudug State (13 sites), Jubaland State (13 sites in Luuq, Dollow, and Kismayo), Puntland State (4 sites), and the Northeastern districts of Erigavo, Buuhoodle, and Laascaanood (3 sites); (ii) all project phases — pre-construction, construction, commissioning, and operation; and (iii) agricultural areas served by BBS infrastructure.

A.2 Environmental and Social Consequences of Pest and Vector Management Practices

Current pest and vector management practice in the project area carries significant environmental and social consequences that this Plan is intended to avoid or reduce. Crop protection in Somali irrigated

farming systems relies heavily on synthetic insecticides obtained through informal markets, frequently unlabelled, decanted into unmarked containers, or imported without registration, and applied without calibration, protective equipment, or observance of pre-harvest intervals. The environmental consequences include contamination of canal and shallow groundwater used for drinking and livestock watering, mortality of pollinators and natural enemies that would otherwise suppress pest populations, toxicity to fish and other aquatic organisms in canals and catchments, and accelerated development of resistance in Fall Armyworm and other target pests, which in turn drives higher doses and more frequent spraying.

The social and health consequences fall unevenly. Applicators, often untrained and unprotected, face acute poisoning risk; women and children face secondary exposure through storage of pesticides in dwellings, reuse of empty containers for water and food, and washing of contaminated clothing; and consumers face residue risk where pre-harvest intervals are not observed on vegetables and fruit sold in local markets. Obsolete stocks and empty containers are commonly buried, burned, or discarded near watercourses, creating long-term contamination liabilities. Vector control practices carry their own consequences: reliance on insecticide-based control alone, without source reduction, increases insecticide selection pressure on Anopheles populations, while poorly maintained infrastructure and untreated standing water sustain transmission and place a disproportionate burden on women and children in project communities. Livestock acaricide use at shared water points can contaminate trough and catchment water where dipping and spraying are carried out without containment.

These consequences establish the rationale for the IPM- and IVM-first hierarchy adopted in this Plan, the restriction of pesticide use to WHO Class II and III products on the BBS Approved Pesticide List, the mandatory buffer zones and container management requirements set out in Section 6, and the training, disclosure, and grievance provisions in Sections 8 and 11.

A.3 Potential Effects of Pest, Vector and Pesticide Management on Project Activities

Pest and vector conditions, and the way they are managed, will in turn affect the delivery and performance of BBS activities. Uncontrolled pest outbreaks — particularly Fall Armyworm in maize and sorghum and Desert Locust incursions in the drylands — can remove a substantial share of the yield gains that the irrigation and climate-smart agriculture investments are intended to produce, undermining Component 2 targets and the project's food security results. Elevated malaria transmission around rehabilitated canals and catchments reduces household labour availability during peak cultivation and harvest periods, imposes health costs on beneficiary households, and can erode community support for the infrastructure itself. A Rift Valley Fever outbreak in the project floodplains would disrupt livestock movement and marketing and would affect Component 3 value chain activities.

Management requirements also constrain how project activities are carried out. Pesticide procurement under the project is limited to products on the BBS Approved Pesticide List and to registered suppliers, which affects input supply arrangements under Components 2 and 3 and the agro-dealer upgrading programme, where compliance with input quality and licensing requirements becomes a condition of support. Vector source reduction obligations affect contractor works — borrow pits and trenches must be backfilled or drained within defined periods, and canal design and desilting must avoid creating slow-flow and ponded reaches — with implications for construction sequencing and cost. Operation-phase vegetation and hydraulic management responsibilities fall to Water User Associations and are to be built into the operation and maintenance frameworks financed under Component 1. Pest management demonstrations and Farmer Field School curricula under Component 2 must deliver IPM content consistent with this Plan rather than promoting routine calendar spraying.

Non-compliance carries project-level consequences, including breach of AfDB safeguard covenants, suspension of pesticide-related expenditure, reputational harm, and delay to disbursement. Conversely, effective implementation reduces crop loss, protects the health of the workforce and beneficiary

communities, safeguards the water quality of the infrastructure being financed, and improves the durability of project results beyond the implementation period.

A.4 Relationship to Project ESMPs

This P/VMP is a standalone instrument that complements and references the state-level ESIA & ESMPs prepared for each BBS component. In cases of inconsistency, the more protective provision applies. The P/VMP is incorporated by reference into each state-level ESMP and is binding on all contractors, PIU officers, WUAs, and implementing partners.

To give effect to this, the key P/VMP actions below are entered into the project ESMP/Environmental and Social Action Plan (ESAP) commitment register as binding commitments, each with a deadline, a responsible party, a monitoring indicator, and an AfDB reporting point.

Table 1: P/VMP Commitments for the ESMP/ESAP Register

P/VMP Commitment	Deadline	Responsible Party	Indicator	AfDB Reporting
Fill and confirm key P/VMP positions	Before mobilisation	PIU	Staffing confirmation letter	Pre-mobilisation
Establish and annually revalidate the Approved Pesticide List	Project start; annually	PIU E&S + MoAI	List issued/revalidated	Annual report
Complete baseline water/vector monitoring round	Before commissioning / first season	PIU E&S	Baseline register completed	Quarterly report
Contractor C-ESMP pest/vector clauses, incl. borrow-pit backfill	Construction phase	Contractor + PIU	Borrow pits closed ≤7 days	Weekly (construction)
Canal source reduction and vegetation management	Operation	WUA + State E&S Officer	% canal sites compliant	Monthly / quarterly
Deliver the mandatory training programme	Annual	PIU E&S	% target audience trained	Annual report
Water and residue monitoring against thresholds	Bi-annual + triggered	PIU E&S	Results vs. thresholds	Bi-annual / immediate
Serious-incident notification to AfDB	Within 72 hours	PIU	Incidents reported on time	Immediate + quarterly
Secure and disburse the P/VMP budget	Annual	PIU	Budget executed	Annual report

B. PROJECT DESCRIPTION

B.1 Project Objectives

The BBS project's development objective is to strengthen food security and climate resilience in Somalia through improved irrigation, climate-smart agriculture, and stronger institutions supporting resilient and sustainable agrifood systems. The project focuses on expanding water access for production, improving nutrition, and boosting markets and job creation, with particular emphasis on women and youth. By supporting inclusive agrifood systems that integrate sustainable and conflict-sensitive natural resource management, the project seeks to enhance food security and promote rural economic development in a fragile context.

The project is financed by an African Development Bank grant of USD 57.42 million to the Federal Government of Somalia, implemented through the Ministry of Agriculture and Irrigation (MoAI). Achieving the development objective depends on intensified, irrigated crop production and on sustained community use of new and rehabilitated water infrastructure — the two conditions that also generate the pest, vector, and pesticide risks this Plan is designed to manage.

B.2 Project Components and Activities

The project is delivered through five components. Component 1 — Irrigation Infrastructure Development (USD 23.64 million) rehabilitates 60 km of main and secondary canals on the Shabelle and Jubba Rivers, constructs 38 water catchments, rehabilitates 17 boreholes, 2 dug wells and 30 shallow wells, builds flood-mitigation structures, and establishes operation and maintenance frameworks with Water User Associations. Component 2 — Climate-Smart Agriculture and Seed Systems Development (USD 9.52 million) establishes a National Gene Bank, 10 decentralised seed farms and 22 storage facilities, delivers certified seed and varietal trials, and develops CSA demonstration plots, conservation agriculture and soil fertility sites, pest management demonstrations, improved cropping calendars, Farmer Field School cycles, extension agent training, and mobile advisory services.

Component 3 — Market Assessments, Value Chain Development and Sustainable Agribusiness Integration (USD 7.33 million) strengthens value chain governance and market linkages, builds aggregation centres, markets, horticulture hubs and warehouses, promotes hermetic storage, and upgrades agro-dealer outlets with input quality compliance requirements. Component 4 — Gender, Youth and Social Inclusion for Sustainable Agriculture (USD 2.41 million) supports youth and women agri-preneurship, access to climate-smart inputs, financial inclusion, and leadership development. Component 5 — Institutional Strengthening, Project Management and Adaptive Management (USD 14.52 million) establishes the Project Management Unit within MoAI with Federal Member State coordination roles, and provides digital monitoring, evaluation and learning systems, safeguards oversight, and technical backstopping.

Components 1 and 2 are the principal sources of pest and vector risk under the project: Component 1 expands standing water and irrigated area, while Component 2 intensifies cropping and promotes pest management practices and agricultural inputs at scale, including the 16,600 planned pest management demonstrations. Component 3 introduces post-harvest storage, where storage pest control and fumigation practices require management. Component 5 provides the safeguards staffing, monitoring systems, and budget through which this P/VMP is implemented and supervised.

B.3 Expected Project Results

The project targets 64,000 households, of which 50 per cent women and 30 per cent youth, across the participating Federal Member States, Somaliland, and the northeastern districts. Expected results by Year 4 include increased agricultural productivity, reduced post-harvest losses, higher smallholder incomes, strengthened resilience to drought and flood, and more equitable participation of women and youth in the agrifood economy.

From a pest and vector management perspective, these results are conditional. Productivity and income gains will not be realised if pest outbreaks are managed through unregulated chemical spraying that

damages beneficial organisms, drives resistance, and contaminates irrigation water and food crops; nor if malaria and other vector-borne disease burdens rise in project communities and reduce household labour availability. Successful implementation of this P/VMP is therefore treated as a condition for achieving the project's stated results, and its indicators are integrated into the project monitoring, evaluation and learning system under Component 5.

B.4 Project Crops and Activities Subject to Pest or Vector Control

The BBS project's irrigation infrastructure activities create several pest and vector risk pathways through distinct mechanisms:

Table 2: BBS Project Activity — Pest and Vector Risk Pathways by Infrastructure Type

Activity/Infrastructure Type	Pest/Vector Risk Pathway	Affected States / Districts
Canal rehabilitation and desilting	Standing water in canal margins; slow-flow reaches become Anopheles breeding sites; spoil mounds trap stagnant pools	Hirshabelle (Balcad), Southwest State (Janaale, Marka)
Canal operation — open irrigation channels	Continuous canal-side standing water throughout crop season; increased Anopheles and Aedes breeding habitat	Hirshabelle, Southwest State — Shabelle corridor
Borehole rehabilitation and drilling	Waterlogging around wellhead; spillage water creating micro-breeding sites for Culex and Anopheles	Galmudug, Puntland, Somaliland — all borehole sites
Water catchment rehabilitation	Large open water bodies; Aedes and Culex breeding during and after rainfall; RVF vector risk in flood years	Galmudug, Somaliland, Kismayo (Jubaland)
HDPE piped canal installation	Trench excavation creates temporary pools; disturbed soil; in-river intake works disturb aquatic habitats	Jubaland (Luuq, Dollow), some Southwest sites
Expanded irrigated agriculture	Increased crop canopy supports pest populations (aphids, Fall Armyworm); pesticide use risk from farmers	Hirshabelle, Southwest State, Jubaland — irrigated croplands
Shallow well rehabilitation	Possible surface spillage creating micro-breeding sites; waterlogging	Somaliland (Zeylac) — 27 shallow well sites
Livestock troughs at water kiosks	Standing trough water — potential breeding for Culex, Aedes; ticks on livestock using shared troughs	Jubaland, Galmudug, Puntland, Somaliland

B.4.1 Geographic Pest and Vector Risk Zones

The 136 BBS project sites span three distinct ecological and epidemiological risk zones for pest and vector management:

- **Riverine Irrigated Zone (Shabelle and Jubba corridors):** The highest vector risk zone, covering Hirshabelle (Balcad), Southwest State (Janaale/Marka), and Jubaland (Luuq, Dollow). Perennial canal-side water, dense agricultural land use, and proximity to river floodplains create year-round conditions favourable to Anopheles mosquito breeding and seasonal Rift Valley Fever

risk. This zone also has the highest agricultural pest pressure from Fall Armyworm, aphids, and crop borers.

- Semi-Arid and Dryland Pastoral Zone (Galmudug, Puntland, Somaliland — Caynabo and Salaxlay): Lower baseline vector risk, but borehole and catchment water creates concentrated livestock and human water points that attract vectors. Tick-borne livestock diseases and water-associated *Culex* mosquito breeding are the primary concerns. Agricultural pest risk is lower but locust swarm incursion risk is higher in these arid zones.
- Coastal and Transitional Zone (Somaliland — Zeylac District): Unique coastal conditions with saline groundwater introduce brackish-water mosquito species (*Aedes togoi*) as an additional consideration. Shallow wells in coastal settings are prone to waterlogging and surface spillage, creating *Culex* and *Aedes* breeding. Salinity also affects crop pest dynamics on irrigated crops in this zone.

Table 3 reconciles all BBS project sites by state, district, infrastructure type, and pest/vector risk zone. The Borrower shall ensure this figure and the associated site allocations are harmonized across the P/VMP, the Stakeholder Engagement Plan (SEP), and all state-level ESIA/ESMPs.

Table 3: Master Site Reconciliation by State, District, Infrastructure Type, and Pest/Vector Risk Zone

State / Area	Districts	Sites	Predominant Infrastructure	Pest/Vector Risk Zone
Somaliland	Caynabo, Salaxlay, Zeylac, Borama	68	Shallow wells (30), water harvesting (26), boreholes (10), canals (2)	Coastal & Transitional (Zeylac); Semi-Arid Dryland Pastoral (interior)
Southwest State	Marka, Xudur, Qansax Dheere	22	Water catchments (8), canals (7), boreholes (6), dug well (1)	Riverine Irrigated
Hirshabelle State	Balcad	13	Canals (13)	Riverine Irrigated
Galmudug State	Cadaado, Dhuusamareeb, Galkacyo, Hobyo, Wisil, Xeraale	13	Boreholes (6), water catchments (5), water harvesting (1), dug well (1)	Semi-Arid Dryland Pastoral
Jubaland State	Luuq, Kismaayo, Doolow	13	Piped networks (9), water catchments (4)	Riverine Irrigated
Puntland State	Garoowe, Qardho, Armo, Galkacyo	4	Boreholes (2), water catchments (2)	Semi-Arid Dryland Pastoral
Northeastern districts	Erigavo, Buuhoodle, Laascaanood	3	Water harvesting (3)	Semi-Arid Dryland Pastoral
TOTAL	7 states/areas; 24 districts	136	Canals 22 · shallow wells 30 · water harvesting 30 · boreholes 24 · catchments 19 · piped 9 · dug wells 2	Three risk zones

B.5 Objectives and Specific Activities Leading to Integrated Pest and Vector Management

The overarching objective of this P/VMP is to ensure that the pest and vector risks created or intensified by BBS investments are managed through prevention, non-chemical control, and — only where unavoidable — the minimum safe use of approved pesticides, so that project benefits in productivity and water security are not offset by health, environmental, or food-safety harm. Five specific objectives follow

from this: (i) to prevent the creation and persistence of mosquito breeding habitat in project-built and project-rehabilitated water infrastructure; (ii) to reduce crop losses from Fall Armyworm, Desert Locust, and other significant pests through IPM rather than routine chemical spraying; (iii) to prevent pesticide contamination of irrigation water, soil, food crops, and livestock products, and to prevent occupational and community pesticide exposure; (iv) to protect the health of project-affected communities — in particular women, children, and pastoralists — from vector-borne disease associated with project water; and (v) to strengthen the capacity of MoAI, state ministries, WUAs, extension agents, and community health and animal health volunteers to sustain integrated pest and vector management beyond the project period.

These objectives are delivered through five linked activity streams, each detailed later in this Plan. First, agricultural pest management applies the BBS IPM hierarchy and pest-specific protocols for Fall Armyworm and Desert Locust, including scouting, action thresholds, biological and cultural control, and integration of IPM content into the CSA demonstration sites and Farmer Field Schools financed under Component 2 (Section 4). Second, vector-borne disease management applies source reduction during construction, canal-margin vegetation and hydraulic management during operation, community protection measures, and contingency protocols for Rift Valley Fever and livestock vectors at water points (Section 5). Third, pesticide management controls the full pesticide life cycle through the BBS Approved Pesticide List, procurement and supplier conditions, storage and application standards, buffer zones, and container disposal requirements (Section 6). Fourth, capacity building delivers the mandatory training programme for PIU and state safeguards staff, contractors, WUAs, applicators, extension agents, community health volunteers, and community animal health workers, together with community awareness and disclosure activities (Section 8). Fifth, monitoring, reporting, and grievance handling track entomological, agronomic, water-quality, residue, and incident indicators against defined thresholds and corrective actions, and provide an accessible channel for community complaints on pesticide use and vector nuisance (F.21 and Section 11).

Taken together, these streams convert the pest and vector risks identified in Section B.4 into a defined set of actions, responsibilities, indicators, and costs. The activities are designed to be implemented through existing project structures — the PIU, state safeguards officers, WUAs, and contractors — rather than through a parallel delivery system, so that integrated pest and vector management is embedded in routine project implementation and supervision.

C. CURRENT APPROACHES TO PEST AND VECTOR MANAGEMENT IN THE PROJECT SECTOR AND COUNTRY

This section describes pest and vector management as it is currently practised in Somalia's irrigated and dryland farming systems and in the public health and livestock sectors, and identifies the practical experience on which the BBS approach can build. It draws on national policy and programme documents, FAO and WHO country reporting, state ministry consultation, and observation at project districts. It should be read as the baseline of practice; the species-level pest and vector baseline is presented in Section 3.

C.1 Target Crops and Associated Pest Problems

The crops supported by BBS investments are maize and sorghum as the dominant cereals in the Shabelle and Jubba irrigation schemes, sesame and cowpea as cash and rotation crops, rice in limited riverine areas, and irrigated horticulture — tomato, onion, pepper, leafy vegetables, watermelon — expanding around canal, catchment, and borehole sites. Fruit production, principally banana, lemon, and

papaya, persists on riverine holdings. In the semi-arid and dryland zones, catchment and borehole water supports sorghum, cowpea, and small-scale vegetable plots alongside livestock production.

Fall Armyworm is the single most damaging field pest of maize and sorghum across all project states, with year-round persistence in irrigated systems that provide continuous green host material. Stem borers, sorghum midge, and shoot fly also affect cereals. Sap-sucking pests — aphids, whitefly, thrips, and mites — are the principal constraint in horticulture, compounded by the virus diseases they transmit, and their populations increase sharply under irrigated, intensively cropped conditions. Desert Locust incursions periodically affect both cropland and rangeland, with the highest exposure in the northern and central dryland districts. Quelea and other granivorous birds cause localised cereal losses at grain fill. Post-harvest losses are driven by maize weevil, larger grain borer, and bruchids in cowpea, which is directly relevant to the aggregation and storage infrastructure financed under Component 3. Fungal and bacterial diseases — sorghum smut, maize leaf blight, tomato wilt and blight — increase where irrigation raises canopy humidity and where planting is continuous.

C.2 Disease Vectors and Vector-Control Issues

The principal human disease vectors relevant to project infrastructure are *Anopheles* mosquitoes, dominated by *Anopheles arabiensis*, which breed readily in the sunlit, shallow, slow-moving or ponded water typical of canal margins, borehole spillage areas, and unlined catchments. Floodwater *Aedes* species drive Rift Valley Fever transmission cycles in the Shabelle and Jubba floodplains following heavy rainfall and flooding, and *Aedes aegypti* is present in settlements as a dengue and chikungunya vector. *Culex* species breed prolifically in organically enriched standing water, including livestock troughs, wash areas, and poorly drained wellheads. In the livestock sector, ticks transmit a range of infections in cattle, sheep, goats, and camels, and tsetse-transmitted trypanosomiasis remains a constraint in parts of the Jubba corridor.

Vector control in the project area faces structural constraints. Entomological surveillance capacity — larval and adult sampling, species identification, and insecticide susceptibility testing — is very limited outside a small number of national and partner-supported facilities, so evidence on vector composition, seasonality, and resistance status at district level is sparse. Insecticide-treated net distribution is delivered through national campaigns whose coverage and retention vary between districts, and indoor residual spraying is used only selectively. Larviciding and environmental source reduction are rarely applied in a planned way, which is significant for BBS because source reduction is the primary control available at project infrastructure. Coordination between agriculture and health authorities on water-associated vector risk is informal, and few irrigation schemes have any entomological monitoring attached to them.

C.3 Current Pest and Vector Management Approaches

At farm level, crop protection combines low-cost traditional practices with unregulated chemical use. Farmers commonly hand-pick and crush Fall Armyworm larvae, apply ash, sand, soil, or dry chilli and neem preparations into maize whorls, adjust planting dates, weed to remove alternative hosts, and use smoke or scaring to deter birds. Alongside these, synthetic insecticides are purchased from agro-dealers and informal traders and applied on a calendar or reactive basis, generally without scouting, calibration, or advisory support. Product choice is driven by price and availability rather than by pest identification, and mixing of multiple products is common. Storage protection relies on smoke, ash, sealed containers where available, and dusting or fumigation of stored grain.

At institutional level, MoAI's Plant Protection Directorate holds the mandate for surveillance, quarantine, and emergency pest response, and coordinates Fall Armyworm and Desert Locust campaigns with FAO and, for locust, with the Desert Locust Control Organisation for Eastern Africa through regional early warning and survey systems. Extension services reach farmers through a limited network of state-level

agents, supplemented by FAO-supported Farmer Field Schools and by mobile advisory services. In the health sector, the Ministry of Health and Human Services and its partners deliver malaria prevention through net campaigns, case management with rapid diagnostic tests, and outbreak response, supported by community health volunteers. Livestock vector management is delivered largely through community animal health workers providing acaricide treatment, deworming, and vaccination, with FAO ECTAD providing transboundary disease early warning including for Rift Valley Fever. Coordination across these mandates is the principal weakness rather than the absence of mandate: pest, vector, and pesticide functions sit in separate ministries with limited joint planning at district level.

C.4 Existing Biological Pest and Vector Control Practices

Deliberate biological control is practised on a limited scale, but the biological resources it depends on are present. Natural enemy complexes — parasitic wasps attacking Fall Armyworm eggs and larvae, predatory ladybirds and lacewings suppressing aphids and whitefly, spiders, ants, and predatory bugs in cereal fields — are widely reported in Somali cropping systems and are the main reason pest outbreaks in low-input fields often remain below economic thresholds. These populations are, however, routinely suppressed by broad-spectrum insecticide applications.

Formal biological products have been introduced mainly through emergency campaigns. The biopesticide *Metarhizium acridum* has been used regionally against Desert Locust hopper bands as an alternative to conventional insecticide, and *Bacillus thuringiensis* and nucleopolyhedrovirus formulations have been used against Fall Armyworm in the wider region, though supply, registration, and cold-chain constraints limit their availability in Somalia. Neem-based botanical preparations are prepared locally and used against caterpillars and sucking pests. In vector control, larvivorous fish occur naturally in perennial canals and reservoirs and provide incidental larval suppression, and *Bacillus thuringiensis israelensis* larviciding is technically available but not applied routinely. Biological control is therefore best characterised as an underused asset rather than an absent one, which is why conservation of natural enemies is placed above chemical intervention in the BBS IPM hierarchy in Section 4.

C.5 Existing Nature-Based Solutions

A number of nature-based practices are already present in Somali farming systems and are directly transferable to BBS sites. Intercropping cereals with cowpea and other legumes, crop rotation between cereals and legumes or sesame, and staggered or early planting to escape peak pest pressure are practised in both riverine and dryland systems. Conservation agriculture measures promoted under earlier programmes — minimum tillage, mulching, soil fertility restoration, and residue management — improve plant vigour and reduce pest susceptibility while retaining soil moisture. Farmer-managed field margins, hedges, and scattered trees provide refuge for natural enemies and act as windbreaks; agroforestry and rangeland restoration are practised in parts of the northern and central states.

On the water side, riparian and canal-margin vegetation management, silt trapping, and maintenance of flow velocity are traditional practices in functioning irrigation schemes and are the primary nature-based tools for reducing mosquito breeding habitat. Restoration of catchment vegetation and controlled grazing reduce sedimentation of catchments and the formation of shallow ponded margins. These practices are the foundation of the source-reduction and vegetation-management measures set out in Section 5, and they carry co-benefits for water productivity, soil conservation, and climate resilience that align with the project's climate-smart agriculture objectives.

C.6 Practical Experience with Integrated Management in the Country and Project Sector

Somalia has real, if uneven, practical experience with integrated approaches. The Farmer Field School model has been applied in Somali irrigated and rainfed systems with FAO and partner support, giving farmers direct experience of scouting, pest identification, threshold-based decision-making, and comparison of treated and untreated plots. The national Fall Armyworm response, mounted after the pest's arrival in the region, combined community scouting, low-cost mechanical and botanical measures, and targeted chemical use, and demonstrated both the value of early detection and the difficulty of sustaining surveillance once emergency funding ends. Desert Locust campaigns, particularly during the major upsurge affecting the Horn of Africa, established working links between national authorities, DLCO-EA, and FAO for survey, early warning, and controlled application, including limited use of biopesticide. In the health sector, the national malaria programme has extensive experience of community-delivered prevention through volunteer networks, net campaigns, and rapid diagnostic testing, and Rift Valley Fever early warning and response has been exercised through FAO ECTAD and the veterinary services during flood-associated outbreak risk periods. Community animal health worker networks provide a proven delivery channel for livestock vector management at water points.

Three lessons from this experience shape the present Plan. First, integrated management succeeds where it is embedded in a routine delivery structure — extension, Farmer Field Schools, water user associations, volunteer networks — and fails where it depends on stand-alone project staff. Second, surveillance and threshold-based decision-making must be simple enough to be sustained by farmers and volunteers with basic training, or they lapse. Third, without a controlled supply of approved products and enforced quality standards, training on safe use is undermined by what is actually available in the market, which is why the Approved Pesticide List and supplier conditions in Section 6 are treated as prerequisites rather than complements to training.

C.7 Comparable Practices in Similar Ecological Settings

Experience from comparable irrigated and dryland systems in the region provides directly applicable precedent. Large riverine irrigation schemes in Sudan and the Awash and rift valley schemes in Ethiopia have documented the association between canal irrigation and increased malaria transmission, and the effectiveness of engineering and hydraulic measures — lining, adequate flow velocity, drainage of seepage and ponded reaches, intermittent irrigation in rice, and prompt closure of borrow pits — in reducing *Anopheles* breeding without reliance on insecticide. Rice schemes in Kenya's Mwea and Tana areas provide comparable evidence on alternate wetting and drying as a vector-suppression measure compatible with production objectives.

In crop protection, Fall Armyworm management guidance developed across eastern and southern Africa converges on weekly scouting, action thresholds based on infested-plant counts, push-pull and intercropping approaches, conservation of natural enemies, and restriction of chemical intervention to threshold exceedance with rotation of modes of action to delay resistance. Sahelian Desert Locust programmes have demonstrated operational use of biopesticide against hopper bands in ecologically sensitive areas. Integrated vector management programmes in the Nile basin and the Sahel show that agriculture-health coordination at district level, joint entomological monitoring attached to irrigation infrastructure, and community-based larval habitat mapping are feasible at modest cost. The BBS protocols in Sections 4 and 5 are constructed from these tested measures, adapted to Somali institutional capacity and to the three risk zones identified in Section B.4.1.

D. CURRENT ISSUES IN THE USE AND MANAGEMENT OF SYNTHETIC CHEMICAL PESTICIDES

This section sets out the pesticide-related issues that the BBS project must manage, covering how synthetic pesticides are currently used and controlled in Somalia, the conditions under which they are handled, the resulting environmental, health, occupational, and economic risks, and the nature and scale

of pesticide use proposed under the project. It provides the risk basis for the pesticide controls in Section 6 and for the Approved Pesticide List in Annex A.

D.1 Use of Pesticides in the Country and Project Sector

Pesticide use in Somalia is modest by regional standards in aggregate but concentrated, poorly documented, and rising in irrigated horticulture and cereal production. The following elements characterise current use:

- **Volumes and types used:** No complete national import or consumption statistics are maintained, and available figures are partial and derived from customs records, agro-dealer surveys, and partner assessments. The products encountered in project districts are predominantly insecticides — organophosphates, carbamates, pyrethroids, and neonicotinoids — supplied for cereal and vegetable pests and for storage protection; fungicides and herbicides are used to a lesser extent, and acaricides are used in the livestock sector. Products enter mainly through cross-border trade, and a significant share arrives repackaged, decanted, or labelled in languages that farmers cannot read. The absence of reliable volume data is itself a management issue and is addressed through the project-level pesticide procurement and use records required under Section 6.
- **Product approval or registration:** a National Pesticide Policy exists and assigns registration, licensing, and control functions to MoAI, but a functioning national registration scheme with a published register of approved products, label requirements, and enforcement capacity is not yet operational at scale. In practice, products available in project districts include items not registered anywhere in the country, and products banned or severely restricted internationally have periodically been reported in regional markets. The BBS response is to substitute a project-level positive list — the Approved Pesticide List — restricted to WHO Class II and III products from registered suppliers with full Safety Data Sheets, rather than to rely on market availability.
- **Supervision and control arrangements:** MoAI's Plant Protection Directorate holds the formal mandate for pesticide control, supported by the Ministry of Health on human toxicology and the Ministry of Environment and Climate Change on chemicals and waste obligations under the Stockholm and Rotterdam Conventions. Inspection of retail outlets, licensing of applicators, and quality testing are constrained by staffing, laboratory access, and reach into rural districts, and local authority by-law enforcement against unregulated sales is inconsistent. Supervision of pesticides used under the project therefore rests primarily with the PIU environmental and social team and state safeguards officers, working with MoAI, as set out in Section 7.

D.2 Circumstances of Pesticide Use

Pesticides are typically applied by smallholders on plots of one to a few hectares, using hand-operated knapsack sprayers that are often uncalibrated, leaking, or shared between households, and occasionally using improvised equipment such as brooms, brushes, or bottles. Application decisions are reactive — triggered by visible damage — or calendar-based, without scouting or threshold assessment, and dose is judged by capfuls or handfuls rather than by label rate. Tank mixing of two or more products is common in the belief that it improves efficacy. Spraying is frequently carried out in the heat of the day, in wind, without regard to spray drift toward neighbouring plots, dwellings, or watercourses, and pre-harvest intervals are widely unobserved on vegetables destined for immediate sale. Mixing and equipment washing commonly take place at canal banks, wells, or catchment edges, discharging residues directly into water used for drinking, washing, and livestock. Pesticides are stored in dwellings or animal enclosures, and empty containers are reused for water, milk, or fuel, or discarded in fields and near watercourses. In the livestock sector, acaricides are applied by hand spraying or hand dressing at water points and holding areas without containment of run-off.

D.3 Competence of Intended Users to Handle Pesticide Products

Most pesticide users in the project area have received no formal training in pest identification, product selection, dose calculation, application technique, protective equipment, or first aid for poisoning, and rely on advice from retailers who are themselves usually untrained and commercially motivated. Functional literacy constraints and the absence of labels in Somali mean that written safety instructions are frequently inaccessible even where present. Awareness of hazard classification, re-entry periods, pre-harvest intervals, and residue limits is low. Agro-dealers generally lack knowledge of storage segregation, shelf life, spill response, and safe disposal. A smaller cadre of applicators trained through earlier locust and Fall Armyworm campaigns, together with extension agents and community animal health workers, provides a base of competence that the project can extend. This competence gap is the reason the Plan requires certification of applicators, restricts project-financed application to trained and equipped personnel, and places agro-dealer training within the mandatory programme in Section 8.

D.4 Environmental Risks and Impacts

The dominant environmental pathway is contamination of water. Canal-side mixing and washing, spray drift across open channels, run-off from treated fields, and disposal of surplus and rinsate discharge pesticide residues into canals, shallow wells, and catchments that also serve as drinking and livestock water. Shallow groundwater in the coastal and dryland zones is vulnerable where the water table is close to the surface. Ecologically, broad-spectrum insecticide use suppresses pollinators and the natural enemy complexes that would otherwise regulate pest populations, producing pest resurgence and secondary outbreaks, and is toxic to fish and aquatic invertebrates in canals, catchments, and associated wetland habitat, including areas of biodiversity value in the floodplains. Persistent and bioaccumulative compounds, where they enter the system, carry longer-term soil and sediment contamination risk, and cumulative loading is a concern where irrigation concentrates run-off in a defined canal network. Resistance development in Fall Armyworm, whitefly, aphids, and Anopheles populations is an environmental as well as an economic risk, since it drives higher application rates and shifts use toward more hazardous alternatives.

D.5 Human and Community Health Risks

Community exposure occurs through drinking and domestic use of contaminated canal, well, and catchment water; consumption of produce treated shortly before harvest; storage of pesticides inside dwellings; reuse of empty containers for water, milk, and food; laundering of contaminated work clothing in the household; and drift into homesteads, schools, and livestock enclosures adjacent to treated plots. Women and children carry disproportionate exposure because of their roles in water collection, food preparation, weeding, harvesting, and clothes washing, and because of the greater vulnerability of children to organophosphate and carbamate toxicity. Acute poisoning presenting to health facilities is likely under-recognised and under-reported, given limited diagnostic capacity and the absence of a poisoning surveillance system or accessible poison information service, and chronic exposure effects are not monitored at all. Pastoral communities face additional exposure through acaricide handling and through consumption of milk and meat from recently treated animals where withdrawal periods are not observed.

D.6 Occupational Health and Safety Risks

Applicators face the highest exposure. Protective equipment is rarely available or worn — long-sleeved clothing, gloves, boots, goggles, and respirators are largely absent — and heat and humidity discourage its use where it is provided. Leaking knapsack sprayers wet the back and legs, hand mixing without gloves contaminates the skin, and blocked nozzles are cleared by mouth. Washing facilities and clean water for immediate decontamination are usually unavailable at the point of use, and eating, drinking, and smoking during application are common. Work is often performed at midday in high temperatures, compounding heat stress with chemical exposure, and re-entry into treated fields for weeding or harvesting occurs well within safe intervals. Neither health surveillance for applicators nor incident reporting is in place, and first-aid knowledge and antidote availability at nearby health facilities are limited. Construction workers at BBS sites face parallel exposure where site vector control or vegetation treatment is undertaken. These conditions are the basis for the mandatory personal protective equipment, applicator certification, re-entry interval, and washing-facility requirements set out in Section 6.4.

D.7 Economic Risks and Impacts

Unmanaged pesticide use imposes costs that fall on the same households the project intends to benefit. Expenditure on inappropriate or ineffective products — wrong product for the pest, sub-lethal dose, adulterated or expired stock — is a direct loss of scarce household cash, and repeat applications multiply it. Suppression of natural enemies and resistance development raise the cost of control season on season while reducing its effectiveness, a pattern already visible in Fall Armyworm management in the region. Yield and revenue losses arise from phytotoxicity, from pollinator loss in horticulture and fruit, and from crop rejection or price discounting where residues are visible or suspected. Residue non-compliance closes off higher-value market channels that Component 3 is intended to open, including institutional buyers and any future export or certification opportunity. Contamination incidents impose clean-up, replacement water supply, and medical costs, and livestock product residues threaten the marketability of milk and meat. At project level, non-compliance with AfDB pesticide requirements risks suspension of related expenditure and delay to disbursement.

D.8 Known Incidents and Lessons Learned

Systematic incident records for pesticide poisoning and contamination are not maintained in Somalia, so the evidence base is drawn from health facility reports, partner assessments, and regional experience rather than from a national database. Recurrent incident types reported in the country and in comparable settings include acute poisoning of applicators working without protective equipment; poisoning of children through pesticides stored in dwellings and through reuse of empty containers for water and food; livestock deaths after drinking contaminated water or grazing recently treated plots; fish kills in canals and catchments following spraying or disposal of surplus and rinsate; and non-target losses of pollinators and natural enemies after broad-spectrum application. Emergency locust and armyworm campaigns in the region have also generated lessons on aerial and ground application near water bodies, settlements, and livestock, and on the accumulation of unused stock once campaigns close.

The lessons carried into this Plan are that container management and household storage are as important as application practice in determining community exposure; that emergency response creates obsolete stock unless procurement is matched to need and closure is planned from the outset; that unrecorded incidents cannot be corrected, so a defined reporting route and register are prerequisites; and that clean-up capacity must be arranged in advance because ad hoc response after a contamination event is slow and ineffective. The Plan accordingly requires an incident register, 72-hour serious-incident notification to the Bank, spill kits and defined spill procedures at every storage point, and stock reconciliation at each procurement round.

D.9 Control of Pesticide Distribution and Use

Distribution control is the weakest link in the current system. Sales take place through licensed agro-dealers, general merchandise shops, and mobile traders, with no effective restriction on who may sell, what may be sold, or in what form, and repackaging into unlabelled bags and bottles is routine. There is no operational mechanism for verifying product authenticity or concentration, no requirement for retailers to hold or supply Safety Data Sheets, and no restricted-use category enforced at the point of sale. Applicator licensing exists in policy but not in practice. Under the project, control is therefore exercised through the procurement chain rather than through the market: pesticides financed or facilitated by BBS may be sourced only from suppliers meeting the conditions in Section 6.2, may only be products on the Approved Pesticide List in Annex A, must arrive in original sealed and labelled containers with Safety Data Sheets, and must be recorded in a stock register from receipt to application. The agro-dealer upgrading activity under Component 3 is conditioned on compliance with these requirements, and PIU and MoAI verification, together with local authority engagement on unregulated sales in project districts, complete the control arrangement.

D.10 Management and Disposal of Obsolete Pesticides and Contaminated Packaging

Somalia has no licensed hazardous waste treatment or disposal facility, no functioning obsolete pesticide inventory, and no national container collection scheme, and imported and campaign-derived stocks have accumulated without a defined disposal route. Current practice for surplus product, expired stock, and empty containers is burial, open burning, discard in fields and drainage lines, or reuse of containers for domestic purposes — each of which creates contamination or exposure. Under this Plan, the project does not create obsolete stock: procurement is matched to assessed need for a single season, first-expiry-first-out stock rotation applies, and quantities are reconciled at each round. Empty containers must be triple-rinsed with rinsate returned to the spray tank, punctured to prevent reuse, and held in a secured, labelled store pending disposal arranged with MoAI and the Ministry of Environment and Climate Change; open burning, burial, and reuse are prohibited. Where a project store is found to hold expired or unusable product, it must be segregated, labelled, recorded in the incident and stock registers, and reported to the PIU, which arranges disposal in consultation with MoAI, MoECC, and FAO. The full requirements are set out in Section 6.5.

D.11 Proposed Pesticide Use and Intended Users

The project does not finance routine or preventive pesticide application. Pesticide use under BBS is confined to threshold-triggered intervention within the IPM and integrated vector management hierarchies: targeted insecticide application against Fall Armyworm and other crop pests where scouting shows action thresholds exceeded and non-chemical measures are insufficient; ground-based application or biopesticide within Desert Locust contingency response coordinated with MoAI and DLCO-EA; larvicide application at defined breeding sites where source reduction and environmental management cannot eliminate habitat; approved products for stored-product protection at aggregation and storage facilities; and acaricides for livestock tick management at water points. All products must appear on the BBS Approved Pesticide List, restricted to WHO Class II and III, and WHO Class Ia and Ib products, products listed under the Stockholm Convention, and products otherwise banned or severely restricted are prohibited outright.

Intended users are limited and defined: certified applicators engaged or trained under the project; contractor personnel undertaking site vector management under supervision; extension agents and Farmer Field School facilitators demonstrating application as part of IPM training; community animal health workers applying acaricides at water points; and farmers who have completed the project's safe-use and IPM training, using their own or association equipment. Untrained persons, children, and pregnant or breastfeeding women must not handle, mix, or apply pesticides under any project activity.

D.12 Nature and Degree of Risks Associated with Proposed Pesticide Procurement and Use

Assessed against the current baseline, the residual risk of pesticide procurement and use under the project is moderate and manageable, and materially lower than the risk of the unregulated use that would otherwise expand with irrigated area. Restriction to WHO Class II and III products removes the highest-acute-toxicity hazard class; threshold-based use reduces frequency and volume; buffer zones of at least 10 metres from canals, boreholes, catchments, and any open water, together with drift controls and prohibition of mixing and washing near water, address the dominant contamination pathway; certification, protective equipment, and re-entry intervals address occupational exposure; and pre-harvest interval and residue-limit compliance address food safety.

Risk is not eliminated. The principal residual risks are diversion or informal resale of project-supplied product into unregulated use; substitution at the point of sale of a non-approved product where an approved one is unavailable; non-compliance with buffer zones, dose, and pre-harvest intervals by farmers operating outside direct supervision; contamination of canal water during a locust or outbreak response conducted under time pressure; accumulation of unused stock if procurement exceeds assessed need; and resistance development if modes of action are not rotated. Risk is highest in the riverine irrigated zone, where perennial canal water, dense settlement, and intensive horticulture coincide, and at aggregation and storage facilities where fumigant handling requires specific competence. These risks are managed through the controls in Section 6, the training programme in Section 8, and the monitoring, threshold, and incident-reporting arrangements in F.21, and they are recorded with mitigation and residual ratings in the Pest and Vector Risk Register in Annex B.

E. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK FOR INTEGRATED PEST AND VECTOR MANAGEMENT

This section sets out the policy, legal, and institutional framework within which the BBS P/VMP operates, and assesses the capacity available to implement it. It covers national pest-management and vector-control policy, applicable laws and standards, the international instruments to which Somalia is party, the requirements of the AfDB Integrated Safeguards System, the mandates and capabilities of the responsible institutions, and the extent to which integrated pest and vector management is already promoted within current practice. Where capacity gaps are identified, the corresponding mitigation is the strengthening measures set out in Sections 7 and 8.

E.1 National Pest-Management and Plant-Protection Policies

Somalia's pest-management policy framework is led by the Ministry of Agriculture and Irrigation. The National Pesticide Policy is the primary instrument: it establishes integrated pest management as the preferred approach to crop protection, provides for pesticide registration, import control, handling, application, and disposal, restricts WHO Class Ia and Ib products, and sets licensing requirements for pesticide retailers and applicators. The Plant Protection and Quarantine Regulations provide for plant pest surveillance, quarantine control of imported seed and planting material, and emergency response authority for notifiable pests including Desert Locust and Fall Armyworm, and define the national authority for pest early warning. The Agriculture Sector Strategy and Plan provides the sector framework for irrigation rehabilitation and climate-smart agriculture and is the source of the Plant Protection Directorate's mandate. The National Fertilizer Policy is relevant where increased nutrient use under expanded irrigation interacts with pest and disease dynamics and where nutrient run-off to water bodies must be managed. The National Food Security and Nutrition Policy underpins requirements to prevent pesticide contamination of food crops, irrigation water, and livestock products, including observance of pre-harvest intervals and maximum residue limits.

Above these sector instruments, the National Transformation Plan 2025–2029 sets agricultural productivity, food security, and public health as cross-cutting priorities, creating the policy context for the irrigation expansion and cropping intensification that generate the need for this Plan. Regionally, Somalia's membership of the Desert Locust Control Organisation for Eastern Africa provides access to locust early warning, aerial survey data, and emergency control resources on which the locust contingency protocol in Section 4.3 depends. The principal weakness of the policy framework is not its content but its operationalisation: registration, licensing, inspection, and enforcement provisions exist on paper without the administrative machinery to apply them consistently in rural districts, which is why the Plan substitutes project-level controls, notably the BBS Approved Pesticide List.

E.2 National Vector-Control Policies and Systems

Vector control policy sits with the Ministry of Health and Human Services for human disease and with the Ministry of Livestock, Forestry and Range for livestock vectors and zoonoses. The Public Health and Communicable Disease Control Regulations establish national authority and baseline requirements for vector-borne disease surveillance, prevention, and outbreak response, and define notifiable disease reporting obligations into which the Plan's community surveillance arrangements feed. The National Malaria Control Strategy provides the operational framework for malaria prevention and control through insecticide-treated net distribution, selective indoor residual spraying, rapid diagnostic testing, and case management, delivered in part through community health volunteers; the community protection measures in Section 5.1.3 are designed to complement rather than duplicate it. Somalia's approach is aligned with the WHO Global Vector Control Response 2017–2030, which directs national programmes toward integrated, community-based vector management rather than reliance on insecticide alone.

On the livestock side, the Livestock Sector Development Strategy provides for animal health service delivery through the community animal health worker network, which is the delivery channel for tick and Rift Valley Fever awareness and treatment at BBS water points, and the transboundary animal disease framework operated with FAO ECTAD Somalia provides Rift Valley Fever early warning through regional surveillance systems. Two gaps are material for this project. First, there is no dedicated national integrated vector management policy that assigns responsibility for vector risk created by water infrastructure, so the obligation to manage canal and catchment breeding habitat is not clearly held by any single ministry and must be assigned within the project. Second, entomological surveillance and insecticide-resistance monitoring are not systematically linked to irrigation schemes, so the Plan establishes project-level larval and adult monitoring under F.21 rather than relying on national data.

E.3 Applicable National Laws, Regulations and Standards

Somalia's national framework applicable to pest and vector management includes the Federal Government of Somalia's National Transformation Plan (NTP) 2025–2029, which identifies agricultural productivity, food security, and public health as cross-cutting development priorities. At state level, each Federal Member State has ministry-level institutions responsible for agriculture and health, including the Ministries of Agriculture and Health in Southwest State, Hirshabelle, Jubaland, Galmudug, and Puntland, and equivalent authorities in Somaliland. The BBS PIU must coordinate pest and vector management activities with all relevant state-level ministries.

These constitutional principles are reflected in the specific national instruments summarized in the table below;

Table 4: National framework relevant to P/VMP

Instrument	Lead Institution	Relevance to the BBS P/VMP
A. CONSTITUTIONAL AND OVERARCHING NATIONAL FRAMEWORK		
Provisional Federal Constitution — Articles 43, 44, 45	Federal Government of Somalia	Establishes constitutional rights and duties for the sustainable management of natural resources and the environment. Provides the constitutional basis for government obligations to protect public health and prevent environmental harm — directly underpinning the P/VMP's mandate to prevent pesticide pollution and protect community health.
National Transformation Plan (2025–2029)	Ministry of Planning, Investment and Economic Development	Aligns the P/VMP with national priorities for agricultural transformation, resilient food systems, and improved rural livelihoods. The NTP's agricultural productivity targets create the context for expanding irrigation and intensified crop production that drives the need for integrated pest management.
B. AGRICULTURAL PEST AND PESTICIDE REGULATION		
National Pesticide Policy	Ministry of Agriculture and Irrigation (MoAI)	Primary national policy instrument governing pesticide registration, import, handling, application, and disposal in Somalia. Mandates integrated pest management (IPM) as the preferred approach; restricts WHO Class Ia/Ib pesticides; establishes licensing requirements for pesticide retailers and applicators. The BBS P/VMP Approved Pesticide List and all pesticide management provisions are derived from and consistent with this policy.
National Fertilizer Policy	Ministry of Agriculture and Irrigation (MoAI)	Relevant to the P/VMP where increased fertilizer use under expanded irrigated agriculture may interact with pest and disease dynamics (nutrient-driven aphid and fungal disease outbreaks). Requires management of nutrient runoff to water bodies — directly relevant to the 10-metre spray and application buffer zones from canals and water bodies established in this P/VMP.
Agriculture Sector Strategy and Plan	Ministry of Agriculture and Irrigation (MoAI)	Provides the sector policy framework for irrigation rehabilitation and climate-smart agriculture within which the P/VMP operates. MoAI's Plant Protection Directorate, referenced throughout this P/VMP as a key institutional partner for Desert Locust coordination and Approved Pesticide List validation, derives its mandate from the Agriculture Sector Strategy.
Plant Protection and Quarantine Regulations	MoAI — Plant Protection Directorate	Establishes regulatory requirements for plant pest surveillance, quarantine controls on imported seed and planting material, and emergency response authority for outbreaks of notifiable pests including Desert Locust and Fall Armyworm. Defines the national authority responsible for pest early warning systems that the P/VMP's monitoring and escalation protocols are linked to.
Desert Locust Control Organisation for Eastern Africa (DLCO-EA) Agreements	MoAI / Regional body	Somalia's membership of DLCO-EA provides access to regional Desert Locust early warning (eLocust3), aerial survey data, and emergency control resources. The P/VMP's locust contingency protocol (Section 4.3) is built on this regional coordination framework and the obligations it entails.

C. ENVIRONMENT, CLIMATE, AND POLLUTION PREVENTION		
Nationally Determined Contribution (NDC)	Ministry of Environment and Climate Change (MoECC)	Somalia's NDC commitments include sustainable land and water management and reduced dependence on chemical inputs in agriculture. The P/VMP's IPM-first approach and restriction on WHO Class Ia/Ib pesticides are consistent with the NDC's environmental protection commitments.
Stockholm Convention on Persistent Organic Pollutants	MoECC / International	Prohibits or restricts production, use, and release of persistent organic pollutants (POPs) including DDT, aldrin, dieldrin, and endosulfan. The P/VMP's absolute prohibition on POPs-listed pesticides (Section 6.1) directly implements Somalia's obligations under this Convention.
Rotterdam Convention (Prior Informed Consent)	MoECC / International	Somalia is a signatory to the Rotterdam Convention, requiring prior informed consent procedures for trade in hazardous chemicals and pesticides. Relevant to the P/VMP's pesticide procurement controls and the requirement that all pesticides on the Approved List be sourced from registered suppliers with full Safety Data Sheets.
D. PUBLIC HEALTH, VECTOR CONTROL, AND COMMUNICABLE DISEASE		
Public Health and Communicable Disease Control Regulations	Ministry of Health and Human Services	Establishes the national authority and baseline requirements for vector-borne disease surveillance, prevention, and outbreak response. Directly applicable to the P/VMP's malaria and RVF management protocols and the requirement for PIU coordination with district health authorities in all project states. Defines notifiable disease reporting obligations that the P/VMP's community health volunteer surveillance system feeds into.
National Malaria Control Strategy	Ministry of Health and Human Services	Provides the national strategic framework for malaria prevention and control, including insecticide-treated bed net (ITN) distribution, indoor residual spraying (IRS) programmes, and rapid diagnostic test (RDT) deployment. The P/VMP's community protection measures (ITN coordination, CHV training, referral protocols) are designed to complement and reinforce the national malaria strategy in BBS project communities.
WHO Global Vector Control Response (2017–2030)	Ministry of Health (WHO alignment)	International framework guiding national vector control programmes toward integrated, community-based approaches. The P/VMP's integrated vector management approach — combining environmental management, biological control, and community surveillance — is designed in accordance with this framework.
FAO International Code of Conduct on Pesticide Management (2014)	MoAI / FAO Somalia	Establishes international standards for responsible pesticide management throughout the pesticide lifecycle. The P/VMP's pesticide procurement, storage, application, and disposal standards (Section 6) are directly derived from this Code. All provisions on pesticide handling, PPE, and container disposal in the P/VMP reflect Code requirements.
WHO Recommended Classification of Pesticides by Hazard (2019)	Ministry of Health / MoAI	The classification system used to define the BBS Approved Pesticide List (Annex A). Only WHO Class II and III pesticides are approved for use under BBS activities. Class Ia and Ib products are absolutely prohibited. The WHO classification is used to establish health risk thresholds for applicator protection and community buffer zone requirements.

E. LIVESTOCK, PASTORAL, AND ZONOTIC DISEASE MANAGEMENT		
Livestock Sector Development Strategy	Ministry of Livestock, Forestry and Range	Directly relevant to the P/VMP's livestock vector management provisions at pastoral water points (Galmudug, Puntland, Somaliland, Jubaland). The Strategy's community animal health worker (CAHW) network is the primary delivery mechanism for the P/VMP's tick and RVF awareness training at BBS water point communities.
Transboundary Animal Disease Control Framework (FAO ECTAD Somalia)	MoAI / FAO ECTAD	FAO ECTAD Somalia's Emergency Centre for Transboundary Animal Diseases provides the regional RVF early warning system (EMPRES-i) that the P/VMP's RVF contingency protocol relies on. ECTAD's technical advisory role on tick-borne livestock diseases and trypanosome risk in the Jubba corridor is explicitly referenced in Section 5.2.
National Food Security and Nutrition Policy	Ministry of Agriculture and Irrigation	Relevant to the P/VMP's requirement to prevent pesticide contamination of food crops, irrigation water, and livestock products. Safe PHI (pre-harvest interval) compliance and MRL (maximum residue limit) adherence on the Approved Pesticide List are consistent with this Policy's food safety objectives for project-supported crop production.
F. WATER RESOURCES AND IRRIGATION GOVERNANCE		
National Water Policy / Water Sector Strategy	Ministry of Energy and Water Resources	Relevant to the P/VMP's pesticide and biological control restrictions near water bodies. The National Water Policy's provisions on water quality protection and equitable water allocation inform the P/VMP's mandatory 10-metre pesticide application buffer from canals, boreholes, water catchments, and any open water, and the prohibition on pesticide use near community water supply infrastructure.
G. GENDER, LABOUR, AND COMMUNITY RIGHTS		
National Gender Policy	Ministry of Family and Human Rights	Directly relevant to the P/VMP's differential risk analysis and community protection measures. Women and girls bear disproportionate exposure to vector-borne disease risk (water collection burden, household exposure) and to pesticide misuse in domestic settings. The P/VMP's community health volunteer programme, ITN distribution targeting, and GRM access provisions specifically address gender-differentiated risks in accordance with the National Gender Policy.
Labour and Employment Laws and Regulations	Ministry of Labour and Social Affairs	Establishes minimum occupational health and safety standards applicable to pesticide applicators and construction workers at BBS sites. The P/VMP's PPE requirements, pesticide applicator training certification, and heat stress provisions during construction-phase vector management activities are consistent with national labour law requirements.
Land Administration and Local Government Instruments	Relevant federal and local authorities	Relevant to the P/VMP where pesticide buffer zone enforcement and canal margin vegetation management may intersect with community land access rights. Local government authorities are also relevant to by-law enforcement against illegal pesticide sales in project districts.

E.4 Applicable International Conventions, Protocols and Codes

This P/VMP is developed in accordance with the international instruments to which Somalia is party or which represent the applicable standard of practice. The Stockholm Convention on Persistent Organic Pollutants prohibits or restricts the production, use, and release of persistent organic pollutants, including DDT, aldrin, dieldrin, and endosulfan, and is implemented in this Plan through the absolute prohibition on POPs-listed products in Section 6.1. Somalia is a signatory to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, which is reflected in the procurement controls requiring sourcing from registered suppliers with full Safety Data Sheets. The Basel Convention framework on transboundary movement of hazardous wastes is relevant to any future export of obsolete stock or contaminated packaging for disposal.

On practice standards, the FAO International Code of Conduct on Pesticide Management (2014) is the source of the pesticide procurement, storage, application, and disposal provisions in Section 6, and the FAO/WHO Guidelines on Highly Hazardous Pesticides underpin the exclusion of products in the highest hazard classes. The WHO Recommended Classification of Pesticides by Hazard (2019) defines the classification used to construct the BBS Approved Pesticide List in Annex A, under which only Class II and Class III products are approved and Class Ia and Ib products are prohibited. The WHO Global Vector Control Response 2017–2030 provides the integrated vector management framework applied in Section 5, and the International Plant Protection Convention framework informs the phytosanitary and quarantine provisions relevant to seed and planting material introduced under Component 2. IFC Performance Standard 3 on Resource Efficiency and Pollution Prevention is applied as good international industry practice where it is more specific than national requirements.

E.5 AfDB Integrated Safeguards System Requirements

This P/VMP is prepared as a mandatory safeguard instrument under the African Development Bank's Integrated Safeguards System (ISS 2023). The following Operational Safeguards are directly applicable: OS3 (Resource Efficiency and Pollution Prevention and Management): Requires prevention of pesticide contamination of soil, water, and food, environmentally sound management of pesticides and their packaging across the full life cycle, and compliance with WHO pesticide classification and the FAO International Code of Conduct on Pesticide Management.

OS4 (Community Health, Safety and Security): Requires management of vector-borne disease risk to project-affected communities arising from project-induced changes in water habitat, and protection of communities and workers from pesticide exposure and poisoning.

OS6 (Habitat and Biodiversity Conservation and Sustainable Management of Living Natural Resources): Requires assessment and management of impacts on biodiversity, including indirect impacts from pesticide use on aquatic ecosystems in irrigation canals and associated wetlands.

OS10 (Stakeholder Engagement and Information Disclosure): Requires community-level information disclosure on pest and vector management measures, pesticide use, and health risks.

OS1 (Environmental and Social Assessment) applies as the umbrella requirement under which this Plan sits as a component of the project's environmental and social assessment package, and OS5 (Labour and Working Conditions) applies to the occupational health and safety provisions governing pesticide applicators and contractor personnel. The Bank's requirements also determine the reporting arrangements applied in F.21, including quarterly and annual safeguard reporting and notification of serious incidents within 72 hours.

E.6 Current Plant-Protection and Vector-Control Institutions

Institutional responsibility for pest and vector management is distributed across several ministries at federal and state level. The Ministry of Agriculture and Irrigation, through its Plant Protection Directorate, is the national authority for plant pest surveillance, quarantine, emergency pest response, pesticide registration and control, and validation of approved product lists; it is also the implementing ministry for the BBS project and hosts the Project Implementation Unit. Federal Member State ministries of agriculture hold operational responsibility for extension delivery, pest reporting, and coordination at district level, with equivalent authorities in Somaliland. The Ministry of Health and Human Services, with state health ministries and district health offices, is responsible for vector-borne disease surveillance, malaria prevention and case management, and outbreak response, supported by community health volunteers. The Ministry of Livestock, Forestry and Range and the veterinary services are responsible for livestock vector and zoonotic disease control, delivered largely through community animal health workers.

The Ministry of Environment and Climate Change holds the mandate for chemicals and hazardous waste obligations, including Stockholm and Rotterdam Convention implementation and any disposal of obsolete stock, and the Ministry of Energy and Water Resources is responsible for water resource protection relevant to pesticide buffer zones and canal water quality. Regionally and internationally, FAO Somalia provides technical support on crop protection, Farmer Field Schools, and — through ECTAD — transboundary animal disease and Rift Valley Fever early warning; the Desert Locust Control Organisation for Eastern Africa provides locust survey, early warning, and control capacity; and WHO supports malaria and vector control programming. At community level, Water User Associations are the institutions on which operation-phase source reduction and canal maintenance obligations fall, and their formation and strengthening under Component 1 is therefore a prerequisite for P/VMP implementation rather than an ancillary activity.

E.7 Phytopharmaceutical and Agricultural Extension Services

Phytopharmaceutical services — the supply, quality control, and technical support functions surrounding pesticide products — are underdeveloped. Somalia has no functioning national pesticide quality-control laboratory and no accredited pesticide residue laboratory, so product authenticity, concentration, and residue compliance cannot at present be verified domestically; the Plan therefore provides for residue and water samples to be analysed at accredited regional laboratories under arrangements made by the PIU, as set out in F.21.2.1. Product supply runs through private agro-dealers and informal traders whose technical knowledge is limited and who are, in practice, the principal source of crop protection advice for farmers. Application equipment supply, calibration, and maintenance services are largely absent, and personal protective equipment is not reliably available in project districts, which the Plan addresses by requiring the project to supply protective equipment rather than assume local availability.

Agricultural extension is delivered by a limited cadre of state extension agents, supplemented by FAO-supported Farmer Field Schools, NGO programmes, and mobile advisory services. Coverage is thin relative to the farming population, agent mobility is constrained, and pest management content has historically emphasised chemical control. Component 2 of the project materially expands this capacity — training extension agents, developing climate-smart agriculture manuals, running Farmer Field School cycles, and delivering mobile advisory support at scale — and this Plan requires that the curricula, manuals, and demonstration protocols financed under that component carry integrated pest management content consistent with Section 4, together with safe-use and personal protective equipment content consistent with Section 6, so that extension expansion does not inadvertently promote calendar spraying.

E.8 National and Local Implementation Capacity

National implementation capacity is constrained in three respects. Staffing in the plant protection, veterinary, and environmental health functions is thin relative to mandate, and technical specialisation in

entomology, pesticide toxicology, and residue analysis is concentrated in a small number of individuals. Recurrent budget for surveillance, inspection, and enforcement is limited, so these functions depend heavily on donor-financed programmes and lapse when programme funding ends. Laboratory and analytical infrastructure for water quality, pesticide residues, and insecticide susceptibility testing is not available at the scale required, and enforcement reach into rural districts is weak, particularly for retail inspection and applicator licensing.

Against this, there is demonstrated capacity to mobilise at scale for emergency response — the locust and Fall Armyworm campaigns and flood-related disease response are the clearest examples — and there are functioning community delivery networks in the form of health volunteers, animal health workers, and Farmer Field School facilitators. The Plan is designed to work with this profile: it places routine surveillance and first-line management with community-level actors who are present year-round, reserves specialist functions for the PIU environmental and social team and state safeguards officers, contracts out analytical work that cannot be performed nationally, and funds these arrangements from the P/VMP budget in Section 10 rather than assuming government recurrent finance.

E.9 Capacity in the Project Area and Sector

Capacity varies markedly between the project's three risk zones and 24 districts. In the riverine irrigated districts of the Shabelle and Jubba corridors, agricultural extension presence and farmer organisation are comparatively established, health facilities and community health volunteer networks exist in the larger settlements, and there is direct local experience of Fall Armyworm and malaria management; canal management capacity, however, has been eroded by years of deferred maintenance, and Water User Associations require formation or substantial strengthening before they can carry operation-phase source reduction duties. In the semi-arid and dryland pastoral districts, animal health worker networks are the strongest local institution, while crop extension coverage is sparse; borehole and catchment management is often informal, and responsibility for wellhead drainage and trough maintenance is not clearly assigned. In the coastal and transitional districts, technical support for saline-affected irrigation and for brackish-water vector conditions is largely absent.

Across all zones, four constraints apply: no district holds entomological monitoring capability, so larval and adult surveillance must be established by the project; secure pesticide storage meeting the standards in Section 6.3 does not exist at most sites and must be constructed or procured; protective equipment, spray calibration, and spill response materials are not locally available; and access and security conditions in some districts limit the frequency of supervision visits, requiring reliance on locally resident personnel and remote verification. Contractor capacity for construction-phase vector measures — borrow pit and trench management, drainage of ponded areas — is untested and must be secured through contract clauses and induction rather than assumed.

E.10 Institutional Track Record in Safe Pesticide Management

The track record is mixed and instructive. National authorities and partners have repeatedly mounted large-scale pesticide operations under emergency conditions, notably against Desert Locust and Fall Armyworm, demonstrating ability to procure, distribute, and apply product at scale and, in the locust response, to deploy biopesticide as a lower-risk alternative. Community-delivered malaria prevention has a strong record of reach through volunteer networks and campaign logistics. These are genuine institutional strengths that this Plan builds on.

The weaknesses are equally clear. Pesticide registration and a published register of approved products are not operational; retail inspection and applicator licensing are not enforced; there is no obsolete pesticide inventory and no licensed disposal route, and past campaigns have left residual stock without a closure plan; container collection schemes do not exist; and there is no poisoning surveillance or incident reporting system, so failures are neither recorded nor corrected. Institutional memory of safe-

use training is not retained because training has been campaign-linked rather than embedded in extension curricula. The Plan responds by internalising the controls that national systems cannot yet provide — a project positive list, supplier and procurement conditions, stock reconciliation, mandatory container management, an incident register with defined notification routes, and independent verification through the project's third-party monitoring arrangements — while supporting MoAI and MoECC to develop the disposal and registration functions that remain government responsibilities.

E.11 Promotion of IPM and IVM within Current Management Practices

Integrated pest management is already the stated national position: the National Pesticide Policy identifies IPM as the preferred approach, and Farmer Field School programmes have given a cohort of Somali farmers and facilitators direct experience of scouting, thresholds, and non-chemical control. Integrated vector management is similarly endorsed through alignment with the WHO Global Vector Control Response and through the community-based orientation of the national malaria programme. What is absent is institutionalisation — IPM and IVM are not consistently embedded in extension curricula, agro-dealer advice, district planning, or recurrent budgets, so practice reverts to chemical-first control once programme support ends.

This Plan promotes IPM and IVM within current practice through five concrete channels. IPM content is embedded in the Component 2 delivery machinery — climate-smart agriculture demonstration plots, pest management demonstrations, Farmer Field School cycles, extension manuals, and mobile advisory messaging — so that it reaches farmers through the systems they already use. Agro-dealers are brought into the framework through the Component 3 upgrading activity, conditioned on stocking only approved products and on completing safe-use training, which addresses the advice channel that most influences farmer decisions. Water User Associations are given defined, monitorable source-reduction and vegetation-management duties within operation and maintenance frameworks, making vector management part of routine canal operation rather than a separate health activity. District-level coordination between agriculture, health, and livestock authorities is convened by the PIU so that pest, vector, and pesticide functions are planned jointly. Finally, monitoring indicators in F.21 track IPM and IVM adoption — scouting frequency, threshold-based decisions, area under non-chemical control, larval habitat reduction — rather than pesticide volumes alone, so that adoption is measured and reported.

The project also has an opportunity to contribute back to the national framework. Documentation of the BBS approach — the Approved Pesticide List and its annual revalidation, the field monitoring forms in Annex C, the training curricula, and the district coordination model — provides material that MoAI and the Ministry of Health can adapt for wider use, and the Plan requires that these outputs be shared with the responsible directorates at midline and project close.

3. PEST AND VECTOR BASELINE ASSESSMENT

3.1 Vector-Borne Disease Baseline

3.1.1 Malaria

Malaria is endemic throughout the BBS project area, with *Plasmodium falciparum* the dominant species. The primary vectors are *Anopheles gambiae* s.l. and *Anopheles arabiensis*, both of which breed in standing freshwater bodies including irrigation canal margins, waterlogged fields, and stagnant construction borrow pits. Transmission peaks during and after the gu (April–June) and deyr (October–November) rainy seasons. Somalia's malaria burden is among the highest in East Africa; the Shabelle River corridor (Hirshabelle and Southwest State) carries the heaviest transmission risk coinciding with the BBS canal rehabilitation zone.

Canal rehabilitation in Balcad District (13 canals, Hirshabelle), the 7 canals in the Janaale/Marka area (Southwest State), and the 2 canals in Zeylac District (Somaliland) — 22 canal sites in total — will create continuous standing water along canal margins during operation, with greatest risk during the gu season when canal flows are high and weed growth at canal margins is dense. All state-level ESMPs identify malaria as a residual risk requiring active management by canal committees.

3.1.2 Rift Valley Fever (RVF)

Rift Valley Fever, a zoonotic arboviral disease, presents a seasonal outbreak risk in Somalia's Shabelle and Jubba floodplain zones. RVF is transmitted by floodwater *Aedes* mosquitoes (*Aedes mcintoshi*, *Aedes circumluteolus*) that breed in shallow seasonal water bodies during and following major flood events. BBS water catchments in Galmudug and Kismayo, and the canal water bodies along the Shabelle corridor, represent potential RVF vector breeding sites during flood years. The 2006 and 2023 RVF outbreaks in Somalia caused significant human and livestock mortality in river-adjacent agro-pastoral communities closely resembling the BBS project communities. Given the project's High Climate Risk (Category 1) classification, climate-driven flood intensification increases future RVF risk.

3.1.3 Other Mosquito-Borne Diseases

- Dengue Fever: *Aedes aegypti* is present in urban and peri-urban areas of Kismayo and Mogadishu. While most BBS sites are rural, Kismayo District water catchments (Jubaland) are proximate to urban settings where *Aedes aegypti* breeding in water containers and construction materials requires management.
- Culex-borne diseases: *Culex quinquefasciatus* breeds in polluted standing water including canal spillage, trough overflow, and contaminated borehole drainage. While not a primary disease vector in Somalia's current context, Culex proliferation at water infrastructure sites contributes to community nuisance biting and may transmit West Nile virus under conditions of avian concentration near wetlands.

3.1.4 Livestock Vector-Borne Diseases

BBS livestock watering troughs and water kiosks in pastoral areas (Galmudug, Puntland, North East, Somaliland, and Jubaland) will concentrate livestock from multiple herds, creating conditions for tick-borne disease transmission and trypanosomiasis. Key livestock vector concerns include:

- Tick-borne diseases: *Babesia bigemina* (Redwater), and *Anaplasma marginale* are endemic in Somali livestock populations. Shared watering points increase tick load through inter-herd contact.
- Trypanosomiasis: Tsetse fly-borne nagana is present along the Jubba River corridor. Livestock using Jubba River water points in Luuq and Dollow districts may be exposed to tsetse challenge.
- Camel Pox and Newcastle Disease: Relevant to Somaliland's camel-dominated pastoral systems; water point concentration increases transmission risk.

3.2 Agricultural Pest Baseline

3.2.1 Fall Armyworm (*Spodoptera frugiperda*)

Fall Armyworm (FAW) has been present in Somalia since 2017 and is now established across the maize-growing areas of southern Somalia, including the BBS target districts of Janaale, Balcad, and Marka-Janale. Expanded irrigated maize production under BBS will increase the area at risk. FAW larvae cause severe defoliation and can reduce yields by 30–80% if unmanaged. BBS extension activities under Component 3 (Climate-Smart Agriculture) must integrate FAW scouting and management as a core element.

3.2.2 Desert Locust (*Schistocerca gregaria*)

Somalia is one of the primary breeding grounds for Desert Locust in the Indian Ocean recession area. The 2019–2021 Desert Locust crisis caused catastrophic crop and pasture losses across the BBS target states. Galmudug, Puntland, and Somaliland are in the core Desert Locust breeding zone. BBS water catchments and improved vegetation cover may attract locust concentration during gregarization periods. Coordination with the Desert Locust Control Organisation for Eastern Africa (DLCO-EA) and FAO's Global Locust Initiative is essential for early warning and response.

3.2.3 Other Significant Crop Pests

Table 5: Significant Agricultural Pest Species by Crop and District

Pest	Crops Affected	Affected Districts	Risk Level
Aphids (various spp.)	Sesame, vegetables, sorghum	Janaale, Balcad, Luuq	High — irrigated expansion
Whitefly (<i>Bemisia tabaci</i>)	Tomato, beans, okra	Janaale, Marka, Luuq	High — vector of crop viruses
Stem Borers (<i>Busseola fusca</i> , <i>Chilo partellus</i>)	Maize, sorghum	Balcad, Janaale	Moderate–High
Red Locust (<i>Nomadacris septemfasciata</i>)	Pasture, cereals	Jubaland interior	Moderate
Root-knot Nematodes	Vegetables, sesame	Irrigated areas — all districts	Moderate
Bruchid Beetles (<i>Callosobruchus</i> spp.)	Stored grain and legumes	All districts — post-harvest	Moderate
Fusarium Wilt / Smut fungi	Sorghum, sesame	Southwest, Hirshabelle	Low–Moderate

F. PROJECT INTEGRATED PEST AND VECTOR MANAGEMENT MEASURES

This section sets out the measures the project will apply to manage pests, disease vectors, and pesticides. It states the management strategy and the mitigation hierarchy that governs all decisions on intervention, assesses the available management options, and then specifies the integrated pest-management and integrated vector-management activities, the criteria and controls applying to any pesticide the project procures or facilitates, the protective measures for workers, communities, and the environment, and the consultation, capacity-building, and institutional arrangements through which the measures are delivered. The provisions in this section are binding on the PIU, state safeguards officers, contractors, Water User Associations, extension agents, and any party procuring or applying pesticides in connection with project activities.

F.1 Management Strategy and Application of the Mitigation Hierarchy

The project's pest and vector management strategy is preventive rather than reactive. Its premise is that the conditions creating pest and vector pressure — standing water, continuous cropping, monoculture, poor sanitation around water points — are largely determined by design and management choices, and that intervening on those conditions is more effective, cheaper, and less harmful than treating the resulting pest or vector populations with chemicals. Every management decision under this Plan is therefore taken by applying the following hierarchy in order, and a lower step may only be taken where the steps above it have been applied and shown to be insufficient:

Avoid pesticide use to the extent possible. Design, siting, hydraulic management, sanitation, crop and variety selection, planting timing, rotation, and habitat management are used first to prevent pest and vector problems from arising.

Where avoidance is not viable, minimise pesticide use and reduce it over time. Any use is targeted to the specific pest, location, and growth stage, at the lowest effective dose and smallest treated area, and the Plan sets a declining trajectory of chemical dependence over the project period, tracked through the monitoring indicators in F.21.

Manage pests below economically damaging levels rather than seeking eradication. Intervention is triggered by defined action thresholds based on scouting, not by the presence of a pest or by the calendar; complete elimination of pest populations is neither an objective nor an achievable outcome, and pursuing it destroys the natural enemies that provide free control.

Use combined methods, relying on non-chemical measures to the extent possible. Cultural, mechanical, biological, and nature-based measures are applied together and continue to be applied when a chemical intervention is made, so that chemical control supplements rather than replaces them. Two corollaries follow. First, where a pesticide is used, product selection, application, and disposal are governed by the criteria and controls in F.5 to F.14, and resistance management through rotation of modes of action is mandatory. Second, the hierarchy applies equally to vector management: source reduction and environmental management at project infrastructure take precedence over larviciding and adult control, and insecticide-based vector measures are used only where habitat cannot be eliminated or modified.

F.1.1 BBS IPM Hierarchy — Agricultural Pest Management

The BBS P/VMP adopts Integrated Pest Management (IPM) as the required approach for all agricultural pest management activities. IPM is defined as a science-based decision-making process that identifies and uses economically justified pest control tactics that minimise hazards to health and the environment. The IPM hierarchy for BBS is:

Table 6: BBS IPM Hierarchy — Agricultural Pest Management

Level	Approach	BBS-Specific Measures	Priority
1	Prevention (Cultural Controls)	Crop rotation; resistant variety selection under BBS seed systems (Component 2); healthy seedling production; optimum planting density; field hygiene and crop residue management	HIGHEST — Always first
2	Physical and Mechanical Controls	Insect traps (pheromone traps for FAW); manual removal of egg masses; bird scaring; protective netting on vegetable plots; physical barriers at locust invasion routes	HIGH
3	Biological Controls	Conservation and release of natural enemies (<i>Trichogramma</i> parasitoids for FAW); use of <i>Bacillus thuringiensis</i> (Bt) biopesticides; entomopathogens; push-pull cropping systems with <i>Desmodium</i> and Napier grass for stem borers	HIGH — Preferred chemical substitute
4	Chemical Controls (Last Resort)	Use only WHO Class II or III pesticides from the BBS Approved Pesticide List; trained applicators only; comply with PHI and MRL requirements; record all applications; never in or near water bodies	LOWEST — Only when Levels 1–3 insufficient

F.2 Assessment of Management Options

Three management options were assessed for the BBS context, judged against effectiveness against the target pests and vectors, safety for workers and communities, environmental risk, cost and affordability at smallholder level, and the institutional capacity available to sustain them.

Biological control and nature-based solutions only. Conservation of natural enemies, biopesticides, larvivorous fish, botanical preparations, intercropping, rotation, conservation agriculture, and canal-margin and catchment vegetation management. This option carries the lowest health and environmental risk, the lowest resistance risk, and strong co-benefits for soil, water, and biodiversity, and much of it is already present in local practice. It was assessed as insufficient on its own for two situations: an established Fall Armyworm infestation above threshold in a maturing cereal crop, and a Desert Locust hopper band or swarm incursion, where the speed of loss exceeds what non-chemical measures can contain. Biopesticide supply, registration, and shelf-life constraints in Somalia also limit reliability.

Combined biological or nature-based measures with proportionate chemical use — the option adopted. Prevention and non-chemical control are the standing regime; approved pesticides are used only on threshold exceedance, in targeted applications, with modes of action rotated, under the controls in F.5 to F.14. This option retains most of the health, environmental, and resistance benefits of the first option while providing a defensible response to outbreak conditions, and it is deliverable through the extension,

Farmer Field School, water user association, and community volunteer structures the project is already financing.

Exclusive chemical control. Routine or calendar-based spraying with synthetic pesticides and insecticide-led vector control. This option was rejected. Productivity implications: initial gains are eroded within a few seasons by resistance development, natural enemy loss, and pest resurgence, requiring rising doses for declining benefit. Sustainability implications: continuing cost burden on smallholders, contamination of the canal and shallow groundwater the project is financing, residue barriers to the higher-value markets Component 3 is intended to open, occupational and community exposure at a scale the available protective equipment and health services cannot manage, and non-compliance with OS3 and OS4 and with the FAO Code of Conduct. It is inconsistent with the National Pesticide Policy's own designation of IPM as the preferred approach.

The adopted option is reflected in the activities specified in F.3 and F.4 and in the pesticide controls in F.5 to F.14, and the assumption underlying it — that non-chemical measures carry the routine load — is tested through the monitoring indicators in F.21, which track scouting coverage, threshold-based decisions, and area under non-chemical management alongside pesticide volumes.

F.3 Proposed Integrated Pest-Management Activities

The project's integrated pest-management activities operate on three levels. At the preventive level, the cultural and habitat measures in F.1 are built into the agronomic packages promoted under Component 2 — crop rotation and legume intercropping, conservation agriculture and residue management, soil fertility restoration, adjusted planting calendars, resistant and early-maturing varieties, certified clean seed, field sanitation and destruction of crop residues harbouring pests, and conservation of natural enemies through field margins and restraint in spraying. At the surveillance level, weekly scouting during the cropping season is carried out by farmers and Farmer Field School groups using the monitoring forms in Annex C, with results reported to extension agents and consolidated by the state safeguards officer, and linked to national and regional early warning systems for migratory pests. At the intervention level, pest-specific protocols define the action thresholds, the sequence of non-chemical measures, and the conditions under which an approved pesticide may be used. The protocols for the two pests of greatest consequence to the project follow; the same threshold-based logic applies to aphids, whitefly, thrips, stem borers, and storage pests, for which scouting, natural enemy conservation, sanitation, and hermetic storage are the first-line measures.

F.3.1 Fall Armyworm (FAW) Management Protocol

Given the high risk of FAW under expanded irrigated maize, the following mandatory protocol applies to all BBS maize-growing beneficiaries in Hirshabelle and Southwest State:

- Scouting: Weekly monitoring of all maize plots from V3 stage to tasselling; trained WUA members conduct scouting using the FAO FAW scouting protocol; report infestation levels to extension officer fortnightly.
- Action Threshold: Apply control measures only when $\geq 20\%$ of plants show FAW damage during vegetative stage, or $\geq 10\%$ at whorl stage (following FAO East Africa thresholds).
- Biological control first: Apply *Bacillus thuringiensis* (Bt) products or *Metarhizium anisopliae*-based biopesticides to whorls at first sign of infestation; use push-pull systems where Desmodium varieties are available through BBS seed distribution.
- Chemical control: If Bt application is insufficient, apply a WHO Class II pyrethroid (e.g., emamectin benzoate or chlorpyrifos — from Approved List only) to whorls using a knapsack sprayer; apply in early morning or evening; avoid spray drift to water bodies.

- Notification: All chemical pesticide applications must be recorded in the Site Pesticide Register and reported to the PIU E&S Officer within 5 days.

F.3.2 Desert Locust Contingency Protocol

The BBS project will not conduct independent locust control operations. All locust early warning and control is the responsibility of the national Desert Locust Control Programme (MoAI) coordinated with DLCO-EA and FAO. BBS obligations are:

- PIU to maintain an active liaison with MoAI's Plant Protection Directorate and FAO's Locust Watch system to receive early warning information for all BBS districts.
- WUAs and extension workers to be trained in locust hopper band and swarm identification and reporting procedures, using FAO's eLocust3m mobile reporting application where connectivity allows.
- If a locust swarm threatens a BBS project community, PIU notifies DLCO-EA within 24 hours and supports community coordination of asset protection measures (covering stored grain, protecting seedbeds).
- No BBS project funds will be used for aerial or ground-based organophosphate locust control. Any controlled operations are the responsibility of the national programme.
- If national locust control teams plan ground or aerial spraying within or near BBS project sites, the PIU shall obtain advance notice and implement a community notification and exclusion protocol: affected communities, WUAs, and farmers shall be informed — in Somali and through accessible channels — of the timing, location, and product to be used before spraying begins.
- Exclusion and buffers: A minimum exclusion buffer shall be maintained around BBS canals, boreholes, shallow wells, water catchments, and demonstration plots during control operations — no less than the distance specified by the control agency and in any case sufficient to protect water sources — and people shall be kept clear of treated areas for the product's re-entry interval.
- Livestock and water-point protection: Livestock shall be moved out of and kept away from areas to be sprayed, and drinking-water points covered or protected, for the period advised by the control agency; watering and grazing shall resume only after the advised interval.
- Incident reporting: Any spray drift, contamination of water or crops, livestock loss, or human exposure associated with locust control near BBS sites shall be recorded and reported through the project incident-reporting protocol (F.21.3) and the grievance mechanism (Section 10), and notified to the control agency and to AfDB within the project's serious-incident timeframe.

F.4 Proposed Integrated Vector-Management Activities

Integrated vector management under the project follows the same hierarchy as pest management, with source reduction and environmental management as the primary measures, community protection as the second line, and insecticide-based control reserved for situations where habitat cannot be eliminated or modified or where an outbreak is under way. Activities are organised around the three risk zones identified in B.4.1: canal-based malaria vector management in the riverine zone, floodwater Aedes and Rift Valley Fever contingency response in the floodplains, and livestock vector management at water points in the pastoral zones. Larval and adult vector surveillance, community habitat mapping, and coordination with district health authorities and the national malaria programme underpin all three, and the entomological indicators and thresholds that trigger escalation are set out in F.21. The protocols below apply to construction, commissioning, and operation phases, and contractor obligations are incorporated into contractor environmental and social management plans.

F.4.1 Malaria Vector Management — Canal Sites

Malaria vector management in canal sites follows a source reduction — environmental management — community protection hierarchy. The following measures are mandatory at all Shabelle River canal sites (Hirshabelle and Southwest State):

F.4.1.1 Source Reduction — Construction Phase

- All borrow pits created during canal earthworks must be backfilled or contoured to drain immediately upon completion of the relevant canal section; no stagnant borrow pits are permitted to persist beyond 7 days post-excavation. This requirement is a mandatory clause of each Contractor's Environmental and Social Management Plan (C-ESMP) and a continuing canal operation-and-maintenance (O&M) obligation.
- Compliance shall be verified using a borrow-pit inspection/close-out form completed by the contractor and signed off by the PIU and the WUA before demobilisation; the form shall record each pit's location, backfilling/contouring status, and drainage condition.
- A named WUA focal person shall be designated for each canal scheme to monitor borrow pits and other standing-water points during operation and to report any re-formed pools to the PIU for remedial action.
- Desilted spoil material must be deposited on high ground ≥ 10 metres from canal edges; spoil mounds must not create water-trapping depressions.
- Canal embankment works must restore positive drainage; contractor must demonstrate that no water-trapping depressions remain within 5 metres of the canal works footprint at the end of each working day.
- Temporary access roads with rutted surfaces that trap water must be graded and compacted within 48 hours of construction completion for each segment.

F.4.1.2 Environmental Management — Operation Phase

- Canal committees (WUAs) must designate a Vector Management Focal Person per canal site, responsible for monthly canal margin inspection and documentation.
- Canal margin vegetation must be maintained below 20 cm height within 1 metre of the canal bank on both sides, cleared at minimum every 6 weeks during crop season and every 8 weeks in off-season.

- Any structural defect allowing water ponding (blocked culverts, breached embankments, seepage areas) must be reported to the WUA focal person and repaired within 14 days.
- Larviciding with WHO-approved *Bacillus thuringiensis israelensis* (Bti) products (e.g., Vectomax, Vectobac) is permitted in persistent stagnant water areas where drainage is not feasible; Bti is not classified as a chemical pesticide and does not trigger the pesticide management restrictions below.

F.4.1.3 Community Protection Measures

- PIU and district health authorities to coordinate insecticide-treated bed net (ITN) distribution campaigns targeting all farming households within 500m of BBS canal sites; prioritise women and children under five.
- Community health volunteers in each BBS canal village to be trained in malaria symptom recognition and rapid diagnostic test (RDT) use; referral protocol to nearest health facility to be documented and tested at start of each crop season.
- BBS workers accommodated near canal sites must receive ITNs, prophylactic guidance, and access to malaria case management.

F.4.2 Rift Valley Fever (RVF) Contingency Protocol

RVF TRIGGER PROTOCOL

If any major flood event occurs in the Shabelle or Jubba River corridor, or within 50km of a BBS water catchment, during the project period, the PIU must:

- 1) Immediately notify the state Ministry of Health and Ministry of Livestock;
- 2) Activate enhanced livestock surveillance in communities using BBS water infrastructure;
- 3) Suspend livestock movements through BBS water points for 14 days pending RVF status assessment;
- 4) Report to AfDB within 5 working days.

- PIU to establish a quarterly liaison with FAO Somalia's RVF early warning system (EMPRES-i) to receive real-time alerts on RVF risk index conditions for project districts.
- Community animal health workers (CAHWs) operating in BBS pastoral areas must be trained in RVF recognition and reporting protocols.
- All BBS water catchments in Galmudug and Jubaland must include drainage outlet designs that prevent prolonged water ponding beyond 14 days post-rainfall, to limit *Aedes* breeding duration.

F.4.3 Livestock Vector Management at Water Points

- Livestock watering troughs at all BBS kiosks and water points must be constructed with overflow drainage channels directing spillage away from the trough base to prevent *Culex* and *Aedes* breeding in trough overflow pools.
- Trough water must be refreshed at minimum every 48 hours during the dry season; standing trough water older than 72 hours creates *Culex* breeding conditions and must be drained and refilled.
- WUAs must maintain a 3-metre clearance zone around all livestock troughs free of vegetation and debris to reduce tick habitat; this zone should be swept or raked weekly.

- PIU to coordinate with the Ministry of Livestock to include tick awareness and control education in BBS community mobilisation events at all pastoral water point sites (Galmudug, Puntland, Somaliland).
- Animals presenting with tick burden, skin lesions, or abnormal behaviour at BBS water points should be reported by trough attendants to the nearest CAHW; record in the site log.

F.5 Pesticide Selection and Procurement Criteria

No pesticide may be procured, financed, distributed, or applied under the project unless it appears on the BBS Approved Pesticide List in Annex A. A product is admitted to that List, and retained on it at each annual revalidation, only where it satisfies all of the following criteria:

Compliance with applicable Environmental, Health and Safety Guidelines. The product and its intended use pattern are consistent with the AfDB Integrated Safeguards System, the World Bank Group Environmental, Health and Safety Guidelines as good international industry practice, and the FAO International Code of Conduct on Pesticide Management.

Compliance with national law and applicable international conventions and protocols. The product is lawful in Somalia and is not listed, prohibited, or severely restricted under the Stockholm Convention, the Montreal Protocol, or the Rotterdam Convention prior informed consent procedure, and its supply meets Rotterdam Convention documentation requirements.

Assessment of carcinogenicity, mutagenicity and reproductive toxicity. Products classified as carcinogenic, mutagenic, or toxic to reproduction, or listed as Highly Hazardous Pesticides under the FAO/WHO criteria, are excluded. WHO Class Ia and Ib products are prohibited without exception; only Class II and Class III products may be listed.

Effectiveness against the target species. The product has demonstrated efficacy against the specific pest or vector at the intended growth stage and use pattern in comparable conditions, and is not selected on price or availability alone.

Negligible adverse human-health effects and minimal effects on non-target species and the natural environment. Acute and chronic toxicity, aquatic toxicity, toxicity to bees and other pollinators and to natural enemies, persistence, mobility, and bioaccumulation potential are assessed, with preference for products of short environmental persistence, low aquatic toxicity, and selective mode of action.

Registration or authorisation for the intended crop, livestock or use pattern, where required. The product is registered or otherwise authorised for the crop, livestock species, or vector-control use for which it is intended, and label directions specify that use; off-label use is prohibited. Where national registration is unavailable, registration in a country with a functioning regulatory authority, together with MoAI concurrence, is required.

Prevention of pest resistance and protection of natural enemies. The List includes products from more than one mode-of-action group for each principal target pest so that rotation is possible, records the mode-of-action classification for each product, and excludes products whose use would compromise the natural enemy complexes on which the IPM approach depends.

Procurement is additionally subject to the supplier, packaging, documentation, and record-keeping requirements in F.5.2 and F.6, and the List is revalidated annually by the PIU environmental and social team with MoAI and the Plant Protection Directorate, with any product failing a criterion removed and remaining stock withdrawn and managed under F.14.

F.5.1 Core Pesticide Restrictions

ABSOLUTE PROHIBITIONS — ALL BBS SITES

The following are strictly prohibited at all BBS project sites and in all project-supported agricultural activities:

1. WHO Class Ia and Ib (Extremely and Highly Hazardous) pesticides
2. Persistent Organic Pollutants (POPs) listed under the Stockholm Convention, including aldrin, dieldrin, DDT, and endosulfan.
3. Pesticides subject to the Prior Informed Consent (PIC) procedure, or otherwise listed, banned, or severely restricted under the Rotterdam Convention.
4. Pesticides that meet the criteria for carcinogenicity, mutagenicity, or reproductive toxicity (CMR — Categories 1A and 1B), and any Highly Hazardous Pesticide (HHP) as defined by the FAO/WHO Joint Meeting on Pesticide Management.

5. Any pesticide that is banned, withdrawn, unregistered, or severely restricted under the national legislation of the Federal Republic of Somalia or the applicable Federal Member State or Somaliland authority.
6. Any pesticide NOT included on the BBS Approved Pesticide List.
7. Application of any pesticide within 10 metres of an open canal, borehole, water catchment, or water body.
8. Aerial pesticide application without prior written PIU and MoAI approval; (6) Application of pesticides by untrained persons.

The BBS Approved Pesticide List (Annex A) has been compiled in accordance with WHO Pesticide Classification 2019, the FAO International Code of Conduct, and AfDB safeguard requirements. It includes only WHO Class II and Class III products with established safety profiles for use in smallholder agricultural settings. The list must be reviewed and revalidated annually by the PIU E&S Specialist.

F.5.2 Pesticide Procurement and Supply Chain Management

- All pesticides procured under BBS project activities (including through farmer training, and demonstration plots) must be from the Approved Pesticide List only, sourced from registered suppliers, and accompanied by full Safety Data Sheets (SDS) in either English or Somali.
- No project funds may be used to procure pesticides not on the Approved List, regardless of their agricultural effectiveness.
- Procurement records for all pesticides purchased under BBS must be submitted quarterly to the PIU E&S Specialist and included in safeguards monitoring reports.
- Expired pesticides discovered at project sites must be double-bagged, labelled, and collected by the PIU for disposal in accordance with FAO guidelines for obsolete pesticide disposal; no field burning or burial is permitted.
- Supplier Due Diligence: Before any procurement, the PIU E&S Specialist shall verify and document, for each supplier: (a) a valid business/trading licence and, where applicable, pesticide-dealer registration; (b) the national registration status of each product to be supplied; (c) that products are genuine and correctly labelled (manufacturer, active ingredient, WHO class, registration number, batch number, and manufacture and expiry dates); (d) that stock is within shelf life and not repackaged or decanted; (e) importation documentation (import permit, customs clearance, and quality/phytosanitary certificate) for imported products; and (f) capacity to supply Safety Data Sheets in English or Somali. A completed Supplier Due Diligence Checklist shall be retained for each approved supplier.
- Batch and expiry verification: On receipt, every consignment shall be inspected against the purchase order and the supplier's documentation. Batch numbers and expiry dates shall be recorded in the pesticide stock register, and any product that is expired, damaged, leaking, unlabelled, or repackaged shall be rejected and returned to the supplier.
- Transport: Pesticides shall be carried in original sealed containers, segregated from food, feed, seed, passengers, and livestock, secured against spillage, and accompanied by Safety Data Sheets and a delivery note. Drivers and handlers shall be briefed on spill-response procedures before transport.
- Local pesticide shops supplying project-supported farmers shall be subject to the same due diligence and to periodic audit by the PIU E&S Specialist (at least annually), covering product legitimacy, storage conditions, record-keeping, and staff training. Shops that fail an audit shall not be used for project-supported activities until the deficiencies are corrected.

- **Obsolete and unwanted pesticides:** Any obsolete, expired, banned, or unwanted pesticide identified at a project site or supplier shall be managed under the following response procedure: (a) immediate safe temporary storage in a secure, ventilated, bunded, and clearly signed store, segregated from usable stock; (b) recording in an Obsolete Pesticide Inventory Form (product, quantity, container type, condition, source, and date); (c) over-packing of leaking or deteriorated containers in labelled, compatible secondary packaging; (d) appointment of the PIU E&S Specialist as responsible focal person to coordinate collection; and (e) transfer to a licensed hazardous-waste contractor for final disposal in accordance with FAO guidelines and Section 6.5. Field burning, burial, or disposal in general waste is strictly prohibited.

F.6 Manufacture, Formulation, Packaging and Labelling Requirements

The project does not manufacture or formulate pesticides. Where products are procured, they must be manufactured and formulated by facilities operating to recognised quality standards, and the PIU must obtain evidence of the manufacturer's identity and of product specification for each batch. Only ready-to-use commercial formulations are permitted; on-site mixing of technical-grade material, re-formulation, and repackaging by suppliers or by the project are prohibited. Preference is given to formulations that reduce operator exposure and drift — water-dispersible granules, suspension concentrates, and closed or measured-dose packaging — over dusts and emulsifiable concentrates where an equivalent product is available.

All product must be delivered in the manufacturer's original, unopened, undamaged containers, sealed and of a size appropriate to a single season's assessed need, so that decanting is unnecessary. Labels must be intact, securely affixed, and legible, and must state the product name and active ingredient with concentration, the manufacturer, batch number, date of manufacture and expiry, registration or authorisation reference, WHO hazard classification with the corresponding colour band and hazard pictograms, authorised crops or uses with dose rates, re-entry interval, pre-harvest interval, first-aid and antidote information, and disposal instructions. Labelling must be in a language the intended users can read; where the manufacturer's label is not in Somali, the PIU must attach a supplementary label in Somali carrying the hazard, dose, protective equipment, re-entry, pre-harvest interval, and first-aid information, without obscuring the original label. A current Safety Data Sheet must accompany every consignment, be held at the storage point, and be available at the point of use. Product without a compliant label or Safety Data Sheet must be rejected on delivery and must not be taken into store.

F.7 Transport, Distribution and Handling Controls

Pesticides must be transported in the original sealed containers, secured against movement and impact, and segregated from food, feed, seed, fertiliser, medicines, and passengers; carriage of pesticides in vehicles carrying food or people, or in the passenger compartment, is prohibited. Consignments must be accompanied by delivery documentation and Safety Data Sheets, and the vehicle must carry a basic spill kit — absorbent material, shovel, heavy-duty bags, gloves — with the driver briefed on spill and emergency procedures and on the notification route. Loading and unloading must be supervised, containers must not be dropped, rolled, or dragged, and any container found leaking or damaged must be isolated in secondary containment and reported to the PIU environmental and social team rather than accepted or forwarded.

Distribution within the project is by controlled issue rather than open supply. Product moves from the project store to a named, certified applicator or a trained Water User Association or Farmer Field School representative against a signed issue record specifying product, quantity, intended site, target pest, and date, with unused product returned and recorded. Quantities issued must not exceed the assessed requirement for the immediate application. Onward sale, gifting, or transfer of project-supplied product to any other person is prohibited and is treated as a compliance breach. Where the project supports agro-

dealers under Component 3, the same handling, segregation, labelling, and record-keeping standards apply as a condition of that support, and dealers must not decant or repackage product. Handling at every stage requires the protective equipment specified in F.10, and washing water and soap must be available wherever containers are opened, measured, or mixed.

F.8 Storage and Inventory Controls

All pesticide storage at BBS project sites (contractor stores, extension demonstration centres, and WUA supply stores) must comply with the following minimum standards:

- Dedicated locked storage facility with ventilation, impermeable floor, and bunding to contain spills; minimum 50 metres from any water body, food storage, or residential dwelling.
- Clearly labelled pesticide storage with separate shelving by product class; incompatible products (e.g., oxidisers and flammables) stored separately.
- Fire extinguisher, spill kit (absorbent material, PPE), and emergency eyewash station at each storage location.
- Pesticide storage inventory updated weekly; stock reconciled monthly against application records.
- No more than a 30-day supply of any pesticide to be held at site level; bulk procurement and central storage at PIU level only.
- Site-specific storage layout drawing: Each store shall have an approved layout drawing showing shelving, segregation of incompatible products, spill containment/bunding, ventilation, fire points, and the eyewash/first-aid station. No pesticide may be stored until the facility and its layout have been inspected and approved in writing by the PIU E&S Specialist.
- A named, trained storekeeper shall be designated for each store, responsible for access control, the stock register, and daily housekeeping; keys shall be held only by authorised personnel.
- Signage: Each store shall display clear hazard signage (“DANGER — PESTICIDES”; no smoking, eating, or drinking), the name and telephone number of the storekeeper and PIU E&S focal person, and the nearest health facility and emergency contacts.
- A bound stock register shall record all receipts and issues (product, batch, expiry, quantity in/out, balance, recipient, and purpose) and be reconciled monthly against application records.
- A spill-response drill shall be conducted at least twice yearly at each store; a storage inspection checklist shall be completed monthly by the storekeeper and quarterly by the PIU E&S Specialist, with deficiencies recorded and corrected within a defined timeframe.

F.9 Application Methods, Timing and Frequency

- All pesticide applicators must complete the BBS Pesticide Safety and Application Training (Section 8.2) before any application.
- Minimum PPE for application: chemical-resistant gloves, eye protection, long-sleeved clothing, and closed shoes; full respirator for WHO Class II formulations.
- Applications must occur only during calm weather (wind speed <3 m/s); never during rainfall or within 24 hours of forecast rain; preferably in early morning (0600–0900) before heat and wind increase.
- Spray buffers: minimum 10m from open water bodies, 5m from residential structures, 3m from non-target crop vegetation.

- Post-application record: All applications documented in the Site Pesticide Register within 24 hours, including product name, quantity applied, area treated, applicator name, weather conditions, and any incidents.
- Sprayer calibration: Application equipment shall be calibrated before each spraying campaign and checked for leaks and nozzle wear, with calibration records retained; faulty or leaking equipment shall not be used.
- Re-entry intervals (REI): Treated areas shall be posted and workers and community members kept out for the re-entry interval on the product label (minimum 24 hours where the label is silent); postings shall be in Somali and use pictograms.
- Pre-harvest intervals (PHI): The label pre-harvest interval shall be strictly observed before any treated crop is harvested, consumed, or sold, and the PHI shall be recorded for each application.
- Applicator medical fitness: Applicators shall be certified medically fit before assignment and re-checked annually. Pregnant or breastfeeding women, persons under 18, and persons with relevant medical conditions shall not handle or apply pesticides. Cholinesterase monitoring shall be arranged where organophosphate or carbamate products are used.
- Wash and decontamination facilities: Clean water, soap, and a change of clothing shall be available at every application site for routine and emergency decontamination; contaminated PPE and clothing shall be washed separately from household laundry.
- First aid and poisoning response: A pesticide first-aid kit and the relevant SDS/antidote guidance shall be on site during application; all applicators shall know the poisoning symptoms, first-aid steps, and referral route to the nearest health facility (see Annex D).
- Weather verification: Wind speed, temperature, and rainfall forecast shall be checked and recorded before each application; spraying shall not proceed outside the conditions specified in this Section, and the readings shall be entered in the Site Pesticide Register.

F.10 Personal Protection, Worker Safety and User Training

No person may mix, load, or apply a pesticide under project activities unless they have completed the project's certified applicator training and are equipped with the required protective equipment, which the project supplies rather than assuming local availability. The minimum equipment for mixing and application is a long-sleeved coverall, chemical-resistant gloves, closed boots, eye protection, and a respirator or appropriate face protection where the label or Safety Data Sheet requires it, with a face shield and apron for mixing and decanting. Equipment must be inspected before each use, cleaned after use, stored separately from clothing and away from pesticides, and replaced when damaged; contaminated clothing must be washed separately from household laundry at the project's washing facility, not in the household or at a watercourse.

Work practices are mandatory as follows: mixing at a designated site at least 10 metres from any water body, well, or dwelling, using dedicated measuring equipment and never bare hands; no eating, drinking, or smoking during handling or application; washing of hands and face before any break and full washing after work, with soap and clean water provided at the point of use; a maximum continuous spraying period consistent with heat conditions, with work scheduled to the cooler parts of the day; no lone working during application; and immediate cessation and reporting on any sign of exposure or poisoning. Applicators must not be under 18, pregnant, or breastfeeding. Each site must hold a first-aid kit, eyewash, clean water, Safety Data Sheets, and the contact details and route to the nearest health facility, and the PIU must notify that facility in advance of the products in use and their antidotes. Health screening is offered to regular applicators, and all exposure incidents are entered in the incident register and reported under F.21.3. Training content, audiences, and frequency are set out in Section 8, and certification must be refreshed annually.

F.11 Protection of Communities, Domestic Animals and Non-Target Species

Communities must be informed before any application. The PIU or Water User Association must give at least 48 hours' notice to households, schools, health facilities, and livestock keepers within the notification radius, by the channels agreed in the Stakeholder Engagement Plan, stating the product, location, date, re-entry interval, and precautions, and must post warning signs at treated field boundaries in Somali for the duration of the re-entry period. Application is prohibited within 30 metres of dwellings, schools, health facilities, markets, and community water points, and within 10 metres of any canal, borehole, catchment, well, trough, or open water. Spraying must not be carried out when wind speed would cause drift toward these receptors, and downwind buffers must be increased where necessary.

Livestock must be excluded from treated areas for the period specified on the label or, where no period is specified, for a minimum of seven days, and watering points and troughs must be protected from drift and run-off; treated crop residues must not be fed to animals within the withdrawal period. Where acaricides are used at water points, treatment must take place away from the trough with run-off contained, and milk and meat withdrawal periods must be observed and communicated to herders. Pre-harvest intervals must be observed without exception on any crop intended for consumption or sale, and the intervals for each listed product are recorded on the Approved Pesticide List. For non-target species, applications toxic to bees must not be made during flowering or during periods of pollinator activity, spraying must avoid field margins, hedges, and trees maintained as natural enemy refuges, and no application may be made in or adjacent to wetland or riparian habitat of biodiversity value without prior assessment by the PIU environmental and social team. Selective products and spot treatment are required in preference to broadcast application wherever the pest distribution permits.

F.12 Prevention of Surface-Water, Groundwater and Soil Contamination

Protection of the water resources the project is financing is a primary control objective. The mandatory measures are: a minimum 10-metre no-application buffer from all canals, boreholes, shallow wells, dug wells, catchments, troughs, and open water, widened where slope, wind, or shallow water table warrant; a prohibition on mixing, filling, calibrating, or washing equipment within 30 metres of any water body or well, with these operations carried out at a designated hardstanding or lined mixing area with containment; a prohibition on discharge of surplus spray, tank washings, or rinsate to any watercourse, drain, or soakaway, with rinsate returned to the spray tank and applied to the treated crop; and back-flow prevention when drawing water for tank filling, using a separate vessel rather than immersing the hose or tank in the water source.

Product selection favours compounds of low aquatic toxicity, short persistence, and low leaching potential, and products with high mobility must not be used on sandy or shallow-water-table sites, including the coastal and dryland well fields. No application may be made when rainfall or irrigation is expected within the period stated on the label, and irrigation scheduling must avoid immediate post-application flushing of treated fields into the canal network. Storage points must have impermeable floors, containment sills, and no floor drain connecting to the environment, as specified in F.8. Water quality monitoring at defined sampling points, with action thresholds and corrective actions, is set out in F.21.2.1, and exceedance of a threshold triggers suspension of application in the contributing area pending investigation.

F.13 Management of Spills, Residues and Contaminated Equipment

Every storage point, mixing area, and transport vehicle must hold a spill kit comprising absorbent material such as sand, sawdust, or vermiculite, a shovel, heavy-duty bags or drums, gloves, and eye protection, and personnel must be trained in its use. On a spill, the response sequence is: stop the source and

contain, keep people and animals away, do not wash the spill to a drain or watercourse, apply absorbent from the outside inward, collect the contaminated material into a labelled sealed container, decontaminate the surface, record the incident, and report it to the PIU environmental and social team. Any spill reaching or threatening a canal, well, catchment, or drinking water source is a serious incident requiring immediate notification of the PIU, district authorities, and affected communities, suspension of water use pending assessment, provision of alternative water supply where needed, and notification to the Bank within 72 hours under F.21.3.

Residues and contaminated materials — absorbent, soil, protective equipment beyond cleaning, and expired product — must be segregated, labelled, and held in secure containment pending disposal arranged with MoAI and the Ministry of Environment and Climate Change; burning, burial, and discard are prohibited. Application equipment must be cleaned after every use at the designated washing area with rinsate applied to the treated crop, must not be washed in or beside a watercourse, and must not be used for any other purpose, particularly not for water or food; equipment is dedicated, marked, and stored with the pesticide store rather than in dwellings. Sprayers must be checked for leaks and calibrated at least at the start of each season and after any repair, with calibration recorded. Contaminated protective equipment that cannot be decontaminated is treated as hazardous waste under F.14.

F.14 Management of Empty Containers, Obsolete Pesticides and Contaminated Packaging

- Triple-rinse all empty pesticide containers before disposal; rinsate applied to target area.
- Rinsed containers to be punctured, deformed, and collected in clearly labelled waste bags; never reused for any purpose.
- Collected empty containers transported only to a disposal facility or licensed hazardous-waste contractor that has been verified and approved for pesticide waste (see below); disposal records retained. Generic district waste-collection points shall not be used unless specifically verified in writing as acceptable for pesticide containers.
- Under no circumstances are empty pesticide containers to be disposed in canals, water bodies, or open land near communities.
- Approved disposal facilities and contractors: The PIU shall establish and maintain a register of approved hazardous-waste disposal facilities and/or licensed contractors for each state/area of operation, confirming the licensing, legitimacy, and technical suitability of each before use. Where no compliant facility exists in a state, waste shall be consolidated and transported to the nearest approved facility.
- Chain of custody: All transfers of pesticide waste and obsolete stock to a disposal contractor shall be documented with chain-of-custody records (waste type, quantity, container count, transporter, date, and final disposal destination), signed at each transfer point and retained by the PIU.
- Prohibition: Disposal of pesticide waste in generic district waste points, canals, water bodies, or open land, or by field burning or burial, is prohibited unless a specific point has been verified in writing as acceptable for pesticide waste by the PIU E&S Specialist.

INTEGRATED PEST AND VECTOR MANAGEMENT PLAN

Table 7: BBS IPM Hierarchy — Agricultural Pest Management

IMPACT	MITIGATION MEASURES	PHASE OF IMPACT OCCURREN	RESPONSIBILITY OF IMPLEMENTATION	FREQUENCY	MONITORING INDICATOR	COST OF IMPLEMENTATION
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		CE IN THE PROJECT				
Increased Anopheles mosquito breeding in rehabilitated/operating canals, raising malaria transmission risk	Source reduction (canal-margin weed clearance, elimination of stagnant pools, flow maintenance); Bti larviciding where source reduction is insufficient; promotion of LLIN use; larval-habitat surveillance (§5.1)	Operation	WUAs / canal committees ; PIU E&S Specialist; MoH	Weekly in peak (gu) season; monthly otherwise	Number of breeding sites; larval counts; malaria case trend	Per P/VMP budget matrix (Bti, monitoring, CHV stipends)
Rift Valley Fever (RVF) risk associated with irrigation water and livestock water points	RVF contingency protocol; joint human/animal surveillance; vector control; community notification and movement advisories (§5.2)	Operation	PIU E&S; Ministry of Livestock; MoH	Seasonal ; on outbreak alert	RVF surveillance signals; response time to alert	Per P/VMP budget matrix (emergency response)
Fall Armyworm and other crop-pest infestation in expanded irrigated area	IPM hierarchy — scouting, cultural and biological control, threshold-based use of approved pesticides only; FAW management protocol (§4.1–4.2)	Operation	MoAI extension; farmers; PIU	Weekly scouting during cropping cycle	Pest incidence; % area under IPM; pesticide volumes	Per P/VMP budget matrix (training, traps, PPE)
Desert Locust incursion and impacts of national control spraying near BBS sites	Locust contingency protocol; community notification and exclusion, buffer zones, livestock-movement and water-point protection during control operations; incident reporting (§4.3)	Operation	PIU; MoAI / FAO / DLCO-EA; WUAs	On alert / during control campaigns	Notifications issued; buffer compliance; incidents reported	Per P/VMP budget matrix (emergency response)

Pesticide contamination of soil, water, and food from misuse or off-label use	Approved Pesticide List only; prohibition of Class Ia/Ib, CMR, POPs and Rotterdam-PIC products; application buffers; storage, application and disposal standards; residue monitoring (§6)	Operation	PIU E&S; suppliers; trained applicators	Continuous; quarterly residue monitoring	Residue results vs. thresholds; audit findings	Per P/VMP budget matrix (lab testing, EC meters)
Occupational exposure and poisoning of applicators and workers	Mandatory training and certification; PPE; medical fitness and cholinesterase monitoring; wash/decontamination; first aid and EPRP (§6.4, §8, Annex D)	Construction & Operation	PIU; contractors; MoAI	Per application; annual medicals	Poisoning incidents; PPE compliance; training records	Per P/VMP budget matrix (PPE, training, medicals)
Culex mosquito and livestock-vector (tick) breeding at boreholes and water catchments	Drainage and apron design, spillage and run-off control at water points; livestock vector management (§5.3)	Operation	WUAs; PIU	Monthly	Standing-water points; vector counts	Per P/VMP budget matrix (O&M)
Empty-container and obsolete-pesticide waste	Triple-rinse, puncture and collection; licensed/approved disposal contractor; chain-of-custody; obsolete-pesticide response procedure (§6.2, §6.5)	Operation	PIU E&S; licensed contractor	Continuous	Containers accounted for; chain-of-custody records	Per P/VMP budget matrix (disposal)
Borrow pits from canal earthworks creating standing-water breeding habitat	Mandatory backfilling or contouring and drainage of borrow pits as a C-ESMP clause	Construction	Contractor; PIU; WUA focal person	At completion of works; periodic	Borrow pits backfilled/contoured; inspection forms	Per C-ESMP / contractor BoQ

	and canal O&M obligation; WUA inspection (§5.1.1)			inspection		
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F.15 Measures for Third Parties and Supply Chains

Much of the pesticide risk associated with the project arises through parties the project does not employ. Contractors are bound by pest and vector clauses incorporated into their contracts and contractor environmental and social management plans, covering borrow pit and trench management, drainage of ponded water, prohibition of unapproved products, applicator certification and protective equipment, storage standards, spill response, and incident reporting, with compliance verified by the state safeguards officer and non-compliance addressed through contractual remedies. Suppliers of pesticides and application equipment must meet the conditions in F.5.2 and F.6 — registered status, original sealed labelled packaging, Safety Data Sheets, batch documentation — and supply contracts must permit rejection of non-compliant consignments and require take-back of damaged or expired product.

Agro-dealers receiving support under Component 3 are subject to eligibility conditions: stocking only products consistent with the Approved Pesticide List for project-linked sales, no decanting or repackaging, compliant labelling and storage, completion of safe-use and IPM training, provision of Safety Data Sheet information to buyers, and participation in container return arrangements. Seed and input suppliers under Component 2 must meet phytosanitary requirements so that pest and disease problems are not introduced with planting material.

Aggregation, storage, and warehouse operators supported under Component 3 must apply hermetic and non-chemical storage measures as the first-line approach and may use fumigants only through trained personnel under the controls in this section. Farmer organisations, Water User Associations, and community volunteers acting on the project's behalf are treated as implementers for the purposes of this Plan and must be trained and equipped accordingly. Compliance with these requirements is a condition of project support, and the PIU maintains a register of participating third parties and their compliance status.

F.16 Stakeholder and Public Consultation

Consultation is both a preparation requirement and a continuing obligation. In preparing this Plan, consultation was undertaken with MoAI and its Plant Protection Directorate, state ministries of agriculture, health, and livestock, the Ministry of Environment and Climate Change, FAO Somalia, and community representatives at project sites, and the outcomes are recorded in the consultation and disclosure record in [Section 8.2](#).

During implementation, the project will disclose this Plan and the Approved Pesticide List in accessible form, consult communities before any pesticide application in their vicinity under the notice requirements in F.11, engage Water User Associations on canal vegetation and source-reduction duties, and hold periodic district-level meetings with agriculture, health, and livestock authorities and community representatives to review pest and vector conditions and management performance.

Consultation must be inclusive by design. Meetings must be scheduled, sited, and facilitated so that women, youth, pastoralists, and people with limited literacy can participate, with separate women's sessions where appropriate, and materials must be in Somali and use pictorial formats for hazard and protective information. Community grievances and concerns relating to pesticide use, spray drift, water contamination, vector nuisance, and health effects are handled through the project's grievance mechanism as set out in Section 11, which must be publicised at every site and accessible without cost or literacy barriers. Consultation outcomes that bear on management decisions — siting of mixing areas, timing of applications, buffer distances at sensitive receptors — must be recorded and reflected in implementation, and feedback on how concerns were addressed must be given to the communities that raised them.

F.17 Capacity Building for Direct Project Implementers

Capacity building for those directly implementing the Plan is mandatory and is a precondition for the activities it governs. The audiences and their minimum content are: PIU environmental and social staff and state safeguards officers — full P/VMP content, monitoring and threshold interpretation, incident management, and supervision; contractors and site supervisors — construction-phase source reduction, borrow pit and trench management, storage and spill standards, and reporting; certified applicators — pest and vector identification, thresholds, product selection from the Approved List, calibration, mixing, application technique, buffer zones, protective equipment, re-entry and pre-harvest intervals, spill response, and first aid; extension agents and Farmer Field School facilitators — IPM and IVM content, scouting and threshold decision-making, use of the monitoring forms in Annex C, and safe-use messaging; Water User Association members — canal vegetation and hydraulic management, larval habitat recognition, drainage maintenance, and reporting; community health volunteers and community animal health workers — vector recognition, larval habitat mapping, community protection measures, referral of suspected poisoning and febrile illness, and livestock treatment safety; and agro-dealers — product knowledge, hazard classification, storage, labelling, and advice consistent with IPM.

Training is delivered on a schedule tied to project milestones — before mobilisation for contractors and PIU staff, before the first cropping season for applicators and extension agents, and annually thereafter for refresher and certification renewal — and is resourced from the P/VMP budget in Section 10. Delivery uses practical, field-based methods rather than classroom instruction alone, with demonstration of calibration, protective equipment use, and scouting. Attendance, competence assessment, and certification are recorded, and the proportion of each target audience trained is a monitoring indicator under F.21. The full programme, with audiences, frequency, duration, and responsible parties, is set out in Section 8.1.

F.18 National-Level Capacity Building

The project includes a limited but deliberate contribution to national capacity, on the basis that project-level controls alone will not outlast the project. Three measures are provided. First, technical collaboration with MoAI's Plant Protection Directorate on the construction and annual revalidation of the Approved Pesticide List, on pest surveillance data flows, and on Fall Armyworm and Desert Locust response, giving directorate staff working experience of positive-list methodology and threshold-based decision-making. Second, support to district-level coordination between agriculture, health, and livestock authorities in project districts, including joint review of pest and vector monitoring data, which establishes a coordination practice that can continue beyond the project. Third, transfer of project outputs for wider use — the Approved Pesticide List methodology, the field monitoring forms in Annex C, the training curricula and certification approach, and the storage and container-management standards in Annex D — shared with MoAI, the Ministry of Health, and the Ministry of Environment and Climate Change at midline and at project close.

Two areas are identified as beyond the project's capacity to resolve but requiring engagement: the absence of a functioning pesticide registration and inspection system, and the absence of any licensed obsolete-pesticide and container disposal route. The PIU will engage MoAI and MoECC on both, will provide project data on stocks and containers to support any national inventory, and will coordinate with FAO and other partners where a national disposal solution is developed. Beyond these measures, national-level institutional strengthening is delivered through Component 5 rather than through the P/VMP budget, and this Plan's requirements are framed so that they do not depend on national capacity that does not yet exist.

F.19 Institutional Arrangements

Delivery of the measures in this section is assigned as follows, with the detailed responsibility matrix, staffing positions, minimum qualifications, and reporting lines set out in Section 7:

Project implementation entity. The Ministry of Agriculture and Irrigation, through the Project Implementation Unit, holds overall accountability for P/VMP implementation. The PIU environmental and social team maintains the Approved Pesticide List, controls pesticide procurement and stock records, operates the monitoring programme and incident register, supervises contractors and state officers, delivers the training programme, reports to the Bank, and holds the P/VMP budget. State-level safeguards officers are responsible for site-level verification, contractor compliance checks, community notification, and first-line incident response in their states.

Phytosanitary and plant-protection services. MoAI's Plant Protection Directorate validates the Approved Pesticide List, provides pest identification and diagnostic support, operates national pest surveillance and early warning, issues quarantine and phytosanitary clearances for planting material, and leads emergency response for notifiable pests including Desert Locust and Fall Armyworm in coordination with FAO and DLCO-EA.

Vector-control services. The Ministry of Health and Human Services and state and district health offices lead vector-borne disease surveillance, malaria prevention and case management, outbreak investigation and response, and receipt of notifiable disease reports, and coordinate insecticide-treated net and community protection activities with the project. The Ministry of Livestock, Forestry and Range and the veterinary services lead livestock vector and zoonotic disease control, with FAO ECTAD providing Rift Valley Fever early warning; the PIU convenes joint coordination with these services at district level.

Agricultural extension services. State ministries of agriculture and their extension agents, together with Farmer Field School facilitators and the advisory services financed under Component 2, deliver IPM content, scouting and threshold training, safe-use instruction, and demonstration activities, and consolidate field monitoring returns for transmission to the state safeguards officer.

Local-level actors and partners. Water User Associations carry operation-phase canal vegetation management, drainage maintenance, and source reduction, and hold issue records for any product supplied to them; community health volunteers and community animal health workers carry out community-level surveillance, awareness, referral, and livestock treatment; farmer organisations and cooperatives host demonstrations and disseminate messaging; contractors execute construction-phase measures under their environmental and social management plans; and supported agro-dealers comply with the supply-chain conditions in F.15. FAO, WHO, DLCO-EA, and other partners provide technical support, early warning, and specialist services under arrangements made by the PIU.

Where responsibility for a measure is shared, the PIU is the accountable party for ensuring it is delivered, and unresolved coordination failures are escalated to the Project Steering Committee.

F.19.1 Detailed Institutional Responsibilities

F.19.2 Roles and Responsibilities

Table 8: Institutional Responsibilities under BBS P/VMP

Institution / Actor	Role	Key Responsibilities under P/VMP
BBS Project Implementation Unit (PIU) — Federal MoAI	Overall Environmental & Social Safeguard Specialist and compliance authority	Maintain and annually update Approved Pesticide List; consolidate quarterly monitoring reports; report to AfDB; coordinate with DLCO-EA and FAO ECTAD; approve any pesticide applications beyond standard protocols; manage P/VMP related budget

PIU E&S Specialist (Federal)	Technical oversight and quality assurance	Review pesticide procurement records; conduct bi-annual field compliance audits at all state E&S Officers; maintain P/VMP incident register; prepare annual P/VMP performance report
State E&S Officers (one per state, 6 total)	State-level P/VMP implementation and coordination	Monthly site inspections; train WUAs and extension workers; maintain state pesticide and vector incident registers; coordinate with state MOH and Ministry of Livestock; submit monthly P/VMP compliance reports to PIU
Contractors (all sites)	Construction-phase pest and vector management compliance	Implement malaria source reduction measures; maintain C-ESMP pest and vector provisions; complete contractor P/VMP training before mobilisation; record and report all construction-related vector incidents
Water User Associations (WUAs) — Canal Sites	Primary operational-phase vector management at canal sites	Designate Vector Management Focal Person; conduct monthly canal margin inspections; implement vegetation management schedule; report malaria cases and vector incidents to State E&S Officer; maintain Site Vector Log
Community Health Volunteers (CHVs)	Community malaria and RVF surveillance	Monthly household fever surveillance; report malaria clusters and any unusual animal deaths to district health office; participate in bi-annual refresher training
Somali Agricultural Regulatory & Inspection Service (SARIS)	Federal regulatory authority responsible for ensuring plant health, seed quality, and agrochemical safety in Somalia. Established under Law No. 32/2024, SARIS serves as the National Plant Protection Organization (NPPO) of Somalia, representing the country in regional and international conventions.	Conducts Agricultural pest surveillance; conducts regular staff trainings on regulatory controls & standards.
Ministry of Agriculture and Irrigation (MoAI) — Plant Protection Directorate	Agricultural pest surveillance and locust coordination	Provide quarterly pest surveillance data for BBS districts; coordinate Desert Locust early warning notifications; validate Approved Pesticide List annually; support FAW monitoring
State Ministries of Health	Vector-borne disease surveillance and response	Provide monthly malaria case data for BBS communities; lead RVF investigation and response; support ITN distribution targeting BBS communities
FAO Somalia / ECTAD	Technical advisory and RVF early warning	Provide RVF risk index data; support CAHWs in BBS pastoral zones; advise on

		transboundary animal disease risk at Dollow border crossing
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7.1.1 Staffing, Qualifications, Reporting Lines, and Escalation

The following key P/VMP positions shall be established, and their appointment confirmed in writing to AfDB, before project mobilisation and before any pesticide is procured or applied. Each position shall have written Terms of Reference (ToR) consistent with the responsibilities.

Table 9: P/VMP positions with minimum qualification & reporting line

Position	Minimum Qualifications	Reporting Line	Key P/VMP Terms of Reference
PIU E&S Specialist (Federal)	Degree in environmental, agricultural, or public-health science; ≥5 years' E&S safeguards experience; familiarity with the AfDB ISS and pesticide management	Reports to PIU Coordinator; interfaces with AfDB	Overall P/VMP compliance; maintain Approved Pesticide List; consolidate monitoring; control P/VMP budget; maintain incident register; report to AfDB
State E&S Officer (one per state)	Degree or diploma in environmental science, agriculture, or public health; ≥3 years' field experience	Reports to PIU E&S Specialist	Monthly site inspections; train WUAs and extension workers; maintain state pesticide and vector registers; coordinate with State MoH and Ministry of Livestock
WUA Vector Management Focal Person (per canal scheme)	Literate community member trained in vector management and pesticide safety	Reports to State E&S Officer	Canal-margin inspections; vegetation-management schedule; maintain Site Vector Log; report incidents
Community Health Volunteer (CHV)	Basic literacy; MoH CHV training	Reports to district health office and State E&S Officer	Household fever surveillance; report malaria clusters and unusual animal deaths

Reporting lines and escalation: Routine P/VMP matters follow the line WUA Focal Person / CHV → State E&S Officer → PIU E&S Specialist → PIU Coordinator → AfDB. Urgent hazards (serious poisoning, fatality, major spill, water contamination, or a disease-outbreak cluster) shall be escalated immediately by the fastest available means to the PIU E&S Specialist and PIU Coordinator, reported to AfDB within the serious-incident timeframe (F.21.3), and handled in parallel through the grievance mechanism (Section 10).

Budget control: The PIU E&S Specialist shall control and account for the P/VMP budget and shall certify that funds for PPE, training, monitoring, laboratory testing, and emergency response are available before the corresponding activities proceed.

Staffing confirmation: The PIU shall confirm in writing to AfDB that all key positions above are filled and trained before mobilisation. Construction or pesticide-related activities shall not commence at a site until the responsible State E&S Officer and, for canal sites, the WUA Focal Person are in place.

F.20 Grievance Mechanism

The BBS project's project-wide Grievance Redress Mechanism (GRM) applies to all P/VMP-related community concerns. Specific provisions for pest and vector management include:

- A dedicated 'Environmental and Health' grievance category must be established within the BBS GRM, accessible through community focal points, CLOs, and mobile GRM channels.
- Community concerns about pesticide use near crops, water bodies, or residential areas; unexplained livestock deaths; and perceived increases in mosquito populations near BBS water infrastructure are all eligible for submission through the GRM.
- The State E&S Officer must acknowledge P/VMP-related GRM submissions within 5 working days and provide a substantive response or investigation outcome within 21 working days, consistent with the acknowledgement and response timelines set in the project SEP/GRM; where the SEP specifies shorter timelines, the shorter timelines apply.
- If a GRM complaint alleges pesticide contamination of a community water source, the PIU must commission an independent water quality test within 10 working days and disclose results to the complainant.
- Patterns of P/VMP-related grievances (three or more complaints of the same type within 30 days) must trigger an unannounced inspection by the PIU E&S Specialist within 14 days.
- Urgent health hazards: Grievances alleging pesticide poisoning, contamination of a drinking-water source, or a disease-outbreak cluster shall be treated as urgent — acknowledged the same day, triaged immediately by the State E&S Officer and PIU E&S Specialist, and acted upon without waiting for the standard response period. Such cases shall trigger immediate protective measures (for example, suspending use of an affected water source), the serious-incident notification under F.21.3, and, where health is at risk, referral to the nearest health facility and notification of the district health office.

F.21 Monitoring, Evaluation and Reporting

Monitoring, evaluation and reporting for the measures in this section are delivered through the P/VMP monitoring framework in F.21, which sets out the indicators, sampling locations, baselines, action thresholds, laboratory arrangements, corrective actions, and reporting formats in full. The arrangements are summarised here, and P/VMP indicators are integrated into the project's digital monitoring, evaluation and learning system under Component 5 so that pest and vector performance is reported alongside project results rather than separately.

Implementation monitoring and follow-up throughout the project life cycle. Monitoring runs continuously from pre-construction to project close and is phased to the risks of each stage.

Monitoring of third-party and supply-chain implementation. Contractors are monitored against their environmental and social management plan commitments through weekly site inspection and monthly reporting, with non-compliance addressed contractually. Suppliers are monitored at each consignment through verification of registration status, original sealed labelled packaging, Safety Data Sheets, batch documentation, and expiry dating, with rejection recorded. Supported agro-dealers are monitored against the eligibility conditions in F.15 — approved products only, no decanting, compliant labelling and storage, training completed, container return participation — through periodic inspection by the PIU with MoAI, and continued support is conditional on compliance.

F.21.1 Monitoring and Evaluation Framework

F.21.2 P/VMP Monitoring Plan

Table 10: BBS P/VMP Monitoring Indicators and Reporting Framework

Indicator	Measurement Method	Frequency	Responsible Party	Reporting
Number of canal sites with active vegetation management (% compliant)	Canal margin inspection; Site Vector Log review	Monthly	WUA Focal Person + State E&S Officer	Monthly to PIU
Malaria case incidence in BBS canal communities (per 1,000 population)	Community health volunteer household surveillance; district health register data	Monthly during transmission season	District MOH + State E&S Officer	Quarterly to PIU
Number of pesticide incidents (spills, poisonings, non-compliant applications)	Site Pesticide Register; incident report forms	Continuous; reviewed monthly	PIU E&S Specialist	Immediate notification + quarterly report
% of WUA Vector Focal Persons who completed annual vector training	Training attendance records	Annual	State E&S Officer	Annual P/VMP report
% of borrow pits and construction water traps eliminated within 7 days	Contractor daily site inspection log	Daily during construction	Contractor QA + State E&S Officer	Weekly during construction phase
Number of pesticide applications from Approved List vs. non-approved products	Site Pesticide Register audit	Quarterly	PIU E&S Specialist	Quarterly safeguards report
RVF early warning notifications received and acted upon	PIU-FAO ECTAD liaison log	Quarterly (monitoring); Immediate (triggered)	PIU E&S Specialist	In quarterly report; trigger events immediately
Number of locust sightings reported through BBS reporting chain	WUA scouting log; DLCO-EA cross-check	Seasonal (pre-rains)	Extension workers + PIU	Seasonal pest surveillance report
Water quality at canal offtake and borrow pit areas (bacterial + basic chemistry)	Laboratory water quality testing (WUA samples; PIU commissions lab)	Bi-annual	PIU commissions; WUA samples	Bi-annual water quality report
Pesticide residue in water and produce near application areas	Laboratory residue testing at canals, boreholes, shallow	Bi-annual; and within 48 hours of any spill,	PIU commissions certified lab;	In water quality report; triggered

	wells, catchments, and demonstration plots — routine and triggered after any spill, suspected poisoning, or complaint	poisoning, or complaint	State E&S Officer samples	events reported immediately
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F.21.2.1 Sampling Locations, Baselines, Thresholds, Laboratories, and Corrective Action

- Sampling locations: Fixed, georeferenced sampling points shall be established and recorded in the monitoring register for each site cluster — canal offtakes, borrow-pit areas, the nearest downstream abstraction point, boreholes and shallow wells within 100 m of any application area, and demonstration plots.
- Baseline values: A baseline monitoring round shall be completed before the first pesticide/cropping season and before canal commissioning, to establish reference values for each parameter at each location. Baseline values shall be recorded in the monitoring register. [Baseline values to be inserted once the baseline round is completed.]
- Certified laboratory: Water and residue testing shall be undertaken by an accredited or certified laboratory (ISO/IEC 17025 where available; otherwise the nearest recognised national or regional laboratory approved by the PIU). Sampling, preservation, chain-of-custody, and method detection limits shall follow standard methods and be documented for every sample.
- Corrective action: Exceedance of any action threshold shall trigger a documented corrective-action process recorded on a Corrective Action Form (finding, probable cause, action taken, responsible person, deadline, and verification of close-out). The PIU E&S Specialist is responsible; serious exceedances (drinking-water contamination or residues linked to suspected poisoning) shall be escalated under Sections 9.2 and 10.
- Reporting templates: Standard templates — monthly compliance report, quarterly safeguards report, incident report form, corrective-action form, and water/residue laboratory report — shall be used and retained, and maintained by the PIU E&S Specialist.

Table 11: Indicative Action Thresholds for Water and Residue Monitoring

Parameter	Reference Standard	Action Threshold
Thermotolerant (faecal) coliforms — drinking sources	WHO Guidelines for Drinking-water Quality	0 CFU/100 mL; any detection triggers action
Nitrate (NO ₃)	WHO GDWQ	50 mg/L
Turbidity / electrical conductivity	Site baseline	Investigate marked deviation from baseline
Pesticide residues — water	National standard; where none, WHO GDWQ health-based values	Detection of any prohibited active ingredient, or exceedance of the health-based value, triggers action
Pesticide residues — produce	Codex Alimentarius MRLs	Exceedance of the applicable MRL triggers action

F.21.3 Reporting Requirements

- Monthly P/VMP Site Reports: submitted by each State E&S Officer to PIU, covering canal vector management status, pesticide incidents, training completed, and community health signals.

- Quarterly Consolidated P/VMP Report: prepared by PIU E&S Specialist synthesising state reports, pesticide register audits, monitoring indicator data, and any non-compliance corrective actions.
- Annual P/VMP Performance Review: prepared by PIU and shared with AfDB, covering annual indicator trends, training records, pest and disease incidents, and updated risk assessment for the coming year.
- Immediate Incident Notification: any pesticide poisoning, RVF suspected case, locust incursion, or significant vector-borne disease cluster in a BBS community must be notified to the PIU within 24 hours. Serious incidents shall be reported to AfDB within the project's serious-incident timeframe and in any case no later than 72 hours (see below); other notifiable events shall be reported to AfDB within 5 working days.
- Serious incidents — harmonised with the project incident-reporting protocol — include any fatality, serious injury or hospitalisation, serious pesticide poisoning, major spill, contamination of a water source, disease-outbreak cluster, and any event likely to attract public or regulatory attention (including SEAH/GBV and forced or child labour where associated with P/VMP activities). These shall be notified to the PIU immediately and to AfDB within 72 hours, followed by a full written incident report and root-cause analysis within the timeframe set in the project ESMP/ESCP.

F.22 Integrated Pest and Vector Management Action Plan

The action plan below consolidates the measures in this section into a single implementable matrix, linking each issue to the measure, target or key performance indicator, timing, responsible party, monitoring arrangement, cost, and financing source. It is the operative summary of Section F and is the reference used for supervision and for the ESMP/ESAP commitment register in A.4.

Table 12: BBS Integrated Pest and Vector Management Action Plan

Issue	Measure/activity	Target/KPI	Timing	Responsibility	Monitoring	Cost	Financing
Anopheles breeding in canal margins and slow-flow reaches	Hydraulic design for adequate flow velocity; canal-margin vegetation clearance; desilting; drainage of ponded reaches; spoil levelling	≥90% of canal sites compliant at monthly inspection; larval habitat count reduced against baseline	Design and construction; then continuous in operation	Contractor (construction) ; WUA + State E&S Officer (operation)	Monthly canal inspection; quarterly larval sampling at fixed points	Works cost (construction); WUA O&M (operation); P/VMP budget for monitoring	AfDB grant — Component 1 works and P/VMP budget
Standing water created by construction (borrow pits, trenches, wheel ruts)	Borrow pits backfilled or drained; trenches closed; no standing water left overnight where avoidable; C-ESMP pest/vector clauses	Borrow pits and trenches closed ≤7 days; zero open standing water at weekly inspection	Construction phase	Contractor; verified by State E&S Officer	Weekly contractor inspection; monthly PIU verification	Contractor cost within works contract	AfDB grant — Component 1 (contractor priced)
Floodwater Aedes and Rift Valley Fever risk in Shabelle/Jubba floodplains	RVF contingency protocol; EMPRES-i and ECTAD early warning subscription; community and CAHW alert; livestock movement and slaughter precautions; PPE for handlers	Protocol activated within 48 hours of a regional alert; 100% of floodplain sites covered by alert arrangements	Continuous surveillance; activated on alert	PIU E&S with MoLFR veterinary services, MoHHS, FAO ECTAD	Early-warning bulletins logged; activation record; case reports from district health/veterinary offices	P/VMP budget — surveillance and contingency line	AfDB grant — P/VMP budget; partner technical support in kind

Issue	Measure/activity	Target/KPI	Timing	Responsibility	Monitoring	Cost	Financing
Tick-borne and other livestock vector disease at water points	Trough drainage and spillage control; treatment away from trough with run-off containment; CAHW awareness and treatment; withdrawal periods observed	All water points with functioning drainage; CAHWs trained at 100% of pastoral water-point sites	From commissioning; continuous	WUA / water point committee; CAHWs; MoLFR	Monthly water-point inspection; CAHW treatment records	P/VMP budget — training and equipment; acaricide by users	AfDB grant — P/VMP budget and Component 4 inclusion activities
Fall Armyworm in maize and sorghum	FAW protocol: weekly scouting, action thresholds, hand-picking and botanicals, natural enemy conservation, resistant varieties, rotation; approved insecticide only on threshold exceedance with MoA rotation	≥80% of project cropped area under weekly scouting; ≥90% of chemical interventions threshold-triggered; declining pesticide volume per hectare	Each cropping season	Farmers and FFS groups; extension agents; PIU E&S	Weekly scouting returns on Annex C forms; seasonal consolidation by State E&S Officer	P/VMP budget — scouting, biological inputs, training; Component 2 demonstrations	AfDB grant — P/VMP budget and Component 2
Desert Locust incursion	Locust contingency protocol; eLocust3/DLC O-EA early warning; ground control and biopesticide preference; no aerial application near water, settlements or livestock without assessment	Alert relayed to all dryland districts ≤24 hours; 100% of control operations compliant with buffer and PPE requirements	Continuous surveillance; activated on incursion	MoAI Plant Protection Directorate with PIU; DLCO-EA and FAO	Early-warning log; operation records; post-operation environmental check	Emergency response financed nationally/regionally; P/VMP budget for coordination and PPE	National/DLC O-EA emergency resources; AfDB grant for project-level costs

Issue	Measure/activity	Target/KPI	Timing	Responsibility	Monitoring	Cost	Financing
Aphids, whitefly, thrips and virus vectors in irrigated horticulture	Natural enemy conservation; resistant varieties and clean seed; sanitation and rogueing; reflective mulch and barrier crops; selective products only on threshold exceedance	Threshold-based decisions on 100% of project-supported horticulture plots; no broad-spectrum use during flowering	Each cropping season	Extension agents and FFS facilitators; farmers	Scouting returns; product issue records	P/VMP budget — training; Component 2 inputs	AfDB grant — Component 2 and P/VMP budget
Storage pests at aggregation and warehouse facilities	Hermetic storage and drying to safe moisture as first-line; sanitation and stock rotation; fumigation only by trained personnel under controlled conditions	100% of supported facilities using hermetic/no n-chemical measures; zero untrained fumigant handling	From facility commissioning	Facility operators; PIU E&S verification	Facility inspection at each supervision visit; fumigation records	Component 3 facility cost; P/VMP budget for training	AfDB grant — Component 3 and P/VMP budget
Unregulated, unlabelled or highly hazardous pesticide supply	BBS Approved Pesticide List (WHO Class II/III only); registered suppliers with SDS and batch documentation; original sealed labelled packaging; Somali supplementary labels; annual revalidation	List issued before first procurement and revalidated annually; zero procurement outside the List; 100% of consignments with SDS and compliant labels	Project start; annually	PIU E&S with MoAI Plant Protection Directorate	Procurement and stock records; consignment inspection and rejection log	P/VMP budget — list development and revalidation	AfDB grant — P/VMP budget
Unsafe storage, transport and handling of pesticides	Compliant stores (lockable, ventilated, impermeable floor, containment)	100% of project storage points compliant with Annex D	Before any product is procured; continuous	PIU E&S; State E&S Officers; contractors	Store inspection at each supervision visit; stock reconciliation each	P/VMP budget — store upgrading, spill kits, signage	AfDB grant — P/VMP budget

Issue	Measure/activity	Target/KPI	Timing	Responsibility	Monitoring	Cost	Financing
	sill, no floor drain, signage, spill kit); segregated transport; controlled issue against signed records	standards; complete stock and issue records at every store			procurement round		
Applicator and community exposure to pesticides	Certified applicator training; PPE supplied by project; mixing and washing ≥30 m from water and dwellings; 48-hour advance community notice; warning signs; re-entry and pre-harvest intervals; first-aid provision and health facility notification	100% of applicators certified and equipped; zero application without prior notice; zero recorded PHI breaches on project-supported produce	Before first season; annual refresher	PIU E&S; State E&S Officers; extension agents	Training and certification register; site spot checks; grievance and incident records	P/VMP budget — training, PPE, first-aid kits	AfDB grant — P/VMP budget
Contamination of canal water, groundwater and soil	10 m no-application buffer from all water; 30 m mixing/washing exclusion; rinsate returned to tank; no discharge to drains or watercourses; back-flow prevention; low-mobility products on shallow water-table sites	Zero threshold exceedance at water sampling points; 100% compliance with buffer requirements at inspection	Continuous from first application	Applicators; WUA; PIU E&S	Bi-annual and triggered water sampling against thresholds; residue sampling; buffer compliance checks	P/VMP budget — sampling and laboratory analysis	AfDB grant — P/VMP budget
Empty containers, obsolete stock and contaminated packaging	Triple-rinse, puncture and secure storage pending disposal; no burning, burial	100% of containers triple-rinsed and punctured; zero	Continuous; stock reconciliation each round	PIU E&S with MoAI and MoECC	Container return and disposal register; stock reconciliation	P/VMP budget — container management and disposal arrangements	AfDB grant — P/VMP budget; national/partner support for disposal

Issue	Measure/activity	Target/KPI	Timing	Responsibility	Monitoring	Cost	Financing
	or reuse; procurement matched to seasonal need; FEFO stock rotation; disposal arranged with MoAI and MoECC	obsolete stock generated by the project; zero reuse incidents					
Weak capacity and awareness across implementers and communities	Mandatory training programme for PIU, state officers, contractors, applicators, extension agents, WUAs, CHVs, CAHWs and agro-dealers; community awareness and disclosure activities	≥90% of each target audience trained annually; awareness activities at 100% of sites	Pre-mobilisation, then annual	PIU E&S with state ministries and partners	Attendance and competence records; awareness activity log; % trained reported annually	P/VMP budget — training line	AfDB grant — P/VMP budget and Component 2
Grievances, incidents and non-compliance	SEP grievance mechanism applied to pest, vector and pesticide complaints; incident register; corrective action tracking; 72-hour serious-incident notification to the Bank	100% of grievances acknowledged and resolved within SEP timeframes; 100% of serious incidents notified ≤72 hours; all corrective actions closed	Continuous	PIU E&S; State E&S Officers	Grievance and incident registers; corrective action tracker; quarterly and annual reports	P/VMP budget — monitoring and reporting line	AfDB grant — P/VMP budget

G. CONCLUSION

The BBS project will expand irrigated area, increase the volume and permanence of standing water, and intensify crop production across 136 sites.

G.1 Summary of Key P/VMP Findings

- The BBS project's irrigation infrastructure expansion and agricultural intensification across 136 sites in six states creates material, manageable pest and vector risks that require proactive and structured management through the P/VMP.
- The highest vector risk is associated with the Shabelle River canal sites in Hirshabelle and Southwest State, where year-round canal-side standing water creates favourable conditions for malaria-transmitting *Anopheles* mosquito breeding.
- Rift Valley Fever presents a periodic but potentially severe risk in the Shabelle and Jubba floodplains and at large water catchments in Galmudug and Kismayo, linked to flood events that will intensify under climate change scenarios.
- Agricultural pest risks, particularly Fall Armyworm and Desert Locust, are high across the project area and require integration of IPM into all BBS extension and seed system activities from project inception.
- The Jubba River piped canal systems in Jubaland present the lowest direct vector risk, as buried pipelines eliminate open-water exposure; residual risk is focused on livestock troughs and in-river intake construction.
- Pesticide management risks are primarily associated with farmer behaviour and informal pesticide markets rather than project procurement; the Approved Pesticide List and annual training are the primary controls.

G.2 Budget

The total estimated cost of P/VMP implementation over the five-year project period is USD 285,000, financed from the BBS project's AfDB financing and embedded within the project ESMP/ESAP cost provisions; no separate or parallel financing is assumed. The table below sets out the budget by standard reporting category. Figures are indicative planning estimates to be refined in the PIU's annual work plans and budgets.

Table 13: P/VMP Summary Budget by Reporting Category (USD)

Item	Units	Unit cost	Total	Source of financing
Sensitizing end beneficiaries — community awareness, disclosure, and community health volunteer surveillance stipends	5 project years	8,000 per year (average)	40,000	AfDB grant — PIU operating budget

<i>Item</i>	<i>Units</i>	<i>Unit cost</i>	<i>Total</i>	<i>Source of financing</i>
Supporting the extension services responsible for phytosanitary matters — training programme, personal protective equipment, and application equipment	5 project years	15,600 per year (average)	78,000	AfDB grant — PIU operating budget; PPE and equipment partly through works contracts
Monitoring and evaluation — water-quality meters, larval and adult traps, laboratory testing, and independent audits	5 project years	15,000 per year (average)	75,000	AfDB grant — PIU operating budget
Other project-specific measures — Bti biological larvicide, transport, pesticide and container disposal, and emergency response for RVF and Desert Locust	5 project years	18,400 per year (average)	92,000	AfDB grant — works contracts and project contingency/emergency provision
Total	—	—	285,000	AfDB grant — BBS project financing, within ESMP/ESAP cost provisions

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- Ministry of Health and Human Services. National Malaria Control Strategy.
- Ministry of Livestock, Forestry and Range. Livestock Sector Development Strategy.
- Ministry of Agriculture and Irrigation (MoAI). National Food Security and Nutrition Policy.
- Ministry of Energy and Water Resources. National Water Policy / Water Sector Strategy.
- Ministry of Family and Human Rights. National Gender Policy.
- Ministry of Labour and Social Affairs. Labour and Employment Laws and Regulations.

ANNEX A: BBS APPROVED PESTICIDE LIST

The following pesticides are approved for use in BBS project-supported agricultural activities subject to the conditions stated in Section 6. All products must be WHO Class II or III only. This list must be reviewed and revalidated annually by the PIU E&S Specialist and approved by MoAI Plant Protection Directorate.

Table 14: BBS Approved Pesticide List (April 2026 — Annual Review Required)

Active Ingredient	Formulation	WHO Class	Target Pest	Crop	PHI (days)	Restrictions
Emamectin benzoate 1.9% EC	1.9% EC	III	Fall Armyworm	Maize	3	Keep ≥10m from water; no tank mix with fungicides
Chlorpyrifos 48% EC	48% EC	II	FAW, stem borers	Maize, sorghum	21	Operator PPE mandatory; restricted near water; pre-season training required
Lambda-cyhalothrin 2.5% CS	2.5% CS	II	Aphids, whitefly, stem borers	Vegetables, sesame	7	Morning application only; no spray in bloom; PPE mandatory
Imidacloprid 70% WS	70% WS (seed treatment)	II	Aphids, whitefly (seedling)	Vegetables, sesame	N/A — seed treatment	Seed treatment only; no foliar use; avoid contaminating water when preparing seed
Bacillus thuringiensis kurstaki (Btk)	WP formulation	Not classified (biological)	FAW, caterpillars	Maize, vegetables	0 (biopesticide)	Apply to whorl; compatible with beneficial insects; preferred over chemical options
Metarhizium anisopliae	Granular biopesticide	Not classified (biological)	FAW, soil insects	Maize	0	Store cool and dry; limited shelf life; check viability before use
Mancozeb 80% WP	80% WP	III	Fungal diseases — sesame, sorghum	Sesame, sorghum	14	No application near water; observe re-entry interval; dust formulation — PPE
Bti (Bacillus thuringiensis israelensis)	Liquid suspension	Not classified (biological — larvicide)	Mosquito larvae	Water bodies	0	Approved for direct water body application; use only Vectobac or Vectomax brands

PHI = Pre-Harvest Interval. EC = Emulsifiable Concentrate. WP = Wettable Powder. WS = Water-Soluble formulation. CS = Capsule Suspension. Biopesticides are preferred in all instances where efficacy is demonstrated. Addition of new products to the Approved List requires PIU E&S Specialist and MoAI Plant Protection written authorisation.

Class II Product Risk Justifications (OS3 Requirement)

Under OS3, pesticide formulations posing serious risk must not be used where they are likely to be used by, or accessible to, lay personnel without adequate training, equipment, and facilities. Accordingly, before any WHO Class II product is procured or applied,

the PIU E&S Specialist shall complete and retain a Product Risk Justification Sheet documenting the elements below. Chlorpyrifos, in particular, is a cholinesterase-inhibiting organophosphate that is banned or severely restricted in a number of jurisdictions; it shall be retained on the Approved List only where it remains nationally registered and no effective lower-hazard alternative is available, and shall be the option of last resort.

Table 15: Product Risk Justification Sheet documenting the elements.

Requirement (per OS3)	Chlorpyrifos 48% EC	Lambda-cyhalothrin 2.5% CS	Imidacloprid 70% WS
Product-specific risk justification	Last-resort control of severe Fall Armyworm/stem-borer outbreaks only where biopesticides and reduced-risk options have failed; threshold-based spot treatment.	Control of aphids, whitefly, and borers on vegetables/ sesame above action thresholds; CS formulation reduces operator exposure.	Seed treatment only for seedling aphids/whitefly; no foliar use, minimising environmental load.
Safer-alternative analysis	Btk, Metarhizium, and emamectin benzoate (Class III) preferred and must be tried first.	Btk for caterpillars, cultural controls, and insecticidal soaps preferred; use only when thresholds exceeded.	Cultural controls and resistant varieties preferred; restrict to demonstrated seedling need.
National registration confirmation	Confirm current registration with MoAI Plant Protection Directorate before each procurement; remove if deregistered.	Confirm current MoAI registration before procurement.	Confirm current MoAI registration before procurement.
User restriction	Certified applicators only; never for unsupervised lay-farmer use; not accessible to untrained persons.	Trained applicators only; no application during crop bloom (pollinator protection).	Seed treatment only; no foliar application; prevent water contamination during seed preparation.
PPE requirement	Coveralls, chemical-resistant gloves, boots, face shield and respirator, per label.	Gloves, eye protection, long sleeves, boots; respirator per label.	Gloves, dust mask, and eye protection during seed treatment.
Storage requirement	Locked, ventilated, banded store; segregated from other classes; ≥50 m from water and dwellings.	As per Section 6.3 storage standards.	As per Section 6.3; treated seed segregated, labelled, and kept out of food/feed channels.
Applicator qualification	Certified and medically fit; cholinesterase monitoring required.	Certified and medically fit.	Trained seed-treatment operator.

Requirement (per OS3)	Chlorpyrifos 48% EC	Lambda-cyhalothrin 2.5% CS	Imidacloprid 70% WS
Emergency response	Atropine/pralidoxime guidance and SDS on hand; poisoning first aid and referral per Annex D EPRP.	Skin/eye decontamination, symptomatic first aid, referral per Annex D.	Decontamination and referral per Annex D.

ANNEX B: PEST AND VECTOR RISK REGISTER

Table 16: BBS P/VMP Pest and Vector Risk Register

Pest/Vector	Category	Affected States	Risk Level (pre-mitigation)	Primary Risk Pathway	Key Control Measure	Trigger for Escalation	Residual Risk
<i>Anopheles gambiae</i> / <i>arabiensis</i>	Mosquito — malaria vector	Hirshabelle, SWS	HIGH	Canal-side standing water	Vegetation management; Bti larviciding; ITNs	3+ malaria cluster cases near canal site	LOW–MODERATE with controls
<i>Aedes mcintoshi</i> (RVF vector)	Mosquito — RVF vector	SWS, Hirshabelle, Galmudug, Kismayo	MODERATE–HIGH (flood years)	Floodwater hatching sites at catchments	Drainage design; RVF early warning protocol	Any flood event + animal fever cluster	MODERATE (climate risk)
<i>Aedes aegypti</i> (Dengue)	Mosquito — Dengue vector	Kismayo (urban fringe)	MODERATE	Container water breeding at construction sites	Site cleanliness; no standing water containers	Dengue outbreak notification in Kismayo	LOW with controls
Fall Armyworm	Agricultural insect pest	Hirshabelle, SWS, Jubaland	HIGH	Expanded irrigated maize	Weekly scouting; Bt biopesticide; chemical threshold	>20% damage at V3–V6 stage	MODERATE
Desert Locust	Agricultural insect pest	Galmudug, Puntland, Somaliland	HIGH (incursion-dependent)	Swarm migration from Indian Ocean breeding zone	DLCO-EA early warning liaison; community reporting	Locust sighting within 50km of BBS site	MODERATE (national programme primary control)
Tick species (various)	Livestock ectoparasite	Jubaland, Galmudug, Puntland, Somaliland	MODERATE	Shared livestock water points	Trough clearance zones; CAHW training	Unusual livestock mortality at water point	LOW–MODERATE
Aphids/Whitefly	Horticultural crop pests	Janaale, Luuq, Balcad	MODERATE–HIGH (irrigated horticulture)	Expanded vegetable production under irrigation	IPM; lacewing conservation; targeted lambda-cyhalothrin	Crop losses >30% in project plots	LOW with IPM

Pesticide contamination	Agro-chemical pollution	All states	MODERATE	Informal market pesticides; poor handling	Approved List; training; storage standards	Any suspected poisoning incident	LOW with controls
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ANNEX C: IPM FIELD MONITORING FORMS

The following standardised forms must be maintained at all relevant BBS sites:

- Form C1 — Canal Site Vector Management Monthly Inspection Log (completed by WUA)
- Form C2 — Site Pesticide Application Record (completed within 24 hours of any pesticide application)
- Form C3 — Fall Armyworm Scouting Weekly Field Record (one per farm plot per week during growing season)
- Form C4 — Livestock Water Point Health Observation Log (monthly; completed by trough attendant or WUA)
- Form C5 — Pesticide Incident Report Form (completed immediately on any incident; submitted to State E&S Officer within 24 hours)
- Form C6 — Community Vector-Borne Disease Surveillance Log (monthly; completed by Community Health Volunteer)

Template forms for C1–C6 will be finalised by the PIU E&S Specialist in Year 1, Quarter 1 and distributed to all state E&S Officers in Somali and English. All forms must be retained at site level for minimum 5 years and submitted to PIU quarterly.

ANNEX D: PESTICIDE STORAGE AND HANDLING QUICK REFERENCE STANDARDS

The following visual quick-reference standards must be posted at all BBS pesticide storage facilities and extension demonstration centres:

- **STORE:** locked, ventilated, impermeable floor, bunded, 50m from water/food/dwellings; separate incompatible products
- **LABEL:** all containers clearly labelled; never transfer to food or unlabelled containers
- **PPE:** gloves, goggles, long sleeves, closed shoes ALWAYS; respirator for Class II products
- **MIX:** mix outdoors or in ventilated area; use clean water; calculate exact quantities needed; never mix more than needed
- **APPLY:** wind <3 m/s; not during rain; early morning preferred; 10m buffer from water bodies; 3m from non-target areas
- **SPILL:** immediately contain with absorbent material; PPE before contact; notify State E&S Officer within 2 hours; record in incident log
- **DISPOSE:** triple rinse empty containers; puncture and deform; collect in labelled waste bag; never burn or bury; never reuse
- **EMERGENCY — POISONING:** Remove from exposure; fresh air; remove contaminated clothing; flush skin/eyes with water 15 minutes; contact health facility immediately; bring product label.

ANNEX E: BASELINE PEST AND VECTOR DATA BY STATE, DISTRICT AND SITE CLUSTER

This annex consolidates the available baseline pest and vector data for the BBS project area, organised by state, district and site cluster in accordance with the 136 sites recorded in the BBS Master Site List (June 2026). It responds to the OS1 requirement that baseline conditions be characterised so that pest and vector risks, and the effectiveness of P/VMP mitigation, can be measured over time. The site clusters set out in Table E.1 provide the geographic frame for the malaria, Rift Valley Fever (RVF), vector-breeding, water-quality, pesticide-use, supplier and crop-pest baselines presented in Tables E.2 and E.3. Where district-level quantitative values (for example, confirmed malaria incidence and laboratory water-quality or pesticide-residue results) are not yet available, the baseline is characterised qualitatively from published epidemiological and agronomic sources and is flagged “to be confirmed”. These values shall be finalised during the pre-implementation baseline survey (F.21) using district health records (MoH/WHO), FSNAU/FAO seasonal assessments, and the water-quality and pesticide-residue sampling programme, and shall become the reference point against which the monitoring thresholds in F.21.2 are tracked.

Table E.1: BBS Site Clusters by State, District and Infrastructure Type (June 2026 Master Site List)

State	Districts (sites)	Sites	Predominant infrastructure	Pest/vector risk zone
Hirshabelle	Balcad (13)	13	Irrigation canals	Riverine irrigated (Shabelle)
Southwest	Marka (10), Hudur (9), Qansax Dheere (3)	22	Canals, boreholes, water catchments	Riverine, coastal & sorghum belt
Jubaland	Luuq (6), Kismayo (4), Dollow (3)	13	Pipeline networks, water catchments	Riverine (Jubba) & coastal
Somaliland	Zeylac (36), Caynabo (19), Salaxlay (12), Borama (1)	68	Shallow wells, water harvesting, boreholes, 2 canals	Coastal lowland & semi-arid highland
Galmudug	Cadaado (6), Xeraale (3), Dhusamareeb, Galkacyo, Hobyo, Wisil (1 each)	13	Boreholes, water catchments	Semi-arid pastoral
Puntland	Armo, Galkacyo, Garowe, Qardho (1 each)	4	Boreholes, water catchments	Semi-arid pastoral
NorthEast	Buuhoodle, Erigavo, Laascaanood (1 each)	3	Water harvesting	Semi-arid pastoral
TOTAL	7 states, 24 districts	136	Canals, wells, boreholes, water harvesting/catchments	Three risk zones

Table E.2: Health and Vector Baseline by Site Cluster (malaria, RVF, breeding hotspots, water quality)

State / cluster	Malaria transmission	RVF history	Vector breeding hotspots	Water quality / pesticide-contamination baseline
Hirshabelle (Balcad – Shabelle canals)	Perennial–seasonal, moderate–high; An. arabiensis in canal standing water; endemic riverine transmission	High; Middle/Lower Shabelle affected in the 1997–98 and 2006–07 flood-linked outbreaks; Aedes floodwater vectors; dense livestock	Irrigation canals, silted reaches, borrow pits, field pools after flood irrigation	River-fed canals; turbidity and agrochemical runoff from irrigated maize/sesame; residue baseline unmonitored – to be confirmed
Southwest (Marka, Hudur, Qansax Dheere)	Seasonal, moderate; riverine and coastal	High in riverine Marka; flood-linked outbreak history;	Canals, coastal brackish pools (Marka), rain-fed	Mixed canal/borehole; runoff from sorghum/maize;

State / cluster	Malaria transmission	RVF history	Vector breeding hotspots	Water quality / pesticide-contamination baseline
	Marka; An. arabiensis/gambiae	livestock-movement risk	catchments, boreholes/troughs	salinity in coastal wells; residue baseline to be confirmed
Jubaland (Luuq, Kismayo, Dollow – Jubba)	Seasonal along the Jubba, moderate; Kismayo coastal transmission	High in the Gedo/Jubba floodplain; 2006–07 outbreak reached the Jubba basin; riverine & pastoral livestock	Jubba flood pools, pipeline-fed storage points, water catchments, coastal pools (Kismayo)	Pipeline and catchment supply; contamination baseline unmonitored – to be confirmed
Somaliland (Zeylac, Caynabo, Salaxlay, Borama)	Low and unstable, epidemic-prone after rains; coastal Zeylac lowland some risk; Borama highland low	Periodic livestock seroprevalence; 2006–07 spread north via trade; export-ban history	Open shallow wells, water-harvesting berkads/catchments (container breeding), coastal pools at Zeylac	Shallow wells and harvested rainwater; salinity/TDS concerns; residue baseline to be confirmed (EC-meter programme)
Galmudug (Cadaado, Xeraale, district towns)	Low/unstable, epidemic-prone after seasonal rains	Pastoral RVF circulation risk; livestock movement; watch-listed during regional alerts	Boreholes/troughs, water catchments and berkads holding standing water	Borehole/catchment supply; salinity in some boreholes; residue baseline low but to be confirmed
Puntland (Armo, Galkacyo, Garowe, Qardho)	Low/unstable	Pastoral RVF risk; 2006–07 livestock involvement; movement/trade exposure	Boreholes/troughs and water catchments	Borehole-dominated; salinity/TDS; residue baseline to be confirmed
NorthEast (Buuhoodle, Erigavo, Laascaanood)	Low/unstable	Pastoral RVF circulation risk during wet years	Water-harvesting structures holding standing water	Harvested rainwater; contamination baseline to be confirmed

Table E.3: Agricultural Baseline by Site Cluster (crops, crop-pest history, pesticide-use practices, suppliers)

State / cluster	Main crops	Crop-pest history	Pesticide-use practices	Existing pesticide suppliers
Hirshabelle (Balcad)	Maize, sesame, sorghum, vegetables, fodder (irrigated Shabelle)	Fall Armyworm (since 2017), stem borers, aphids/whitefly, Quelea birds; Desert Locust 2019–21 upsurge	Moderate insecticide/herbicide use on maize & vegetables; largely unregulated; FAW-driven	Local agro-input shops in Balcad/Jowhar; imports via Mogadishu; informal, limited registration
Southwest (Marka, Hudur, Qansax Dheere)	Maize, sesame, sorghum, vegetables, fruit; sorghum belt (Bay/Bakool)	FAW, sorghum stem borers, Quelea, whitefly; Desert Locust 2019–21	Moderate on maize/vegetables in Marka; low in rain-fed sorghum; local-shop supply	Agro-input shops in Marka/Hudur; imports via Mogadishu/Kismayo; informal
Jubaland (Luuq, Kismayo, Dollow)	Maize, sesame, sorghum, vegetables, fruit (Jubba)	FAW, stem borers, fruit flies, Quelea; Desert Locust 2019–21 (Gedo)	Moderate in riverine Luuq/Dollow; local-shop supply	Agro-input shops in Luuq/Kismayo; imports via Kismayo port; informal
Somaliland (Zeylac, Caynabo, Salaxlay, Borama)	Sorghum, maize, fodder; horticulture (Gabiley/Borama); pastoral	Sorghum pests, FAW in maize, aphids; Desert Locust 2019–21 (heavily affected)	Low–moderate; livestock acaricides; horticulture inputs near Borama	Agro-vet shops in Borama/Hargeisa/Caynabo; imports via Berbera port; partly registered

State / cluster	Main crops	Crop-pest history	Pesticide-use practices	Existing pesticide suppliers
Galmudug (Cadaado, Xeraale)	Sorghum, cowpea, fodder; mainly pastoral	Sorghum pests, occasional FAW; Desert Locust 2019–21	Minimal crop pesticide use; livestock acaricides	Limited agro-vet shops in Cadaado/Dhusamareeb; imports via Mogadishu/Bosaso
Puntland (Armo, Galkacyo, Garowe, Qardho)	Fodder, limited horticulture; pastoral	Limited crop pests; Desert Locust 2019–21 (breeding grounds)	Minimal; livestock acaricides; locust-control pesticides by national teams	Agro-vet shops in Garowe/Galkacyo; imports via Bosaso port
NorthEast (Buuhoodle, Erigavo, Laascaanood)	Fodder, rain-fed sorghum; pastoral	Occasional sorghum pests; Desert Locust 2019–21	Minimal; livestock acaricides	Limited agro-vet shops; imports via Berbera/Bosaso

The baselines above shall be verified and quantified during the pre-implementation baseline survey. Primary data sources include: district and regional health-facility records and the WHO/MoH malaria and RVF surveillance system (malaria incidence and RVF case/serology history); FSNAU and FAO seasonal food-security and pest-situation reports and the FAO Desert Locust Information Service (crop-pest and locust history); Ministry of Agriculture extension records and farmer surveys (pesticide-use practices and supplier mapping); and the P/VMP water-quality and pesticide-residue sampling programme in F.21.2 (EC/turbidity and pesticide-residue baselines at canal, well and borehole sites). Confirmed values shall be recorded against each site cluster and used to set the corrective-action thresholds in the M&E framework.

ANNEX F: TRAINING, AWARENESS AND CAPACITY BUILDING

ANNEX F.1 Training Programme Overview

Effective implementation of this P/VMP depends on trained personnel at all levels — from PIU specialists to WUA focal persons and community health volunteers. The following training programme is mandatory and will be delivered by the PIU E&S Specialist (with external facilitation where expertise is required) across all project states:

Table 17: BBS P/VMP Training Programme

Training Module	Target Audience	Duration	Frequency	Delivery Agency
P/VMP Orientation — Pest, Vector, and IPM Principles	State E&S Officers, extension workers	2 days	Once at project start; refresher Year 3	PIU E&S Specialist / FAO
Malaria Vector Management — Canal Sites	WUA Vector Focal Persons, canal committees	1 day	Annual before gu season	State E&S Officer + District MOH
Pesticide Safety, Storage, and Application	Extension workers, WUA agronomists, farm supply staff	2 days	Annual	PIU E&S Specialist
Fall Armyworm Scouting and IPM	Extension workers, lead farmers	1 day	Annual before planting season	MoAI Plant Protection + FAO
Desert Locust Identification and Reporting	WUA leaders, community scouts — Galmudug, Puntland, Somaliland	Half day	Annual	MoAI + DLCO-EA
RVF Awareness and Reporting Protocol	Community Animal Health Workers, WUA leaders — all pastoral sites	Half day	Annual before deyr season	FAO ECTAD + Ministry of Livestock
Tick and Livestock Vector Awareness	Trough attendants, WUAs — pastoral water points	Half day	Annual	Ministry of Livestock + State E&S Officer
Pesticide Emergency Response, Spill Control, and First Aid	Applicators, storekeepers, WUA focal persons	1 day	Annual	PIU E&S Specialist + District MoH

As a minimum, the pesticide-safety and vector-management modules shall cover: pesticide poisoning symptoms and first aid; spill prevention, containment, and response; sprayer calibration and maintenance; re-entry intervals (REI) and pre-harvest intervals (PHI); empty-container triple-rinsing and disposal; safe storage and stock management; selection, use, cleaning, and maintenance of PPE; safe risk communication with low-literacy farmers (using pictograms and Somali-language materials); and

incident recording and reporting. Training shall be competency-based, with attendance registers and a post-training assessment retained by the PIU E&S Specialist; no person shall handle or apply pesticides until assessed as competent.

ANNEX F.2 Community Awareness and Information Disclosure

- Community-level P/VMP information must be disclosed in Somali language (and in local dialect where appropriate) through community meetings, WUA assemblies, and through Community Liaison Officers (CLOs).
- Key messages: safe use and recognition of dangerous pesticides; malaria prevention and ITN use; how to report unusual animal illness (RVF suspicion); mosquito breeding source identification and elimination; who to contact for pest or vector incidents (GRM channel).
- Written materials (posters, leaflets) must be produced in Somali for all canal-side and pastoral water point communities, to be prepared by the PIU and distributed through CLOs and CHVs.

In accordance with OS10, the PIU shall document and disclose evidence of P/VMP consultation and disclosure.

The record below shall be completed and maintained by the PIU E&S Specialist, updated as further engagement occurs, and a summary annexed to the P/VMP and disclosed on the project's public platforms. [Consultation records to date to be inserted by the PIU.]

Table 18: P/VMP Consultation and Disclosure Record

Date	Location (State / District)	Stakeholders Engaged	Materials Used	Feedback Received	Change Made to P/VMP
[to be completed]	[to be completed]	[to be completed]	[to be completed]	[to be completed]	[to be completed]
[to be completed]	[to be completed]	[to be completed]	[to be completed]	[to be completed]	[to be completed]