

Malawi National Adaptation Plan

Water Sector M&R Framework and Indicator Definition Sheets (IDS)



Ministry of Natural Resources

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Water Sector Indicators

STRATEGY 1: RAINWATER HARVESTING

Adaptation Action 1. Install climate-resilient micro-catchments, check dams and storage tanks in drought-prone and flood-affected catchments.

Objective: Enhance water conservation for irrigation and reduce water stress.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of micro-catchments, check dams, and tanks constructed	0 (2025)	≥1,500 structures by 2030	Project construction reports; site inspections
Outcome	Volume of water harvested annually (m³)	<50 million m³	≥250 million m³/year by 2030	Annual water audit reports
Impact	% increase in irrigation water availability in dry seasons	TBD	≥40% by 2030	Ministry of Agriculture and Water Resources surveys

Adaptation Action 2. Train farmers on runoff capture and safe storage

Objective: Improve water use efficiency and resilience at farm level.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of farmers trained	0 (2025)	≥25,000 farmers by 2030	Training reports, attendance logs
Outcome	% of trained farmers adopting runoff harvesting	TBD	≥70% adoption rate	Post-training follow-up surveys
Impact	Reduction in dry-season crop failure among trained farmers	TBD	≥30% reduction by 2030	Agriculture productivity assessments

STRATEGY 2: IRRIGATION SCHEMES

Adaptation Action 3. Develop climate-resilient small-scale irrigation systems to reduce crop failure under erratic rainfall and drought.

Objective: Increase area under irrigation for improved food security.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Hectares under new small-scale irrigation	~5,000 ha	≥104,000 ha by 2030	Land registry and satellite data
Outcome	% increase in cropping intensity	1.0	≥1.5 by 2030	Agriculture productivity reports
Impact	% of households with improved food security	TBD	≥50% by 2030 in target areas	DHS and local food security surveys

Adaptation Action 4. Form Farmer Irrigation User Associations (IUA)

Objective: Promote community-led irrigation governance.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of IUAs formed	0	≥500 by 2030	Registry of IUAs
Outcome	% of IUAs implementing irrigation water use plans	TBD	≥75% by 2030	IUA reports and field monitoring
Impact	Reduction in irrigation conflicts and overuse	High	Low by 2030	Community-level surveys and complaints logs

STRATEGY 3: ACCESS TO WATER AND SANITATION (WASH)

Adaptation Action 5. Launch hygiene education campaigns

Objective: Build community capacity for hygiene in response to climate impacts.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of hygiene campaigns conducted	0	≥29 campaigns (district-wide)	MoH and NGO reports
Outcome	% increase in handwashing and hygiene behavior	TBD	≥70% by 2030	KAP surveys
Impact	Reduction in hygiene-related diseases	High	≥50% reduction	MoH annual bulletins

STRATEGY 4: EXPAND CLIMATE-RESILIENT RURAL WATER SUPPLY SYSTEMS

Adaptation Action 6. Construct solar-powered boreholes in vulnerable districts

Objective: Improve rural water supply resilience to droughts.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of functional solar-powered boreholes	<50	≥500 by 2030	Field inspections, borehole inventory
Outcome	% population with access to safe water	65%	≥85% by 2030	National Water Point Mapping
Impact	Reduced time to fetch water	1-2 hrs	≤30 minutes	Community surveys

STRATEGY 5: IMPLEMENT INTEGRATED CATCHMENT MANAGEMENT (ICM)

Adaptation Action 7. Restore priority degraded catchments

Objective: Reduce land degradation and improve water retention.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of catchments restored	0	≥17 by 2030	Field verification, GIS data
Outcome	Hectares rehabilitated through SWC & reforestation	TBD	≥100,000 ha	Environmental audits
Impact	Reduction in sediment load and flood risk	High	≥50% reduction	River sedimentation studies

STRATEGY 6: DEVELOP MEDIUM-SCALE WATER STORAGE INFRASTRUCTURE

Adaptation Action 8. Build sand/earth dams in dryland areas

Objective: Enhance year-round water availability.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of sand/earth dams constructed	0	≥50 by 2030	Construction records
Outcome	Volume of water stored in dry season	TBD	≥250 million m ³ by 2030	Water monitoring reports
Impact	% reduction in dry season water stress	High	≥60%	Community impact surveys

STRATEGY 7: ENHANCE EARLY WARNING SYSTEMS FOR RIVERINE FLOODING AND DROUGHTS

Adaptation Action 9. Establish flood and drought early warning systems

Objective: Improve preparedness to water-related climate hazards.

Indicator Type	Indicator	Baseline	Target	Means of Verification
Output	Number of operational EWS in hotspots	0	≥10 by 2030	EWS functionality tests
Outcome	% of communities receiving early alerts	TBD	≥90%	SMS alert logs, community surveys
Impact	Reduction in flood and drought-related losses	High	≥70% reduction	Disaster loss databases

STRATEGY 8: BUILD CAPACITY OF LOCAL WATER USER ASSOCIATIONS (WUAS)

Adaptation Action 10: Train WUAs in Climate-Smart Water Planning

Objective: To promote sustainable and climate-resilient water resource management through the capacity building of Water User Associations (WUAs).

Indicator Level	Indicator	Baseline (2025)	Target (2030)	Metric	Means of Verification
Output	Number of Water User Associations (WUAs) trained in climate-smart water planning	0	≥1,000 WUAs	Count	Training attendance records; training completion reports
Outcome	% of trained WUAs implementing climate-resilient water management best practices	TBD (est. <10%)	≥75% of trained WUAs	Percentage	Field audits; WUA activity reports; district-level monitoring
Impact	Improved sustainability and equity in community-level water resource use and governance	Low institutional capacity and poor water governance	Measurable improvements in equitable and sustainable water allocation and use in target areas	Composite index (e.g., water use efficiency, community satisfaction, governance quality)	Periodic WUA evaluations; community surveys; water use audits

Water Sector – Indicator Definition Sheets

The Water Sector IDSs establish standardized methodologies for measuring progress towards strengthened water security and climate resilience under the Malawi NAP.

For each approved indicator, the IDS specifies the definition, purpose, metric, calculation method, baseline, target, data source, means of verification, collection methodology, reporting frequency and responsible institution.

Collectively, the sheets enable consistent monitoring of changes in water availability, access, management, infrastructure resilience, catchment protection and preparedness for climate-related water risks, while supporting comparable reporting across institutions and reporting periods.

STRATEGY 1: RAINWATER HARVESTING

Adaptation Action 1. Install climate-resilient micro-catchments, check dams and storage tanks in drought-prone and flood-affected catchments.

Objective: Enhance water conservation for irrigation and reduce water stress.

IDS 1: Number of micro-catchments, check dams, and tanks constructed

Field	Description
Indicator Level	Output
Indicator Name	Number of micro-catchments, check dams, and tanks constructed
Indicator Definition	Cumulative number of distinct micro-catchments, check dams and storage tanks completed under the adaptation action, meeting approved technical specifications and verified as functional at the reporting cut-off date.
Purpose / Relevance to Adaptation	Measures physical delivery of rainwater-harvesting infrastructure intended to increase water capture, reduce runoff losses and improve water availability in drought-prone and flood-affected catchments.
Metric / Unit of Measurement	Count of verified functional structures
Calculation Method	Compile the asset register for supported structures; verify completion and functionality through construction records and site inspection; count each unique qualifying structure once.
Formula	Total structures = Σ verified functional micro-catchments + Σ verified functional check dams + Σ verified functional storage tanks
Numerator	Not applicable - absolute count of verified structures.
Denominator	Not applicable - absolute count indicator.
Baseline	0 (2025)
Baseline Year	2025

Field	Description
Target	≥1,500 structures by 2030
Target Year	2030
Data Source(s)	Project asset register; construction completion records; contractor/supervision records; georeferenced site-inspection records.
Means of Verification	Project construction reports; site inspections
Data Collection Method	Update a georeferenced structure register from completion certificates and field-inspection forms. Record structure type, location, completion date and operational status.
Disaggregation	Structure type; district; catchment; drought-prone/flood-affected area; functional status.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources. Supporting: District Councils, implementing agencies/contractors and relevant catchment authorities.
Data Quality / Verification	Reconcile project records with the georeferenced asset register; inspect a risk-based sample or all completed structures where feasible; remove duplicates; confirm functionality and location before counting.
Methodological Notes / Assumptions	Count a structure only after physical completion and verification. Repairs to an already-counted structure are not new structures. A clear definition of "functional" and minimum climate-resilient design criteria should be approved and applied consistently.
Link to Adaptation Result	Directly tracks delivery of the infrastructure required to increase harvested water and reduce seasonal water stress.

IDS 2: Volume of water harvested annually (m³)

Field	Description
Indicator Level	Outcome
Indicator Name	Volume of water harvested annually (m ³)
Indicator Definition	Total volume of rainwater captured and retained during the reporting year by the supported micro-catchments, check dams and storage tanks, expressed in cubic metres.
Purpose / Relevance to Adaptation	Tests whether constructed rainwater-harvesting assets translate into a material increase in water captured for productive and other planned uses, rather than measuring construction alone.
Metric / Unit of Measurement	Cubic metres harvested per year (m ³ /year)
Calculation Method	For metered structures, sum measured inflows or usable captured volume. For unmetered structures, apply an approved engineering/hydrological estimation method using storage geometry, water-level observations and/or runoff capture parameters. Aggregate across unique structures.
Formula	Annual harvested volume = Σ annual measured/estimated harvested volume for each verified structure
Numerator	Not applicable - aggregated annual water volume.
Denominator	Not applicable - volume indicator.
Baseline	<50 million m ³
Baseline Year	2025
Target	≥250 million m ³ /year by 2030
Target Year	2030
Data Source(s)	Annual water audit database; structure monitoring logs; meter/water-level records; hydrological estimation sheets; asset register.
Means of Verification	Annual water audit reports
Data Collection Method	Record metered flows or periodic water levels and storage characteristics for each structure. Apply the same approved estimation method where direct measurement is unavailable and aggregate annually.
Disaggregation	Structure type; district; catchment; season/month; measured versus estimated volume.
Reporting Frequency	Annual, supported by seasonal/monthly monitoring where available.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources. Supporting: District Councils, catchment/water management bodies and project implementers.

Field	Description
Data Quality / Verification	Check unit consistency, calibration of meters, storage-capacity assumptions, missing periods and duplicate assets. Compare annual totals with rainfall/runoff conditions and investigate implausible year-to-year changes.
Methodological Notes / Assumptions	The baseline value is stated in the framework without a baseline year; 2025 is applied as the IDS baseline year for harmonization. Separate gross storage capacity from actual annual harvested volume. The same estimation protocol must be retained across years.
Link to Adaptation Result	Measures the immediate water-resource outcome expected from expanded rainwater harvesting.

IDS 3: % increase in irrigation water availability in dry seasons

Field	Description
Indicator Level	Impact
Indicator Name	% increase in irrigation water availability in dry seasons
Indicator Definition	Relative percentage increase, compared with the 2025 baseline, in the quantity of irrigation water reliably available to target irrigation users during the defined dry season.
Purpose / Relevance to Adaptation	Measures whether increased rainwater capture ultimately improves water availability when rainfall is insufficient and irrigation demand is highest.
Metric / Unit of Measurement	Percent increase from baseline (%)
Calculation Method	Establish a 2025 baseline quantity of dry-season irrigation water available in target areas using a consistent survey/measurement protocol. Measure the same quantity in the reporting period and calculate relative change.
Formula	$((\text{Current dry-season irrigation water availability} - \text{Baseline dry-season irrigation water availability}) \div \text{Baseline dry-season irrigation water availability}) \times 100$
Numerator	Current dry-season irrigation water availability minus baseline dry-season irrigation water availability.
Denominator	Baseline dry-season irrigation water availability.
Baseline	TBD
Baseline Year	2025
Target	≥40% by 2030
Target Year	2030
Data Source(s)	Irrigation scheme records; water-abstraction/delivery records; water-user surveys; water availability assessments.
Means of Verification	Ministry of Agriculture and Water Resources surveys

Field	Description
Data Collection Method	Define the dry-season reference months; collect measured or consistently estimated water delivered/available to irrigation schemes and users; aggregate across the same target geography used for the baseline.
Disaggregation	District; catchment; irrigation scheme; water source; month/dry-season period; beneficiary category.
Reporting Frequency	Annual, at the end of the defined dry season.
Responsible Institution(s)	Proposed joint responsibility: institutions responsible for Water Resources and Agriculture, with District Councils and irrigation schemes providing primary records.
Data Quality / Verification	Use the same dry-season period, target geography and measurement method each year. Cross-check survey estimates with scheme delivery/abstraction records and rainfall/hydrological conditions.
Methodological Notes / Assumptions	A numeric 2025 baseline must be established before the percentage change can be calculated. "Availability" should be defined as a measurable volume or reliable supply quantity, not perceived availability alone.
Link to Adaptation Result	Demonstrates the higher-level adaptation result of improved dry-season irrigation water security.

Adaptation Action 2. Train farmers on runoff capture and safe storage.

Objective: Improve water use efficiency and resilience at farm level.

IDS 4: Number of farmers trained

Field	Description
Indicator Level	Output
Indicator Name	Number of farmers trained
Indicator Definition	Cumulative number of unique farmers who complete the approved training package on runoff capture and safe water storage.
Purpose / Relevance to Adaptation	Measures reach of the capacity-building intervention intended to enable farmers to capture and store runoff safely and use water more efficiently.
Metric / Unit of Measurement	Count of unique farmers completing training
Calculation Method	Deduplicate attendance records using a consistent participant identifier and count farmers who meet the minimum completion requirement for the approved training package.
Formula	Total trained farmers = Count of unique eligible farmers completing the training package
Numerator	Not applicable - absolute count of trained farmers.

Field	Description
Denominator	Not applicable - absolute count indicator.
Baseline	0 (2025)
Baseline Year	2025
Target	≥25,000 farmers by 2030
Target Year	2030
Data Source(s)	Training attendance registers; participant database; training completion records; facilitator reports.
Means of Verification	Training reports, attendance logs
Data Collection Method	Register participants at each training event using unique identifiers and basic demographic data; verify completion against the approved attendance/completion threshold; update the cumulative register.
Disaggregation	District; sex; age group; disability status where available; farmer group; training cohort.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: institution responsible for Agriculture, with the institution responsible for Water Resources, District Councils and implementing partners supporting delivery and reporting.
Data Quality / Verification	Check duplicate participants, incomplete attendance, eligibility and consistency between attendance registers and completion reports. Retain signed/electronic source records.
Methodological Notes / Assumptions	Count each farmer once even if they attend refresher sessions. The training package and minimum completion threshold should be standardized nationally.
Link to Adaptation Result	Tracks whether farmers receive the knowledge and skills required to adopt farm-level runoff harvesting and safe storage practices.

IDS 5: % of trained farmers adopting runoff harvesting

Field	Description
Indicator Level	Outcome
Indicator Name	% of trained farmers adopting runoff harvesting
Indicator Definition	Percentage of trained farmers who are verified, after training, to be applying at least the agreed minimum runoff-harvesting practice on their farms.
Purpose / Relevance to Adaptation	Measures whether training produces actual uptake of runoff-harvesting practices rather than only participation in training.
Metric / Unit of Measurement	Percentage of trained farmers adopting (%)

Field	Description
Calculation Method	From the cohort of trained farmers assessed during follow-up, verify adoption using the approved practice checklist. Divide adopters by all trained farmers assessed and multiply by 100.
Formula	$(\text{Number of trained farmers verified as adopting runoff harvesting} \div \text{Total trained farmers assessed}) \times 100$
Numerator	Number of trained farmers verified as adopting the defined runoff-harvesting practice(s).
Denominator	Total number of trained farmers included in the follow-up assessment.
Baseline	TBD
Baseline Year	2025
Target	≥70% adoption rate
Target Year	2030
Data Source(s)	Post-training follow-up survey dataset; farm verification checklist; training participant register.
Means of Verification	Post-training follow-up surveys
Data Collection Method	Select a representative follow-up sample or conduct a census where feasible; interview trained farmers and verify observable practices on-farm using a standard checklist.
Disaggregation	District; sex; age group; farm size/category; practice type; training cohort.
Reporting Frequency	Annual, preferably after an agricultural season following training.
Responsible Institution(s)	Proposed lead: institution responsible for Agriculture, with District Councils/extension services and relevant water-sector staff.
Data Quality / Verification	Link follow-up respondents to the original training register; document non-response; use consistent adoption criteria; conduct spot checks of self-reported adoption.
Methodological Notes / Assumptions	The framework baseline is TBD; a baseline/adoption starting value should be established for the first trained cohorts. Adoption must mean actual use, not intention to adopt or receipt of materials.
Link to Adaptation Result	Shows the behavioural change required for training to improve farm-level water resilience.

IDS 6: Reduction in dry-season crop failure among trained farmers

Field	Description
Indicator Level	Impact
Indicator Name	Reduction in dry-season crop failure among trained farmers

Field	Description
Indicator Definition	Relative reduction from the 2025 baseline in the dry-season crop-failure rate among trained farmers in target areas.
Purpose / Relevance to Adaptation	Assesses whether runoff harvesting and safe storage contribute to more reliable crop production under dry-season water stress.
Metric / Unit of Measurement	Percent reduction in crop-failure rate (%)
Calculation Method	Define crop failure consistently (for example, crop/plot not reaching harvest or nationally agreed yield-loss threshold). Estimate the baseline and current crop-failure rates among comparable trained-farmer cohorts and calculate relative reduction.
Formula	$((\text{Baseline dry-season crop-failure rate} - \text{Current dry-season crop-failure rate}) \div \text{Baseline dry-season crop-failure rate}) \times 100$
Numerator	Baseline dry-season crop-failure rate minus current dry-season crop-failure rate.
Denominator	Baseline dry-season crop-failure rate.
Baseline	TBD
Baseline Year	2025
Target	≥30% reduction by 2030
Target Year	2030
Data Source(s)	Agricultural production assessments; crop-cut/yield records where available; farmer follow-up surveys; extension records.
Means of Verification	Agriculture productivity assessments
Data Collection Method	At the end of each dry-season production cycle, assess crop outcomes for trained farmers using the same crop-failure definition, sampling approach and target geography used for the baseline.
Disaggregation	District; crop; sex of farmer; farm size/category; runoff-harvesting adoption status; hazard/season.
Reporting Frequency	Annual, after the dry-season production cycle.
Responsible Institution(s)	Proposed lead: institution responsible for Agriculture, supported by District Councils/extension services and the institution responsible for Water Resources.
Data Quality / Verification	Use consistent crop-failure criteria and avoid comparing materially different crops or hazard severities without adjustment. Cross-check farmer reports against field/production records where feasible.

Field	Description
Methodological Notes / Assumptions	A numeric 2025 crop-failure rate is required because the source baseline is TBD. To strengthen attribution, results should also be compared by adoption status and, where feasible, against similar non-participant farmers or historical hazard conditions.
Link to Adaptation Result	Measures the ultimate resilience benefit expected from improved farm-level water capture and storage.

STRATEGY 2: IRRIGATION SCHEMES

Adaptation Action 3. Develop climate-resilient small-scale irrigation systems to reduce crop failure under erratic rainfall and drought.

Objective: Increase area under irrigation for improved food security.

IDS 7: Hectares under new small-scale irrigation

Field	Description
Indicator Level	Output
Indicator Name	Hectares under new small-scale irrigation
Indicator Definition	Total net land area, in hectares, brought under newly developed functional small-scale irrigation systems and available for irrigated cultivation in target areas.
Purpose / Relevance to Adaptation	Measures the expansion of climate-resilient irrigation coverage intended to reduce dependence on erratic rainfall.
Metric / Unit of Measurement	Hectares (ha)
Calculation Method	Map the perimeter of each new functional irrigation scheme using GIS/survey data, calculate net irrigable area, remove overlaps and sum verified hectares.
Formula	Total new irrigated area (ha) = Σ unique GIS-verified net hectares under functional new small-scale irrigation
Numerator	Not applicable - area measure.
Denominator	Not applicable - area measure.
Baseline	~5,000 ha
Baseline Year	2025
Target	≥104,000 ha by 2030
Target Year	2030
Data Source(s)	Land registry; irrigation scheme registry; GIS/satellite imagery; engineering completion records.
Means of Verification	Land registry and satellite data

Field	Description
Data Collection Method	Georeference each supported irrigation scheme; digitize/verify net irrigable boundaries; confirm system functionality and land actually available for irrigation; update the spatial register annually.
Disaggregation	District; irrigation scheme; irrigation technology; water source; operational status.
Reporting Frequency	Annual, with updates at scheme completion.
Responsible Institution(s)	Proposed joint responsibility: institutions responsible for Water Resources/Irrigation and Agriculture, with District Councils and scheme management bodies.
Data Quality / Verification	Cross-check land records against satellite/GIS polygons and field verification; exclude duplicated/overlapping polygons and non-functional schemes; document whether reported area is design, command or actually irrigable area.
Methodological Notes / Assumptions	The source baseline is approximately 5,000 ha. For comparability, the same definition of "under new small-scale irrigation" must be applied to baseline and target. Report net unique area, not summed seasonal cropped area.
Link to Adaptation Result	Tracks the physical expansion of irrigation capacity required to buffer crop production against rainfall variability and drought.

IDS 8: % increase in cropping intensity

Field	Description
Indicator Level	Outcome
Indicator Name	% increase in cropping intensity
Indicator Definition	Change in cropping intensity in supported irrigation areas, operationalized as the ratio of total annual cropped area across all seasons to the net cultivated/irrigable area.
Purpose / Relevance to Adaptation	Measures whether irrigation expansion enables land to be cropped more frequently within a year, thereby improving productive use of water and land.
Metric / Unit of Measurement	Cropping intensity ratio (index); 1.0 = one full crop cycle per year, 1.5 = equivalent of 1.5 crop cycles
Calculation Method	For each scheme, sum the area actually cropped in all seasons during the year (gross cropped area) and divide by the net cultivated/irrigable area. Aggregate using area-weighted values where a sector-wide result is required.
Formula	Cropping intensity = Total gross cropped area across all seasons ÷ Net cultivated/irrigable area. Relative % increase may additionally be reported as ((Current index - Baseline index) ÷ Baseline index) × 100.

Field	Description
Numerator	Total gross cropped area across all seasons during the reporting year.
Denominator	Net cultivated/irrigable area in the same schemes.
Baseline	1.0
Baseline Year	2025
Target	≥1.5 by 2030
Target Year	2030
Data Source(s)	Agriculture productivity reports; irrigation scheme cropping records; GIS/land records.
Means of Verification	Agriculture productivity reports
Data Collection Method	Record area planted in each season for the same scheme boundaries; verify against scheme registers and, where feasible, remote-sensing data; calculate the annual ratio.
Disaggregation	District; irrigation scheme; crop; season; irrigation technology.
Reporting Frequency	Seasonal data collection, with annual calculation.
Responsible Institution(s)	Proposed joint responsibility: institutions responsible for Agriculture and Irrigation/Water Resources, with scheme management bodies and District Councils.
Data Quality / Verification	Use identical scheme boundaries for numerator and denominator; ensure fallow/uncropped land is treated consistently; prevent double counting within a season; reconcile production reports with mapped area.
Methodological Notes / Assumptions	Technical clarification: although the source indicator is worded "% increase in cropping intensity", its baseline (1.0) and target (1.5) are ratios, not percentages. This IDS therefore treats 1.0→1.5 as an increase in the cropping-intensity index (equivalent to a 50% relative increase). The source wording and target are retained unchanged.
Link to Adaptation Result	Shows whether new irrigation is enabling more intensive and reliable annual production, contributing to food security.

IDS 9: % of households with improved food security

Field	Description
Indicator Level	Impact
Indicator Name	% of households with improved food security
Indicator Definition	Percentage of assessed households in target irrigation areas whose food-security status has improved relative to the established 2025 baseline using one consistently applied, nationally accepted household food-security measure.

Field	Description
Purpose / Relevance to Adaptation	Measures the intended household-level welfare and resilience benefit from more reliable irrigated production.
Metric / Unit of Measurement	Percentage of households with improved food-security status (%)
Calculation Method	Select and document one food-security classification/score at baseline. Reassess comparable households using the same tool. Count households whose status improves according to the agreed rule and divide by all households assessed.
Formula	$(\text{Number of assessed households with improved food-security status} \div \text{Total assessed households in target areas}) \times 100$
Numerator	Number of households meeting the agreed criterion for improvement in food-security status.
Denominator	Total number of households assessed in target areas.
Baseline	TBD
Baseline Year	2025
Target	≥50% by 2030 in target areas
Target Year	2030
Data Source(s)	DHS where relevant variables are available; local food-security survey datasets; agriculture/household monitoring surveys.
Means of Verification	DHS and local food security surveys
Data Collection Method	Conduct representative household surveys in defined target areas using the same food-security tool, season and sampling approach used for the baseline.
Disaggregation	District; sex of household head; household vulnerability group; livelihood; irrigation scheme; wealth/poverty category where available.
Reporting Frequency	Annual or aligned to the approved household food-security survey cycle.
Responsible Institution(s)	Proposed lead: institution responsible for Agriculture, working with the national statistics function, District Councils and relevant food-security monitoring partners.
Data Quality / Verification	Maintain a consistent food-security instrument, recall period and seasonal timing; document sample design and non-response; verify data cleaning and weighting where survey weights apply.
Methodological Notes / Assumptions	The source does not define "improved food security". Before baseline measurement, select one nationally accepted metric and a precise improvement rule; do not switch instruments over time. A 2025 numeric baseline is required.

Field	Description
Link to Adaptation Result	Captures the intended contribution of climate-resilient irrigation to household food security in target areas.

Adaptation Action 4. Form Farmer Irrigation User Associations (IUAs).

Objective: Promote community-led irrigation governance.

IDS 10: Number of IUAs formed

Field	Description
Indicator Level	Output
Indicator Name	Number of IUAs formed
Indicator Definition	Cumulative number of Farmer Irrigation User Associations formally constituted and entered in the recognized IUA registry for supported irrigation schemes.
Purpose / Relevance to Adaptation	Measures establishment of local governance structures needed for collective irrigation management, allocation and accountability.
Metric / Unit of Measurement	Count of registered IUAs
Calculation Method	Count unique IUAs that meet the approved formation/registration requirements and have a valid registry entry; remove dissolved or duplicate entities according to the reporting rule.
Formula	Total IUAs formed = Count of unique IUAs meeting formal formation/registration criteria
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	0
Baseline Year	2025
Target	≥500 by 2030
Target Year	2030
Data Source(s)	IUA registry; registration/formation records; scheme governance records.
Means of Verification	Registry of IUAs
Data Collection Method	Update the IUA registry when an association completes formation requirements. Verify identity, scheme served, registration date and current status.
Disaggregation	District; irrigation scheme; IUA status; year formed.
Reporting Frequency	Quarterly, with annual consolidation.

Field	Description
Responsible Institution(s)	Proposed lead: institution responsible for Irrigation/Water Resources, supported by the institution responsible for Agriculture, District Councils and irrigation scheme management.
Data Quality / Verification	Use unique registry identifiers; reconcile formation reports with the official registry; verify that associations counted are not duplicate committees for the same scheme unless formally distinct.
Methodological Notes / Assumptions	The source baseline does not state a year; 2025 is applied as the IDS baseline year. Define whether an IUA must be legally registered or formally recognized under an approved administrative process and apply the rule consistently.
Link to Adaptation Result	Tracks creation of the community institutions required for participatory irrigation governance.

IDS 11: % of IUAs implementing irrigation water use plans

Field	Description
Indicator Level	Outcome
Indicator Name	% of IUAs implementing irrigation water use plans
Indicator Definition	Percentage of assessed IUAs that have an approved irrigation water-use plan and are verified to be implementing the plan during the reporting period.
Purpose / Relevance to Adaptation	Measures whether IUAs move beyond formation to active, planned and accountable management of irrigation water.
Metric / Unit of Measurement	Percentage of assessed IUAs implementing plans (%)
Calculation Method	Using an approved implementation checklist, classify each assessed IUA as implementing/not implementing. Divide IUAs meeting the minimum implementation threshold by all IUAs assessed.
Formula	$(\text{Number of assessed IUAs verified as implementing irrigation water-use plans} \div \text{Total IUAs assessed}) \times 100$
Numerator	Number of assessed IUAs meeting the agreed implementation threshold.
Denominator	Total number of IUAs assessed during the reporting period.
Baseline	TBD
Baseline Year	2025
Target	≥75% by 2030
Target Year	2030
Data Source(s)	IUA water-use plans; IUA activity reports; field-monitoring checklists; scheme water-allocation records.
Means of Verification	IUA reports and field monitoring
Data Collection Method	Review plans and IUA records, then verify implementation through field monitoring and evidence such as allocation schedules, meeting records, compliance actions and water-use monitoring.
Disaggregation	District; irrigation scheme; IUA age; implementation status; plan component.
Reporting Frequency	Annual.
Responsible Institution(s)	Proposed lead: institution responsible for Irrigation/Water Resources, with District Councils and IUA/irrigation scheme structures.
Data Quality / Verification	Require documentary and field evidence, not self-report alone; define a minimum implementation threshold; document IUAs not assessed and reasons for exclusion.

Field	Description
Methodological Notes / Assumptions	A 2025 baseline percentage should be established. Possession of a plan alone does not constitute implementation; the checklist should require evidence of actual application during the reporting period.
Link to Adaptation Result	Shows whether local irrigation governance institutions are actively managing water according to agreed plans.

IDS 12: Reduction in irrigation conflicts and overuse

Field	Description
Indicator Level	Impact
Indicator Name	Reduction in irrigation conflicts and overuse
Indicator Definition	Change in the level of irrigation-water conflict and overuse in target schemes, classified using a standardized High/Medium/Low rating derived from documented conflict incidence and water-use non-compliance/overuse evidence.
Purpose / Relevance to Adaptation	Measures whether stronger community irrigation governance reduces competition, disputes and unsustainable water use.
Metric / Unit of Measurement	Ordinal conflict-and-overuse rating (High / Medium / Low), supported by underlying numeric measures
Calculation Method	At baseline, define thresholds for High, Medium and Low using two documented components: verified irrigation conflict incidence and verified overuse/non-compliance incidence. Calculate the same component measures each year and apply the fixed thresholds.
Formula	Composite rating = Classification of standardized conflict incidence and overuse/non-compliance incidence using pre-approved thresholds. Underlying rates should be reported alongside the rating.
Numerator	For underlying rates: number of verified conflict cases and number of verified overuse/non-compliance events.
Denominator	For underlying rates: agreed exposure base (e.g., IUAs, schemes, users or monitoring periods), fixed at baseline methodology stage.
Baseline	High
Baseline Year	2025
Target	Low by 2030
Target Year	2030
Data Source(s)	Community survey dataset; complaints/grievance logs; IUA records; field-monitoring and water-use compliance records.
Means of Verification	Community-level surveys and complaints logs

Field	Description
Data Collection Method	Compile and verify complaints/conflict cases and overuse events; conduct periodic community perception surveys; calculate underlying rates and apply the approved classification thresholds.
Disaggregation	District; scheme; conflict type; water-use issue; user group; sex/vulnerability group where survey data permit.
Reporting Frequency	Annual, with continuous logging of complaints/events.
Responsible Institution(s)	Proposed lead: institution responsible for Irrigation/Water Resources, with IUAs, District Councils and scheme management structures.
Data Quality / Verification	Use standardized case definitions; distinguish unique cases from repeated reports; triangulate complaints with IUA/field records; maintain the same classification thresholds over time.
Methodological Notes / Assumptions	The source uses qualitative baseline/target categories (High→Low), so a numeric numerator/denominator is not inherently specified. This IDS recommends retaining the ordinal indicator while preserving underlying quantitative rates to make the classification auditable and less subjective.
Link to Adaptation Result	Demonstrates whether community-led irrigation governance reduces conflict and unsustainable water use.

STRATEGY 3: ACCESS TO WATER AND SANITATION (WASH)

Adaptation Action 5. Launch hygiene education campaigns.

Objective: Build community capacity for hygiene in response to climate impacts.

IDS 13: Number of hygiene campaigns conducted

Field	Description
Indicator Level	Output
Indicator Name	Number of hygiene campaigns conducted
Indicator Definition	Cumulative number of completed district-wide hygiene education campaigns delivered under the adaptation action and meeting the agreed minimum campaign-content and coverage criteria.
Purpose / Relevance to Adaptation	Measures delivery of climate-responsive hygiene communication intended to strengthen preventive behaviour during climate-related water and sanitation risks.
Metric / Unit of Measurement	Count of qualifying campaigns
Calculation Method	Review campaign records and count each distinct completed campaign once when it meets the approved minimum criteria for content, target population and district coverage.

Field	Description
Formula	Total hygiene campaigns = Count of unique completed campaigns meeting approved criteria
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	0
Baseline Year	2025
Target	≥29 campaigns (district-wide)
Target Year	2030
Data Source(s)	MoH campaign database/reports; NGO/partner activity reports; district WASH records; campaign schedules and materials.
Means of Verification	MoH and NGO reports
Data Collection Method	Register each campaign with date, district, audience, delivery channels, climate/WASH messages and evidence of completion; reconcile partner submissions at district/national level.
Disaggregation	District; campaign theme; delivery channel; target population; implementing organization.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: Ministry responsible for Health, with the institution responsible for Water Resources/WASH, District Councils and implementing NGOs/partners.
Data Quality / Verification	Check duplicate reporting across partners; verify campaign completion and district coverage; retain materials, activity reports and attendance/reach evidence where available.
Methodological Notes / Assumptions	The source target does not explicitly state a year. This IDS applies 2030 as the target year consistent with the framework target horizon. Define what constitutes one "district-wide campaign" before reporting.
Link to Adaptation Result	Tracks implementation of hygiene education needed to reduce climate-sensitive WASH risks.

IDS 14: % increase in handwashing and hygiene behavior

Field	Description
Indicator Level	Outcome
Indicator Name	% increase in handwashing and hygiene behavior
Indicator Definition	Relative percentage increase from the 2025 baseline in the proportion of the target population meeting the agreed handwashing and hygiene-behaviour standard measured through KAP surveys.

Field	Description
Purpose / Relevance to Adaptation	Measures whether hygiene campaigns translate into improved preventive practices that reduce vulnerability to climate-sensitive WASH-related disease.
Metric / Unit of Measurement	Percent increase from baseline in prevalence of defined hygiene behaviours (%)
Calculation Method	Define a reproducible hygiene-behaviour standard at baseline. Estimate the baseline and current proportion of respondents/households meeting the standard using comparable KAP surveys, then calculate relative percentage increase.
Formula	$((\text{Current proportion meeting the hygiene-behaviour standard} - \text{Baseline proportion}) \div \text{Baseline proportion}) \times 100$
Numerator	Current proportion meeting the hygiene-behaviour standard minus baseline proportion.
Denominator	Baseline proportion meeting the hygiene-behaviour standard.
Baseline	TBD
Baseline Year	2025
Target	≥70% by 2030
Target Year	2030
Data Source(s)	KAP survey datasets; household/community hygiene monitoring records.
Means of Verification	KAP surveys
Data Collection Method	Conduct representative KAP surveys using the same questions, observation criteria, target population, sampling approach and seasonal timing as the baseline.
Disaggregation	District; sex; age group; rural/urban setting; vulnerability group; household type.
Reporting Frequency	Annual or aligned to the approved KAP survey cycle.
Responsible Institution(s)	Proposed lead: Ministry responsible for Health, supported by WASH/water institutions, District Councils and survey/implementation partners.
Data Quality / Verification	Maintain identical indicator questions and scoring; where possible verify self-reported behaviour through observation; document sample design, non-response and survey timing.
Methodological Notes / Assumptions	Technical clarification: the source says "% increase" and gives a target of ≥70%; this IDS therefore interprets the target as a relative increase from baseline, not simply 70% prevalence. If stakeholders intended "≥70% practicing", the indicator wording should be revised at framework level rather than silently changing the IDS.

Field	Description
Link to Adaptation Result	Shows behavioural adaptation resulting from hygiene education in climate-vulnerable communities.

IDS 15: Reduction in hygiene-related diseases

Field	Description
Indicator Level	Impact
Indicator Name	Reduction in hygiene-related diseases
Indicator Definition	Relative reduction from the 2025 baseline in the incidence rate of the agreed set of hygiene-related diseases in target populations.
Purpose / Relevance to Adaptation	Measures the public-health resilience benefit expected from improved hygiene behaviour under climate-related WASH stress.
Metric / Unit of Measurement	Percent reduction in disease incidence rate (%)
Calculation Method	Define the disease set and surveillance denominator at baseline. Calculate baseline and current incidence rates for the same diseases, population and reporting period, then compute relative reduction.
Formula	$((\text{Baseline hygiene-related disease incidence rate} - \text{Current incidence rate}) \div \text{Baseline incidence rate}) \times 100$
Numerator	Baseline incidence rate minus current incidence rate for the defined disease set.
Denominator	Baseline incidence rate for the defined disease set.
Baseline	High
Baseline Year	2025
Target	≥50% reduction
Target Year	2030
Data Source(s)	Routine health information system; disease surveillance records; district health records; MoH annual bulletins.
Means of Verification	MoH annual bulletins
Data Collection Method	Extract confirmed/reported cases and population denominators for the predefined disease set and target areas; calculate comparable incidence rates each year.
Disaggregation	District; disease; sex; age group; outbreak/non-outbreak period; climate-sensitive season where feasible.
Reporting Frequency	Annual, with routine monthly/quarterly surveillance feeding the annual result.

Field	Description
Responsible Institution(s)	Proposed lead: Ministry responsible for Health, with District Health Offices and WASH/water-sector institutions supporting interpretation and linkage to interventions.
Data Quality / Verification	Use consistent case definitions and denominators; assess changes in surveillance completeness/testing; investigate outbreaks and reporting artefacts; reconcile district and national totals.
Methodological Notes / Assumptions	The source baseline is qualitative (High) while the target is a quantitative percentage reduction. A numeric 2025 incidence-rate baseline must therefore be established and retained alongside the qualitative "High" status to make the target calculable. The disease set must be fixed before baseline measurement.
Link to Adaptation Result	Demonstrates whether improved hygiene capacity contributes to fewer climate-sensitive hygiene-related illnesses.

STRATEGY 4: EXPAND CLIMATE-RESILIENT RURAL WATER SUPPLY SYSTEMS

Adaptation Action 6. Construct solar-powered boreholes in vulnerable districts.

Objective: Improve rural water supply resilience to droughts.

IDS 16: Number of functional solar-powered boreholes

Field	Description
Indicator Level	Output
Indicator Name	Number of functional solar-powered boreholes
Indicator Definition	Number of solar-powered boreholes in target vulnerable districts that are installed and verified as functional and supplying water at the reporting cut-off date.
Purpose / Relevance to Adaptation	Measures operational expansion of drought-resilient rural water infrastructure, focusing on functionality rather than installations alone.
Metric / Unit of Measurement	Count of functional solar-powered boreholes
Calculation Method	Reconcile the borehole inventory with field inspections and count each unique solar-powered borehole that meets the approved functionality criteria at the reporting date.
Formula	Functional solar boreholes = Count of unique inventoried solar-powered boreholes passing functionality verification
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	<50
Baseline Year	2025
Target	≥500 by 2030
Target Year	2030
Data Source(s)	National/district borehole inventory; construction/commissioning records; field-inspection forms; maintenance records.
Means of Verification	Field inspections, borehole inventory
Data Collection Method	Maintain a georeferenced borehole register and conduct periodic functionality checks covering water production and core solar/pumping components.
Disaggregation	District; community; borehole status; installation year; failure type where non-functional.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/rural water supply, with District Councils and water-point management structures.

Field	Description
Data Quality / Verification	Use unique water-point IDs; reconcile inventory and field status; record inspection date; exclude non-functional points from the indicator even if previously commissioned.
Methodological Notes / Assumptions	The source baseline is "<50" rather than an exact count; establish the exact 2025 functional baseline where possible. Functionality criteria and maximum acceptable downtime should be standardized.
Link to Adaptation Result	Tracks the operational water-supply assets intended to maintain access during drought and power constraints.

IDS 17: % population with access to safe water

Field	Description
Indicator Level	Outcome
Indicator Name	% population with access to safe water
Indicator Definition	Percentage of the target population with access to a functioning water source that meets the nationally approved criteria for safe water and the defined service-access standard.
Purpose / Relevance to Adaptation	Measures whether resilient rural water infrastructure expands reliable access to safe water for vulnerable populations.
Metric / Unit of Measurement	Percentage of target population with access (%)
Calculation Method	Estimate the population served by qualifying functional safe-water points within the approved service-access criteria; remove overlapping service populations where necessary; divide by the total target population.
Formula	$(\text{Population with access to qualifying safe-water service} \div \text{Total target population}) \times 100$
Numerator	Population in target areas with access to a qualifying functional safe-water source.
Denominator	Total population in the defined target areas.
Baseline	65%
Baseline Year	2025
Target	≥85% by 2030
Target Year	2030
Data Source(s)	National Water Point Mapping database; water-quality test records; population projections/census data; district water-point records.
Means of Verification	National Water Point Mapping

Field	Description
Data Collection Method	Update water-point location/functionality and safety status; spatially link service areas to current population estimates using an approved access methodology.
Disaggregation	District; rural community; sex/age/vulnerability where household survey data permit; water-source type.
Reporting Frequency	Annual.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/rural water supply, supported by District Councils, national statistics function and relevant water-quality authorities.
Data Quality / Verification	Check functionality dates, water-quality status, population denominators and overlapping service areas. Use one access definition consistently over time.
Methodological Notes / Assumptions	"Safe water" and "access" must follow the nationally approved water-service definitions. The target should not be calculated from borehole counts alone; population coverage and source functionality/safety are required.
Link to Adaptation Result	Measures improved resilient access to safe water in drought-vulnerable rural areas.

IDS 18: Reduced time to fetch water

Field	Description
Indicator Level	Impact
Indicator Name	Reduced time to fetch water
Indicator Definition	Average household round-trip time required to travel to a primary water source, wait/queue and return with water in target communities, measured in minutes.
Purpose / Relevance to Adaptation	Captures a direct household resilience and welfare benefit of improved local water access, including reduced time burden on water collectors.
Metric / Unit of Measurement	Average round-trip collection time (minutes)
Calculation Method	For a representative sample, record total round-trip water collection time including travel and queueing for the primary source. Calculate the mean (and preferably median) using the same seasonal reference period.
Formula	Average collection time = Σ reported/observed round-trip collection minutes $\div$ Number of valid water-collection observations/households
Numerator	Total round-trip water-collection minutes recorded for valid observations.
Denominator	Number of valid household/collection-trip observations.

Field	Description
Baseline	1-2 hrs
Baseline Year	2025
Target	≤30 minutes
Target Year	2030
Data Source(s)	Community/household survey datasets; time-use/water-access modules; water-point accessibility records.
Means of Verification	Community surveys
Data Collection Method	Survey primary water collectors during a defined reference period, recording travel, queueing and return time. Where feasible, validate a sample through direct observation/GPS timing.
Disaggregation	District; community; sex and age of primary water collector; disability status where available; season; water source.
Reporting Frequency	Annual, preferably during the comparable dry-season period.
Responsible Institution(s)	Proposed lead: institution responsible for rural water supply, with District Councils and household/community survey partners.
Data Quality / Verification	Standardize whether time includes queueing; maintain comparable seasonal timing; inspect outliers; report median alongside mean where distributions are skewed.
Methodological Notes / Assumptions	The source baseline is a range (1-2 hours), not a single mean. A precise 2025 average/median should be established for formal trend calculation while retaining the source range as the framework baseline. The ≤30-minute target is treated as an average service outcome unless the framework later specifies a population threshold.
Link to Adaptation Result	Demonstrates reduced household time burden and improved practical water accessibility resulting from resilient rural supply systems.

STRATEGY 5: IMPLEMENT INTEGRATED CATCHMENT MANAGEMENT (ICM)

Adaptation Action 7. Restore priority degraded catchments.

Objective: Reduce land degradation and improve water retention.

IDS 19: Number of catchments restored

Field	Description
Indicator Level	Output
Indicator Name	Number of catchments restored

Field	Description
Indicator Definition	Number of priority degraded catchments in which the approved restoration package has been implemented to the minimum completion threshold and verified in the field and through GIS evidence.
Purpose / Relevance to Adaptation	Measures implementation of catchment-scale restoration intended to improve infiltration, water retention and landscape resilience.
Metric / Unit of Measurement	Count of qualifying restored catchments
Calculation Method	Maintain the approved list and boundaries of priority catchments. Assess each against the minimum restoration-completion criteria and count unique catchments meeting the threshold.
Formula	Restored catchments = Count of unique priority catchments meeting the approved restoration-completion threshold
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	0
Baseline Year	2025
Target	≥17 by 2030
Target Year	2030
Data Source(s)	Priority catchment register; restoration implementation records; GIS layers; field-verification records.
Means of Verification	Field verification, GIS data
Data Collection Method	Map catchment boundaries and interventions; verify the required restoration measures and completion threshold through field inspection and GIS/remote-sensing evidence.
Disaggregation	Catchment; district; restoration intervention; completion status; year restored.
Reporting Frequency	Annual.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/catchment management, supported by environmental/forestry/land-management institutions and District Councils.
Data Quality / Verification	Use fixed catchment boundaries and unique IDs; verify reported completion spatially and in the field; prevent counting partial interventions as a fully restored catchment.
Methodological Notes / Assumptions	The source baseline does not state a year; 2025 is applied. "Restored" requires a predefined minimum package/threshold; otherwise the count is vulnerable to subjective interpretation.

Field	Description
Link to Adaptation Result	Tracks catchment-level restoration delivery required to reduce degradation and improve hydrological function.

IDS 20: Hectares rehabilitated through SWC & reforestation

Field	Description
Indicator Level	Outcome
Indicator Name	Hectares rehabilitated through SWC & reforestation
Indicator Definition	Total unique land area, in hectares, within target catchments verified as rehabilitated through soil and water conservation (SWC), reforestation, or both, and meeting the agreed implementation/survival criteria.
Purpose / Relevance to Adaptation	Measures the spatial scale of functioning land rehabilitation expected to improve infiltration, reduce erosion and strengthen catchment water retention.
Metric / Unit of Measurement	Hectares (ha) of unique rehabilitated land
Calculation Method	Map intervention polygons, verify implementation through field/environmental audits, remove overlaps and sum unique hectares meeting the rehabilitation criteria.
Formula	Rehabilitated area (ha) = Area of union of all verified qualifying SWC and reforestation polygons
Numerator	Not applicable - area measure.
Denominator	Not applicable - area measure.
Baseline	TBD
Baseline Year	2025
Target	≥100,000 ha
Target Year	2030
Data Source(s)	Environmental audit reports; GIS/remote-sensing layers; restoration project records; field-survival/maintenance assessments.
Means of Verification	Environmental audits
Data Collection Method	Digitize intervention boundaries; verify SWC condition and reforestation establishment/survival using field audits and imagery; calculate unique area in GIS.
Disaggregation	Catchment; district; intervention type (SWC/reforestation/both); land-use type; implementation year.
Reporting Frequency	Annual, with seasonal field checks as appropriate.

Field	Description
Responsible Institution(s)	Proposed lead: institution responsible for catchment/water-resource management, with environmental/forestry/land-management institutions and District Councils.
Data Quality / Verification	Use GIS topology checks; remove spatial overlap so land receiving both SWC and reforestation is counted once in the total; verify minimum condition/survival requirements before inclusion.
Methodological Notes / Assumptions	The source baseline is TBD and the target does not explicitly state a year; 2025 and 2030 are applied as the IDS baseline/target years. Report intervention-specific hectares separately in addition to the de-duplicated total.
Link to Adaptation Result	Measures the scale of land rehabilitation through which catchment restoration is expected to improve water retention and reduce erosion.

IDS 21: Reduction in sediment load and flood risk

Field	Description
Indicator Level	Impact
Indicator Name	Reduction in sediment load and flood risk
Indicator Definition	Reduction in two linked catchment-impact dimensions: (1) river sediment load and (2) flood risk in target catchments, each measured against an established 2025 quantitative baseline.
Purpose / Relevance to Adaptation	Measures whether catchment rehabilitation improves downstream hydrological resilience by reducing erosion/sedimentation and flood risk.
Metric / Unit of Measurement	Percent reduction in sediment load (%) and percent reduction in a defined flood-risk measure (%); combined result reported conservatively
Calculation Method	Calculate sediment-load reduction and flood-risk reduction separately using comparable monitoring methods. For a single headline result, use the lower of the two percentage reductions so that improvement in only one component cannot mask deterioration in the other.
Formula	Sediment reduction = $((\text{Baseline sediment load} - \text{Current sediment load}) \div \text{Baseline sediment load}) \times 100$; Flood-risk reduction = $((\text{Baseline flood-risk metric} - \text{Current flood-risk metric}) \div \text{Baseline flood-risk metric}) \times 100$; Headline indicator = MIN(Sediment reduction, Flood-risk reduction).
Numerator	For each component: baseline value minus current value.
Denominator	For each component: corresponding baseline value.
Baseline	High
Baseline Year	2025
Target	≥50% reduction
Target Year	2030
Data Source(s)	River sedimentation studies; hydrological monitoring records; flood-risk assessments/models; catchment monitoring data.
Means of Verification	River sedimentation studies
Data Collection Method	Monitor sediment using consistent stations/methods and update the same defined flood-risk metric for the same catchments. Calculate both component changes and retain both in the reporting dataset.
Disaggregation	Catchment; river reach/station; district; sediment component; flood-risk component; hazard event/season.
Reporting Frequency	Annual, with event-based measurements after major floods where appropriate.

Field	Description
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/catchment management, with environmental/forestry institutions, hydrological services and District Councils.
Data Quality / Verification	Maintain station locations, sampling methods and flood-risk model assumptions; quality-control laboratory/field data; account for exceptional hazard magnitude when interpreting annual changes.
Methodological Notes / Assumptions	This is a compound indicator. The source baseline "High" is qualitative and cannot support a 50% calculation by itself. Numeric 2025 baselines are therefore required for both sediment load and the selected flood-risk metric. Reporting both components is essential; the conservative MIN rule is an operational recommendation, not a change to the source target.
Link to Adaptation Result	Demonstrates whether integrated catchment management reduces downstream sedimentation and flood-related climate risk.

STRATEGY 6: DEVELOP MEDIUM-SCALE WATER STORAGE INFRASTRUCTURE

Adaptation Action 8. Build sand/earth dams in dryland areas.

Objective: Enhance year-round water availability.

IDS 22: Number of sand/earth dams constructed

Field	Description
Indicator Level	Output
Indicator Name	Number of sand/earth dams constructed
Indicator Definition	Cumulative number of distinct sand dams and earth dams completed under the adaptation action, commissioned and verified as structurally/operationally fit for intended water-storage service.
Purpose / Relevance to Adaptation	Measures delivery of medium-scale storage infrastructure intended to retain water for dry-season use.
Metric / Unit of Measurement	Count of commissioned functional dams
Calculation Method	Count each unique dam once after completion/commissioning and verification against approved technical and operational criteria.
Formula	Total dams constructed = Count of unique commissioned sand dams + Count of unique commissioned earth dams
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.

Field	Description
Baseline	0
Baseline Year	2025
Target	≥50 by 2030
Target Year	2030
Data Source(s)	Construction records; completion/commissioning certificates; dam asset register; site-inspection records.
Means of Verification	Construction records
Data Collection Method	Update the georeferenced dam asset register at commissioning; verify dam type, location, completion status and functionality through engineering/site records.
Disaggregation	District; dam type; catchment; completion year; functional status.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/water infrastructure, with District Councils, implementing agencies and relevant dam/catchment authorities.
Data Quality / Verification	Reconcile contractor records, commissioning certificates and site inspections; use unique asset IDs; exclude incomplete or non-commissioned structures.
Methodological Notes / Assumptions	The source baseline does not state a year; 2025 is applied. Major rehabilitation of an existing dam should not be counted as a newly constructed dam unless the framework explicitly permits it.
Link to Adaptation Result	Tracks the storage infrastructure required to improve dry-season and year-round water availability.

IDS 23: Volume of water stored in dry season

Field	Description
Indicator Level	Outcome
Indicator Name	Volume of water stored in dry season
Indicator Definition	Total usable water volume physically stored in supported sand/earth dams at the defined dry-season reference date or averaged over an approved dry-season monitoring period.
Purpose / Relevance to Adaptation	Measures whether new dams actually retain a substantial quantity of water during the period of greatest scarcity.
Metric / Unit of Measurement	Cubic metres of usable stored water (m ³)

Field	Description
Calculation Method	Use calibrated water-level/storage curves, direct volume measurements or approved engineering estimates to determine usable stored volume at each dam for the defined dry-season reference period; sum across dams.
Formula	Dry-season stored volume = Σ usable stored volume in each verified supported dam at the defined reference period
Numerator	Not applicable - aggregated volume.
Denominator	Not applicable - volume indicator.
Baseline	TBD
Baseline Year	2025
Target	≥ 250 million m ³ by 2030
Target Year	2030
Data Source(s)	Water monitoring reports; reservoir/dam level records; storage-capacity curves; dam asset register.
Means of Verification	Water monitoring reports
Data Collection Method	Record water levels at agreed intervals/reference date, convert levels to storage volumes using validated curves or approved estimation methods, and aggregate across operational dams.
Disaggregation	District; dam; dam type; catchment; month/reference date; usable versus dead storage where data permit.
Reporting Frequency	At least annually during the defined dry-season reference period; monthly/seasonal monitoring preferred.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources/water infrastructure, with District Councils and dam/catchment management bodies.
Data Quality / Verification	Calibrate/validate level-volume relationships; distinguish design capacity from actual stored volume; flag missing readings and non-functional dams; use consistent reference timing year to year.
Methodological Notes / Assumptions	The source baseline is TBD. Establish a 2025 dry-season baseline using the same reference date/period and storage definition. The indicator should measure actual usable stored water, not nominal design capacity.
Link to Adaptation Result	Measures the immediate water-availability outcome created by medium-scale storage infrastructure.

IDS 24: % reduction in dry season water stress

Field	Description
Indicator Level	Impact

Field	Description
Indicator Name	% reduction in dry season water stress
Indicator Definition	Relative reduction from the 2025 baseline in a standardized dry-season water-stress index for target communities/areas served by supported storage infrastructure.
Purpose / Relevance to Adaptation	Measures whether additional storage reduces the severity of seasonal water shortages experienced by communities and users.
Metric / Unit of Measurement	Percent reduction in dry-season water-stress index (%)
Calculation Method	At baseline, define a measurable water-stress index using a consistent service/supply metric (for example, unmet dry-season demand as a share of total demand or another nationally approved measure). Calculate the same index each year and compute relative reduction.
Formula	$((\text{Baseline dry-season water-stress index} - \text{Current dry-season water-stress index}) \div \text{Baseline dry-season water-stress index}) \times 100$
Numerator	Baseline water-stress index minus current water-stress index.
Denominator	Baseline dry-season water-stress index.
Baseline	High
Baseline Year	2025
Target	≥60%
Target Year	2030
Data Source(s)	Community impact surveys; water-supply/service records; drought/water-availability assessments; dam/storage monitoring data.
Means of Verification	Community impact surveys
Data Collection Method	Apply the approved water-stress measure during the same dry-season reference period in target areas, combining community survey and service/supply evidence as defined in the baseline protocol.
Disaggregation	District; community; water-use category; user/vulnerability group; source/storage scheme; dry-season month.
Reporting Frequency	Annual, during/after the defined dry season.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources, supported by District Councils, local water-management structures and relevant service providers.
Data Quality / Verification	Keep the water-stress definition, denominator and dry-season timing constant; triangulate perceived stress with supply/service records; document drought severity to interpret year-to-year variation.

Field	Description
Methodological Notes / Assumptions	The source baseline "High" is qualitative, while the target is a 60% reduction. A numeric 2025 water-stress index must therefore be established alongside the qualitative baseline. The exact index should be approved nationally before reporting to avoid subjective interpretation.
Link to Adaptation Result	Demonstrates the intended resilience effect of greater storage: materially lower dry-season water stress.

STRATEGY 7: ENHANCE EARLY WARNING SYSTEMS FOR RIVERINE FLOODING AND DROUGHTS

Adaptation Action 9. Establish flood and drought early warning systems.

Objective: Improve preparedness to water-related climate hazards.

IDS 25: Number of operational EWS in hotspots

Field	Description
Indicator Level	Output
Indicator Name	Number of operational EWS in hotspots
Indicator Definition	Number of flood and/or drought early warning systems established in identified hotspots that pass the approved end-to-end operational functionality test during the reporting period.
Purpose / Relevance to Adaptation	Measures deployment of functioning warning capacity in locations at high risk from riverine flooding and drought.
Metric / Unit of Measurement	Count of operational early warning systems (EWS)
Calculation Method	Maintain a registry of EWS/hotspots; conduct the approved functionality test for each system; count unique systems that pass all mandatory operational criteria at the reporting cut-off date.
Formula	Operational EWS = Count of unique hotspot EWS passing all mandatory functionality criteria
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	0
Baseline Year	2025
Target	≥10 by 2030
Target Year	2030
Data Source(s)	EWS registry; functionality-test reports; system operation/maintenance logs; communication test records.
Means of Verification	EWS functionality tests

Field	Description
Data Collection Method	Conduct scheduled end-to-end tests covering the agreed essential functions (monitoring/trigger, warning generation, dissemination and receipt/communication) and record pass/fail status.
Disaggregation	District; hotspot; hazard type (flood/drought/both); EWS type; operational status.
Reporting Frequency	At least semi-annual functionality testing, with annual indicator reporting; additional pre-season tests recommended.
Responsible Institution(s)	Proposed joint responsibility: institutions responsible for Water Resources, disaster risk management and meteorological/climate services, with District Councils and local warning structures.
Data Quality / Verification	Use one standardized functionality checklist; retain test evidence and system logs; do not count installed systems that fail mandatory components; verify unique hotspot/system IDs.
Methodological Notes / Assumptions	"Operational" should require successful end-to-end functionality, not installation alone. Mandatory criteria and allowable downtime should be agreed before first reporting.
Link to Adaptation Result	Tracks whether priority hotspots have functioning systems capable of generating and communicating flood/drought warnings.

IDS 26: % of communities receiving early alerts

Field	Description
Indicator Level	Outcome
Indicator Name	% of communities receiving early alerts
Indicator Definition	Percentage of target hotspot communities for which timely receipt of an issued flood or drought early alert is verified through dissemination records and/or community confirmation.
Purpose / Relevance to Adaptation	Measures whether operational EWS actually reach at-risk communities in time to support preparedness and early action.
Metric / Unit of Measurement	Percentage of target communities receiving timely alerts (%)
Calculation Method	For each qualifying warning event, identify target communities and verify alert receipt using system/SMS logs and community evidence. Calculate the proportion reached; aggregate across events using an approved annual rule (e.g., event-weighted or community-event coverage).
Formula	$(\text{Number of target community-alert instances with verified timely receipt} \div \text{Total target community-alert instances for issued warnings}) \times 100$
Numerator	Number of target community-alert instances with verified timely alert receipt.
Denominator	Total target community-alert instances expected to receive alerts for qualifying warning events.
Baseline	TBD
Baseline Year	2025
Target	≥90%
Target Year	2030
Data Source(s)	SMS/platform dissemination logs; EWS communication logs; community surveys/feedback; district warning records.
Means of Verification	SMS alert logs, community surveys
Data Collection Method	Extract recipient/delivery logs for each warning; map them to target communities; verify a sample through community surveys/feedback and record timing relative to the hazard/action threshold.
Disaggregation	District; hotspot; community; hazard type; alert channel; warning event; timeliness status.
Reporting Frequency	After each qualifying warning event, with annual consolidation.

Field	Description
Responsible Institution(s)	Proposed joint responsibility: disaster risk management, Water Resources and meteorological/climate services, with District Councils, telecom/communication partners and community warning structures.
Data Quality / Verification	Define the target-community list before events; verify successful delivery rather than messages sent; deduplicate channels; document system outages and communities not covered.
Methodological Notes / Assumptions	The source target does not explicitly state a year; 2030 is applied as the framework target horizon. "Receiving" should mean verified delivery/receipt within the hazard-specific actionable lead time, not merely issuance of an alert.
Link to Adaptation Result	Shows whether early warning capacity translates into actual last-mile warning coverage for vulnerable communities.

IDS 27: Reduction in flood and drought-related losses

Field	Description
Indicator Level	Impact
Indicator Name	Reduction in flood and drought-related losses
Indicator Definition	Relative reduction from a 2025 baseline in normalized flood- and drought-related losses in target hotspot areas, using a consistent loss metric and accounting, as far as data allow, for changes in hazard severity and exposure.
Purpose / Relevance to Adaptation	Measures whether improved warning and preparedness are associated with lower human, livelihood and/or asset losses from water-related climate hazards.
Metric / Unit of Measurement	Percent reduction in a defined normalized disaster-loss rate (%)
Calculation Method	Define the loss metric at baseline (e.g., economic loss per exposed asset value, affected livelihood loss rate, or another approved normalized measure). Calculate comparable baseline and current loss rates for qualifying flood/drought events and compute relative reduction.
Formula	$((\text{Baseline normalized loss rate} - \text{Current normalized loss rate}) \div \text{Baseline normalized loss rate}) \times 100$
Numerator	Baseline normalized flood/drought loss rate minus current normalized loss rate.
Denominator	Baseline normalized flood/drought loss rate.
Baseline	High
Baseline Year	2025
Target	≥70% reduction

Field	Description
Target Year	2030
Data Source(s)	Disaster loss databases; post-disaster needs/damage assessments; sector damage/loss records; hazard intensity and exposure datasets.
Means of Verification	Disaster loss databases
Data Collection Method	For each qualifying event, compile verified losses, hazard characteristics and exposure; calculate the approved normalized loss metric and aggregate across comparable events/periods.
Disaggregation	District/hotspot; hazard type; loss type (human/livelihood/infrastructure/economic); sex/age/vulnerability where available; event severity.
Reporting Frequency	After major events, with annual consolidation and periodic multi-year trend analysis.
Responsible Institution(s)	Proposed lead: disaster risk management authority, with Water Resources, meteorological/climate services, District Councils and affected sector institutions supplying loss/exposure data.
Data Quality / Verification	Use standardized loss definitions and avoid double counting across sector reports; reconcile post-event datasets; document missing data and changes in exposure; compare events of similar severity where possible.
Methodological Notes / Assumptions	The source baseline "High" is qualitative and cannot directly support a 70% calculation. Establish a numeric 2025 normalized loss baseline. Raw annual losses alone are a weak performance measure because hazard severity and exposure vary; normalization or matched-event analysis is recommended for credible adaptation interpretation.
Link to Adaptation Result	Demonstrates the intended ultimate benefit of EWS: reduced losses from flood and drought events.

STRATEGY 8: BUILD CAPACITY OF LOCAL WATER USER ASSOCIATIONS (WUAS)

Adaptation Action 10. Train WUAs in Climate-Smart Water Planning.

Objective: Promote sustainable and climate-resilient water resource management through the capacity building of Water User Associations (WUAs).

IDS 28: Number of Water User Associations (WUAs) trained in climate-smart water planning

Field	Description
Indicator Level	Output
Indicator Name	Number of Water User Associations (WUAs) trained in climate-smart water planning

Field	Description
Indicator Definition	Cumulative number of unique Water User Associations whose designated representatives complete the approved climate-smart water-planning training package.
Purpose / Relevance to Adaptation	Measures coverage of institutional capacity building for local water governance and climate-resilient planning.
Metric / Unit of Measurement	Count of unique WUAs completing training
Calculation Method	Link attendance/completion records to the WUA registry and count each unique WUA once after it meets the minimum training-completion requirement.
Formula	Trained WUAs = Count of unique registered/recognized WUAs meeting the training-completion threshold
Numerator	Not applicable - absolute count.
Denominator	Not applicable - absolute count indicator.
Baseline	0
Baseline Year	2025
Target	≥1,000 WUAs
Target Year	2030
Data Source(s)	Training attendance records; training completion reports; WUA registry; participant database.
Means of Verification	Training attendance records; training completion reports
Data Collection Method	Record WUA identity and representatives at each training; verify completion; deduplicate repeat/refresher participation at WUA level; update cumulative trained-WUA register.
Disaggregation	District; catchment; WUA; training cohort; sex of representatives where available.
Reporting Frequency	Quarterly, with annual consolidation.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources, with District Councils, catchment/local water-management structures and training partners.
Data Quality / Verification	Use unique WUA identifiers; reconcile training records with the WUA registry; check duplicate participation; retain evidence that the minimum training package was completed.
Methodological Notes / Assumptions	The source explicitly labels the baseline as 2025 and target as 2030 for this adaptation action. Count WUAs, not individual participants. Refresher training does not create an additional WUA count.
Link to Adaptation Result	Tracks whether local water institutions receive the climate-smart planning capacity needed for improved governance.

IDS 29: % of trained WUAs implementing climate-resilient water management best practices

Field	Description
Indicator Level	Outcome
Indicator Name	% of trained WUAs implementing climate-resilient water management best practices
Indicator Definition	Percentage of trained WUAs that are verified to be implementing the agreed minimum package of climate-resilient water-management best practices during the reporting period.
Purpose / Relevance to Adaptation	Measures whether capacity building translates into institutional practice change in local water planning and management.
Metric / Unit of Measurement	Percentage of trained WUAs implementing best practices (%)
Calculation Method	Define the minimum best-practice package and verification checklist. Assess trained WUAs and classify each as implementing/not implementing based on the threshold. Divide qualifying WUAs by all trained WUAs assessed.
Formula	$(\text{Number of trained WUAs verified as implementing the minimum best-practice package} \div \text{Total trained WUAs assessed}) \times 100$
Numerator	Number of trained WUAs meeting the approved implementation threshold.
Denominator	Total number of trained WUAs assessed during the reporting period.
Baseline	TBD (est. <10%)
Baseline Year	2025
Target	≥75% of trained WUAs
Target Year	2030
Data Source(s)	Field-audit dataset; WUA activity reports; district monitoring records; WUA plans/minutes/water-use records.
Means of Verification	Field audits; WUA activity reports; district-level monitoring
Data Collection Method	Conduct standardized annual field audits of trained WUAs; review documentary evidence and observe implementation; record practice-level compliance and overall pass/fail status.
Disaggregation	District; catchment; WUA; practice type; years since training; WUA governance characteristics.
Reporting Frequency	Annual.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources, with District Councils and catchment/local water-management structures.

Field	Description
Data Quality / Verification	Use a standardized checklist and assessor guidance; require documentary/observational evidence; document non-assessed WUAs; conduct supervisory spot checks and inter-rater consistency reviews.
Methodological Notes / Assumptions	The source baseline is TBD with an estimate of <10%. Establish a verified 2025 baseline using the same best-practice checklist. The list of "best practices" and the minimum implementation threshold must be fixed before baseline assessment.
Link to Adaptation Result	Shows whether WUA training produces observable adoption of climate-resilient water-management practices.

IDS 30: Improved sustainability and equity in community-level water resource use and governance

Field	Description
Indicator Level	Impact
Indicator Name	Improved sustainability and equity in community-level water resource use and governance
Indicator Definition	Change in a standardized composite index capturing sustainability and equity of community-level water use and governance in target WUA areas.
Purpose / Relevance to Adaptation	Measures the higher-level institutional and resource-management result expected from stronger WUA capacity: more sustainable, equitable and trusted local water allocation and governance.
Metric / Unit of Measurement	Composite index (recommended 0-100 scale) covering water-use efficiency/sustainability, equity of allocation/access, community satisfaction and governance quality
Calculation Method	At baseline, define component indicators, normalization rules and weights. Normalize each component to a common 0-100 scale and calculate the weighted composite score. Repeat using the same method and compare with the baseline score.
Formula	Composite index = $\sum (w_i \times \text{normalized component score}_i)$, where $\sum w_i = 1$. Improvement = Current composite score - Baseline composite score (and/or relative % change where required).
Numerator	Not applicable as a single numerator; component numerators are defined within each sub-indicator.
Denominator	Not applicable as a single denominator; component denominators are defined within each sub-indicator.
Baseline	Low institutional capacity and poor water governance
Baseline Year	2025
Target	Measurable improvements in equitable and sustainable water allocation and use in target areas
Target Year	2030

Field	Description
Data Source(s)	Periodic WUA evaluation dataset; community survey data; water-use audits; WUA governance and allocation records.
Means of Verification	Periodic WUA evaluations; community surveys; water use audits
Data Collection Method	Apply a standardized WUA evaluation tool, community survey and water-use audit; calculate component scores and the composite index using fixed weights and scoring rules.
Disaggregation	District; catchment; WUA; sex; age/vulnerability group; water-user category; composite component/domain.
Reporting Frequency	Periodic evaluation (recommended annually or biennially), with annual administrative monitoring of component data where feasible.
Responsible Institution(s)	Proposed lead: institution responsible for Water Resources, with District Councils, WUA/catchment structures and an independent/technical evaluation function where feasible.
Data Quality / Verification	Document the index methodology; test reliability and sensitivity to weights; use consistent survey instruments; independently verify a sample of water-use and governance records; report component scores alongside the composite.
Methodological Notes / Assumptions	The source specifies a qualitative baseline and a non-numeric target, with a composite-index metric example. A numeric 2025 baseline score and an explicit threshold for what constitutes "measurable improvement" should be approved before formal target assessment. Weights should not be changed during the reporting period unless the full historical series is recalculated.
Link to Adaptation Result	Captures the intended long-term improvement in sustainable, equitable and accountable community water governance.