ADAPTATION FUND

SINGLE COUNTRY INNOVATION PROJECT PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Enhancing Adaptation and Resilience through Nature-based Solutions (EARNSS) in Somalia
Country:	Somalia
Thematic Focal Area:	Nature-based Solutions and ecosystem-based adaptation.
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	United Nations Environment Programme (UNEP)
Executing Entities:	Sadar Development and Resilience Institute (Sadar)
Amount of Financing Requested:	5,000,000 (in U.S Dollars Equivalent)
Letter of Endorsement (LOE) signed:	Yes ☒ No ☐

NOTE: The LOE should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒ This proposal has been submitted before including at a different stage (concept, fully-developed proposal)

☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: 8/9/2024

Please note that fully-developed proposal documents should not exceed 100 pages for the main document, and 100 pages for the annexes.

Project Background and Context

Geographic context

Along with the larger Jubba River, the Shabelle River is one of Somalia's two perennial rivers, carrying a considerable proportion of the country's surface water[1]. This river originates in Ethiopia's Bale Mountains at elevations exceeding 4,200 m[2] and flows ~1,200 km southeast across the Hirshabelle and South-West States before discharging into the Indian Ocean.[3] Along this path, it passes through the capital cities of the target districts — Beledweyne within the Hiiraan region, Jowhar within the Middle Shabelle region and Afgooye within the Lower Shabelle region[4].

The Shabelle River Basin, where the proposed project interventions will be implemented, comprises the catchment of the Shabelle River and its tributaries. Although the majority of this 283,000 km[2] catchment lies in the Ethiopian Highlands, the Shabelle River carries necessary water resources and nutrients to agropastoral communities situated along its floodplains in Somalia. Near the coast, the Shabelle River's gradient flattens considerably — to less than 1% between Beledweyne and Jowhar — creating a series of wetlands and floodplains that periodically become inundated during the rainy seasons. The fertile alluvial soils deposited across these plains during floods support diverse agricultural activities and sustain a considerable portion of Somalia's population[5].

Figure 1. Map of southern Somalia, illustrating the flow of the Shabelle River from Ethiopia through the Hiiraan, Middle Shabelle (Shabelle [6]) and Lower Shabelle (Shabelle Hoose) regions[7].

Socio-economic context

Demographic profile

The estimated 2025 populations of the Beledweyne, Jowhar and Afgooye districts are ~351,000, ~446,000 and ~575,000 respectively, with women comprising 50.2% of the population in Beledweyne and Jowhar and 50.3% in Afgooye. These districts are characterised by young populations and consequently high dependency ratios[8] of 60.1% in Beledweyne and Jowhar and 57.0% in Afgooye[9]. Moreover, in 2022, Beledweyne accommodated over 112,387 Internally Displaced Persons (IDPs)[10], while Jowhar and Afgooye accommodated 35,752 and

[1] FAO-SWALIM. (n.d.). The Juba and Shabelle Rivers and Their Importance to Somalia. https://faoswalim.org/article/juba-and-shabelle-rivers-and-their-importance-somalia. Accessed on 27 May 2025.
[2] FAO-SWALIM. (n.d.). The Juba and Shabelle Rivers and Their Importance to Somalia. https://faoswalim.org/article/juba-and-shabelle-rivers-and-their-importance-somalia. Accessed on 27 May 2025.
[3] World Bank Group. (2023). Somalia Climate Risk Review.
[4] Listed from the uppermost to lowermost district along the Shabelle River, respectively.
[5] FAO-SWALIM. (n.d.). The Juba and Shabelle Rivers and Their Importance to Somalia. https://faoswalim.org/article/juba-and-shabelle-rivers-and-their-importance-somalia. Accessed on 27 May 2025.
[6] UN. 2011. Somalia. https://www.un.org/geospatial/content/somalia. Accessed on 27 May 2025.
[7] Variable spellings such as Hiraan for Hiiraan and Jawhar/Giohar for Jowhar are common in Somalia. The district capitals of Beledweyne, Jowhar and Afgooye are marked in yellow.
[8] The age dependency ratio refers to the proportion of dependents (people younger than 15 or older than 64) relative to the working-age population (15–64 years), expressed as a percentage.
[9] The Humanitarian Data Exchange. 2024. Somalia - Subnational Population Statistics. https://data.humdata.org/dataset/cod-ps-som. Accessed on 27 May 2025.
[10] UNHCR. 2021. Somalia: Verified IDP sites in Beledweyne, Jowhar and Afgooye as of August 2021. UNHCR, Nairobi. https://data.unhcr.org/en/documents/details/90703. Accessed on 1 April 2025.

57,753[11], respectively. The rapidly growing and urbanising population and high dependency ratio increase demand for limited services, employment and infrastructure to support dependents, exacerbating existing socio-economic and developmental vulnerabilities in the region.

Cultural context

The ethnic and clan composition across Somalia is characterised by a lineage-based social structure. Although Somalia is considered ethnically homogeneous[12], it is divided into over 500 clans and subclans, with four major clan families, namely: the Darood, Dir, Hawiye and Isaaq. In the districts situated along the Shabelle River, historically marginalised groups such as the Rahanweyn (Digil-Mirifle), Bantu, Benadiri and Bajuni communities form a substantial proportion of the population alongside members of the major clan families. Beledweyne and Jowhar, located in the Hirshabelle State, are predominantly inhabited by Hawiye subclans. Afgooye has a more mixed composition that includes members of the Digil-Mirifle and Bantu communities, among others. These marginalised groups have historically been excluded from political representation and often face barriers to land ownership, education and public services[13].

Economic development

The target districts of Beledweyne, Jowhar, and Afgooye are highly dependent on agriculture and have limited access to public services. Beledweyne and Jowhar are mainly agropastoral and feature settled crop-livestock systems[14,15]. Irrigated farming is practised in areas with functioning canal infrastructure, supported by supplementary water sources including storage reservoirs and hand-dug wells, particularly during the dry season[16]. Afgooye is characterised by rainfed agriculture and hosts a large population of IDPs reliant on informal labour and external assistance[17]. In all three districts, the majority of livelihoods are closely linked to rainfed crop production and pastoralism.

Riparian forests, bushlands and grasslands in the Shabelle River Basin are used for pastoralism, wood harvesting or a combination of both. Conflicts over rangelands in the region arise occasionally, as grazing areas are communally owned while livestock ownership is private. This complicates regulation of rangeland use and leads to disputes, particularly during the dry season when competition for forage and water intensifies. The expansion of agriculture along river valleys further decreases the availability of grazing lands, exacerbating tensions between pastoralist groups and between pastoralists and settled farmers[18].

Food security

Approximately 70% of Somali households depend on agricultural livelihoods, including rainfed pastoralism, agropastoralism and subsistence farming. In the humid southern regions, including the Shabelle River Basin, settled livestock production, including camels, goats, sheep and cattle, and agropastoralism are common[19]. Maize and sorghum are the main staple crops[20], but domestic cereal production meets only 22% of national demand[21]. Imports of wheat and rice have increased substantially, with food import values rising from US$82 million in the 1980s to US$1.17 billion in 2020[22]. In contrast, livestock exports remain a considerable source of income, generating US$300–400 million annually. Agricultural productivity is limited by inadequate access to

[11] UNHCR. 2024. Somalia: UNHCR Somalia IDP Sites Verification Exercise – January to March 2024. UNHCR, Geneva. https://data.unhcr.org/en/documents/details/104423 . Accessed on 1 Apr 2025.
[12] UNDP. 2012. Somalia Human Development Report 2012: Empowering Youth for Peace and Development. UNDP, Nairobi. https://www.undp.org/sites/g/files/zskgke326/files/publications/HDR-Somalia-2012-E.pdf.
[13] World Bank Group. 2023. Somalia Climate Risk Review. World Bank, Washington, DC.
[14] Pablo Fernández Maestre and UNHABITAT, 2020: Beledweyne Urban Profile Working Paper and Spatial Analyses for Urban Planning Consultations and Durable Solutions for Displacement Crises.
[15] FAO SWALIM. 2014. Land Use Characterization of the Juba and Shabelle Catchments. FAO-SWALIM, Nairobi and Mogadishu.
[16] Oduori S, Vargas R and Alim M. 2007. Land Use Characterisation of the Juba and Shabelle riverine areas in Southern Somalia. FAO-SWALIM. Project Report No. L-07. Nairobi, Kenya. https://www.faoswalim.org/resources/site_files/L-07%20Land%20Use%20Characterization%20of%20the%20Juba%20and%20Shabelle_0.pdf. Accessed on 9 April 2025.
[17] World Bank. 2022. Somalia Drought Impact & Needs Assessment: Volume I – Synthesis Report. World Bank Group, Washington D.C.
[18] Ibid.
[19] World Bank. 2022. Somalia Drought Impact & Needs Assessment: Volume I – Synthesis Report. World Bank Group, Washington D.C..
[20] Ibid.
[21] World Bank. 2022. Somalia Drought Impact & Needs Assessment: Volume I – Synthesis Report. World Bank Group, Washington D.C..
[22] AfDB. 2023. Somalia Country Food and Agriculture Delivery Compact. AfDB, Abidjan. https://www.afdb.org/sites/default/files/documents/publications/somalie_country_food_and_agriculture_delivery_compact.pdf. Accessed on 27 May 2025.

quality inputs, including drought-resistant seeds, fertilisers and tools[23]. Across the Shabelle River Basin, maize and sorghum are the dominant crops, whilst irrigation enables smallholders to grow fruits and vegetables seasonally for income and dietary diversity[24]. Mixed farming systems integrate livestock, particularly cattle, goats and sheep. Crop and livestock production are increasingly affected by drought and riverine flooding[25].

Gender

Women in Somalia experience greater rates of unemployment than men. Nationally, only 19% of women participate in the labour force, compared with 74% of men. This low participation is partly explained by limited access to education and skills development. Most women are employed in informal, low-paying sectors. Nationally, 55% of women and 40% of men have no formal education[26], with women consistently underrepresented across all levels of attainment.

Women-headed households in IDP settlements — which are common in Beledweyne, Jowhar and Afgooye — are vulnerable to additional challenges in securing stable livelihoods resulting from displacement, exposure to gender-based violence (GBV), gender-based discrimination, inadequate shelter and limited access to justice. These barriers also limit access to essential services such as healthcare, safe water and maternal care, particularly in underserved and densely populated areas such as Afgooye Town. Furthermore, women and youth in displaced communities are vulnerable to compounded constraints in securing agricultural livelihoods because of barriers such as land tenure insecurity, limited access to credit and exclusion from formal labour markets[27].

Environmental context

Climate baseline

In the regions that include the target districts[28], the monthly maxima of daily maximum temperature reach 35.2–37.6°C in March — the hottest month — whilst the mean annual temperature is 27.2°C[29]. Rainfall is typically limited and characterised by considerable intra- and inter-annual variability. The Shabelle River Basin receives an average of ~400 mm of rainfall per year, precipitated primarily during two rainy seasons: the *Gu* (Apr–Jun) — which delivers more than 60% of the annual rainfall — and the *Deyr* (Oct–Dec). These are interspersed with two dry seasons: the *Xagaa* (Jul–Sep) and the *Jilaal* (Jan–Mar). Rainfall patterns are irregular, with regional recurrent droughts every 3–4 years and more severe dry spells every 7–9 years[30]. High rates of potential evapotranspiration (PET), ranging from 1,500 to 2,000 mm per year in the project districts, exacerbate moisture deficits. Relative humidity — and consequently soil moisture — increase with proximity to the Shabelle River, resulting in a corridor of less arid land that supports agriculture and pastoralism in the basin[31].

[23] Refer to Socio-economic context for a detailed explanation of baseline challenges decreasing food security.
[24] World Bank. 2022. Somalia Drought Impact & Needs Assessment: VOLUME I Synthesis Report. https://documents1.worldbank.org/curated/en/901031516986381462/pdf/122991-v1-GSURR-Somalia-DINA-Report-Volume-I 180116-Digital.pdf. Accessed on 27 May 2025.
[25] FAO SWALIM. 2018. Land Use Characterization of the Juba and Shabelle River Basins (L-07). FAO – Somalia Water and Land Information Management. Nairobi.
[26] IFAD. 2021, Country Strategy Note (2022-2023). Report No: 6032-SO Near East, North Africa and Europe Division Programme Management Department.
[27] World Bank. 2022. Somalia Drought Impact & Needs Assessment: VOLUME I Synthesis Report..
[28] Hiiraan, Middle Shabelle and Lower Shabelle, containing the target districts of Beledweyne, Jowhar and Afgooye, respectively.
[29] World Bank Group. 2021. Climate Change Knowledge Portal Somalia: Current Climate. https://climateknowledgeportal.worldbank.org/country/somalia/climate-data-historical. Accessed on 8 May 2025.
[30] Ogallo LA, Omondi P, Ouma G and Wayumba G. 2018. Climate Change Projections and the Associated Potential Impacts for Somalia. American Journal of Climate Change. 7:153-170.
[31] Oduori S, Vargas R and Alim M. 2007. Land Use Characterisation of the Juba and Shabelle riverine areas in Southern Somalia. FAO-SWALIM. Project Report No. L-07. Nairobi, Kenya.

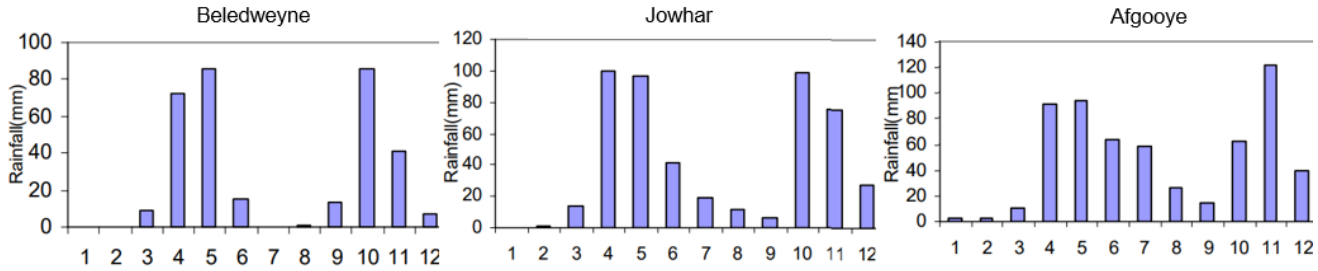

Figure 2. Mean monthly (Jan–Dec) rainfall (mm) in project districts, 1963–2001.

Land cover and land use

Land use in the Shabelle River Basin is influenced by seasonal climate, water access and rural livelihoods. Sedentary farmers practise small-scale mixed farming, integrating crops and livestock, whilst transhumance pastoralism dominates the rangelands. Rainfed and mixed rainfed-pastoral systems cover much of the area, producing crops such as sorghum, maize, millet and legumes. Near the river, irrigated zones support high-value crops including bananas, sesame, vegetables and fruit trees, particularly in Jowhar and Afgooye, occasionally combined with livestock grazing[32]. Livestock is managed seasonally, with lactating animals kept near homes and others herded further afield. The landscape also includes riparian forests, bushlands, grasslands and urban settlements that offer limited formal employment.

Observed and projected climate change hazards and impacts

Changes in temperature

Somalia's mean annual temperature has increased by ~2°C between 1950 and 2023[33]. The observed mean annual temperatures of the target districts of Beledweyne, Jowhar and Afgooye follow this national warming trend, with the mean annual temperatures of Jowhar and Afgooye historically being lower than those of Beledweyne, which is farther inland[34]. In addition to mean temperatures, temperature extremes have also increased. For example, the annual maximum daily temperature of Somalia increased from 35.5ºC in 1950 to 37.3ºC in 2020[35]. Similarly, the mean number of annual days with a heat index of >35ºC has increased from 0.79 during 1950–1959 to 3.24 during 2010–2019, with a peak of 7.07 days in 2016[36].

Temperatures are projected to continue increasing in Somalia as a whole and in the target districts. Between 2023[37] and 2100, mean annual temperatures in Somalia are expected to increase by 2.0°C and 4.3°C under SSP2-4.5[38] and SSP5-8.5, respectively (Table 1; Figure 3)[39]. The projected mean annual temperatures for the Hiiraan, Middle Shabelle and Lower Shabelle Regions[40] reflect the national trends under SSP2-4.5 and SSP5-8.5. Moreover, maximum annual temperatures are projected to increase by ~0.5ºC per decade in the target regions[41].

[32] Ibid.
[33] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P176246037561 90c409e570193ea2ae944d.pdf. Accessed on 27 May 2025.
[34] World Bank. (n.d.). Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia. Accessed on 27 May 2025.
[35] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA.
[36] World Bank. 2023. Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia/era5-historical. Accessed on 27 May 2025.
[37] The World Bank Group's most recent temperature and precipitation data in Somalia were recorded in 2023. Projected anomalies in Table 1 are calculated from these most current recorded (2023) data and the projected data for 2100.
[38] Shared Socio-economic Pathways (SSPs) are scenarios used in climate modelling to reflect different socio-economic trajectories, often paired with Representative Concentration Pathways (RCPs), which represent greenhouse gas concentration levels. For example, SSP5-8.5 aligns with a high-emissions, fossil fuel-intensive future, while SSP2-4.5 reflects moderate mitigation.
[39] World Bank Group. 2023. Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia/climate-data-projections. Accessed on: 15 April 2025.
[40] Used here as proxies because no district-level projections are available.
[41] Climate Change Knowledge Portal: Somalia. 2023. https://climateknowledgeportal.worldbank.org/country/somalia/trends-variability-projections. Accessed on: 25 April 2025.

Table 1. Projected temperature and precipitation between 2023 and 2100 under SSP2-4.5 and SSP5-8.5 in the three target districts and Somalia as a whole[42].

Area	Temperature increase (°C)		Precipitation change (mm per year)	
	SSP2-4.5	SSP5-8.5	SSP2-4.5	SSP5-8.5
Somalia	2.0	4.3	-52	56
Hiiraan (Beledweyne)	2.0	4.3	-42	105
Middle Shabelle (Jowhar)	2.2	4.3	80	230
Lower Shabelle (Afgooye)	2.0	4.1	108	265

Changes in precipitation

Whereas temperature has increased in the past several decades, there has been no substantial long-term trend in annual precipitation in Somalia between 1950 and 2023, although this varies spatially. The regions of Middle Shabelle and Lower Shabelle[43] have recorded precipitation decreases of 6.9 mm and 0.67 mm per decade, respectively[44], whereas in the Hiiraan region, precipitation increased by 13 mm per decade.

Precipitation variability has increased between 1950 and 2020, as the number of consecutive dry days increased by 4.2 days per decade[45]. In addition, Somalia's *Deyr* season has lengthened since the 1960s[46]. The primary rainy season (*Gu*) showed a drying trend from 1986 to 2007[47] and is predicted to occur earlier in 2025, in March–May[48]. Between 1998 and 2014, seasonal rainfall patterns shifted, leading to changes in precipitation intensity and distribution across various regions in Somalia[49], including a decrease in *Gu, Hagga* and *Jilaal* rainfall in southern districts and an increase in *Deyr* rainfall in central and northern districts during July–September[50].

Precipitation projections in Somalia vary depending on the SSP and spatial resolution of the projection. Between 2023 and 2100, national annual precipitation is projected to decrease by 52 mm under SSP2-4.5 and increase by 56 mm under SSP5-8.5[51]. In contrast to temperature, precipitation projections are more variable at greater spatial resolutions (Figure 4). Between 2023 and 2100, annual precipitation in the Hiiraan Region is expected to decrease by 42 mm under SSP2-4.5 and increase by 105 mm under SSP5-8.5. In the Middle Shabelle and Lower Shabelle Regions, precipitation is expected to increase under both SSPs — by 80 mm and 230 mm in Middle Shabelle, and by 108 mm and 265 mm in Lower Shabelle, under SSP2-4.5 and SSP5-8.5 respectively.

[42] World Bank Group. 2023. Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia/climate-data-projections. Accessed on: 15 April 2025.
[43] Containing the target districts of Jowhar and Afgooye, respectively.
[44] World Bank. 2021. Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia/trends-variability-historical. Accessed on 27 May 2025.
[45] Ibid.
[46] Trisos CH et al. 2022. Africa. In: Pörtner H-O et al. (eds.) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the IPCC, pp. 1285–1455. Cambridge University Press, Cambridge, UK. https://doi.org/10.1017/9781009325844.011.. Accessed on 27 May 2025.
[47] Trisos CH et al. 2022. Africa. In: Pörtner H-O et al. (eds.) Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the IPCC, pp. 1285–1455. Cambridge University Press, Cambridge, UK. https://doi.org/10.1017/9781009325844.011. Accessed on 27 May 2025.
[48] Somali Magazine. 2025. Somalia Braces for Hotter, Drier Gu 2025 Season Amid Food and Water Security Fears. https://somalimagazine.so/somalia-braces-for-hotter-drier-gu-2025-season-amid-food-and-water-security-fears. Accessed on: 15 April 2025.
[49] Office of the Prime Minister, GoFS. 2018. The initial national communication for Somalia to the UNFCCC. GoFS, Mogadishu, Somalia.
[50] Ibid
[51] Ibid

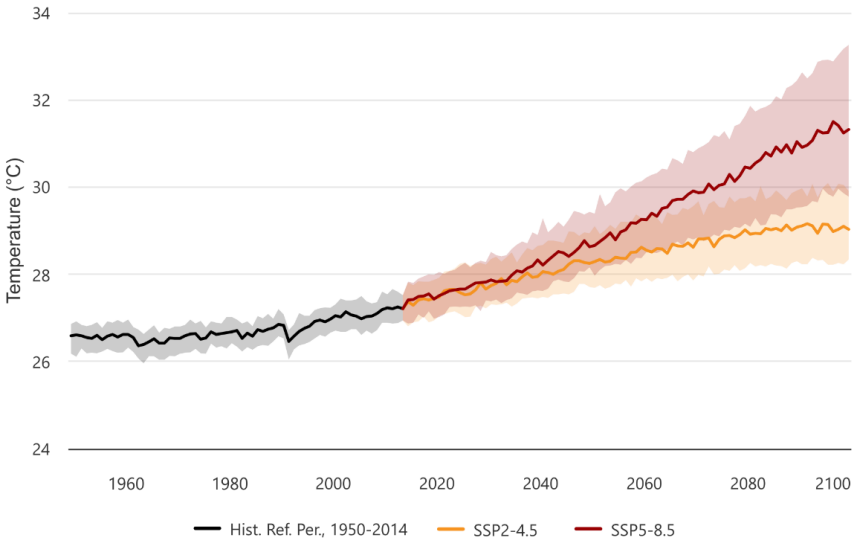

Figure 3. Projected mean annual temperatures in Somalia under SSP2-4.5 and SSP5-8.5 [52].

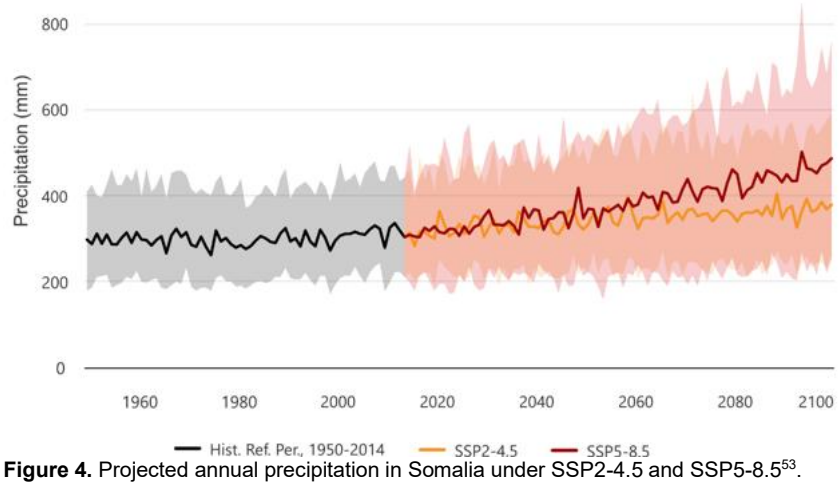

Figure 4. Projected annual precipitation in Somalia under SSP2-4.5 and SSP5-8.5[53].

Sectoral impacts of climate change hazards

During 2008–2021, 49 climate hazards were reported in Somalia — of which 26 were droughts and 22 were floods — resulting in the internal displacement of 3.5 million people[54]. In addition to casualties, both floods and droughts caused considerable economic losses, with US$1–5 billion in annual drought losses and US$100 million to US$1 billion in annual flood losses over that same period. Droughts are common in the country[55,56] and have resulted in substantial fatalities across the country, causing ~10,000 deaths annually[57]. Under the RCP4.5 and RCP8.5 scenarios, the change in land area affected by drought is projected to increase by 36%

[52] World Bank. (n.d.). Climate Change Knowledge Portal: Somalia. https://climateknowledgeportal.worldbank.org/country/somalia. Accessed on: 27 May 2025.
[53] Ibid.
[54] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P176246037561 90c409e570193ea2ae944d.pdf. Accessed on 27 May 2025.
[55] Ibid.
[56] UNEP-DHI. 2022. Applicability of Nature-based Solutions for Flood and Drought Management in Somalia: Final Report. UNEP-DHI Centre: Hørsholm, Denmark. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf. Accessed on 27 May 2025.
[57] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P176246037561 90c409e570193ea2ae944d.pdf. Accessed on 27 May 2025.

and 39% in the 2080s, respectively[58].

The target districts are also vulnerable to flooding, with Beledweyne undergoing regular floods[59]. Although floods cause fewer casualties than droughts — resulting in 10–100 deaths annually[60] — they have considerable impacts on households and livelihoods. Somalia has documented recent flooding events in 1997-98, 2005, 2006, 2009, 2011, 2013, 2015, 2016, 2018, 2019, 2020 and 2023 — with the intensity of frequency of these events increasing since 2000. The number of heavy precipitation days — an indicator of flash floods — is projected to increase by 7.5–12.2 days by 2080 under RCP6.0, although no trend is discernible under RCP2.6[61].

Impacts on agriculture and pastoralism

Climate hazards — particularly droughts and floods — have disrupted Somalia's agricultural sector, particularly in the fertile districts along the Shabelle and Jubba Rivers. Since 2016, droughts have increased in frequency and intensity, with little recovery time[62]. For example, the 2016–2018 drought — followed by insufficient rains during the 2021–2022 season — destroyed 68% of vegetation and caused environmental losses valued at ~US$1.2 billion[63]. Cereal crop production, which contributes 30–50% of Somalia's dietary energy, has decreased by more than 66% per capita since 1966[64]. Local production now meets only 22% of cereal needs, prompting a steep increase in agricultural imports — from US$82 million in the late 1980s to US$1.2 billion by 2021[65]. The negative impacts of climate hazards on crops and limited local production have led to chronic food insecurity, with ~8 million people food insecure as of 2023[66].

Projections show that the mean flow of the Shabelle River at Afgooye will potentially be reduced by ~96% in 2050[67], considerably reducing water availability for household and agricultural use and decreasing the productivity of crop- and grazing lands (Figure 5).

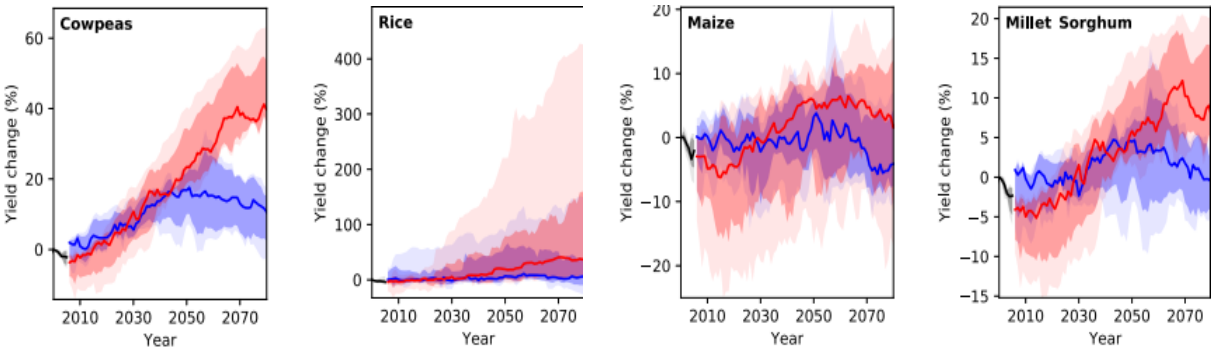

Figure 5. Projected crop yield changes and uncertainty under RCP2.6 (red) and RCP6.0 (blue), based on 2005 extent of land use and management [68].

Nomadic pastoralism in Somalia is reliant on rainfed ecosystems and, therefore, increasingly vulnerable to overlapping cycles of drought and flooding. Prolonged drought between mid-2021 and the end of 2022 resulted

[58] Haile GG, Tang Q, Hosseini-Moghari SM, Liu X, Gebremicael TG, Leng G, Kebede A, Xu X, Yun X. 2020. Projected impacts of climate change on drought patterns over East Africa. Earth's Future, 8: e2020EF001502.
[59] UN Habitat. 2020. An Analysis of Flood Risk and Urban Resilience in Beledweyne. https://unhabitat.org/an-analysis-of-flood-risk-and-urban-resilience-in-beledweyne. Accessed on 27 May 2025.
[60] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA.
[61] Binder L, Šedová B, Rüttinger L. 2022. Climate Risk Profile Somalia. Potsdam Institute for Climate Impact Research, Potsdam, Germany.
[62] Save the Children. 2022. Somalia's worst drought crisis in a decade leaves millions hungry with lives at risk. https://www.savethechildren.net/news/somalia-s-worst-drought-crisis-decade-leaves-millions-hungry-lives-risk. Accessed on 27 May 2025
[63] World Bank. 2020. Diagnostic study on trends and threats for environmental and natural resources challenges.
[64] Gavin, R. et al, 2019: The Relative Contributions of Cereal Production, Imports, And Aid to Somali Food Security. African Journal of Food, Agriculture, Nutrition and Development 2019; 19(3): 14587–14601.
[65] International Trade Administration. 2024. Somalia Country Commercial Guide. https://www.trade.gov/country-commercial-guides/somalia-agribusiness-and-food. Accessed on: 15 April 2025.
[66] OCHA. 2022. Somalia Humanitarian Needs Overview 2023. https://reliefweb.int/report/somalia/somalia-humanitarian-needs-overview-2023 -february-2023. Accessed on: 27 May 2025.
[67] International Bank for Reconstruction and Development. 2021. Technical Report. Somalia: Surface Water and Riverine Assessment. https://documents1.worldbank.org/curated/en/099430012022130498/pdf/P17499403c63df07e086e90eab1140bf66d.pdf.
[68] Weathering Risk. 2022. Climate Risk Profile Somalia. https://weatheringrisk.org/sites/default/files/document/220214_SomaliaClimateRiskProfile-05.pdf. Accessed on: 15 April 2025.

in one-third of livestock being lost in the most severely exposed areas[69]. These losses have deepened vulnerabilities among pastoralist communities who depend heavily on livestock for income, nutrition and cultural identity[70]. Current climate change impacts on pastoral communities are likely to become exacerbated under projected climate trends, as decreased availability of water and fodder for livestock, and increased heat stress and prevalence of livestock pathogens and parasites will cause greater livestock mortality, although exact trends are difficult to quantify[71]. Moreover, livestock are expected to yield less milk and be less productive, with productivity decreases of ~5% per 1% temperature increase[72].

Impacts on public health and nutrition

Climate change hazards in Somalia create public health challenges and degrade the capacity of the healthcare system to respond adequately. For example, 2018 floods damaged or destroyed 15 healthcare facilities in the country and resulted in contaminated water supplies that caused an increase in cholera and acute watery diarrhoea[73]. Altered climatic conditions are likely to expand the range of disease vectors such as mosquitoes, potentially resulting in an increase of vector-borne diseases. Increased spread of water-borne pathogens is also probable because of more frequent and severe flooding, which will potentially contaminate drinking water supplies[74].

The loss of crops and livestock, as well as internal displacement of farmers and pastoralist, have contributed to a national food security crisis. Malnutrition rates in the country are among the world's highest, with 17.4% of children below the age of five suffering from moderate acute malnutrition (MAM) and 3.2% severely malnourished (SAM)[75]. The food security crisis is compounded by conflict, economic shocks and global trade disruptions.

Impacts on infrastructure and settlements

Floods have had severe and compounding effects on infrastructure and livelihoods across Somalia's urban centres, particularly in Beledweyne, Jowhar and Afgooye. Repeated flood events have damaged roads, bridges and markets, isolating communities and disrupting supply chains, including access to healthcare and food distribution networks. For example, in Beledweyne floods frequently damage the main road linking the city to Mogadishu, hindering emergency response and market access. Recurrent urban flooding also affects social infrastructure as schools and health facilities are frequently inundated, reducing access to services and increasing the risk of waterborne diseases. As unplanned settlements expand in flood-prone zones, the risks intensify — particularly for IDPs, who typically reside in marginal areas with inadequate drainage. Flood exposure compounds existing vulnerabilities, contributing to a cycle of displacement, poverty and environmental degradation[76].

More frequent and intense floods caused by increased rainfall variability are likely to exacerbate the existing

[69] Reliefweb. 2023. Somalia Humanitarian Needs Overview 2023 (February 2023). https://reliefweb.int/report/somalia/somalia-humanitarian-needs-overview-2023-february-2023. Accessed on: 22 April 2025.
[70] IGAD Center for Pastoral Areas & Livestock Development. 2016. Policy Brief on The Contribution of Livestock to Somalia Economy Jan 2016. https://icpald.org/wp-content/uploads/2019/08/Policy-Brief-on-The-Contribution-of-Livestock-to-Somalia-Economy-Jan-2016.pdf. Accessed on: 22 April 2025.
[71] SPARC. 2024. Assessing and financing loss and damage due to climate change in Somalia. London, UK. https://www.sparc-knowledge.org/sites/default/files/documents/resources/Report%20Assessing%20and%20financing%20loss%20and%20damage%20due%20to%20climate%20change%20in%20Somalia_HiRes.pdf. Accessed on: 25 April 2025.
[72] Warsame AA, Sheik-Ali IA, Hassan AA and Sarkodie SA. 2021. Extreme climatic effects hamper livestock production in Somalia. Environmental Science and Pollution Research. 29: 40755–40767.
[73] World Bank. 2013. Somalia Climate Risk Review. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P176246037561 90c409e570193ea2ae944d.pdf. Accessed on: 25 April 2025.
[74] World Bank. 2023. Somalia Climate Risk Review. Washington DC, USA. https://openknowledge.worldbank.org/entities/publication/8f51dc1a-e342-40a3-8fbe-08e9aa4a2058. Accessed on: 27 May 2025.
[75] World Bank. 2022. Somalia Drought Impact & Needs Assessment: VOLUME I Synthesis Report. https://documents1.worldbank.org/curated/en/901031516986381462/pdf/122991-v1-GSURR-Somalia-DINA-Report-Volume-I-180116-Digital.pdf. Accessed on: 27 May 2025.
[76] Ibid

socio-economic impacts of floods[77], particularly in urban areas within the Shabelle River Basin (Table 2)[78]. These floods will contribute to infrastructure degradation, decreasing the capacity of the country's already inadequate transport, energy, and public service infrastructure. These damages — combined with displacement of people and the impacts on the productivity of the agricultural and pastoral sectors — will challenge livelihoods and impede Somalia's socio-economic development considerably. Although the uncertainty surrounding adaptation interventions and development in the country makes exact projections challenging, it is estimated that by 2050, flood and drought damages across the economy will exceed US$5 billion and potentially reach as high as US$100 billion[79].

Table 2. Projected impacts of floods with a 25-year return period, excluding damage to crops and livestock[80].

Flood impact	2010 (baseline)	2030	2050	2080
Damage (million US$ per year)	270	2,700	10,000	38,000
Affected population (thousand people)	9,300	13,000	16,000	18,000
Affected proportion of total population (%)	7.3	9.6	9.7	9.5
Affected gross domestic product (million US$ per year)	320	1,200	3,000	9,000

Baseline situation for climate change adaptation and NbS

National policy initiatives

Somalia has developed several national policy initiatives to address climate change adaptation, disaster risk reduction (DRR) and sustainable development. These are summarised in Table 3. The proposed project's alignment with these national priorities and institutional frameworks is discussed in Part II, Section F: 'Consistency with other strategies'.

Table 3. Somalia's national climate policy initiatives.

Policy	Description
National Adaptation Plan (Draft approved in 2025)[81]	Somalia's NAP outlines a national strategy to build resilience against climate change impacts, including droughts, floods, water scarcity and health risks. It focuses on climate-smart agriculture, sustainable water management, resilient health systems and climate-proof infrastructure. The plan promotes cross-sectoral coordination, community-led action and strong institutional frameworks, supported by a financing strategy. Moreover, a Monitoring, Evaluation, and Learning framework ensures accountability and adaptive management. The NAP aims to integrate climate resilience into development, protect vulnerable populations, and support long-term sustainability.
Nationally Determined Contribution (NDC)[82]	Somalia submitted its NDC 3.0 in June 2025. Its submission foreground sustainable development, peacebuilding and climate adaptation as national priorities across federal, member state and local government levels.
National Development Plan 2020–2024 (NDP-9)[83]	NDP-9 identifies climate disasters as a primary driver of poverty in Somalia. It emphasises improved management of environmental and natural resources and building resilience among households, communities and government as imperative actions for building climate resilience.
National Transformation Plan (NTP) 2025–2029[84]	Following on from the NDP-9, the NTP (2025–2029) is a strategic framework guiding Somalia's development towards inclusive governance, rule of law, and a resilient, service-oriented economy. It envisions a stable and prosperous Somalia and is structured around four core pillars: i) transformational

[77] Refer to Figure 1. Map of southern Somalia, illustrating the flow of the Shabelle River from Ethiopia through the Hiiraan, Middle Shabelle (Shabelle) and Lower Shabelle (Shabelle Hoose) regions.
Socio-economic context for additional details.
[78] World Bank. 2023. Somalia Climate Risk Review. Washington DC, USA. https://openknowledge.worldbank.org/entities/publication/8f51dc1a-e342-40a3-8fbe-08e9aa4a2058. Accessed on: 27 May 2025.
[79] SPARC. 2024. Assessing and financing loss and damage due to climate change in Somalia. London, UK. https://www.sparc-knowledge.org/sites/default/files/documents/resources/Report%20Assessing%20and%20financing%20loss%20and%20damage%20due%20to%20climate%20change%20in%20Somalia_HiRes.pdf. Accessed on: 25 April 2025.
[80] World Bank. 2023. Somalia Climate Risk Review. World Bank Publications: Washington, DC, USA. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P176246037561 90c409e570193ea2ae944d.pdf. Accessed on 27 May 2025.
[81] National Adaptation Plan for the Federal Republic of Somalia (Final Draft). 2024. Mogadishu, Somalia.
[82] Federal Republic of Somalia. 2021. Updated Nationally Determined Contribution (NDC).https://unfccc.int/sites/default/files/NDC/2022-06/Final Updated NDC for Somalia 2021.pdfCopy of Somalia NDC 3.0_Validation_Version_NDC-P_31May2025
[83] Ministry of Planning, Investment and Economic Development. 2022. Somalia National Development Plan 2020 to 2024.https://mop.gov.so/wp-content/uploads/2022/07/Somali-National-Development-Plan-9-2020-2024.pdf
[84] Ministry of Planning, Investment and Economic Development. 2025. National Transformation Plan (NTP). https://mop.gov.so/national-transformation-plan-ntp-2025-2029-report/

	governance, focusing on institutional reform and accountability; ii) sustainable economic transformation, aimed at inclusive growth and diversification; iii) social and human capital transformation, emphasising investments in health, education, and social protection; and iv) environment and climate resilience, integrating sustainability and climate adaptation into national development.
National Disaster Management Policy[85]	Established in 2018, this policy guides disaster management efforts in Somalia. It is supported by the National Disaster Risk Reduction (DRR) Strategy, focusing on addressing underlying disaster risk drivers including unsustainable use of natural resources, environmental degradation, conflict, poverty and rapid urbanisation. The policy identifies NbS as effective tools for flood and drought mitigation.
Somalia Recovery and Resilience Framework (RRF)[86]	This framework was established in 2018, to transition Somalia from early drought recovery to long-term resilience and disaster risk mitigation. It focuses on efficient financial responses, prioritising sectors such as agriculture, food security, water, sanitation and hygiene (WASH), education, transportation, environment, social protection, gender, governance and disaster management.

Current and past programmes and projects at the federal, member state and local government level

A number of past and ongoing projects in Somalia have been implemented to support climate adaptation and natural resource management. These initiatives have strengthened the country's technical and institutional capacity to support the implementation and monitoring of NbS interventions. While not exclusively focused on hybrid NbS, these initiatives offer synergies for the proposed project which are discussed in Part II, Section H: 'Project duplication'.

The NbS catalogue

From August 2021 to March 2022, the Sustainable Flood Management and Risk Reduction Action project was implemented to support national efforts in strengthening climate resilience[87]. This project was funded by the Foreign, Commonwealth and Development Office (FCDO) and was implemented by the Ministry of Energy and Water Resources (MOEWR) in collaboration with the United Nations (UN) Food and Agricultural Organisation (FAO) and UNEP — including the United Nations Environment Programme-Danish Hydraulic Institute (UNEP-DHI). The project supported the implementation of the Somalia National Water Resource Strategy (NWRS)[88], launched by MOEWR in April 2021 — particularly to build the capacity of institutions to coordinate inter-ministerial responses to droughts and floods. UNEP's role included providing data and tools for assessing flash flood risks and conducting research on NbS. Deliverables included a catalogue of NbS measures, modelling of effective options and indicators for prioritising NbS with flood mitigation potential.

The NbS catalogue, developed from desktop research, contains a record of past and present documented NbS, primarily for flood and drought management, in Somalia and similar climates. It draws from research articles, reports and evaluation documents of projects, covering Somalia and other locations with a comparable climate. Many NbS in the catalogue address the negative impacts of drought, focusing on water capture and storage for human and livestock consumption. Traditional methods such as *berkhads*[89], gabions, earth dams and soil bunds are commonly used in NbS interventions. These methods often blend 'hard' construction materials, such as stones and cement, with green measures such as revegetation and reforestation, and as such can be classified as hybrid NbS. These hybrid interventions utilise local materials and traditional knowledge, enhancing scalability and local relevance. Despite their hybrid nature, these NbS have proven long-term efficacy and resilience. This blended approach supports the expansion of NbS applications, leveraging their historical use and adaptation to local conditions.

NbS and hybrid measures with the highest potential for mitigating floods

The United Nations Environment Programme-Danish Hydraulic Institute (UNEP-DHI) and MOEWR conducted an assessment of the efficiency of the NbS and hybrid measures identified in the catalogue. The assessment

[85] Federal Republic of Somalia. 2020. National Disaster Risk Management Policy.https://www.preventionweb.net/media/97400/download?startDownload=20250612
[86] Federal Republic of Somalia. 2018. Somalia Recovery and Resilience Framework.https://www.undp.org/sites/g/files/zskgke326/files/migration/so/Somalia-RRF-Summary-Report_final_layout6July2018-2.pdf
[87] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report.https://www.unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf
[88] Federal Government of Somalia. 2021. National Water Resource Strategy 2021–2025.https://www.afdb.org/sites/default/files/final-draft-strategy-book.pdf
[89] A berkhad is a traditional rainwater harvesting structure used in arid regions to store surface runoff for use during dry periods.

used models to simulate catchment response to heavy rainfall in terms of reducing peak flows for four *wadis* (seasonal streams); two in Beledweyne and two in Qardho districts[90]. Modelling results showed that a combination of V-shaped weirs and sand dams is most effective in reducing peak flow and enhancing aquifer recharge (Table 4). Sand dams and reinforced cement walls across river channels increased infiltration by over 200% in areas such as Beledweyne, but only reduced peak flow by 1% (Table 4). V-shaped weirs — with a V-shaped opening that widens from the riverbed — increased infiltration by 23% and reduced peak flow by 30%. The combined use of sand dams and V-shaped weirs yielded the most promising results, increasing infiltration by 118% and 156% at depths of 1.5 and 2 m respectively and reducing peak flow by 21% and 8% at the same depths. This combination could potentially reduce floods by up to 60% in Qardho and 38% in Beledweyne — although effectiveness varies by flood extent, season and location. Other tested NbS — such as agricultural terracing and replanting trees on 5% of the catchment area — were less effective in reducing flash floods but more beneficial for reducing drought impacts on agriculture.

Table 4. The estimated daily infiltration along the Xarargagabaale River in the different scenarios and the reduction of maximum discharge during the flood event of 28 October 2009. The infiltration is for the entire event of September–October 2009[91].

Scenario	Average infiltration (m^3/d)	Infiltration increase from baseline (%)	Flood peak reduction from baseline (%)
Baseline	240	0	0
V-shape	295	23	30
Sand dam	727	203	1
Combined 1.5 m	522	118	21
Combined 2 m	614	156	8

Proposed technical requirements to guide the prioritising NbS interventions

The successful planning and implementation of NbS interventions requires adequate technical capacity. In addition, appropriate data are required to measure the effectiveness of NbS interventions. These data include metrics such as discharge, volume of water stored, soil erosion rates, sediment deposition, discharge volume and velocity. In addition to enabling better NbS implementation, this information provides insights into the scope for upscaling NbS at the basin and country scale.

Problem to be addressed by the proposed project

Climate change has resulted in intensified floods and droughts throughout the Shabelle River Basin, increasing ecosystem degradation and decreasing agricultural productivity. This has exacerbated water scarcity, food insecurity and public health challenges for urban and rural residents throughout the basin (Figure 6). Despite the increasing number of policies and programmes recognising the necessity for climate change adaptation in the Shabelle basin, and in Somalia in general, the effective implementation, replication and upscaling of NbS, hybrid solutions and other climate change adaptation interventions has been limited. Particularly when paired with conventional 'grey' infrastructure to create hybrid solutions, NbS provide cost-effective, sustainable interventions for climate change adaptation as they decrease climate risks while delivering environmental and socio-economic benefits. Insufficient implementation of NbS and hybrid solutions for climate change adaptation in the Shabelle River Basin are attributable to four primary barriers.

Barrier 1: Inadequate technical capacities to support knowledge-based planning, implementation and maintenance of NbS measures

Development in Somalia continues to be impeded by inadequate technical capacity, skills and experience across all sectors and levels of stakeholders, including communities, technical institutions, civil society, academia and the private sector. The country is slowly rebuilding technical capacities in many areas as it recovers from the 1991 state collapse and the consequent civil war and political unrest. Following the 2022 general elections, the Directorate of Climate Change has been elevated to the Ministry of Environment and Climate Change (MoECC). However, this relatively new ministry will require considerably capacity building to

[90] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report.https://www.unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf

[91] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report.https://www.unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf

adequately implement NbS and hybrid solutions. Similar to other Somali Ministries, the MoECC is under-staffed at the national, Federal Member State (FMS) and district levels, with insufficient budgetary allocation and disbursements of funds. These institutions therefore do not have the appropriate resources to enable their personnel to execute their mandates and support adaptation, including mainstreaming the use of NbS to mitigate climate risks in economic development and livelihood activities.

In the relatively new states of Hirshabelle and South West, capacities are lower than the national average. Existing programmes such as SWALIM and the UNEP-DHI NbS programme emphasise gaps in adaptation and NbS implementation. For example, Beledweyne and Jowhar have as yet only received a 'light touch' approach[92] support from the Joint Programme on Local Governance (JPLG), whilst Afgooye is not yet a beneficiary. Although the JPLG developed an adaptation strategy plan for local governments, it does not have the required financial or technical resources to support the implementation of the strategy. Information remains limited to a few institutions, leading to low awareness and practical knowledge among policymakers and local authorities. This knowledge gap impedes effective NbS design and implementation, compounded by insufficient skilled staff trained in ecosystem management.

Barrier 2: Inadequate data and planning create challenges to the integration of landscape- and ecosystem-scale interventions with farm- or household-level interventions and benefits

Landscape-, ecosystem- and community-level planning for NbS and hybrid solutions in Somalia is challenging because of the scarcity of information and capacity for generating and using information for planning at the national and local levels. SWALIM and its local partners have undertaken many soil and water assessments, such as the 2014 mapping of breakage points along the Jubba and Shabelle Rivers, which is updated regularly and used to monitor flood risk[93].

Moreover, the MoEWR has produced a Shabelle River Basin Diagnostic Report[94] in 2021, which has started to address the data challenges in the country; however, the report acknowledged that the management of water resources is still considerably challenged by: i) insufficient up-to-date data; ii) insecurity in some parts of the system; and iii) inadequate individual, institutional and systemic capacity for water resources management.

The development of a catalogue of NbS measures for managing drought and floods — based on modelling of their efficacy for flood control — has contributed considerably to addressing these data gaps. Many NbS measures currently in use in Somalia are based on traditional knowledge. The Federal Government of Somalia acknowledges that the lack of data is still a primary challenge that affects the quality of research. This has led to insufficient site assessments and evaluation and management of sediment and silt processes. Inadequate catchment-level NbS planning also leads to land use conflicts between different clans. Several strategic planning documents, *inter alia* the NAPA and the National Biodiversity Strategy and Action Plan (NBSAP), acknowledge that the country's history of political instability has resulted in limited scientific knowledge and research into adaptation in the specific context of Somalia. This scarcity of academic expertise presents challenges to comprehensive planning in any sector. The UNEP-DHI NbS modelling report recommended that the accuracy and efficiency of the selected NbS and hybrid solutions — particularly the combined V-shaped weirs and sand dams — were likely affected by this data scarcity. UNEP-DHI recommended that more data be collected and provided to refine the modelling at each *wadi* where project interventions are expected to be implemented. In Jowhar and Beledweyne, the development of district profiles and urban resilience plans was challenged by available data being outdated. Moreover, the rehabilitation of wetlands shows potential for flood control and ecosystem services, but this has not been implemented because of insufficient research into their effectiveness.

[92] Under the 'light touch' approach, support for the establishment of functional structures and systems for local governance planning and programming is limited to: i) training on local government laws and the Public Expenditure Management (PEM) cycle; ii) the development of human resources and local leadership management; iii) the development of financial management including procurement; iv) urban planning; and v) rehabilitation of existing office and market infrastructure.

[93] SWALIM. 2025. Flood Risk and Response Information Management System (FRRIMS). https://frrims.faoswalim.org/rivers/breakages. Accessed on: 3 June 2025.

[94] Government of Somalia. 2022. Shabelle River Diagnostic and Strategic Action Plan. https://reliefweb.int/report/somalia/shabelle-basin-diagnosis-and-strategic-action-plan-2021. Accessed on: 3 June 2025.

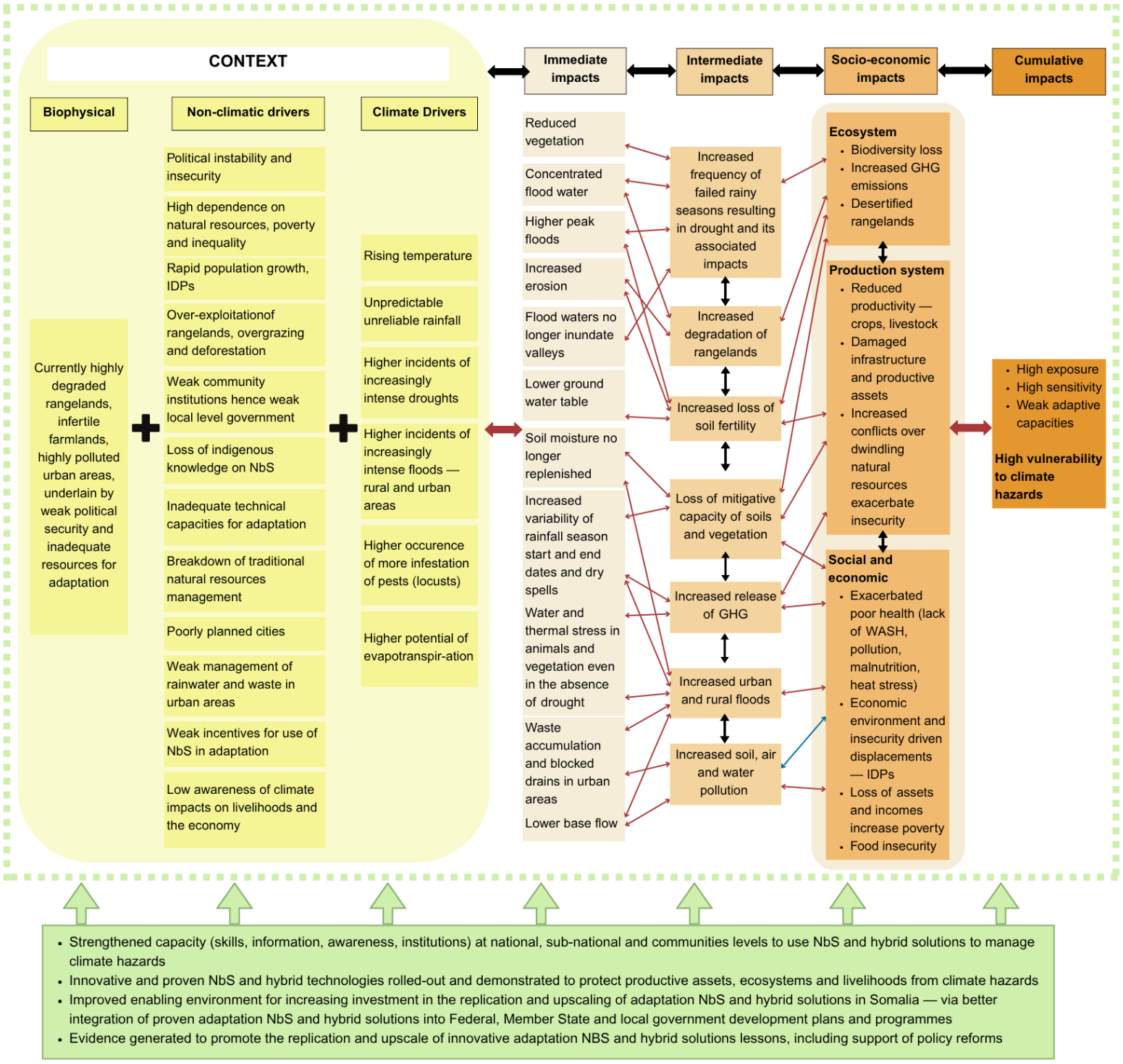

Figure 6. Problem Tree of climatic and non-climatic impacts in the Shabelle River Basin.

Barrier 3: Inadequate policies and incentive packages for the adoption and maintenance of NbS at all levels

Enabling policies are necessary for the effective implementation of NbS measures. Somalia does not have such adequate policies and incentives to promote NbS because of several decades of political instability (1991–2012) that have eroded and weakened governance structures. Although the country is recovering and formulating new policies, inappropriate institutional capacities and low awareness of NbS benefits impede their integration. Formal education programmes on climate change have not incorporated the role of NbS role in adaptation and natural resource management. This has compounded the loss of traditional knowledge necessary for activities

in the development of agriculture and livestock-related activities, as well as urban and economic development. Consequently, the potential of NbS to mitigate climate hazards remains underused and attempts to implement these solutions are limited by insufficient technical and institutional support.

Despite global recognition of NbS benefits, their implementation remains limited in Somalia's urban areas. Recent efforts include resilience plans for cities, including Beledweyne and Jowhar, under programmes such as MIDINIMO II and initiatives by Sadar in collaboration with the United Nations Office for Disaster Risk Reduction and the Ministry of Humanitarian Affairs. However, transforming the potential of NbS into adaptation benefits depends on effective implementation, which requires adequate funding and governmental capacity.

Challenges to the implementation of NbS and hybrid solutions persist in recently established states — such as Hirshabelle and South West — because of their greater financial constraints and capacity gaps. Limited awareness, inter-sectoral collaboration, political will and technical skills further impede NbS integration into adaptation strategies. These challenges are compounded by socio-economic factors in informal settlements and IDP camps, where considerable poverty and marginalisation impede resilience-building efforts. Addressing these issues will require well-informed and comprehensive policies, improved collaboration across sectors and targeted capacity-building.

Barrier 4: Inadequate financial resources for upscaling and replicating proven and innovative NbS and hybrid solutions

Somalia — as a least developed country — is vulnerable to considerable financial, technical and capacity constraints in addressing climate change. According to the NDC, Somalia requires $58.5 billion to implement its adaptation priorities for 2021–2030. Limited government revenue constrains funding for long-term adaptation programmes, with resources frequently being redirected to short-term interventions for immediate disaster relief during droughts and floods.

Existing climate policies frequently lack implementation plans and funding. Most government institutions struggle to access multilateral and bilateral climate funding and attract private sector investment. NbS and hybrid measures to mitigate climate hazards are not prioritised within adaptation programs, receiving minimal budgetary resources. The mainstreaming of NbS in relevant sectors is also inadequate, further limiting financial support. Planning documents, such as the resilient plans for Beledweyne and Jowhar and the JPLG Adaptation Plans for local governments, remain largely unimplemented because of these financial constraints.

In the absence of effective interventions[95] to address these barriers, communities in the Shabelle River Basin are increasingly vulnerable to the impacts of climate change, including crop and livestock losses, riverbank erosion, reduced groundwater recharge and land degradation. The proposed project will improve the adaptive capacity of rural and urban communities across Beledweyne, Jowhar and Afgooye by effectively replicating and upscaling innovative NbS and hybrid interventions in the Shabelle River Basin. These are detailed in Part II, Section A: ‘Project components’.

Project Objectives

List the main objectives of the project.

The objective of this project is to enhance the adaptive capacity of rural and urban communities in the Shabelle river basin through the effective replication and upscaling of proven NbS and hybrid measures, innovative in the context of Somalia, that reduce the vulnerability of people, productive assets and livelihoods to floods and droughts. The project activities will directly benefit 20,870 people (4,524 women, 4,479 men and 11,867 youths) across the Beledweyne, Jowhar and Afgooye districts receiving targeted and high-intensity support[96]. Indirectly, it will reduce the risks of climate change impacts and hazards for the entire population of these districts, estimated at 1,351,193, whilst providing increased food security and protecting livelihoods. The project objective will be achieved through the implementation of four components. In achieving this objective, the project will overcome several barriers to NbS and hybrid solutions implementation for adaptation (Figure 7).

[95] Refer to Part II, Section A: ‘Project components’ for a logical framework of interventions.
[96] Refer to Part II, Section E: Results framework for additional information on beneficiary estimation calculations. Direct and indirect beneficiary calculation based on AFB/EFC/14.6 Guidelines on core indicator methodologies.

1. Build institutional capacity at national, state- and district-level to plan and implement NbS and hybrid solutions to reduce flood and drought risk.
2. Increase the resilience of vulnerable communities against floods and droughts by adopting innovative adaptation practices, tools and technologies.
3. Align policies, incentives and guidelines with the principles of NbS and hybrid solutions to create an enabling environment for adaptation planning.
4. Generate evidence on the performance, cost-effectiveness and scalability of innovative NbS and hybrid solutions to share lessons learned, raise awareness and inform policy and investment decisions.

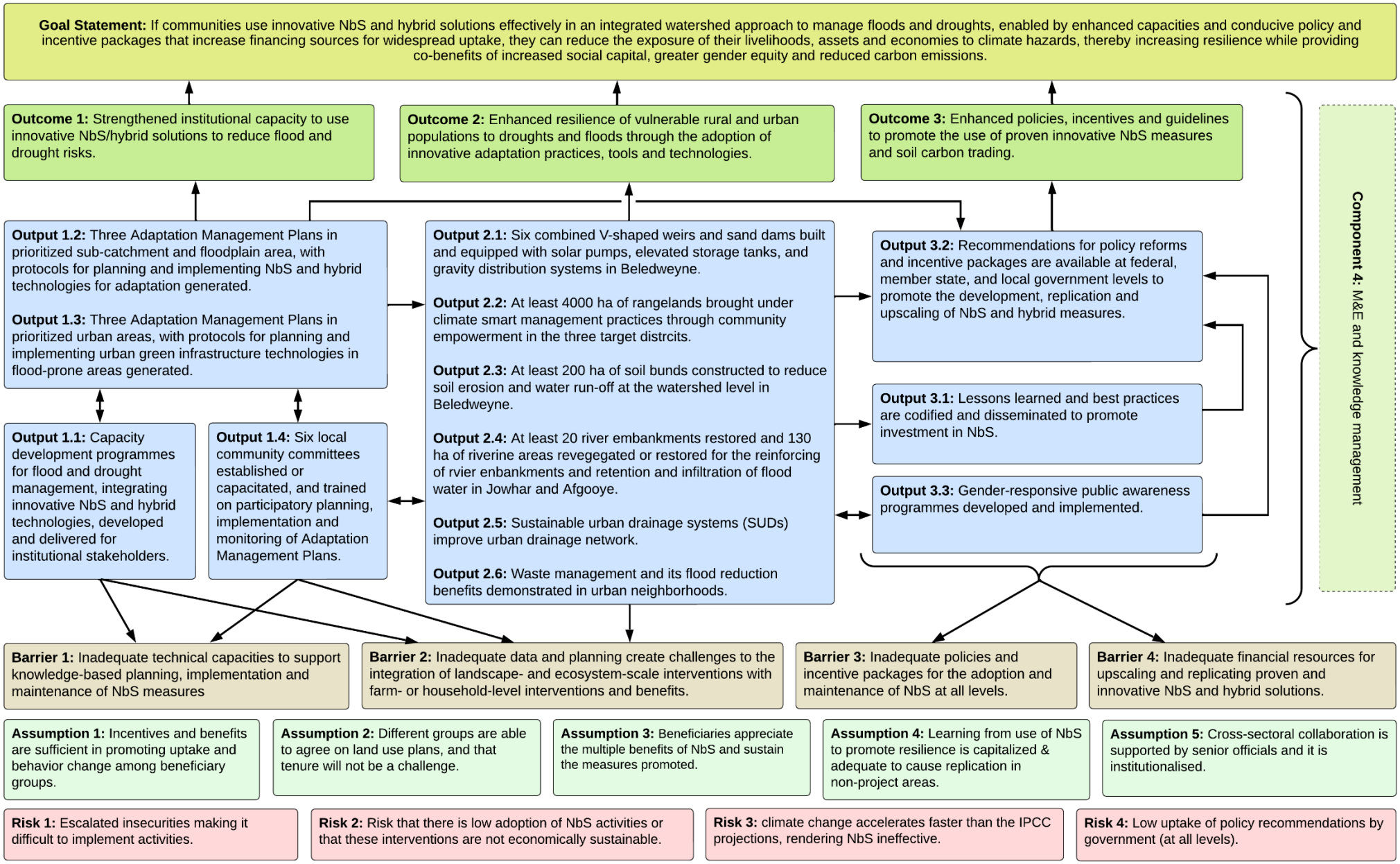

Figure 7. Theory of Change.

Project Components and Financing

The proposed project strategy will implement a set of NbS and hybrid interventions to increase the adaptive capacity and resilience of rural and urban communities in the Shabelle River Basin. This will be achieved through the effective replication and upscaling of proven NbS and hybrid measures that reduce vulnerability to floods and droughts. Specifically, the approach will: i) support the implementation of innovative sustainable urban drainage (SUDs) in urban areas, aligned with city resilience plans, to protect productive assets and livelihoods by reducing urban flooding; and ii) support integrated water resources and rangeland restoration and management across at least 4,000 ha in rural catchments to control flooding, surface run-off and soil erosion, improve infiltration and soil moisture, and create more resilient grazing lands.

These interventions include constructing V-shaped weirs and sand dams equipped with integrated solar-powered multi-purpose water systems, adopting climate-smart rangeland management practices such as pastoralist or farmer-managed natural regeneration, developing soil bunds and rehabilitation and revegetation of canals and embankments. Both the rural and urban interventions will contribute to buffer flooding while promoting water and soil conservation. Additionally, sand dams, innovative in the context of the Shabelle river, increase groundwater availability all year-round, improving access and reducing dependency on expensive water trucking during the dry seasons.

The project activity design is based on available knowledge, drawing on research and lessons learnt from other projects[97] and community knowledge and applying proven NbS and hybrid measures. These interventions will be supported by measures to build the capacity of local communities and relevant institutions in planning, implementation and monitoring, and to improve the enabling environment through policy reforms, incentives, and coordination. A knowledge management component will generate evidence and share lessons learnt, supporting adaptive management and promoting investment in NbS and hybrid solutions. This approach of strengthening institutional capacity, fostering community ownership and integrating interventions into plans and policies will facilitate the sustainability of implementation outcomes beyond the project's lifetime and the replication and upscaling to other areas. The project timeframe is scheduled to last from March 2026 to March 2031.

The proposed project is designed with a commitment to gender responsiveness and equitable access to project benefits. While acknowledging that the entire population of Somalia is vulnerable to the impacts of climate change, the project particularly recognises the high vulnerability of women, youth, IDPs and minority clans, who are disproportionately affected by climate-driven poverty and food insecurity. Cultural norms often limit women's social status, decision-making roles and access to resources, increasing their vulnerability to climate change hazards. To ensure that these groups are fully engaged and benefit equitably, the project implementation will be guided by a Stakeholder Engagement Plan (SEP), an Environmental and Social Safeguards Framework (ESMF) and a Gender Action Plan (GAP)[98].

The GAP, developed through inclusive consultations and a gender analysis, outlines specific actions to address barriers to women's participation, enhance access to resources, and increase their involvement in decision-making processes — ensuring that project interventions do not reinforce existing inequalities. These gender-responsive actions are closely aligned with the project's Stakeholder Engagement Plan, which provides a framework for meaningful consultation and sustained participation of all relevant stakeholders throughout the project cycle. Particular attention is given to engaging vulnerable and marginalised groups — such as women, youth, IDPs, persons with disabilities, and minority clans — by tailoring engagement strategies to suit their needs, including appropriate timings and culturally sensitive approaches to dialogue and feedback.

Additionally, the ESMF integrates safeguards to identify and mitigate potential risks and ensure that interventions do not lead to unintended negative consequences for communities or ecosystems. This includes social and environmental screening processes, risk management measures, and accountability mechanisms to ensure transparency and responsiveness to local concerns. Moreover, capacity building activities are embedded across these plans to empower community-based structures and ensure inclusive representation in project planning, implementation, and monitoring. Approaches such as Cash for Work (CfW), gender

[97] Refer to Part II, Section F: 'Consistency with other strategies'
[98] Refer to Annex 3: Stakeholder Engagement Plan and Annex 5: Gender Assessment and Action Plan for additional details.

mainstreaming, and the use of participatory tools will be employed to maximise equitable benefits and sustainable impact for all target groups. Table 5 describes the project components, indicative outputs and outcomes.

Table 5. Project components and financing.

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
Component 1: Capacity building for the replication and upscaling of innovative NbS and hybrid technologies in Somalia	**Output 1.1:** Capacity development programmes for flood and drought management, integrating innovative NbS and hybrid technologies, developed and delivered for institutional stakeholders. **Output 1.2:** Three Adaptation Management Plans in prioritised sub-catchments and floodplain areas, with protocols for planning and implementing NbS and hybrid technologies for adaptation generated. **Output 1.3:** Three Adaptation Management Plans in prioritised urban areas, with protocols for planning and implementing urban green infrastructure technologies in flood-prone areas generated. **Output 1.4:** Six local community committees established or capacitated, and trained on participatory planning, implementation and monitoring of Adaptation Management Plans.	**Outcome 1:** Strengthened institutional capacity to use innovative NbS/hybrid solutions to reduce flood and drought risks	432,387
Component 2: Protection of productive assets and livelihoods by innovative and proven adaptation NbS and hybrid technologies	**Output 2.1:** Six combined V-shaped weirs and sand dams built and equipped with solar pumps, elevated storage tanks, and gravity distribution systems in Beledweyne. **Output 2.2:** Rangelands brought under climate-smart management practices through community empowerment in the three target districts. **Output 2.3:** Soil bunds constructed to reduce soil erosion and water run-off at the watershed level in Beledweyne. **Output 2.4:** River embankments restored and riverine areas revegetated or restored for the reinforcing of river embankments and retention and infiltration of flood water in Jowhar and Afgooye. **Output 2.5:** Sustainable urban drainage systems (SUDs) improve urban drainage network. **Output 2.6:** Waste management and its flood reduction benefits demonstrated in urban neighborhoods.	**Outcome 2:** Enhanced resilience of vulnerable rural and urban populations to droughts and floods through the adoption of innovative adaptation practices, tools and technologies	2,879,733
Component 3: Improved enabling environment for investment in the replication and upscaling of adaptation NbS and hybrid solutions in Somalia	**Output 3.1:** Lessons learned and best practices are codified and disseminated to promote investment in NbS. **Output 3.2:** Recommendations for policy reforms and incentive packages are available at federal, member state and local government levels to promote the development, replication and upscaling of NbS and hybrid measures. **Output 3.3:** Gender-responsive public awareness programmes developed and implemented.	**Outcome 3:** Enhanced policies, incentives, and guidelines to promote the use of proven innovative NbS measures and soil carbon trading.	566,451
Component 4: M&E and knowledge management (cross-cutting)			330,901
5. Project Execution cost			398,823
6. Total Project Cost			4,608,295
7. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			391,705
Amount of Financing Requested			**5,000,000**

Projected Calendar

Table 6. Project timeline and milestones.

Milestones	Expected Dates
Start of Project Implementation	March 2026
Mid-term Review	August 2028
Project Closing	March 2031
Terminal Evaluation	July 2031

PART II: PROJECT/PROGRAMME JUSTIFICATION

A. Project components

Site selection

Site selection during project development

The proposed project will target rural communities and urban settlements within the Beledweyne, Jowhar and Afgooye districts, situated along the Shabelle River, selected because of their contributions to regional food security and the considerable vulnerability to climate change hazards of urban and rural populations. resilience-building interventions in different hydrological and socio-economic contexts. The site selection process used a multi-criteria assessment (MCA) informed by the technical assessment, ESMF and stakeholder consultations. A two-phased approach was applied: first, flood-prone urban and rural areas were identified based on hydrological data and screened for security and accessibility. Second, sites were prioritised based on vulnerability factors — including marginalised populations, climate-sensitive livelihoods, environmental degradation, poor drainage and public infrastructure — as identified through consultations. The assessment also considered complementarity with other initiatives[99], availability of baseline data, expected benefits and local capacity for implementation and maintenance. The resulting selection criteria are summarised in Table 7.

Table 7. Selection criteria for intervention sites.

Criteria	Description
Phase 1	
Flood and drought risk	Areas with historic or modelled drought and flood risk, including from *wadis* and river overflow, should be prioritised. These will be identified based on a combination of literature review, flood and drought impact data, spatial data and resilience plans. Residual flood modelling and mapping data[100].
Security and accessibility	Areas where secure access for implementation and monitoring is feasible should be prioritised.
Phase 2	
Topography and soil suitability	Spatial and soil data should be used to assess slope, infiltration capacity and land suitability for interventions such as infiltration wells, sand dams or vegetation buffers.
Vegetation and land degradation	District-level data on vegetation cover and degradation status is necessary to target sites for rangeland restoration or agroforestry. These will include rates of soil erosion on slopes and riverbanks.
Public services infrastructure	The presence of infrastructure necessary to support the community, including educational institutions, clinics, markets, religious buildings and transport facilities will increase the priority of sites for adaptation interventions because of their disproportionate value to communities.
Water availability and usage	The presence of irrigation canals, natural topographic depressions and water tables should inform assessment of the feasibility of water harvesting and aquifer recharge solutions.
Waste distribution	Areas where waste accumulates will be identified as priority sites for improved waste management to reduce flood risk.

[99] Refer to Part II, Section D: Consistency with other strategies and Part II, Section F: Project duplication
[100] Available from the FAO SWALIM platform

Community needs	Mapping of community priorities is necessary for the relevance and uptake of interventions. These will be assessed against projected benefits of selected interventions at specific sites.
Synergies with Other Projects	Sites should be chosen based on alignment with ongoing or planned initiatives for water risk management, including existing adaptation infrastructure, to maximise impact and cost-efficiency. Additionally, existing adaptation frameworks such as the urban resilience plans will inform site selection.
Capacity for implementation, monitoring and evaluation and maintenance	The presence of well-managed and capable local institutions, including CBOs, will be assessed to ensure that interventions are sustainable.

A technical assessment of flood and drought risk was undertaken during the project design phase to inform the selection of appropriate sites for NbS and hybrid solutions within the three target districts. The technical assessment comprised: i) rainfall runoff modelling for the catchment; ii) qualitative analysis of the available groundwater data to design site-specific solutions; iii) analysis of site topography, soils and geologic formations. These assessments drew on the Soil and Water Assessment Tool (SWAT) and Hydrologic Engineering Centre–Hydrologic Modelling System (HEC-HMS). Further inputs were provided by Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS), FAO Somalia Water and Land Information Management (SWALIM) soil and land cover datasets and a 12.5 m Digital Elevation Model (DEM) from Advanced Land Observing Satellite – Phased Array type L-band Synthetic Aperture Radar (ALOS PALSAR).

The three target districts have distinct watershed characteristics and are consequently vulnerable to different types of flooding. In Beledweyne, both riverine flooding from the Shabelle River and flash flooding from *wadis*, particularly in the Ceel-Gaal catchment, are prevalent[101]. Catchments in this district are clearly defined by the mountainous topography, including steep slopes and non-perennial streams (*wadis*)_ that flow through urban neighbourhoods before discharging into the Shabelle River. Available datasets to inform site selection include 12.5 m ALOS PALSAR DEMs, CHIRPS rainfall data and SWAT and HEC-HMS hydrologic models for Ceel-Gaal. Moreover, the FAO SWALIM database provides soil and land use data, supplemented by a 5–10 m resolution topographic dataset from 2007 along the floodplain, although coverage outside urban areas remains limited.

Hydrological modelling was conducted for the Ceel Gaal catchment in Beledweyne, which includes two major tributaries that converge upstream of the settlement. SWAT modelling simulated seasonal water balance, infiltration and evapotranspiration. In addition, HEC-HMS modelling of a 50 mm 24-hour storm event produced hydrographs showing rapid runoff peaks typical of flash floods. Based on these findings, two priority sites were identified for sand dam installation to reduce peak flows, limit sediment transport and enhance alluvial aquifer recharge. Design considerations included proximity to Ceel Gaal town, channel slope (<4%), bedrock contact and coarse sediment content. The two sand dams in the Ceel Gaal catchment are expected to yield extractable water volumes of 1,440–2,100 m³ per dam, depending on soil porosity (25–35%). A further four sand dams and V-weirs will be located close to Beledweyne town to enhance access to water supply during the dry seasons and to reduce flooding in the downstream urban areas.

In Jowhar, the landscape is characterised by relatively flat terrain, and flooding is intensified by the river's elevated banks relative to the surrounding land. The district includes paleochannels, natural depressions and inoperational flood management infrastructure, with water frequently becoming trapped within irrigation berms. Drainage generally occurs from northwest to southeast, but local flow patterns are highly variable. Although the area contains extensive irrigation networks and dikes that serve as hydrologic barriers, they are insufficient to prevent flash flooding. The predominantly clay and loam vertisols further limit infiltration potential. Global DEMs are inadequate for accurate flood modelling; therefore, detailed elevation data such as LiDAR will be necessary to support assessments. Available data include FAO SWALIM soil and land use datasets, remote sensing images of ponding and inundation, and historical cross-sections from FAO's 2007 mapping effort. Paleochannel analysis, historical flood imagery and canal system mapping were integrated with satellite imagery and flood extent data to identify priority areas for embankment reinforcement, vegetation buffers and wetland restoration.

[101] Riverine flooding in the project area occurs when the Shabelle River or its non-perennial wadi tributaries overflow, typically due to upstream rainfall. Embankment failures can cause widespread sheet flooding parallel to the river. Flash flooding results from intense rainfall overwhelming drainage capacity, especially in urban areas or where soils limit infiltration. For more information on flood dynamics in the Shabelle River Basin, refer to the key informant interview with the Food and Agriculture Organisation in **Error! Reference source not f ound.** Plan.[102] This table is a summary of the findings of the hydrological and geospatial analysis performed during project implementation. The full report of these analyses is available upon request.

Site selection considered sedimentation risk, soil permeability and local drainage patterns.

Afgooye also has flat topography and extensive irrigation canals and dikes that define watershed limits. However, these features do not prevent widespread flooding during the Gu and Deyr seasons, which is exacerbated by clay-rich vertisol soils that limit infiltration and promote surface ponding. Remote sensing and FAO data were used to map paleochannels and historical floodplains north of the Shabelle River, identifying depressions where floodwaters stagnate. The flat alluvial plain and complex network of paleochannels complicate drainage, and hydrological modelling is hindered by the coarse resolution of global DEMs. Minor elevation differences in the landscape significantly affect runoff direction and accumulation, yet the absence of high-resolution LiDAR data constrains accurate delineation of drainage pathways and depressions needed for nature-based solution planning. Available datasets include 1:250,000 scale soil maps, historical FAO SWALIM topographic data and satellite imagery for flood extent mapping.

The findings from the technical assessment support the prioritisation of sites for NbS and hybrid solutions interventions across the three districts. The selection of NbS and hybrid solutions interventions within the rural and urban contexts in the project districts was informed by district-specific intervention selection criteria (Table 8). Where existing interventions overlap with project activities, the proposed project has focused on upscaling these interventions

Table 8. District-specific considerations informing selection of interventions.

General criteria	Intervention selection considerations	Descriptions
Beledweyne		
Flood and drought risk	Hydrological modelling and infrastructure	Available high-resolution hydrological and flash flood models should inform placement of flood control infrastructure such as dykes and sand dams.
Flood and drought risk	Presence of upstream *wadis*	The *wadis* on the northeast outskirts of the city with the greatest discharge during floods should be prioritised for the construction of sand dams and diversion canals.
Livelihood linkages	Livestock trade	As Beledweyne is a regional trade hub for livestock, it is suitable for rangeland rehabilitation that will increase livestock productivity.
Synergies with Other Projects	Urban planning	Available UN-developed master plans should support integration of NbS and hybrid solutions into broader urban development strategies.
Jowhar		
Topography and soil suitability	Floodplain and depressions	The presence of downstream rainfed areas and natural depressions with potential for water storage and aquifer recharge should be considered.
	Paleo river systems	There exists an opportunity to use a paleo river course and seasonal depressions for multi-functional water management.
Synergies with Other Projects	IOM resettlement areas	Coordination with IOM on relocation areas should enable synergistic design of NbS that reduce flood risk and restore rangelands.
Community needs	Land productivity	Fertile soils and arable land make Jowhar suitable for combined rangeland restoration and agroforestry interventions.
Synergies with Other Projects	Urban planning	Available UN-developed master plans should support integration of NbS and hybrid solutions into broader urban development strategies.
Afgooye		
Waste distribution	Waste management requirements	Waste accumulation in this district presents an opportunity to demonstrate the use of improved waste management for flood control.
Flood and drought risk	Flooding and drought	Interventions in Afgooye should address both riverine flooding and drought risk by rehabilitating embankments and promoting aquifer recharge.
Community needs	Conflict sensitivity	The potential for using social fencing and community bylaws to manage competing water demands between farmers and pastoralists is high in Afgooye.
Water availability and usage	Suitability for wells	Peri-urban areas are suitable for infiltration wells and solar-powered protected wells, particularly where water tables are high.
Water availability and usage	Irrigation	Extensive riverine crop- and agropastoral lands characterise Afgooye as a priority area for canal rehabilitation and rangeland management.

Across all districts, stakeholders — including women, youth, minority clans and internally displaced persons

(IDPs) — called for inclusive planning mechanisms, consideration of land and water access dynamics and integration with existing district development plans. These findings have been incorporated into the site selection criteria and will be used to guide project implementation.

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Proposed NbS interventions

The outcomes of the technical assessments and stakeholder consultations conducted during the project development phase enabled the identification of appropriate NbS and hybrid solutions tailored to each specific site context. These are summarised in Table 9 below[102].

Table 9. NbS and hybrid interventions recommendations based on technical assessment.

District	NbS Recommended	Benefits	Feasibility	Timeline
Beledweyne	Combined sand dams with V-shaped weirs in six priority locations are proposed. Two will be situated across *wadis* at Ceel-Gaal Village. The sand dams will include wingwalls connected to the side slopes, with a plastic liner at the base to prevent seepage and infiltration. A further four dams will be close to Beledweyne town for water supply and reduction in frequent flooding.	• Increase aquifer recharge and available water for domestic and livestock use • Improve flood management • Promote vegetation growth along the riverbank due to increased water table	High	10 months (starting in the *Deyr* season will enable the work to be completed effectively)
Beledweyne	Soil bunds in catchments east of Beledweyne town to promote infiltration and reduce soil erosion. Initially, one catchment will be evaluated and monitored prior to expanding to other catchments in the area. The pilot location will be selected based on the community needs and input. The community will monitor and maintain the site. Soils bunds are not feasible in Jowhar (and likely Afgooye) because of the flat topography and abundance of farmland. For erosion-vulnerable areas in these districts, revegetation is a more appropriate NbS intervention. In Afgooye, west of Afgooye Town distant from agricultural areas, the potential for soil bunds will be evaluated once detailed elevation data are available.	• Increase infiltration, improve soil moisture and reduce peak discharges accumulated along the *wadis*. • Protect vegetation along the slopes • Improve rangeland yields	High	1 year
Beledweyne	Sustainable urban drainage using swales adjacent to roads. Implementation will be dependent on whether ownership of land adjacent to the roads can be secured. Culverts will be required at intersections with other roads to convey the runoff where infiltration is not feasible. Detailed LiDAR topographic data will be required to assess the ideal location for swale design and the ultimate outfall such as retention facilities — or the Shabelle River after pollutants are removed.	• Reduce urban flooding and concentrating runoff along roadside swales that promote linear infiltration.	Low	2 years
Beledweyne, Jowhar and Afgooye	Rangeland regeneration by revegetating selected areas using native plants adapted to the arid climate.	• Grazing land for pastoralists • Ecological restoration and improved wildlife access to resources • Reduced flooding due to river overflowing	Medium	1 year
Jowhar	Restore 25 km of the paleochannel east of Jowhar to store flood runoff when the channel overflows. Once a positive slope is achieved, appropriate seeds and saplings will be planted along its bank to minimise siltation.	• Improved flood storage • Ecological benefits and growth of plants	Low (for >10 km of paleochannel rehabilitation)	3 years
Jowhar and Afgooye	The Shabelle River embankment will be reinforced with gabions at locations of bends, adding a cutoff wall and low flow pipe to extract surface water. A gate will remain in place during high flow events, and an impermeable barrier within the pipe portion will prevent seepage. At locations where no pipe will be installed, fine soil will be	• Prevent flooding from riverbank breakages • Promote vegetation growth along the riverbank	Medium (7 locations in Jowhar and 13 in Afgooye)	2 years

[102] This table is a summary of the findings of the hydrological and geospatial analysis performed during project implementation. The full report of these analyses is available upon request.

	added to prevent seepage. The embankment soil will be recompacted around the breakage and appropriate vegetation will be planted.			
Jowhar and Afgooye	Urban drainage capture using a grass lined swale adjacent to the road (SUDs) to capture runoff and discharge to a collection point. This collection will be a retention facility west or east of the Shabelle River in Jowhar, whereas in Afgooye the water will infiltrate or be pumped from the collection point.	• Decrease runoff velocity using grass lining, thereby preventing erosion and improving water quality • Convey the runoff away from residential areas to low-lying areas east or west of Jowhar Town	Low	2 years

Site selection during implementation

The site validation process will be refined during implementation using an adaptive management approach that allows planning decisions to respond to emerging risks, changes in access and evolving stakeholder dynamics. This flexibility is central to the project's implementation strategy, given the socially and politically fragile context of the target districts.

During project implementation, site selection will be refined through the development and validation of local planning instruments. Specifically, three rural Adaptation Management Plans (Output 1.2) and three urban Adaptation Management Plans (Output 1.3) will be prepared to guide the design, siting and implementation of nature-based and hybrid solution interventions in rural and urban sites. These plans will incorporate updated hydrological, topographical, socio-economic and institutional data gathered through fieldwork, stakeholder consultations and participatory mapping. Site-specific safeguards screening will be applied once locations are identified, in accordance with UNEP's Environmental, Social and Sustainability Framework (ESSF) and the Adaptation Fund's environmental and social policy. Conflict analysis will be incorporated into the development of these Adaptation Management Plans, informing siting, sequencing and mitigation strategies. Where risks of conflict or exclusion are identified, site-level mitigation measures — such as Livelihood Action Plans — will be applied in line with the ESMF.

A participatory validation process will be conducted in each district, led by Sadar and district authorities and supported by community committees established under Output 1.4. These committees will validate local priorities in project implementation. These committees will also support monitoring, information dissemination and the redress of grievances, in coordination with district authorities and Sadar. Their composition will reflect women, youth, internally displaced persons (IDPs) and minority clans, in line with the project's commitment to inclusive governance[103].

The site validation process will include safeguards screening for Unspecified Sub-Projects (USPs) using UNEP's Safeguards Risk Identification Form, with additional site-specific mitigation measures developed where needed[104]. This screening will include an assessment of conflict sensitivity, focusing on potential tensions related to land access, natural resource use or exclusion of vulnerable groups. Where interventions may cause economic displacement, conflict or restricted access to resources, Livelihood Action Plans (LAPs) will be prepared in consultation with affected communities. These LAPs will outline mitigation and livelihood support options ranging from negotiated access agreements to transitional support or revised siting. The LAP requirement is triggered through safeguards screening and validation workshops and will follow the procedural guidance in the Livelihood Action Framework[105]. As outlined in Annex 3: Stakeholder Engagement Plan (SEP), any additional community and stakeholder engagement required during project implementation will adhere to established safeguards procedures[106]. Inclusive consultation methods will be prioritised, including the use of Somali language materials and oral communication channels where appropriate. This approach ensures that the site selection process remains context-responsive, inclusive and aligned with environmental and social safeguards throughout implementation.

[103] Refer to Annex 3: Stakeholder Engagement Plan
[104] Refer to Annex 4: Environmental and Social Management Framework
[105] Refer to Appendix 2 in Annex 4: Environmental and Social Management Framework
[106] Refer to Annex 4: Environmental and Social Management Framework

Project description

To achieve its objective, the proposed project will: strengthen institutional and technical capacities to plan and implement NbS and hybrid solutions (Component 1); implement a portfolio of targeted NbS and hybrid interventions in Beledweyne, Jowhar and Afgooye districts (Component 2); enhance monitoring systems and improve the generation and dissemination of knowledge on the performance of these solutions (Component 3); and create an enabling policy and financial environment to support the sustained replication and upscaling of NbS across Somalia (Component 3). The activities proposed under each of these components are detailed below.

Component 1: Capacity building for the replication and upscaling of innovative NbS and hybrid technologies in Somalia

Outcome 1: Strengthened institutional capacity to use innovative NbS and hybrid solutions to reduce flood and drought risks

The vulnerability of Somalia's communities to the adverse impacts of floods and droughts is compounded by limited institutional and technical capacity across all levels of government to design, implement and scale nature-based and hybrid solutions. Ministries at federal, federal member state and district levels, as well as academic and research institutions, have limited technical competencies such as hydrological modelling, integrated landscape planning and spatial data analysis. These capacity constraints inhibit the mainstreaming of NbS into development plans and reduce the potential for long-term resilience building.

Output 1.1: Capacity development programmes for flood and drought management integrating innovative NbS and hybrid technologies developed and delivered for institutional stakeholders.

Institutional capacity gaps in appropriate government ministries will be assessed by structured consultations and document reviews. Based on identified needs, the project will identify existing training programmes and develop and deliver training programmes for management and technical staff and produce technical protocols to standardise the planning and implementation of NbS and hybrid solutions. This capacity-building will be reinforced using academic partnerships to institutionalise climate adaptation knowledge.

Activity 1.1.1: Develop and implement a capacity-building programme for Federal, State, and District level institutions on NbS and hybrid solutions planning and implementation based on capacity assessment findings.

The institutional capacity of five ministries — the Ministry of Environment and Climate Change (MoECC), Ministry of Energy and Water Resources (MoEWR), Ministry of Livestock, Forestry and Range (MoLFR), Ministry of Agriculture and Irrigation (MoAI), Ministry of Planning, Investment and Economic Development (MoPIED) — to plan and implement NbS will be assessed. This will involve focus group discussions (FGDs) and key informant interviews (KIIs) with two federal representatives of each of these ministries. Topics to be assessed will include: i) awareness of the benefits of NbS and hybrid solutions within the ministry; ii) skills and knowledge gaps for planning and implementation of NbS and hybrid solutions, and iii) existing structures and capacity within these ministries to disseminate information and skills to federal member state and district authorities, for example using a train-the-trainer model.

These consultations will be complemented by a desktop review of recent published and unpublished reports developed by these five ministries to determine: i) the extent to which NbS and hybrid solutions have been implemented in the past, whether implementation has generated the expected benefits and whether interventions have remained operational over the expected lifespan; ii) context-specific best practices from successful implementation and lessons learned from partially or unsuccessful implementation; and iii) the extent to which NbS and hybrid solutions are included in current plans for projects by these ministries.

Additional consultations — including FGDs and KIIs — will be held with academic professionals at Somalia national universities such as the City University of Mogadishu and the University for Peace, research institutions and the Food and Agriculture Organisation (FAO)- SWALIM- to identify hydrological data gaps in the Shabelle river basin. These consultations will include a one-day workshop in Mogadishu, as well as in-person or online interviews. The objective will be to determine: i) the types, scale and resolution of hydrological data required to plan NbS and hybrid solutions; the types, scale and resolution of hydrological data currently available, for

example by SWALIM; and iii) the skills development and knowledge generation required to fill potential gaps in the available data.

The outcomes of the ministerial consultations, desktop review of ministry reports and academic consultations will be synthesised into a gap analysis report that identifies institutional and technical capacity gaps in federal, federal member state and district ministries and academic institutions and assigns these priorities. This report will be made available in English and Somali hardcopies to ministerial representatives at federal, federal member state and district levels. The report will also be uploaded to the knowledge management platform developed under Activity 3.1.3.

Based on this gap analysis, training manuals describing data and modelling skills requirements to plan and implement NbS and hybrid solutions will be developed to train ministerial management staff. These manuals will be designed to support ministerial staff in building capacity within their institutions, including identifying capacity gaps and sources of training. Free online courses that cover the skills emphasised in the gap analysis will be identified and included in the training manuals.

The training manuals will be printed and distributed to ministerial representatives at a two-day training workshop in Mogadishu. The participants will include the ten federal representatives attending the gap analysis workshop, as well as two representatives from each federal member state-level ministry in Hirshabelle and South West, for a total of 30 participants. In addition, representatives of the Somali Climate Action Platform (SCAP) — and potentially other non-governmental organisation (NGO) or Civil society organisation (CSO) representatives to be identified during implementation — will attend. This workshop will familiarise the ministerial management staff with the technical protocols and training manuals to facilitate their use in building ministerial capacity. The training manuals will also be made available on the knowledge management platform developed under Activity 3.1.3 during the second year of implementation.

Activity 1.1.2: Develop protocols for NbS and hybrid solutions applicable to the context of Somalia.

In addition to the review of ministerial reports under Activity 1.1.1, best practices and lessons learned during the development and implementation of other adaptation projects will be assessed. These will include projects developed by international development agencies, NGOs, research institutions and community-based organisations (CBOs), if applicable. Projects in Somalia, other developing nations within the Horn of Africa such as Djibouti, Eritrea and Ethiopia, and other arid countries prone to droughts and floods will be included. These best practices and lessons learned will: i) identify NbS and hybrid solutions with the greatest potential for generating climate change adaptation benefits in the Somali context; ii) support the generation of an evidence base to facilitate the replication and upscaling of NbS and hybrid solutions in Somalia; and iii) inform the implementation of interventions under the proposed project to ensure long-term benefits are achieved and distributed equitably.

Similarly, the academic consultations under Activity 1.1.1 will be supplemented by a desktop review of the hydrological and geospatial data required for NbS and hybrid solutions design and implementation, as well as appropriate methods of analysing these data. Moreover, the data and methodological requirements for establishing carbon credit projects in the Somali context will also be identified to support Activity 4.1.3.

Together with best practices and lessons learned from previous NbS and hybrid solutions projects in Somalia, these desktop reviews will be synthesised to produce a set of technical protocols for the standardised design and implementation of identified NbS and hybrid solutions and their data and methodological requirements. Protocols will include procedures for site evaluation, selection and analysis, criteria for selection of interventions and step-by-step guidance on implementation, with particular focus on ensuring equitable benefit distribution to women and other marginalised and vulnerable groups. The protocols will be updated iteratively as project interventions are implemented and at project closure to enable lessons learned during implementation to inform the design and implementation of future NbS and hybrid solutions initiatives. These protocols will be made available in English and Somali hardcopy to ministerial representatives at federal, federal member state and district levels, as well as on the knowledge management platform developed under Activity 3.1.3.

Activity 1.1.3: Develop university modules in collaboration with Somalia national universities to disseminate NbS knowledge captured in Activity 1.1.2.

The Somalia national universities will be engaged by the Executing Entity to develop a master's coursework module for the existing course 'Master of Arts in Sustainable Water Resources Management and Climate Change Adaptation' during the first two years of implementation. This module will outline the protocols for planning and implementing NbS developed in Activity 1.1.2. and include training for the operation of an online knowledge management platform developed under Activity 3.1.3.

A short undergraduate module covering similar content to the Master's module will be developed for an appropriate course identified by the Somalia national universities. In addition, a short course to teach geospatial and hydrological modelling skills identified under Activity 1.1.2 — particularly in the Somali context — will be developed and opened for enrolment, but will not be compulsory for the completion of the master's programme. This course will be able to support training for both existing ministerial staff and new students enrolling in the undergraduate and master's programmes.

Twelve students comprised of management staff from the ministries that will have attended the training manual workshop under Activity 1.1.1 — as well as potentially personnel of NGOs and CSOs implementing NbS and hybrid solutions in Somalia — will be enrolled in the master's course in the third year of implementation[107]. Both the master's and undergraduate courses will be open for enrolment to the public, providing the opportunity to train the next generation of ministerial personnel, academics and practitioners from non-government organisations (NGOs) within the country. In this way, NbS knowledge and skillsets can be disseminated within Somalia beyond the project lifespan.

Output 1.2: Three Adaptation Management Plans in prioritised sub-catchment and floodplain area, with protocols for planning and implementing NbS and hybrid technologies for adaptation generated.

Adaptation Management Plans will be developed for rural sites in each of the three target districts to guide the effective implementation of rural NbS and hybrid solutions. These plans will integrate technical assessments, cost-effectiveness and conflict analyses to ensure that interventions are technically sound and socially acceptable. Validation workshops will ensure full stakeholder buy-in. Conflict sensitivity will be integrated into the development of these rural Adaptation Management Plans, with analysis used to reduce tensions between clans, as well as between settled farmers and nomadic pastoralists.

Activity 1.2.1: Conduct technical assessments and cost-effectiveness analysis to guide the development of three Adaptation Management Plans in prioritised sub-catchment and floodplain areas

Hydrological, land use and topographic data[108], along with on-site field assessments, will be used to assess the flood attenuation potential of NbS and hybrid solutions in priority catchments[109] and refine the selection of sites for NbS and hybrid interventions, including combined sand dams and V-shaped weirs, rangeland management, construction of soil bunds and revegetation of topographic depressions within the target districts. A cost-effectiveness analysis will be conducted to evaluate the economic viability of the proposed interventions and design options. This analysis will support the development of Adaptation Management Plans under Activity 1.2.2 and contribute to the establishment of a knowledge base on implementing NbS and hybrid solutions in the Somali context, facilitating their replication and upscaling.

Activity 1.2.2: Develop three Adaptation Management Plans in prioritised sub-catchment and floodplain areas to guide the planning and implementation of NbS and hybrid measures in target districts.

Site selection for all NbS and hybrid interventions to be implemented under Outputs 2.1–2.4, as well as the ESS considerations relevant to those sites (see Annex 4), will be integrated into a set of three draft Adaptation

[107] Adaptation Fund financing delivered under this project will include the academic fees for all twelve master's students, comprising US$5,000 per student across the two-year master's programme. All non-academic costs during this period, including living costs, travel and extracurriculars must be covered privately by these students or by the ministries or NGOs/CSOs of which they are a member.
[108] These assessments will acquire and use Digital Surface Model World DEM2 for Beledweyne and Afgooye where appropriate open source data are not available from SWALIM.
[109] Assessment results will also inform the development of reports on the performance and cost-effectiveness of NbS and hybrid solutions implemented in the project under Activity 3.1.2.

Management Plans. These Plans will detail exact sites, site selection rationale and site-specific protocols adapted from the technical protocols developed under Activity 1.1.2 to guide the implementation of interventions in rural sites. Moreover, operations and maintenance (O&M) arrangements and protocols for all project interventions throughout the project lifespan will be outlined in these Adaptation Management Plans[110].

The development of these rural Adaptation Management Plans will also include a suitability assessment undertaken in collaboration with the University of Mogadishu to select appropriate species to be grown in district nurseries for enrichment planting and revegetation under Outputs 2.2 and 2.4. Species will be selected based on: i) resilience under current and projected climatic conditions; ii) ease of cultivation; iii) effectiveness at achieving NbS benefits such as erosion control and increased infiltration; and iv) potential co-benefits as cash and food crops to provide incentives for adoption by communities.

Activity 1.2.3: Host a validation workshop to assess the plans developed under Activity 1.2.2 and validate priority sites for implementing NbS and hybrid solutions.

A one-day validation workshop for the draft Adaptation Management Plans will be held in Mogadishu to present the Plans to the federal and federal member state-level ministerial representatives that participated in the previous workshops, provide opportunity for comment and obtain high-level buy-in. District ministerial representatives and other local authorities and stakeholders will be consulted during a set of further validation workshops that will be held in the district towns of the target districts to facilitate more context-specific feedback and obtain local buy-in. Feedback from these four validation workshops (one federal and three district-level workshops) will be integrated into the rural Adaptation Management Plans to ensure they align with national priorities and are appropriate to the local context. The finalised rural Adaptation Management Plans will be made available in English and Somali language hardcopy to ministerial representatives at federal, federal member state and district levels as well as on the knowledge management platform developed under Activity 3.1.3 during the second year of implementation.

Output 1.3: Three Adaptation Management Plans in prioritised urban areas, with protocols for planning and implementing urban green infrastructure technologies in flood-prone areas generated.

Three Adaptation Management Plans in prioritised urban areas of Beledweyne, Jowhar and Afgooye towns will be developed in alignment with the existing Urban Resilience Plans (in Beledweyne and Jowhar) to facilitate the planning and implementation of NbS and hybrid solutions. These plans will focus on sustainable urban drainage systems (SUDs) and waste management, and will be based on hydrological assessments, land use and land ownership aspects and cost-effectiveness considerations. Conflict sensitivity will be integrated into the development of these urban Adaptation Management Plans, with analysis used to reduce tensions in densely populated, informal or IDP settlements.

Activity 1.3.1: Conduct technical assessments and cost-effectiveness analysis to guide the development of three Adaptation Management Plans in prioritised urban areas.

Hydrological, land use and topographic data[111], along with on-site field assessments and community consultations will allow the identification of areas of flood water accumulation in the prioritized urban areas where SUDs— including retention ponds, bioswales and improved waste management — are viable and have the greatest potential to contribute to urban flooding reduction. Further topographical survey of specific selected areas will be conducted under activity 2.5.1 to inform the SUDs designs.

A cost-effectiveness analysis will be conducted by a financial specialist to evaluate the economic viability of the proposed interventions. This analysis will support site selection and implementation planning under Activity 1.3.2 and contribute to the establishment of a knowledge base on implementing urban NbS and hybrid solutions in the Somali context, facilitating their replication and upscaling.

[110] Refer to Part II, Section M: Project Sustainability for details on the project exit strategy that will be developed to ensure continued O&M following project completion.
[111] These assessments will acquire and use Digital Surface Model World DEM2 for Beledweyne and Afgooye where appropriate open source data are not available from SWALIM.

Activity 1.3.2: Develop three Adaptation Management Plans for the implementation of green infrastructure and waste management in the target districts based on the gaps identified under Activity 1.1.1.

Site selection for all NbS and hybrid solutions interventions to be implemented under Outputs 2.5 and 2.6, as well as the ESS considerations relevant to those sites (see Annex 4), will be integrated into a set of three draft Adaptation Management Plans. These Plans will detail the site selection rationale, the exact sites selected, and site-specific protocols adapted from the technical protocols developed under Activity 1.1.2 to guide the implementation of interventions in urban sites. Moreover, O&M arrangements and protocols for all project interventions throughout the project lifespan will be outlined in these Adaptation Management Plans[112].

Activity 1.3.3: Host a validation meeting to assess the plans developed under Activity 1.3.2 and confirm priority urban areas for urban green infrastructure and waste management.

Following the validation workshop under Activity 1.2.3, a similar one-day validation workshop for the draft urban Adaptation Management Plans will be held in Mogadishu to present the Plans to the federal and federal member state-level ministerial representatives that participated in those previous workshops, to provide an opportunity for comment and obtain high-level buy-in. Similarly, district ministerial representatives and other local authorities and stakeholders will be consulted during a set of validation workshops under Activity 1.2.3 that will be held in the district towns of the target districts to facilitate more context-specific feedback and obtain local buy-in. Feedback from these four validation workshops (one federal and three district-level workshops) will be integrated into the urban Adaptation Management Plans to ensure they align with national priorities and are appropriate to the local context. The finalised urban Adaptation Management Plans will be made available to ministerial representatives at federal, federal member state and district levels in English and Somali language hardcopy. In addition, the plans will be uploaded to the knowledge management platform developed under Activity 3.1.3.

Output 1.4: Six local community committees established or capacitated and trained on participatory planning, implementation and monitoring of Adaptation Management Plans.

To ensure effective implementation of adaptation measures and promote long-term sustainability, six community committees — representing both urban and rural areas — will be established or strengthened, prioritizing where possible the existing committees. These committees will be trained in participatory planning, implementation oversight and performance monitoring.

Activity 1.4.1: Capacitate existing community committees and establish new committees to ensure capacity in each district to consolidate their participation in the Adaptation Management Plans, ensuring the presence of one rural and one urban committee in each district.

The PMU Gender & ESS Officer will travel to the communities near rural and urban implementation sites within each district to conduct a participatory mapping exercise with members of existing committees, cooperatives and CBOs to determine the extent of local knowledge on climate change adaptation and NbS in particular across different groups and stakeholder types. Based on feedback from consultations during the project design phase[113], these groups will likely include Village Savings and Loans Associations (VSLAs), community resilience committees, natural resource management committees, agricultural cooperatives, water user groups, traditional elder councils, women and youth associations and conflict resolution committees. This assessment will record the purpose and responsibilities of these groups, the number of members, their internal structure and operational frameworks and contact details of their leaders. Moreover, the PMU ESS & Gender Officer — supported by the PMU technical staff in each district — will identify and approach prospective groups to be trained to facilitate the implementation of NbS and hybrid solutions under Outputs 2.1–2.6.

Activity 1.4.2: Deliver training to six community committees — including agropastoral and water-user groups — on the planning, implementation and monitoring of rural and urban Adaptation Management Plans.

A series of training workshops, including all required learning materials, will be designed to deliver targeted

[112] Refer to Part II, Section M: Project Sustainability for details on the project exit strategy that will be developed to ensure continued O&M following project completion.
[113] Refer to Annex 3: Stakeholder Engagement Plan

training on planning, implementing and monitoring the NbS and hybrid solutions that will be implemented at the sites near these communities. The ESS and Gender Officer will contribute to ensuring that the workshop process incorporates adequate accommodations to enable women to participate equally and that training materials include information relevant to women where appropriate. The workshop training materials will refer to the rural Adaptation Management Plans and urban Adaptation Management Plans.

A technical presenter will deliver a one-day workshop to each of the six committees based on the training materials during the second year of implementation, ensuring that committee members are adequately prepared to facilitate implementation and maintenance of NbS at demonstration plots, recruit labourers to work these plots under a Cash-for-Work modality and monitor and report on the outcomes of NbS and hybrid solutions interventions, including their adoption within the community. The community committees will also be able to assist local stakeholders in adopting NbS practices, for example by distributing seeds and saplings for revegetating degraded rangelands under Output 2.2. The workshops will emphasise governance and adaptive planning principles to mitigate the risk of conflicts that will potentially arise during implementation.

Component 2: Protection of productive assets and livelihoods by innovative and proven adaptation NbS and hybrid technologies

Outcome 2: Enhanced resilience of vulnerable rural and urban populations to droughts and floods through the adoption of innovative adaptation practices, tools and technologies.

Output 2.1: Six combined V-shaped weirs and sand dams built and equipped with solar pumps, elevated storage tanks and gravity distribution systems in Beledweyne.

Water harvesting and flood attenuation infrastructure will be constructed to significantly improve water security during drought periods while managing flood risks. The infrastructure will feature combined V-shaped weirs and sand dams equipped with protected wells, solar-powered pumping systems and gravity-fed distribution networks to provide reliable water access for both human consumption and livestock watering. Environmental and social impact assessments will be conducted to mitigate ESS risks during implementation and community committees will be trained to operate and maintain the infrastructure and manage the water resources.

Activity 2.1.1: Construct six combined V-shaped weirs and sand dams in wadi catchments in Beledweyne.

An independent ESS consultancy will be contracted to undertake site-specific Environmental and Social Impact Assessments (ESIAs) at each site for sand dam construction. Risks to be evaluated and quantified include: i) clearing of vegetation during dam and pipe network construction; ii) increased erosion during construction; iii) disruption to local ecosystems; iv) restrictions on land access and land use, resulting in economic displacement; v) exacerbation of social tensions, particularly between clans; vi) inequitable access to water resources; vii) public health and safety challenges; and viii) inadvertent damage to undocumented community-valued cultural heritage. If considerably impactful, long-lasting or irreversible risks are identified based on these site-specific ESIAs, appropriate mitigation strategies will be developed to reduce or avoid these risks.

Moreover, a representative of an engineering firm will travel to Beledweyne to ground-truth sites for sand dam and V-shaped weirs construction to ensure that the criteria used for site selection remain accurate and record data to inform the technical designs. The same actions will be carried out for the sites of protected shallow wells, storage tanks, solar pumps, gravity-fed distribution systems and water collection stations supported by the sand dams. Based on this ground-truthing and the rural Adaptation Management Plan for Beledweyne, the engineering firm will prepare technical designs for the combined sand dams and V-shaped weirs at each site. During this ground-truthing mission, the engineer will also install a pressure transducer data logger below the bridge in the *wadi* of the Ceel-Gaal catchment. This instrument will record streamflow data during the rainy seasons prior to and after the construction of the dams in this catchment, to support the monitoring of flood attenuation performance and provide ground-truthing data for the model developed (activity 3.1.2.) . Moreover, its location upstream of Beledweyne town will also enable the generation of peak flow data contributing to flood early warning systems.

A construction firm will then be contracted to procure materials and build — under the supervision of the engineering firm — six sand dams with V-shaped weirs across their outflows in several catchments of the Beledweyne District to regulate streamflow, mitigate flooding and increase dry-season water availability. These

combined sand dams and weirs will have a capacity of ~36,000 m^3, enabling the extraction of 10,800 L of water at full capacity. Water will be extracted by solar-powered pumps into elevated storage tanks (Activity 2.1.2). These tanks will dispense water to community taps and water troughs using a gravity-fed distribution system of subterranean pipes to support domestic use in rural settlements, including Ceel-Gool, Jento-Kundishe, Xarar, Kalaberyr, Jawil and Ilka Code.

Construction will be monitored by an independent civil engineer who will inspect the construction sites and technical completion as per the approved designs. These inspections will take place approximately halfway through construction and at completion. The ESS and Gender Officer will evaluate whether the dams are constructed according to specifications and meet project requirements, including compliance with Annex 3: Environmental and Social Management Framework and the site-specific ESIAs.

Activity 2.1.2: Install one protected well in the throwback of each combined V-shaped weir and sand dam in Beledweyne equipped with a solar pumping system, an elevated water storage tank, and a gravity-based water distribution system for domestic use and livestock.

Following the completion of sand dams under Activity 2.1.1, a construction firm will be contracted to procure and construct combined water extraction, storage and delivery systems. Similarly, the independent civil engineering firm will undertake ground-truthing and inspect the construction sites and technical completion as per the approved designs.

A one-day on-site training will be held upon completion to train the rural community committee in the operation and maintenance of the water infrastructure established under Activities 2.1.1 and 2.1.2. The workshop will be supported by district officials from the MoEWR and based on the rural Adaptation Management Plan for Beledweyne. It will be the responsibility of the committee members to operate and regularly maintain the system, reporting any future major repairs to the district MOWR officials. The committee will also receive guidance to ensure equitable water distribution, especially during dry periods, where the number of jerrycans collected per person may need to be limited to facilitate access to a minimum of 20 L per person per day.

Output 2.2: Rangelands brought under climate-smart management practices through community empowerment in the three target districts

Rangeland restoration and improved management practices will be implemented to increase vegetation cover, soil stability and livestock carrying capacity. Community-based nurseries will be established to support ongoing restoration efforts, while demonstration plots will showcase effective techniques for enrichment planting and sustainable grazing management. Cash-for-work modalities will be employed to incentivise community participation and provide economic co-benefits.

Activity 2.2.1: Construct and stock one small-scale nursery in each of the three target districts for growing young plants for enrichment planting under Activity 2.2.3.

The Procurement Officer will arrange the acquisition and transport of materials to establish and stock one nursery in each district, capable of collectively providing seeds and saplings to ~2,000 agricultural, pastoral or agropastoral households to support revegetation of 4,000 ha of degraded rangelands. This includes the procurement of, inter alia: i) shade netting, poles, wire mesh and other fencing materials to enclose the nursery; ii) timber, nails and corrugated metal roofing to construct a storage shed; iii) a 1,000 L plastic tank; iv) nursery equipment such as polyethene seed bags, seed trays, tables, shelves and hand tools, including spades, hoes and watering cans; v) organic compost or fertiliser; and vi) protective clothing such as gloves and boots.

Once all required materials have been procured and transported to the sites, the rural community committees in each district will identify and recruit labourers to construct the nurseries under a Cash-for-Work (CfW) modality. Committee members — supported by their district PMU technical staff members — will provide instruction, supervise construction and dispense funding to labourers. At each nursery, rubble will be cleared, the site will be enclosed by fencing, a storage shed with shelving will be constructed, a water tank will be installed and shade netting will be suspended over a part of the nursery.

On-site training sessions will be held in each district by an agricultural extension officer to capacitate the rural

community committees for the operation and maintenance of the nurseries. These training sessions will be based on the rural Adaptation Management Plans and include training on planting seeds and saplings, applying compost or fertiliser, managing pests and diseases, cultivating these plants and safely extracting them for replanting on revegetation plots. In addition, committee members will be responsible for reporting damages to the nursery, implementing maintenance and repairs using a CfW modality as required, advising local residents on effective planting and cultivation and maintaining logs of nursery activities. To facilitate division of labour and assign unambiguous responsibilities, committee members will be appointed to specific roles in the management of the nursery based on their experience, skills and interest.

The Procurement Officer will arrange the acquisition and transport of seeds, saplings and suitable waterproof containers to the nurseries, where some of these will be planted and some placed in storage by rural community committee members capacitated under Activity 2.2.1. These plant species will be cultivated for enrichment planting on demonstration plots and eventually made available to local farmers, pastoralists and agro-pastoralists. Plants to be cultivated will comprise only species suitable to the local context, including Super Napier, Sudan and Africa foxtail grasses, sorghum, alfalfa, peanuts and other legumes, and trees, particularly *Senegalia* and *Vachellia* spp[114].

Activity 2.2.2: Based on the Adaptation Management Plans in prioritised sub-catchments and floodplains developed under Output 1.2, build the capacity of agropastoralists and pastoralists to sustainably manage 4,000 ha of rangeland and demonstrate climate-smart management practices incorporating traditional knowledge and innovative practices.

Across two days, an NbS specialist consultant will deliver training on the enrichment planting process to each rural community committee, followed by the establishment of demonstration plots at selected sites. The presentation will cover the benefits of enrichment planting, challenges to the establishment of the selected species and maintenance of demonstration plots.

At least ten plots per district will be established using seeds, saplings and tools transported from the local nurseries established under Activity 2.2.1. The location of these plots will be confirmed under Output 1.2. Land clearing and planting will be achieved using local labour under a CfW-modality as in Activity 2.2.1 during the third and fourth year of implementation. Plots will be marked using field signage. Committee members will be responsible for monitoring and recording the status of these plots as well as performing basic maintenance where necessary.

During the fourth year of implementation, the NbS specialist will undertake a further trip to the target districts to revisit the demonstration plots with these committee members in order to show the improved pasture productivity. A second set of demonstration plots will be established using the same methods as the first set to provide community committees to demonstrate these benefits to local agropastoralists and pastoralists and promote these practices. The target combined area of all demonstration plots established during the first and second visits by the NbS specialist consultant, across all three districts, will comprise at least 4,000 ha. The nurseries established under Activity 2.2.1 will be large enough to produce sufficient seeds and saplings for these plots as well as any land on which local residents adopt climate-smart rangeland management practices.

Output 2.3: Soil bunds constructed to reduce soil erosion and water run-off at the watershed level in Beledweyne.

Soil conservation will be implemented using soil bunds to reduce erosion and improve water infiltration across erosion-vulnerable slopes. The interventions will be implemented using a CfW modality to recruit local labour, providing tools and guidance to enable climate change-resilient construction and appropriate maintenance. Community committees will be trained to maintain and monitor the outcomes of these interventions.

Activity 2.3.1: Provide training to community committees and distribute digging tools, including spades and hoes, to communities.

The procurement officer will be responsible for the acquisition and transport of digging equipment such as hoes

[114] FAO SWALIM. 2025. Land Cover. https://faoswalim.org/land/land-cover. Accessed on 10 July 2025.

and spades, as well as protective equipment, including gloves and boots, to a district storage facility in Beledweyne Town. The district PMU technical staff member will oversee their requisition to the rural district committee, which will distribute the tools among local labourers as required. Similarly to Activity 2.2.3, the district PMU technical staff member will present a safety briefing and demonstrate and instruct on the construction of soil bunds at the sites identified in the rural Adaptation Management Plan for Beledweyne.

The PMU technical staff member will also present a one-day on-site training on monitoring and maintaining soil bunds to the community committee. This training will include design considerations for replicating demonstration plots, such as slope, soil and vegetation characteristics. Using this training, community committee members will be able to monitor and report on the outcomes of this intervention and promote its replication within their community.

Activity 2.3.2: Implement soil bunds on selected slopes in the target districts.

Following the training under activity 2.3.1 the district PMU technical staff member and Beledweyne community committee will oversee the construction of ~200 ha of these bunds on slopes by local labourers recruited under a CfW modality, using the tools and equipment distributed under Activity 2.3.1. Labourers will selectively clear vegetation on these slopes, construct earthen retaining bunds by heaping up soil and sow seeds requisitioned from the district nursery to stabilise the bunds.

Output 2.4: River embankments restored and riverine areas revegetated or restored for the reinforcing of river embankments and retention and infiltration of flood water in Jowhar and Afgooye.

The structural integrity of river embankments will be strengthened and access to water improved by restoring degraded embankments and revegetating riverine areas in Jowhar and Afgooye. This includes installing gabions and low-flow pipes at sites of anthropogenic breakage to enable flow during dry periods. Revegetation will focus on embankments, irrigation canals and the paleo-channel north of Jowhar, using demonstration plots and community labour under a CfW modality.

Activity 2.4.1: Restore embankments with gabions and low-flow pipes in areas where breakages are anthropogenic.

An agricultural engineer will visit sites in Jowhar and Afgooye identified in the rural Adaptation Management Plans for embankment restoration to ground-truth them, select final sites in Jowhar and Afgooye and validate the proposed restoration methodologies. Following this, the agricultural engineer will undertake another site visit to oversee and guide embankment restoration. At sites where embankments have become degraded by inadequate land management or climate change impacts, or where embankments have been purposefully breached to access water for irrigation— as is the case in the confluence of river and irrigation canals in Afgooye — gabions and low-flow pipes will be installed by a contracted construction firm. By providing access to water during low-flow periods, these pipes will reduce the incentive to damage the embankment. Embankment restoration will be undertaken during the fourth year of implementation.

Activity 2.4.2: Revegetate river embankments, banks of irrigation canals in Jowhar and Afgooye, and revegetate the paleochannel north of Jowhar town.

An agricultural specialist will support community committee members in establishing demonstration revegetation plots on river embankments in Jowhar and Afgooye. These plots will be planted using seedlings and saplings from the local nurseries established under Activity 2.2.1. As with previous NbS interventions, labour will be recruited by the committees using a CfW modality. The agricultural specialist will provide on-site technical guidance to ensure planting methods align with the rural Adaptation Management Plans.

To complement this effort, a wetland will be re-established in the paleochannel north of Jowhar town. This will involve directing river water into the paleo-channel, removing silt to restore the channel's natural slope and planting native vegetation to restore its ecological function. The agricultural specialist will oversee community committee members and local labourers to ensure that restored wetland areas are hydrologically connected to the river and resilient to seasonal variation in streamflow.

The agricultural specialist will undertake follow-up visits during year four of implementation to the revegetation demonstration plots and the wetland with community committee members. These visits will assess revegetation benefits, document lessons learned and identify any challenges that emerged during implementation. Based on these findings, additional demonstration plots will be established to support community learning and replication within the district.

Output 2.5: Sustainable urban drainage systems (SUDs) improve urban drainage network.

Urban drainage infrastructure will be constructed to manage flood risks in the three district towns. The interventions will include strategically placed ditches or vegetated swales, detention basins and retention ponds that will divert and store floodwater. Training workshops will demonstrate the benefits of sustainable drainage management and community committees will be trained on infrastructure monitoring and maintenance.

Activity 2.5.1: Establish strategically placed ditches, vegetated swales, detention basins and retention ponds in Beledweyne, Jowhar and Afgooye urban areas.

Based on sites and methodologies selected in the urban Adaptation Management Plans, hydrological assessments using satellite imagery, land ownership and land use analysis and detailed topographic survey of specific sites selected will inform the specific site selection and design of suitable SUDs in each location. Upon design validation a construction firm will be contracted for the implementation of the SUDs mobilising local casual labour as appropriate. During and after construction of these drainage systems, a one-day training workshop will be held in each target district by a drainage management consultant to capacitate the urban community committees. Committee members will be trained on urban runoff management, stormwater control and infiltration potential of different surfaces. To support the workshop, committee members will be taken to sites before and after implementation to demonstrate the benefits of urban drainage. Committees will be responsible for monitoring the status of drainage basins, reporting blockages or damage and undertaking basic maintenance, including clearing waste.

Output 2.6: Waste management and its flood reduction benefits demonstrated in urban neighbourhoods.

Improved waste management systems will be implemented to reduce urban flooding caused by drainage system blockages caused by unmanaged waste. Training workshops will be undertaken to capacitate district authorities on urban waste collection, composting and repurposing techniques. Community-based approaches will be used to establish sustainable waste collection and disposal practices and demonstrate the benefits of improved waste management on flood risk reduction.

Activity 2.6.1: Host training workshops in community buildings in Beledweyne, Jowhar and Afgooye Towns to present the importance and methods of waste collection in reducing flood impacts to local district authorities responsible for urban management.

An urban planner will design and generate training materials for a workshop on improved waste management. This two-day workshop will be presented to district authorities in each district town to train them on strategies for waste collection, separation, disposal, processing and reuse, including the production of compost and the repurposing of solid waste for construction. This will be facilitated by the demonstration of composting kits to sort, layer and turn compost collected within the district town. Composting kits, in addition to bins for compostable and non-compostable waste will be provided to district authority representatives for demonstration purposes.

Activity 2.6.2: Conduct community-led waste collection drives to demonstrate and involve community members in waste collection and proper disposal — to reduce flood impacts based on the plans developed under Output 1.3 — in Beledweyne, Jowhar and Afgooye town.

Bins for compostable and non-compostable waste, as well as protective equipment will be procured and distributed by district PMU technical staff to volunteers recruited for annual waste collection drives by the urban community committees. Community committees will mobilise participants using posters, flyers or by contacting elders and traditional authorities. Committee members will organise the route and refreshments, ensure that participants are provided with appropriate bins, sacks and protective equipment, guide waste collection, oversee

the handover of collected waste to district authorities and record and report participant numbers. These drives will raise awareness of the benefits of improved waste management on flood risk reduction and inform participants on the differences between compostable and non-compostable waste.

These waste collection drives will be complemented by guided visits to blocked and clear drainage infrastructure to demonstrate the impacts of unmanaged waste on flood risk. Facilitators from the urban community committees will lead these walk-throughs, showcase comparison photos of sites taken before and after improved waste management was implemented and capture local perspectives and testimonials for use in awareness-raising campaigns delivered under Activity 3.3.1.

Component 3: Improved enabling environment for investment in the replication and upscaling of adaptation NbS and hybrid solutions in Somalia

Outcome 3: Enhanced policies, incentives and guidelines to promote the use of proven innovative NbS measures and soil carbon trading.

Output 3.1: Lessons learned and best practices are codified and disseminated to promote investment in NbS.

Systematic documentation of project experiences will be conducted through regular community consultations, research partnerships and detailed analysis of the performance and cost-effectiveness of implemented NbS interventions. Knowledge products will be developed and disseminated through multiple channels — including an online knowledge management platform developed in partnership with academic institutions — to reach stakeholders and promote investment in proven approaches.

Activity 3.1.1: Document lessons learned and best practices during project implementation.

The M&E Officer, will undertake annual trips to the project districts to host community consultations with ~10 persons, including vulnerable and marginalised groups, in urban and rural areas respectively. The objectives of these consultations will be to: i) determine public attitudes towards the project; ii) gauge the extent to which it has delivered benefits, and whether these have been distributed equitably throughout the communities; and iii) assess changes in the awareness of NbS and hybrid solutions. Moreover, these consultations will provide opportunities for community members to communicate potential challenges encountered as a result of the project or in accessing project benefits and propose alterations to project implementation. These suggestions — in addition to the assessment of benefits and any emerging challenges that will potentially jeopardise project implementation such as conflict in the project districts — will be taken under consideration as part of the project's commitment to an adaptive management approach. The results of these community consultations will be reported to the PMU for incorporation into the annual performance reports (APRs) presented to the Project Steering Committee (PSC).

During the first two years of implementation, the consultant will meet with representatives of the Somalia national universities to develop research projects to be undertaken by the Master students enrolled under Activity 1.1.3. These projects will be designed to support the generation of a knowledge base on implementing NbS and hybrid solutions in Somalia. Topics will likely focus on several disciplines, including *inter alia* hydrology, geospatial analysis, knowledge management, environmental and social safeguards and carbon crediting mechanisms. The potential for master's candidates to develop the short note on project performance under Activity 3.1.2 will be considered during project implementation.

Activity 3.1.2: Develop and publish reports on the performance and cost-effectiveness of NbS and hybrid solutions implemented in the project.

Building on the prior UNEP-DHI and MOWR work in modelling the performance of a range of NbS in reducing peak flow, hydrological modelling will be used to appraise the flood attenuation and soil infiltration performance of NbS and hybrid solutions in prioritized rural areas, comparing flood attenuation and infiltration indicators at baseline and with the proposed solutions. This comparative analysis will reveal how each solution performs at current and future climatic conditions and the findings will be documented in a report.

Complementarily, a cost-effectiveness analysis based on project implementation costs and modelled reductions in GDP lost to the impacts of floods and droughts on food security, livelihoods and displacement as well as

avoided costs associated with disaster response. Combined with the NbS flood attenuation and infiltration performance report, the cost-effectiveness report drafted by a cost-effectiveness analysis specialist will provide an evidence base to construct the business case for future implementation of NbS and hybrid solutions in Somalia. During the fifth year of implementation, a short note to summarise modelled and recorded project performance and cost-effectiveness, as well as best practices and lessons learned will be developed based on reports produced under Activity 3.1.2. This note will be uploaded to the knowledge management platform developed under Activity 3.1.3.

Activity 3.1.3: Disseminate knowledge products developed under Activities 3.1.1 and 3.1.2 to government stakeholders to promote the integration of NbS and hybrid measures into planning instruments.

During the first two years of implementation, a knowledge management platform will be designed in collaboration with the Somalia national universities and MoEWR to host all public knowledge products developed during project implementation, including course materials for the master's and undergraduate programmes and short course developed under Activity 1.1.3. This open-access platform will be hosted by MoEWR and prioritise usability, being accessible on a variety of platforms including mobile phones and having options for both English and Somali language menus. The use of this platform will be integrated into the coursework component of the university modules.

The short note and both reports produced under Activity 3.1.2 will be made available in English and Somali language hardcopy to ministerial representatives at federal, federal member state and district levels as well as on the knowledge management platform during the fourth year of implementation. In addition, the reports will also be disseminated in Somali to the rural and urban community committees in each district.

Output 3.2: Recommendations for policy reforms and incentive packages are available at federal, member state and local government levels to promote the development, replication and upscaling of NbS and hybrid measures.

Comprehensive policy reviews will be conducted to identify gaps and opportunities for integrating NbS approaches into existing frameworks. Based on these assessments, specific recommendations will be developed for policy reforms, incentive mechanisms and innovative financing approaches including soil carbon credit schemes.

Activity 3.2.1: Review relevant climate change, land planning and water management policies to identify gaps and opportunities for integrating NbS and hybrid measures.

During the first two years of implementation, a policy analysis specialist will review policy on land use planning, zoning regulations and development guidelines at the federal, state and district levels. The review will assess opportunities for integrating NbS and hybrid solutions into rural and urban planning frameworks such as district resilience plans. Moreover, water management polices including water resource management plans and flood management strategies will be assessed to identify policy gaps relating to NbS and hybrid solutions implementation.

The desktop policy review will be complemented by online stakeholder interviews with policymakers at federal, federal member state and district levels within the five ministries capacitated by the project. These interviews will determine gaps in and barriers to the implementation of existing policy relating to NbS and hybrid solutions as well as suggestions for solutions at the policy level. Moreover, these interviews will familiarise appropriate policymakers with the project and its objectives, including the subsequent policy reform recommendations package developed under Activity 3.2.4, which will increase the likelihood of these recommendations being used for policy reform.

During the second year of implementation, the policy specialist will produce a report on the policy gap analysis. This document will be made available in English and Somali language hardcopy to ministerial representatives at federal, federal member state and district levels as well as on the knowledge management platform developed under Activity 3.1.3.

Activity 3.2.2: Identify and evaluate community incentive mechanisms for uptake of NbS in consultation with local communities and key stakeholders and develop proposed incentive mechanism guidelines.

During the second and third year of implementation, community consultations will be held in each target district to identify and evaluate potential incentive mechanisms for community uptake of NbS and hybrid solutions. Stakeholders to be consulted in KIIs will include NGOs and development organisations, as these are experienced in implementing and obtaining community buy-in for novel strategies in Somalia. Moreover, private sector representatives such as businesspeople and famers will be consulted using focus group discussions to identify potential methods of integrating NbS and hybrid solutions into commercially viable local business models, thereby passively providing financial incentives for NbS and hybrid solutions adoption. The assessment of incentive mechanisms will examine the outcomes of previous initiatives using incentive mechanisms, as well as potentially develop novel mechanisms with inputs from these key stakeholders. The proposed incentive mechanisms will be evaluated by their potential for enabling replication and upscaling, environmental and financial sustainability and equitable distribution of benefits among community members.

Based on the consultation outputs, a set of proposed incentive mechanisms guidelines targeted at federal and district policy- and decision-makers will be developed. The resulting report will be made available in English and Somali language hardcopy to ministerial representatives at federal, federal member state and district levels as well as on the knowledge management platform developed under Activity 3.1.3.

Activity 3.2.3: Develop and present viability assessment and business case for the development of a carbon credit scheme in Somalia to the Federal Government.

A technical note outlining the standard protocols for measuring, reporting and verification (MRV) of soil carbon sequestration that are customised to Somali's capacity constraints will be developed during the third and fourth year of implementation. This note will define the requirements to obtain carbon credits from soil carbon sequestration under simplified Tier 1 and Tier 2 IPCC methods in the short term, and internationally recognised methodologies — such as Verra's VM0042 of the Verified Carbon Standard (VCS) — in the long term, specifically focusing on NbS activities such as those implemented under the proposed project[115] : climate-smart rangeland management practices under Activity 2.2.1, including enrichment planting and natural regeneration, as well as the revegetation of river embankments and paleochannels under Activity 2.4.2. Open-source tools and platforms will be emphasised, along with remote sensing — such as satellite-derived normalised difference vegetation index (NDVI) for vegetation cover change — and mobile data collection. The technical note will provide guidance for incorporating soil carbon sequestration components into future NbS initiatives in Somalia and enable the identification of gaps in MRV capacities, including governance and legal structures.

Based on the MRV requirements outlined in the technical note, a desktop study will be conducted to assess the technical potential for soil carbon sequestration in Somalia. This study will consider environmental and geospatial data — where available on platforms such as SWALIM or published in previous government reports and academic studies — including soil characteristics, past and present soil carbon concentrations, sequestration rates of native Somalia vegetation types and soil carbon retention times. These data will be used to identify priority landscapes and species to implement soil carbon crediting projects, with particular focus given to those appropriate for NbS implementation. Data limitations in the availability of baseline carbon and land use data are expected to result in uncertainty; however, pilot data collection in representative landscapes is likely to reduce these uncertainties.

The protocols described in the technical note and desk study of soil carbon sequestration potential will be synthesised into an economic cost-benefit assessment to determine the long-term commercial viability of integrating carbon crediting into NbS initiatives. The assessment will focus on the: i) cost of incorporating MRV procedures into NbS initiatives; ii) cost of building the required capacity[116] for implementing these MRV procedures to the standards outlined in the technical note; iii) cost of maintaining that capacity in the long-term; iv) economic benefits of soil carbon sequestration based on sequestration potential in different Somali landscapes and using different species, as well as current and projected carbon market conditions; v) risks to

[115] Although the proposed project will not implement a carbon crediting scheme within its timeframe, it will generate foundational knowledge and capacity to inform and enable such schemes in the future.
[116] Including *inter alia* laboratory infrastructure, data availability and legal frameworks/enabling environment.

the long-term economic viability of these carbon projects; vi) potential trade-offs in NbS efficacy when implementing carbon crediting, with particular focus on equitable distribution of benefits to vulnerable community members; and vii) costs of monitoring soil carbon content during the implementation of carbon credit projects.

During the third and fourth year of implementation, experts will undertake consultations with subsistence and commercial farmers, pastoralists and agro-pastoralists in the riverine zone of the project districts to determine current and past agricultural practices, including *inter alia* crop types, average area farmed per household, the extent of irrigation and mechanisation, land tenure, MRV capacity of farmers and the current adoption of climate-smart agricultural practices such as crop residue retention and composting. These factors will be considered to ground-truth assumptions, assess practicality, determine gender considerations and develop a set of recommendations of agronomic practices to inform the soil carbon credit scheme implementation strategy.

The cost-benefit analysis, supported by the soil carbon crediting protocols and assessments of sequestration potential and agricultural practices, will be used to develop a viability assessment on incorporating soil carbon credits into future NbS initiatives in Somalia and developing soil carbon credit projects on agricultural land in the target districts. The viability assessment will include technical considerations such as capacity gaps in required MRV procedures required for compliance with international carbon standards[117], long-term commercial viability and environmental and social aspects. During the fourth year of implementation, the assessment will be framed as a business case and presented to federal stakeholders within the appropriate ministries during a workshop in Mogadishu. The business case will present soil carbon crediting as a potential incentive mechanism for facilitating replication and upscaling of NbS and hybrid solutions in Somalia. The objective will be to emphasise the generation of financial and environmental co-benefits in addition to the climate change adaptation benefits provided by NbS and hybrid solutions in reducing drought and flood risk and impacts. Moreover, carbon crediting projects on agricultural land will be emphasised as a potential supplementary adaptation mechanism by promoting the adoption of improved agricultural practices, which comprises the methods of developing carbon credits under specific crediting methodologies such as Verra's VM0042[118].

Activity 3.2.4: Present recommendations for climate change, land planning and water management policy reforms based on the policy review (Activity 3.2.1), incentive mechanisms (Activity 3.2.2) and feasibility assessments (Activity 3.2.3) to federal government stakeholders in a workshop.

During the fourth and fifth year of implementation, a policy reform recommendations package will be developed, describing opportunities for integrating NbS and hybrid solutions into existing and future policy frameworks. These recommendations will be informed by: i) lessons learned and best practices documented under Activity 3.1.1, ii) reports on the flood attenuation and soil infiltration potential and cost-effectiveness of NbS and hybrid solutions implemented in the project under Activity 3.1.2, (iii) the policy review and gap assessment undertaken under Activity 3.2.1; iv) the incentive mechanism guidelines developed under Activity 3.2.2 and v) the business case for developing soil carbon crediting projects on cropland or integrating these into NbS initiatives, developed under Activity 3.2.3. Gender-responsive policy recommendations will emphasise the adaptation, financial and environmental benefits of NbS and hybrid solutions and enable these to be recognised within federal, federal member state and district planning frameworks, facilitating their replication and upscaling. Soil carbon will be emphasised as a cross-cutting policy element, to be positioned in the intersection of climate, agriculture and environment policy by integrating soil carbon indicators and targets within proposed and existing national and subnational planning tools such as National Adaptation Plans, Nationally Determined Contribution strategies and plans on land-use, degradation and soil quality.

The draft package of recommendations for policy reform will be presented to federal policy- and decision-makers among the five ministries at a workshop in Mogadishu during the fifth year of implementation. This workshop will validate the feasibility of adjusting policy frameworks or developing new ones to incorporate NbS and hybrid solutions and, potentially, soil carbon crediting. Federal government stakeholder feedback — including both workshop discussions and formal comments — will be noted and incorporated into the final version of the recommendation package. The final document will be made available in English and Somali language hardcopy

[117] The integration of MRV data collected during implementation into the Knowledge Management Platform developed under Activity 3.1.3 to inform future soil carbon projects will be considered.
[118] VERRA. 2025. VM0042 Improved Agricultural Land Management, v2.1. https://verra.org/methodologies/vm0042-improved-agricultural-land-management-v2-1/. Accessed on: 10 July 2025.

to ministerial representatives at federal, federal member state and district levels as well as on the knowledge management platform developed under Activity 3.1.3.

Output 3.3: Gender-responsive public awareness programmes and a policy advocacy strategy developed and implemented.

Comprehensive awareness-raising strategies will be developed and implemented to build understanding of and support for NbS and hybrid solutions across different stakeholder groups. Multi-channel communication approaches will be used to reach diverse audiences and demonstrate the benefits of integrated adaptation approaches. The strategies will include interactive elements that allow communities to share their experiences and perspectives, contributing to the development of a knowledge base in Somalia.

Activity 3.3.1: Develop tailored awareness-raising strategies using educational resources, events, and media, including SMS, radio programmes and paper media (such as flyers and posters).

During the third to fifth years of implementation, case studies of NbS and hybrid solutions adoption in the target districts as a result of demonstration plots will be evaluated. These case studies will be informed by annual project performance reports and reports from the district community committees and will demonstrate both best practices from successful implementation as well as lessons learned where challenges have impeded the full realisation of adaptation benefits. Particular focus will be given to case studies demonstrating the equitable distribution of adaptation benefits to vulnerable stakeholder groups such as women, minority clans and IDPs. Based on these case studies, educational materials will be developed to share best practices and lessons learned, facilitating further community adoption of NbS and hybrid solutions. Educational materials such as training manuals and fact sheets will be contextually appropriate, being written in Somali, including unambiguous visual aids and focusing on challenges specific to targeted communities.

To enable an awareness-raising campaign that is contextually appropriate and reaches the greatest number of potential stakeholders, educational materials will be developed for dissemination in the form of several media. These will include print materials such as posters, flyers and banners to be distributed to appropriate community buildings, as well as radio programmes broadcast on national and local radio stations. The latter will be hosted live and feature interviews with NbS experts, case studies and airtime dedicated to call-ins from local residents to receive guidance on implementing NbS and hybrid solutions. To supplement this campaign, community committees will be tasked with subscribing local residents interested in NbS implementation to an SMS-messaging list, which will regularly share links to the knowledge management platform, articles on the project progress released by UNEP or Sadar and notifications about upcoming radio shows, trips to demonstration plots, community consultations and waste collection drives. The radio programmes and SMS messaging will be launched during the third year of implementation.

In addition, during the third to fifth year of implementation, annual awareness-raising events will be held in urban and rural communities in each district. These will include the distribution of educational materials as well as discussions with com
unity members across stakeholder groups. Separate events will be held for women and youths to ensure that the public awareness programme is gender-responsive, enabling vulnerable groups to share their perspectives on NbS adoption, challenges and successes and receive targeted guidance.

Component 4: M&E and Knowledge Management

Activity 4.1: Deliver training, implement and monitor the Stakeholder Engagement Plan, Gender Action Plan and Environmental and Social Management Framework.

A project inception workshop will be held during the first year of implementation to present plans and frameworks for project management to federal, federal member state and district representatives. These documents include: i) the Stakeholder Engagement Plan (SEP), outlining the grievance redress mechanism and strategy for consultations during project development; ii) the Gender Assessment and Action Plan (GAAP), describing strategies to ensure that project benefits are distributed equitably, including to women and youths; and iii) the Environmental and Social Management Framework (ESMF), listing identified ESS challenges and their mitigation measures, as well as a strategy for maintaining ESS compliance.

To ensure these frameworks are gender-responsive — particularly the GAAP — a separate session aimed at female ministerial representatives from the five ministries will be held during this project inception workshop. During both sessions, ministerial representatives will have opportunities to share their perspectives on these plans, identify potential challenges and suggest improvements. All feedback will be incorporated into these plans, and the revised documents will be used to develop a training workshop in Mogadishu to capacitate PMU members for the implementation of the plans.

The SEP, GAAP and ESMF will be made available to ministerial representatives at federal, federal member state and district levels in English and Somali language hardcopy. These plans will also be made available on the knowledge management platform developed under Activity 3.1.3 — during the first year of implementation. All PMU personnel will be trained on the revised plans in a workshop during the first year of implementation to ensure that these plans are implemented appropriately. During the entire project lifespan, PMU members will be responsible for implementing these plans to facilitate that target indicators are achieved, benefits are distributed equitably, environmental and social safeguards compliance is maintained, potential challenges are mitigated using adaptive management and the knowledge management platform is established.

Activity 4.2: Implement the Monitoring and Evaluation Plan and Knowledge Management Plan.

In addition to presenting and delivering training on the SEP, GAAP and ESMP under Activity 4.1, Component 4 will include a training workshop to capacitate the PMU to implement: i) a Monitoring and Evaluation (M&E) Plan[119], outlining the monitoring and reporting activities and roles; and ii) a Knowledge Management Plan[120], describing protocols for the use and maintenance of the Knowledge Management Platform to be developed under Activity 3.1.3 to host all project deliverables and enable ongoing capacity building and development of an evidence base to support upscaling and replication of NbS and hybrid solutions in Somalia. The Knowledge Management Plan will also include: i) a results framework and timeline for dissemination of all knowledge products generated during implementation; and ii) elaboration on the use of various communications channels such as radio programmes and annual awareness events in disseminating these products.

Implementation of the M&E Plan and other frameworks developed under Output 4.1 will require the Project Manager to lead the PMU in generating an Annual Progress Report (APR) and presenting this to the PSC personnel each year of implementation. APR development will require inputs from all PMU personnel but will draw particularly from project M&E activities undertaken by the M&E Officer and the ESS & Gender Officer. These APRs will enable PMU members to adjust implementation to mitigate potential challenges, where appropriate, and ensure that the projected benefits of NbS and hybrid solutions will be generated and distributed equitably.

In addition to internal project M&E, during the third year of implementation, an independent results verification exercise will be undertaken to produce a Mid-term Evaluation (MTE). At project closure a similar independent results verification exercise will be carried out and will inform the Terminal Evaluation (TE) will be produced based on a . These evaluations will quantify the project's success in achieving target indicators and summarise best practices and lessons learned, contributing to the establishment of a knowledge base for replication and upscaling of NbS and hybrid solutions in Somalia.

B. Promotion of new and innovative solutions to climate change adaptation

The proposed project will promote the adoption, replication and upscaling of proven nature-based solutions (NbS) and hybrid solutions that are innovative to the Shabelle River Basin. These innovative solutions will increase the adaptive capacity of vulnerable communities in the Beledweyne, Jowhar and Afgooye districts. The proposed project operationalises objectives from Somalia's National Adaptation Plan (NAP) and third Nationally Determined Contribution (NDC), both of which call for scaled-up, risk-informed development solutions to address the impacts of floods, droughts and land degradation. By directly supporting these priorities, the proposed project aligns with national adaptation strategies and strengthens Somalia's institutional capacity to

[119] Refer to Part II, Section G: Learning and Knowledge Management for additional details on the Knowledge Management Plan.
[120] Refer to Part III, Section D: Monitoring and Evaluation for additional details on the M&E arrangements of the proposed project

deliver on its climate goals. Increasing climate change resilience will contribute to Results 2–4 of *Strategic Pillar 2: Innovation* of the Adaptation Fund Medium Term strategy for 2023–2027 (AF MTS 2023–2027)[121].

Result 2: Successful innovation replicated and scaled up
Innovative adaptation practices, tools and technologies that have demonstrated success in other areas of Somalia or other countries in the region will be replicated in the target districts and scaled up in a watershed and landscape approach in rural and urban areas (Component 2). These include the following innovative adaptation practices, tools and technologies:

Combined sand dams and V-shaped weirs for flood control and water supply
The construction of V-shaped weirs in the spillways of sand dams presents a novel combination of these technologies to increase water availability and control floods. Experimental implementation of combined weirs and dams by the United Nations Environment Programme-Danish Hydraulic Institute (UNEP-DHI) indicates a potential flood reduction of up to 60% in Qardho and 38% in Beledweyne[122].

Protected wells will be constructed in the throwbacks of these dams. Solar pumping systems, elevated tanks and gravity distribution systems will distribute this water to community taps to improve access to water throughout the year, particularly during the dry season. As such, the proposed project replicates several proven practices in water distribution, pairing them with the combined sand dams and V-shaped weirs for an innovative climate-resilient solution to water scarcity.

Climate-smart rangeland management
Community-based management systems are frequently implemented in conservation initiatives, yet their application in climate change adaptation is less common, particularly in the context of Somalia. In this project, community committees comprised of stakeholders from the target districts will form part of an integrated watershed approach to address flood and drought risks and impacts. These committees will be incorporated into the validation of urban area and sub-catchment/floodplain area Adaptation Management Plans and will oversee the implementation of NbS and hybrid solutions such as climate-smart rangeland management. This participatory approach empowers communities in rangelands to manage natural resources sustainably, reinforcing customary practices and promoting good governance. Moreover, it will provide opportunities for women, youth and other marginalised groups to contribute to decision-making.

Pastoralist-led rangeland regeneration and improved management will also be innovative in the context of the target districts. The approach includes two innovative aspects: the use of a participatory approach to planning and management, and pastoralist-led rangeland regeneration. The regeneration intervention will employ proven methods of rangeland revegetation, using indigenous trees and shrubs adapted to dryland conditions to control erosion and improve soil structure, productivity, infiltration and biodiversity.

Sustainable drainage and improved waste management in urban areas
Retention basins, detention ponds and drainage channels such as roadside swales are proven flood risk reduction technologies in urban settlements. Despite successful implementation in countries worldwide, these have not been widely adopted in Somalia. Moreover, the absence of organised waste collection and disposal in Beledweyne, Jowhar and Afgooye towns increases the risk of obstructions of drainage infrastructure, decreasing its effectiveness during floods. Urban Resilience Plans developed for Beledweyne town and Jowhar town previously identified potential NbS interventions such as sustainable drainage systems (SUDs) and improved waste management to increase flood resilience. These innovative technologies will protect urban populations and their assets and livelihoods from recurrent flooding.

Exploration of the potential of a soil carbon credit scheme in Somalia
An assessment will be conducted under Activity 3.2.3 to support exploring the feasibility of establishing a soil carbon credit scheme in Somalia, where no such scheme currently exists. Given the exploratory nature of this

[121] Adaptation Fund. 2022. Medium-Term Strategy 2023–2027. https://www.adaptation-fund.org/wp-content/uploads/2022/12/Medium-Term-Strategy-2023-2027.pdf. Accessed on: 25 June 2025.
[122] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf

activity, the focus will be on conducting feasibility studies, identifying risks and institutional gaps, and strengthening the capacity of the Government of Somalia (GoS) to participate in carbon trading. The initiative will include several interconnected components to ensure a robust, context-appropriate foundation for potential implementation.

Stakeholder Engagement and Education
Initial discussions with the GoS, Iroko Analytics, the United Nations Environment Programme (UNEP), and the International Organisation for Migration (IOM) have highlighted the critical need for inclusive stakeholder engagement. Consultations with local organisations in Mogadishu will serve to build trust, manage expectations, and secure early buy-in for the proposed soil carbon credit scheme. These discussions will form the foundation for a structured educational programme focused on carbon offset project management. The programme will cover key aspects such as market dynamics, investor relations, certification processes under internationally recognised standards, and the fundamentals of monitoring, reporting and verification (MRV). These efforts aim to build national and sub-national readiness to engage in carbon markets.

Farm Assessments and Baseline Data Collection
Working in partnership with local government authorities and communities, the project will identify suitable sites for soil carbon credit interventions. At these sites, farm assessments will be conducted to gather baseline data on soil quality, crop history, and current agricultural practices. These assessments will provide insights into existing conditions and inform the development of agronomic recommendations that support carbon sequestration. The data collected will serve as a cornerstone for designing strategies that integrate soil health improvements with climate mitigation objectives.

Development of MRV Protocols for Soil Carbon Sequestration
During the third and fourth years of implementation, a technical note will be developed outlining the standard MRV protocols necessary for generating soil carbon credits. These protocols will be designed in accordance with internationally recognised standards such as Verra's Verified Carbon Standard (VCS). The technical note will specifically address the requirements for obtaining carbon credits from Nature-based Solutions (NbS) like those implemented under the project, including climate-smart rangeland management (Activity 2.2.1) and revegetation of river embankments (Activity 2.4.2). In addition to guiding future implementation, the technical note will help identify institutional, legal, and governance gaps that must be addressed to ensure MRV compliance.

Desktop Study on Sequestration Potential
To complement the MRV work, a desktop study will be undertaken to assess the technical potential for soil carbon sequestration in Somalia. This study will draw on available environmental and geospatial datasets — such as those from SWALIM — as well as published government and academic research. The study will examine variables including soil characteristics, historical and current soil carbon concentrations, sequestration rates of native vegetation, and soil carbon retention times. Its objective will be to identify high-potential landscapes and species for implementation, with a particular focus on those compatible with NbS.

Economic Cost-Benefit Analysis
Insights from the MRV protocols and desktop study will inform an assessment of the commercial viability of soil carbon crediting in future NbS initiatives. This assessment will examine the costs associated with implementing and maintaining MRV procedures, the investments required for capacity building, and the potential financial returns from soil carbon sequestration under different scenarios. It will also assess risks to long-term economic sustainability, market volatility, and possible trade-offs with NbS efficacy—especially with regard to the equitable distribution of benefits to vulnerable communities.

Consultations with Farmers and Agronomic Recommendations
Further consultations will be conducted with both subsistence and commercial farmers operating in the riverine zones of the target project districts. These engagements will collect information on crop types, farm sizes, irrigation and mechanisation practices, land tenure arrangements, and the extent to which climate-smart agricultural techniques — such as composting and crop residue retention — are currently adopted. This data will be used to develop tailored agronomic recommendations for integrating carbon sequestration practices into ongoing farming systems. The recommendations will inform the operational design of the soil carbon credit scheme and contribute to adaptive agricultural strategies in the region.

Viability Assessment and Business Case Development
All findings will be synthesised into a comprehensive viability assessment, which will be developed into a formal business case during the fourth year of implementation. This business case will be presented to national stakeholders in a workshop in Mogadishu, targeting relevant ministries and technical experts. It will highlight the technical, economic, and environmental rationale for integrating soil carbon crediting into Somalia's adaptation and mitigation strategies. Notably, it will position soil carbon crediting as a supplementary adaptation mechanism that enhances resilience by providing new livelihood opportunities for farmers and supporting the replication and scaling of NbS and hybrid solutions. The emphasis will be on delivering financial and environmental co-benefits alongside the climate change adaptation outcomes of reduced drought and flood risks.

Result 3: Access and capacities enhanced for designing and implementing innovation
The proposed project will build capacity within the GoS and vulnerable communities in the Beledweyne, Jowhar and Afgooye districts to facilitate planning and implementation of NbS and hybrid solutions (Component 1). A gap analysis will be undertaken to identify capacity constraints related to expertise, technical skills and equipment within five Ministries at the national, federal member state and district levels. The identified capacity gaps will be addressed through a customised capacity-building programme that integrates context-specific training materials developed for the Somali setting, alongside relevant online courses. Moreover, a review of existing policies on climate change, land use planning and water management as well as incentive mechanisms to promote climate change adaptation will be used to develop a package of recommendations for policy reform. These policies will support the upscaling and replication of the innovative interventions outlined under Result 2, while creating opportunities to introduce additional adaptation measures — novel to the Somali context — at both national and district levels.

Community committees in each district, strengthened through the proposed project, will be responsible for managing and overseeing demonstration plots showcasing NbS and hybrid solutions interventions. By demonstrating the adaptation benefits of NbS to mitigate drought and flood impacts, the proposed project will incentivise local communities to replicate these interventions, facilitating their adoption outside of the project districts. These committees are expected to play an enabling role by disseminating knowledge and facilitating access to shared resources— such as tools and seeds — thereby further strengthening community capacity.

Result 4: Evidence base generated and shared
To support the demonstration and broader adoption, replication and scaling of NbS and hybrid solutions, the proposed project will integrate knowledge management (Components 3 and 4_. A customised multimedia awareness strategy will be implemented, leveraging radio broadcasts, SMS campaigns and printed materials to share locally appropriate case studies of successful NbS and hybrid solutions interventions. This awareness-raising campaign will be complemented by regular live demonstrations designed to maximise community participation and ensure widespread, hands-on exposure to demonstration sites. These sessions will embed best practices and lessons learned into a growing local evidence base. Additionally, all reports, training resources and knowledge products generated throughout project implementation will be made publicly accessible on an open-access knowledge management platform, supporting transparency and long-term impact of project interventions.

In addition, project M&E under this component will contribute to the generation and dissemination of the evidence base for facilitating NbS and hybrid solutions replication and upscaling in Somalia. Project outcomes will be assessed regularly to develop best practices and lessons learned, which will be included in Annual Progress Reports, a Mid-term Evaluation and a Terminal Evaluation. These documents will be made available on the Knowledge Management Platform developed under Activity 3.1.3 to support future NbS and hybrid solutions initiatives in the country.

C. Scaling and replicating innovative adaptation practices, tools and technologies

Innovative adaptation nature-based solutions (NbS) and hybrid solutions that have demonstrated success in other areas of Somalia or other countries in the region will be replicated in the target area and scaled-up using a catchment and landscape planning approach in both rural and urban areas. The innovative solutions

(described in Section B) have been selected because of their proven effectiveness to reduce flood risk and enhance water infiltration and soil moisture retention for improved resilience, water and food security in similar contexts or at smaller scales. The proposed innovative solutions build on the learning and recommendations generated by previous programmes and are part of existing or emerging government-led planning frameworks designed with the participation of many relevant stakeholders, using the latest information available, thereby presenting the largely agreed programmes of work in adaptation. This provides legitimacy and great interest in the results of this project, hence increasing opportunities for further replication and scale-up.

Outcomes 1 and 3 will provide the enabling conditions for scaling up through: i) strengthening institutions, providing training, and building the capacity of communities, Civil Society Organisations (CSO), government actors, academia, and other authorities, as outlined in the Stakeholder Engagement Plan; ii) incorporating NbS considerations into existing mechanisms, programmes, and committees related to natural resources management, disaster risk reduction, adaptation, water resources management, planning, economic development, agriculture and livestock sectors; iii) implementing a public awareness and policy advocacy strategy; and iv) demonstrating the performance and cost-effectiveness of NbS to create policy and investment incentives for their widespread adoption. In addition, the project will support the development of rural and urban Adaptation Management Plans which will provide explicit guidance for the implementation of NbS and hybrid solutions. Moreover, lessons learned, performance data and cost-effectiveness results will then be shared through a newly developed online knowledge platform. These interventions will ensure that field-level innovations can be replicated more broadly and integrated into national planning instruments and funding pathways. Additionally, local community committees trained under the project will lead participatory planning, implementation and monitoring, thereby supporting long-term ownership and sustainability of project interventions.

These interventions will be complemented by a deliberate coordination of project interventions with existing programmes — particularly those ongoing initiatives outlined in the baseline section — to avoid duplication, maximise synergies and sharing of experiences. The Project Steering Committee (PSC) and the Project Management Unit (PMU) will facilitate collaboration, coordination, and leveraging financial resources from other relevant programmes and projects for mutual benefit.

The project's design enables NbS and hybrid adaptation solutions to be institutionalised through a combination of science-based planning, capacity-building at multiple governance levels, evidence generation and dissemination and policy integration. By aligning participatory governance with technical design standards and embedding these within national and district planning, the project presents a scalable and context-responsive model for climate adaptation that links local innovation with systemic change.

D. Economic, social and environmental benefits

The proposed project is designed to deliver integrated economic, social and environmental benefits to project beneficiaries in the Beledweyne, Jowhar and Afgooye districts. The proposed interventions will generate direct and indirect co-benefits through improved water access, increased land productivity, reduced exposure to climate risks and increased institutional capacity for climate-resilient planning. These benefits are outlined in Table 10.

Table 10. Overview of economic, social and environmental benefits to be delivered by the proposed project.

Benefit category	Description	Associated activities/outputs
Economic benefits		
Protection of assets and reduced damage costs	Hybrid interventions — including weirs, sand dams, soil bunds and green infrastructure — reduce damage to homes, farmland and public infrastructure during floods and droughts. This reduces municipal spending on recovery and repairs[123], enabling governments to redirect resources to long-term	Outputs 2.1–2.4

[123] For example, droughts between 2016–2018 caused US$1,175.5 million in damage, while the 2019 floods required US$350 million in recovery funds.

	development[124,125].	
Livelihood generation and income opportunities	Cash-for-work (CfW) modalities used in NbS interventions — including bund construction, enrichment planting and revegetation — provide income-generating opportunities for rural and urban communities, including women, youth and IDPs.	Activities 2.2.2, 2.3.2 and 2.4.2
Improved land productivity	Climate-smart rangeland management will improve ecosystem services for ~12,200 rural community members, promoting denser vegetation, increased soil organic matter and improved water regulation and erosion control[126,127].	Activity 2.2.2
Soil carbon credit potential	Activities under Output 2.2 will increase soil organic matter. The project will develop a business case for monetising soil carbon through future credit systems, supporting private sector investment and sustainable land management.[128]	Activity 3.2.3
Water access and labour efficiency	Decentralised water supply systems — including solar-powered pumps and storage tanks — reduce reliance on trucked water, lower household water costs and reduce labour burdens. In the three target catchments, 8,520 people will benefit from improved water access. This enables women to engage in income-generating activities and supports livestock survival during droughts, preserving livelihood assets.	Activities 2.1.1, 2.1.2; Outcome 2
Social benefits		
Improved water access and reduced labour burden	Sand dams, solar-powered pumps, elevated tanks and embankment-integrated pipelines improve year-round access to water for households and livestock[129], reducing water collection burden for women and children and supporting food production and WASH needs[130].	Activities 2.1.1, 2.1.2, 2.4.1; Output 2.2
Improved health outcomes	Urban drainage and waste management interventions reduce exposure to environmental health risks including cholera, malaria and Rift Valley fever[131] — particularly in flood-prone informal settlements[132].	Outputs 2.5, 2.6
Inclusive governance and local empowerment	Six local community committees will lead participatory planning and monitoring of NbS, supporting inclusive land-use decision-making and improved local governance systems.	Output 1.4
Gender-responsive benefits and women's empowerment	A public awareness strategy, quotas for leadership, and inclusive training approaches will address structural barriers to women's participation and promote equitable access to adaptation benefits.	Output 3.3; Gender Action Plan (GAP)
Conflict management	By improving land stability and vegetation cover in degraded areas, rangeland restoration efforts are expected to reduce competition over land and water resources, mitigating risks of conflict and displacement between herders and farmers[133].	Activity 2.2.2; Output 2.2.
Environmental benefits		
Reduced erosion and improved soil structure	Soil bunds and embankment restoration reduce erosion, slow runoff and improve infiltration, contributing to improved soil structure and water retention across	Activities 2.3.2 and 2.4.1

[124] World Bank. 2020. Diagnostic study on trends and threats for environmental and natural resources challenges. https://documents1.worldbank.org/curated/en/742491594100313982/pdf/Somalia-Country-Environmental-Analysis-Diagnostic-Study-on-Trends-and-Threats-for-Environmental-and-Natural-Resources-Challenges.pdf
[125] Parvez A, Meutia R, Hussein M, Muhumed G, Guled K & Riddell H. 2020. Somalia - 2019 Floods Impact and Needs Assessment. Washington, D.C. World Bank Group. http://documents.worldbank.org/curated/en/764681585029507635
[126] van Steenbergen F, Tuinhof A, Knoop L & Kauffman JH. 2011. Transforming landscapes, transforming lives: The business of sustainable water buffer management. 3R Water. http://re.indiaenvironmentportal.org.in/files/file/Transforming_Landscapes.pdf
[127] Mcharo M & Maghenda M. 2021. Cost-benefit analysis of sustainable land and water management practices in selected highland water catchments of Kenya. Scientific African, 12: e00779.
[128] Leifeld J & Fuhrer J. 2010. Organic farming and soil carbon sequestration: what do we really know about the benefits? Ambio, 39(8): 585-99.
[129] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf
[130] SWALIM and FAO. 2016. The Juba and Shabelle rivers and their importance to Somalia.
[131] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action: Applicability of Nature-based Solutions for Flood and Drought Management in Somalia. Final Report. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf
[132] Osman AA & Abebe GK. 2023. Rural Displacement and Its Implications on Livelihoods and Food Insecurity: The Case of Inter-Riverine Communities in Somalia. Agriculture, 13(7): 1444.
[133] Eklöw K& Krampe F. 2019. Climate-Related Security Risks and Peacebuilding in Somalia: SIPRI Policy Paper No. 53. Stockholm International Peace Research Institute.

	cultivated and grazing areas[134.135].	
Rangeland regeneration and biodiversity	Community-based restoration of 4,000 ha of rangeland using native species will promote denser vegetation, improve soil organic matter and enhance ecosystem services for rural communities.	Output 2.2
Aquifer recharge and improved water management	Sand dams and weirs improve infiltration and aquifer levels[136,137], enhancing water availability and regulating baseflow during the dry season and droughts. Drainage systems, sand dams and embankment vegetation filter runoff, limiting sediment and pollutant loads in watercourses. These interventions protect water quality and ecosystem function in rural and urban sites.	Outputs 2.1–2.3
Ecosystem stewardship and replication	Capacity building will equip local stakeholders with technical expertise to manage water supply infrastructure, rangeland systems, erosion and flood control, urban drainage and improved waste management. These efforts will facilitate the replication of best practices, strengthening national capacity for nature-based adaptation planning and climate-resilient development.	Outcome 1; Output 3.1

E. Cost effectiveness analysis

The proposed project's selection of nature-based solutions (NbS) and hybrid interventions in the Shabelle River Basin aligns with identified environmental challenges[138] and the most suitable approaches for mitigation and adaptation. The proposed project's interventions will provide a cost-effective approach to reduce the impact of climate risks and enhance the resilience of local communities and their livelihoods.

Community engagement underpins the proposed project's strategy to achieve cost-effectiveness and long-term impact by embedding interventions within local governance systems and traditional practices. Through participatory planning and management, communities are given stewardship of natural resources, using approaches such as farmer- and pastoralist-managed natural regeneration to restore ecosystems and support ongoing vegetation growth. By prioritising local stewardship, the project reduces dependency on external maintenance and supports long-term integration of the proposed adaptation measures. Community committees plan, implement and monitor interventions, reducing reliance on external technical and financial inputs. Community involvement also enables wider replication of successful practices, informed by lessons from similar initiatives and guided by knowledge-sharing mechanisms. By investing in community capacity and embedding the management and maintenance of NbS interventions within local governance systems and traditional practices, the project ensures that the benefits extend beyond the project's implementation period.

NbS are generally more cost-effective than grey infrastructure, particularly in Somalia, where extensive engineered systems such as large dams were historically planned but remain unbuilt as the result of political instability, civil conflict and regional disputes. Furthermore, grey infrastructure is costly and typically engineered based on historical climate norms, with limited capacity to accommodate future climatic variability and extremes. By reducing the impact of floods and droughts through NbS and hybrid measures, the project's interventions lead to cost savings for communities, regional states and the federal government by avoiding damages and redirecting resources to development priorities.

The integration of NbS into these agriculturally productive Shabelle River Basin increases the viability of long-term investments in ecosystem restoration and supports market access for climate-resilient livelihoods. Evidence from the modelling and pilot projects supports the cost-effectiveness and sustained impact of these

[134] Adimassu Z, Mekonnen K, Yirga C & Kessler A. 2014. Effect of Soil Bunds on Runoff, Soil and Nutrient Losses, and Crop Yield in the Central Highlands of Ethiopia. Land Degrad Develop, 25(6): 554–564.
[135] Woldearegay K, Grum B, Hessel R, van Steenbergen F, Fleskens L, Yazew E, Tamene L, Mekonnen K, Reda T & Haftu M. 2024. Watershed management, groundwater recharge and drought resilience: An integrated approach to adapt to rainfall variability in northern Ethiopia. Int Soil Water Conserv Res, 12(3): 663–683.
[136] UNEP-DHI Centre. 2022. Project Brief: Nature-based Solutions Supporting Climate Resilience in the Shabelle River Basin. https://unepdhi.org/wp-content/uploads/sites/2/2022/06/Somalia-NbS-brief.pdf
[137] Lopez-Rey P. 2020. An appraisal of the effectiveness and sustainability of sand dams to improve water security and resilience in Somaliland. Concern Worldwide. https://www.preventionweb.net/publication/appraisal-effectiveness-and-sustainability-sand-dams-improve-water-security-and
[138] Refer to Part I: Project Background and Context

interventions[139]. The implementation of project activities in rural areas is expected to reduce flood severity and secure water supplies, with sand dams alone capable of meeting all domestic water requirements during the five-month dry season[140]. Climate-smart rangeland management has shown a reduction in sediment load and increased biomass, with soil carbon improvements translating into higher maize, sorghum and sesame yields[141] — supporting Somalian food security. Furthermore, urban interventions, such as sustainable urban drainage systems (SUDS) and urban forests, are projected to reduce flooding by up to 50%, with tree canopies further delaying runoff and increasing infiltration[142,143].

The proposed project's use of locally available materials and traditional knowledge further reduces costs and supports community ownership. Although context-specific data for Somalia are limited, comparable projects in similar arid and semi-arid regions indicate considerable economic returns — with an estimated US$5.85 million return per US$1 million invested[144]. This is equivalent to a cost-benefit ratio of US$5.85 to US$1. The EARNSS project is structured to generate further evidence on cost-effectiveness and value for money, informing future investment decisions.

These interventions are designed to integrate livelihood strengthening and economic development directly into its climate adaptation strategies, creating a cycle of mutual reinforcement that enhances cost-effectiveness and durability. This is achieved by implementing NbS and hybrid measures that simultaneously improve environmental conditions and provide tangible economic benefits to vulnerable communities[145]. By embedding mechanisms for evidence generation on cost-effectiveness and return on investment, the project also provides a replicable model for climate-resilient development aligned with national and global goals. This integrated approach enhances the proposed project's potential to deliver cost-effective outcomes and long-term benefits for vulnerable communities and ecosystems in the project area.

F. Consistency with other strategies

The Federal Government of Somalia's Ministry of Environment and Climate Change, established in 2022, has developed policies aligned with the proposed Shabelle River Basin project, supporting its relevance, national ownership and long-term sustainability[146] (Table 11).

Table 11. Alignment of project interventions with national and sub-national plans, policies and strategies.

Plans, policies and strategies	Alignment with the proposed project
National	
Somalia National Adaptation Plan (NAP) Framework, 2022[147]	The design and implementation of the proposed project align with several principles of Somalia's NAP framework. For example, stakeholder engagements will focus on understanding the differing needs and vulnerabilities of women and men in target communities, reflecting Principle 3 on Gender Responsiveness. Similarly — in line with Principle 5 on Participatory, Inclusive and Transparent approaches — the project design was guided by a broad range of stakeholder views, including those of women, youth, IDPs, indigenous peoples and persons with disabilities. Moreover, Principle 6 — Best Available Scientific Information and Traditional Knowledge — is addressed through the selection of interventions based on proven techniques from the NbS catalogue developed by the

[139] UNEP-DHI Centre. 2022. Applicability of nature-based solutions for flood and drought management in Somalia: Final report. https://molfr.gov.so/wp-content/uploads/2024/07/FINAL-DRAFT-NATIONAL-FOOD-SAFETY-POLICY-Federal-Republic-of-Somalia-22-July-2024.pdf
[140] Ibid
[141] Climate Resilient Agriculture in Somalia (Ugbaad), Green Climate Fund, 2024
[142] U.S. Environmental Protection Agency. (2025, February 14). Mitigate flooding: Using green infrastructure for flood mitigation. https://www.epa.gov/green-infrastructure/mitigate-flooding
[143] World Bank. 2016. Nature-based solutions for resilient cities: The case of Singapore's ABC Waters program. In Green infrastructure in urban flood management: Lessons from the world (pp. 45–49). Washington, DC: World Bank Group.
[144] Liniger HP and Mekdaschi Studer R. 2019. Sustainable rangeland management in Sub-Saharan Africa – Guidelines to good practice. TerrAfrica; World Bank, Washington D.C.; World Overview of Conservation Approaches and Technologies (WOCAT); World Bank Group (WBG), Washington DC, USA and Centre for Development and Environment (CDE), University of Bern, Switzerland.
[145] Refer to Part II, Section D: Economic, social and environmental benefits
[146] Ministry of Environment & Climate Change. 2023. About us. https://moecc.gov.so/about-us/. Accessed on 24 April 2025.
[147] Federal Government of Somalia. 2022. Somalia's National Adaptation Plan (NAP) Framework. https://napglobalnetwork.org/wp-content/uploads/2022/11/napgn-en-2022-somalia-nap-framework.pdf. Accessed on: 23 April 2025.

	United Nations Environment Programme-Danish Hydraulic Institute (UNEP-DHI)[148]. Additionally, the project responds to Principle 7 on Coordination and Avoiding Duplication, as site selection will consider complementarity and the avoidance of duplication as key criteria. Based on this alignment with the NAP framework, the proposed project will likely also align with several components of the finished NAP once it is developed.
National Climate Change Policy, 2023[149]	The proposed project will align with several policy statements outlined in the National Climate Change Policy, with Output 2.2 supporting policies to "provide capacity building for livestock keepers" and "enhance livestock management systems by implementing improved livestock grazing on rangelands", while Output 2.1 will support policies to "prioritise community level water infrastructure" and incorporate "climate change into water resources infrastructure design" through constructing V-shaped weirs and sand dams with solar-powered pumped reservoirs that provide water for local communities and promote water harvesting for multiple uses. Output 3.1 will support policy review requirements by making recommendations available at federal and local levels, while Outputs 1.1–1.4 align with policies for climate-proofed settlement designs, resilient urban planning, adaptation integration into human development programmes, and spatial Land Use Planning that considers climate change predictions. Additionally, urban waste management plans under Output 2.6 will support improved water supply and waste management systems for cities, Outputs 2.1, 2.4 and 2.5 will support construction of flood reduction infrastructure and water storage systems, and the carbon crediting mechanism under Output 3.3 will promote rangeland establishment and carbon-enhancing activities including reforestation and agroforestry initiatives.
National Environment Policy (NEP), 2019[150]	The proposed project is aligned with several policy statements outlined in the NEP. Output 2.2 supports rangeland and livestock sector goals by improving grazing management and contributing to efficient feed supply chains through strengthened rangeland policies and community participation. Outputs 2.2 and 3.1 will also build institutional capacity and infrastructure in the livestock sector, while supporting range management, grazing and drought reserves and pastoralist engagement through non-formal training. Water availability and conservation policies will be advanced through the construction of V-shaped weirs and sand dams, consistent with objectives to expand rural water infrastructure and slow water flow using barriers. Output 2.6 will contribute to addressing urban waste challenges through improved waste management, while public awareness activities under Output 3.2 will promote responsible disposal practices. Climate-smart rangeland practices under Outputs 2.2 and 2.3 will help reduce soil erosion and support land recovery. Finally, Outputs 3.2 and 4.1, alongside gender mainstreaming across all activities, will contribute to NEP goals on integrating environmental issues into policies for vulnerable groups, promoting women's participation in awareness, education, and decision-making, and ensuring inclusive environmental outreach.
Somalia's Nationally Determined Contribution (NDC), 2021[151]	The project aligns closely with Somalia's NDC by supporting several climate adaptation interventions. Output 2.2 will promote sustainable rangeland management and improved livestock infrastructure, while drainage infrastructure under Output 2.5, complemented by urban Adaptation Management Plans from Output 1.3, will contribute to improved stormwater systems in urban centres such as Mogadishu, Beledweyne, Jowhar and Kismayu. Output 3.1 will deliver public health awareness campaigns in rural areas on climate-related health risks, and Outputs 1.2, 1.3 and 3.1 will further raise awareness of climate change impacts on human settlements, promoting sustainable land use and climate-sensitive development. Output 3.2 will empower women and youth by strengthening their participation in adaptation and environmental conservation activities and supporting climate change communication and education, while Outputs 4.1 and 4.2 will promote climate-resilient traditional and modern knowledge of sustainable pasture and rangeland systems. 4.1 and 4.2 will promote climate-resilient traditional and modern knowledge of sustainable pasture and rangeland systems.
Somalia's Ninth National Development Plan (NDP-9), 2020-2024[152]	Proposed project interventions align with several pillars of the most recent iteration of the National Development Plan. For example, flood control, rangeland management and water provision interventions all support the objective to "improve resilience of food production systems" under Pillar 3: Economic Development. Similarly, these interventions also support "improved access to clean water and food security" under Pillar 4: Social Development. Recurrent drought, climate change, environmental degradation and poor institutional health are identified as causes of multi-dimensional poverty, all of which are mitigated partially by proposed project interventions.
National Biodiversity Strategy and Action Plan	Rangeland restoration using improved grazing management developed under Output 2.2 will broadly align with Strategic Target 3 — elimination of negative incentives and provision of positive incentives for biodiversity conservation — of the NBSAP, as rangelands under improved management typically have greater biodiversity of native plants. Strategic Target 4 — the implementation of plans for sustainable production and consumption

[148] UNEP-DHI. 2022.Sustainable Flood Management and Risk Reduction Action. Applicability of Nature-based Solutions for Flood and Drought Management in Somalia: Final Report. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf. Accessed on 24 April 2025.
[149] The Federal Republic of Somalia Ministry of Environment and Climate Change. 2023. Somalia National Climate Change Policy. https://moecc.gov.so/wp-content/uploads/2024/10/Somalia-National-Climate-Change-Policy-EN.pdf. Accessed on 23 April 2025.
[150] Federal Republic of Somalia. 2019. National Environmental Policy. https://faolex.fao.org/docs/pdf/som207696.pdf. Accessed on: 23 April 2025.
[151] The Federal Republic of Somalia. 2021. Updated Nationally Determined Contribution (NDC). https://unfccc.int/sites/default/files/NDC/2022-06/Final%20Updated%20NDC%20for%20Somalia%202021.pdf. Accessed on: 23 April 2025.
[152] The Ministry of Planning, Investment and Economic Development. 2020.Somalia's National Development Plan 2020 to 2024 (NDP-9). https://nwm.unescwa.org/sites/default/files/2023-06/Somali-National-Development-Plan-2020-2024.pdf. Accessed on 23 April 2025.

(NBSAP), 2015-2020[153]	of natural resources — will also be supported, as improved grazing management will reduce overgrazing. Development of a carbon crediting mechanism on climate-smart rangelands under Output 3.3 will support Strategic Target 15 — ecosystem restoration in support of increased soil carbon stocks for climate change adaptation and mitigation — by incentivising carbon sequestration projects.
National Disaster Risk Management Policy (NDRMP), 2020[154]	Output 1.1 of the proposed project will align with NDRMP Outcome 1.3: Increased capacity to undertake risk assessments and analysis of the National Disaster Risk Management policy by increasing the capacity of government stakeholders for drought and flood prevention. Similarly, Output 1.4 will align with NDRMP Outcome 2.2: Increased capacity for risk assessment, analysis and application at local level by providing capacity training to local communities. The drought- and flood-related policy recommendations made available under Output 3.1 will align with NDRMP Outcome 3.1: Policies, strategies, plans and legal frameworks are adopted and implemented to reduce risk and strengthen resilience, whilst Output 3.2 will support NDRMP Outcome 3.2: Strengthened coherence between climate change adaptation and resilience strategies and disaster risk reduction mechanisms.
Somalia National Water Resource Strategy (NWRS), 2020-2025[155]	The construction of V-shaped weirs and sand dams under Output 2.1 of the proposed project will align with several components of the NWRS, particularly Sub-strategy 17: Improve water security for irrigation and agriculture, Sub-strategy 18: Improve water security for livestock, Sub-strategy 19: Improve provision of Water & Sanitation services and Sub-strategy 20: Enhance provision of ecosystem goods and services.
Somalia National Drought Plan, 2020[156]	The proposed project aligns with several drought mitigation and preparedness measures outlined in Somalia's National Drought Plan. Output 3.1 will support legislative development on water resource management by providing recommendations and incentives to policy- and decision-makers, while Outputs 4.1 and 4.2 will contribute through the assessment and dissemination of best practices and adaptation strategies. Construction of reservoirs at V-shaped weirs and sand dams under Output 2.1 will augment water supply during dry seasons, supporting efforts to increase water storage. Output 3.3 will enable incentives for farm and business diversification through mechanisms such as carbon crediting linked to climate-smart rangeland management. In addition, Output 3.2 will deliver gender-responsive public awareness and advocacy programmes, and Output 1.4 will establish community committees — both reinforcing the drought plan's focus on public education and participation in preparedness efforts.
Sub-national	
Beledweyne Urban Resilience Plan, 2020[157]	The urban resilience plan for Beledweyne outlines several climate change adaptation measures that are well aligned with the proposed project's interventions. Output 2.1 will support the construction of solar-pumped water reservoirs alongside V-shaped weirs and sand dams, while drainage system improvements will be addressed through drainage channels under Output 2.5. Output 2.6 will enhance urban flood control through improved solid waste management and riparian planting and rehabilitation under Output 2.4 will contribute to the creation of a green river buffer zone. Outputs 1.2 and 1.3 will support the development of urban adaptation and greening plans through nature-based and green infrastructure-focused policies. In addition, capacity-building measures will be advanced through Outputs 1.1 and 1.4, and community awareness programmes will be delivered under Outputs 1.4 and 3.2.
Jowhar Resilience Plan, 2021[158]	This urban resilience plan for the city of Jowhar proposes several climate change adaptation interventions that will be supported by this project. The plan proposes the creation of riparian buffer zones and urban green area, as well as hedgerow networks, which will be supported by the creation of urban greening plans and riverine vegetation establishment and rehabilitation under Outputs 1.3 and 2.4, respectively. Similarly, the creation of a sustainable urban drainage network is consistent with the proposed intervention to create drainage channels under Output 2.5. The Jowhar Resilience Plan additionally suggests waste minimisation measures which will align with those proposed under Output 2.6.

G. Project alignment with technical standards

The proposed project complies with the March 2016 revision of the Environmental and Social Policy (ESP) of the Adaptation Fund (AF)[159,160]. The AF-accredited Implementing Entity, the United Nations Environmental Programme (UNEP), together with the executing entity, Sadar Development and Resilience Institute (SADAR), will ensure that the project adheres to the ESP requirements. Project activities have been screened for

[153] Federal Republic of Somalia. 2015. National Biodiversity Strategy and Action Plan (NBSAP). https://www.cbd.int/doc/world/so/so-nbsap-01-en.pdf. Accessed on 23 April 2025.
[154] Federal Republic of Somalia. 2020. Revised National Disaster Risk Management Policy. https://www.preventionweb.net/media/97400/download?startDownload=20250423. Accessed on: 23 April 2025.
[155] Federal Government of Somalia Ministry of Energy and Water Resources. 2021. National Water Resource Strategy 2021 – 2025. https://www.afdb.org/sites/default/files/final-draft-strategy-book.pdf. Accessed on: 23 April 2025.
[156] United Nations Convention to Combat Desertification. 2020. National Drought Plan for Somalia. https://www.preventionweb.net/media/93175/download?startDownload=20250424. Accessed on 24 April 2025.
[157] UN Habitat. 2020. Working paper on flood risk and urban resilience. https://unhabitat.org/sites/default/files/2020/09/beledweyne_resilience_final.pdf. Accessed on: 24 April 2025.
[158] UN Habitat. 2021. Jowhar Resilience Plan. https://unhabitat.org/sites/default/files/2021/08/jowhar_resilience_plan_.pdf. Accessed on: 24 April 2025.
[159] Adaptation Fund. 2016. Environmental and Social Policy. Amended March 2016. https://www.adaptation-fund.org/wp-content/uploads/2016/04/OPG-ANNEX-3-Environmental-social-policy-March-2016.pdf
[160] Refer to Part II, Section N: Environmental and social impacts and risks

environmental and social risks during the project development stage[161,162]. During implementation, UNEP and SADAR will be responsible for applying the Environmental and Social Management Framework (ESMF)[163] and the provisions in Part II, Section N: 'Environmental and social risks and impacts' to mitigate risks and ensure that interventions address local social and environmental challenges in an inclusive and gender-responsive manner. In accordance with AF requirements and UNEP procedures, stakeholder consultations[164] were planned, an ESMF[165] was created and a Safeguard Risk Identification Form (SRIF) was completed. If unforeseen risks arise, the project team will update the ESMF and integrate appropriate mitigation measures during implementation.

The project aligns with applicable national technical standards and regulatory frameworks, including the National Environmental Policy (2019), which outlines requirements for sustainable development, pollution control and natural resource management in Somalia[166]. All civil works, including sand dam and micro-irrigation system construction, will comply with Somalia's existing national and regional technical standards for water infrastructure. These include procedures established under national programmes such as Biyoole I and II[167]. Additionally, the proposed low-risk interventions align with the Somalia National Climate Change Policy[168], which prioritises climate-resilient agriculture, water security and ecosystem restoration. The project also meets requirements outlined in the Somali Environmental and Social Impact Assessment and Audit Regulations issued by the Ministry of Environment and Climate Change (MoECC)[169]. These regulations govern the screening, approval and monitoring of projects with potential environmental and social risks. Additionally, the project will adhere to applicable national labour laws, including occupational health and safety provisions.

Site selection and design will incorporate local zoning rules and agreements. Although Somalia does not currently have a formal national land tenure system[170], national planning frameworks — such as the National Development Plan[171] — prioritise efforts to strengthen land administration and clarify tenure arrangements. The destruction of land registries limited legal recognition of land ownership and unresolved land occupation by non-state armed actors further complicate land administration and infrastructure development. To manage these risks and ensure secure access for project activities, the project will obtain formal agreements or letters of from relevant authorities or traditional leadership structures when using state or community-held land.

Given the low environmental footprint, community-based nature and small-scale of the proposed interventions, most activities are not expected to reach thresholds that trigger EIAs. Under the Environmental and Social Impact Assessment and Audit Regulations, EIAs are typically triggered for large-scale infrastructure or activities carried out by commercial operators that pose significant environmental risks[172]. For project-related infrastructure construction or land use changes that trigger EIAs under federal or member state regulations, the project will follow required screening, scoping, reporting and public consultation processes in line with Somali EIA Guidelines and the ESMF. For activities not requiring full EIAs, the project will conduct preliminary environmental and social safeguards assessments using UNEP tools to identify and address potential risks during project development.

[161] Refer to Part II, Section N: Environmental and social impacts and risks
[162] Refer to Annex 4: Environmental and Social Management Framework
[163] Refer to Annex 4: Environmental and Social Management Framework
[164] Refer to Annex 3: Stakeholder Engagement Plan
[165] Refer to Annex 4: Environmental and Social Management Framework
[166] Federal Government of Somalia. 2019. National Environmental Policy (EN). Ministry of Environment and Climate Change. https://www.moecc.gov.so
[167] Ministry of Energy and Water Resources. 2021. National Water Resources Strategy 2021–2025: Roadmap to Implementation. Federal Government of Somalia. https://moewr.gov.so
[168] Federal Government of Somalia. 2020. Somalia National Climate Change Policy. Ministry of Environment and Climate Change. https://www.moecc.gov.so
[169] Federal Government of Somalia. 2024. Environmental and Social Impact Assessment and Audit Regulations. Ministry of Environment and Climate Change. https://www.moecc.gov.so
[170] Burman, J., Bowden, A., & Gole, A. 2014. Land Tenure in Somalia: A Potential Foundation for Security and Prosperity. Shuraako. https://shuraako.org
[171] Federal Government of Somalia. 2016. National Development Plan 2017–2019, Section 8.8.4.2. Ministry of Planning, Investment and Economic Development: Mogadishu, Somalia. 143.
[172] Federal Government of Somalia. 2024. Environmental and Social Impact Assessment and Audit Regulations. Ministry of Environment and Climate Change. https://www.moecc.gov.so

H. Project duplication

The proposed project is designed to complement — rather than duplicate — existing climate change adaptation, resilience and natural resource management initiatives in Somalia and the wider Horn of Africa region. It builds on the technical expertise, institutional frameworks and implementation experiences of both completed and ongoing programmes, using these as a foundation for promoting more integrated, climate-resilient approaches to water, land and ecosystem management. To facilitate coherence, foster synergies and avoid duplication, the proposed project team will actively engage with ongoing programmes and partners through collaborative planning, joint assessments and regular knowledge-sharing mechanisms at national, regional and local levels. In particular, the project is designed to align closely with and complement existing UN-led initiatives in climate- and conflict-affected areas such as Beledweyne, Jowhar and Afgooye, including:

- the Jowhar Off-Stream Storage Program (JOSP), which focuses on integrated water resource management, flood and drought risk reduction, and climate-resilient infrastructure development along the Shabelle River;
- ongoing UN resilience and early recovery programmes in Beledweyne, such as the FAO flood-breaking project to strengthen community-based disaster risk reduction, natural resource management and livelihood resilience in response to recurrent flooding and displacement; and
- the UN-supported area-based programming in Afgooye, such as the WFP programme on climate-smart agriculture, which links durable solutions for displacement with ecosystem restoration and locally-led adaptation measures.

By leveraging best practices and lessons learned from these initiatives and aligning with their geographical focus, governance structures and technical approaches, the proposed project will enable resource-efficient upscaling of adaptation interventions.

Lessons learned from completed projects

Table 12. Lessons learned from completed projects.

Project	Lessons Learned and complementarity	Integration of lessons learned into EARNSS project interventions
Somalia Water and Land Information Management Project (SWALIM), 2003–2022[173]. **Budget:** ~US$33 million. **Funding:** European Union (EU), UK Department for International Development (DFID), United States Agency for International Development Office of Foreign Disaster Assistance (USAID OFDA), World Bank (WB), Cooperazione Italiana and the UN Children's Fund (UNICEF). **Implementing Agency (IA):** FAO. • Designed to i) support livelihoods throughout Somalia by monitoring and preserving water and land resources; and ii) enable Somali institutions to generate and manage information on these natural resources, using monitoring systems for water, flood, drought, ecosystem degradation and erosion. • Developed the Flood Risk and Response Information Management System (FRRIMS)[174] — a platform with up-to-date data on weather and river bank breakages across the Shabelle and Jubba River basins.	• SWALIM strengthened the information sector and established monitoring systems, enabling sustainable extraction of water resources through initiatives such as groundwater monitoring • Developed training material including courses on Geographic Information Systems (GIS), data analysis and management, water resources management and degradation monitoring	• SWALIM monitoring systems informed the selection of sites and methodologies for enhancing resilience to droughts and floods (Outcome 2). Data from these systems will also inform the water catchment plan (Output 1.2) and green infrastructure plan (Output 1.3), by indicating flood-prone urban areas. • Climate-smart rangeland management practices and infrastructure developed in the proposed project will be optimised using SWALIM's environmental data platforms and monitoring systems. SWALIM's early warning systems (EWS) and tools will improve climate preparedness and decision-making in the proposed project. • Training material will support capacity development programmes for flood and drought management using nature-based solutions (NbS) and hybrid technologies (Output 1.1). Training material from SWALIM will be used to strengthen local committees' skills in participatory planning, implementation and monitoring of catchment and urban greening plans (Output 1.4) [175].
Aroori Livestock Holding Ground (LHG) Project: Enhancing Livestock Exporting Systems with Infrastructure and Support Services (Aroori LHG)[176], 2014–2018. **Budget:** ~US$4.5 million. **Funding:** Somaliland Development Fund (SDF). **IA:** SDF. • Development project with the purpose of increasing income for pastoralists and improving livestock-exporting system in Somalia by providing livestock holding infrastructure such as fencing, ramps, sheds, water troughs and water pumping systems. Provided fodder and water to alleviate starvation and mortality rates among livestock	• As a part of SDF2, the LHG is being converted into a Livestock Centre of Excellence (LCE) which will provide training and extension services for animal production, fodder production and animal health for Somaliland's livestock producers. • Although the Aroori LHG project ended in 2018, the LCE continues to engage in applied research, knowledge and information dissemination.	• Best practices and lessons learned on increasing water access for pastoralists in the LHG project will inform the design, size or placement of infrastructure such as reservoirs, solar water pumping systems, elevated storage tanks and gravity distribution systems (Output 2.2). • EARNSS will leverage the operational experience of agropastoralists involved in the LHG — including infrastructure maintenance — and incorporate relevant agropastoral practices into its water and rangeland activities. Knowledge will be exchanged between EARNSS and the LCE in collaborative forums and working groups. Forums are expected to support the adoption of NbS and hybrid technologies by disseminating lessons learned and best practices from the systems of both projects (Output 3.1).
Enhancing Climate Resilience of the Vulnerable Communities and Ecosystems in Somalia[177], 2015–2022. **Budget:** ~US$18.2 million. **Funding:** Global Environment Facility (GEF) **IA:** United Nations Development Programme (UNDP). • Designed to increase adaptive capacity and resilience to climate change in vulnerable communities in Somalia. by establishing climate monitoring infrastructure, developing EWS, supporting community-based watershed	• Ecosystem restoration activities — such as reforestation and distribution of solar-powered pumps to women — complement the proposed project's work on flood buffering vegetation and energy-efficient water access (Outputs 2.1–2.4) • The project's support for community-based disaster risk structures, such as District Disaster Management Committees, aligns with participatory planning and support for local governance in EARNSS (Output 1.4).	• The project's work on climate-sensitive planning at multiple governance levels informed the proposed project's technical assessment of gaps in existing water catchment and urban area plans and policies (Activities 1.2.1 and 1.3.1). • The project's vulnerability assessments for water and agriculture sectors and its integration of climate risks into sectoral frameworks will inform gender-responsive public awareness and policy advocacy in the proposed project (Output 3.2).

[173] FAO-SWALIM. 2023. SWALIM Homepage. http://www.faoswalim.org/ . Accessed 2 May 2025.
[174] FAO. 2025. Flood Risk and Response Information Management System (FRRIMS). https://frrims.faoswalim.org/rivers/breakages. Accessed 17 April 2025.
[175] FAO-SWALIM. 2024. Training Activities. https://www.faoswalim.org/capacity-development/training-programme/training-activities
[176] Ministry of Planning and National Development. 2025. SDF1 Projects; https://somalilanddevelopmentfund.org/projects/sdf1 . Accessed 2 May 2025
[177] UNDP. 2025. Enhancing Climate Resilience of the Vulnerable Communities. https://open.undp.org/projects/00084974 . Accessed 2 May 2025

management and promoting climate-resilient agricultural practices. • Built institutional capacity for adaptation and integrated climate risks into national and sub-national planning processes. However, the project did not include the hybrid grey-green infrastructure proposed in EARNSS or a dedicated replication and scale-up strategy (Outcome 3) for NbS.	• Infrastructure, including flood routing systems, will provide technical references for sand dams, weirs (Output 2.1) and urban drainage systems (Output 2.5). • Funds for establishing tree nurseries were diverted to drought relief mid-way through the project's timeline, thereby limiting potential for the proposed project to synergise its nursery construction (Activity 2.2.1) with the GEF project.	• EARNSS will use training materials and technical guidelines developed by the project, Resources such as the Shabelle Basin Adaptation Plan will inform the design of capacity development programmes (Output 1.1), the preparation of watershed planning frameworks (Output 1.2) and efforts to support policy integration and reform (Output 3.1). In addition, these existing knowledge products will support documentation, learning and dissemination activities in the proposed project (Output 3.1).
Strengthening National Capacities for Improved Decision-making and Mainstreaming of Global Environmental Obligations — Cross-cutting Capacity Development Project (CCCD) [178]**, 2018–2022.** **Budget: ~US$1 million.** **Funding: GEF** **IA: UNDP.** • Focused on enhancing Somalia's institutional capacity to meet and sustain obligations under the Rio Conventions. • Contributed to environmental governance through improved policy coordination, decentralisation and awareness-raising activities that promoted environmentally responsible attitudes and practices at national and local levels.	• Institutional analyses, governance frameworks and outreach materials developed by CCCD will inform policy reform activities and the public engagement strategy used in EARNSS (Outputs 3.1 and 3.2). Building on existing communications content will reduce duplication. • Synergy will be ensured through alignment with national policy frameworks supported by CCCD, including those related to Somalia's Rio Convention obligations, National Adaptation Plan (NAP) and Nationally Determined Contribution (NDC processes).	• CCCD public service announcements, youth engagement tools and educational curricula will be adapted to reinforce the proposed project's awareness campaigns and advocacy work for NbS. • CCCD's efforts to update and streamline institutional mandates provide a basis for the proposed project's policy reforms and institutional arrangements that implement NbS (Output 3.1). • Governance models developed by CCCD will support the integration of NbS into multi-level planning and regulatory frameworks. • To maintain continuity in climate governance, the proposed project will engage with government actors involved in CCCD implementation through existing environmental coordination platforms or national level working groups.
Water for Agropastoral Productivity and Resilience I Project (Biyoole I), 2019–2023. **Budget:** ~US$29.4 million. **Funding:** WB **IA:** Ministry of Planning, Investment and Economic Development (MoPIED) • Supported livelihood improvement and climate resilience for agropastoral communities in arid areas of Somalia. • Focused on increasing access to and community-level management of water resources, alongside building the capacity of government institutions to plan and implement water-related interventions. • Followed the 'Water for Agropastoralists Livelihoods Pilot' (WALP) and preceded the ongoing 'Somalia Water for Rural Resilience' project (Biyoole II), which expands the geographic scope further south in Somalia.	• Lessons learned on small-scale water infrastructure deployment in pastoral settings will support technical decisions on infrastructure placement, water user management models and climate resilience features. • Biyoole I supported rangeland restoration and soil erosion mitigation, providing relevant practices for the proposed project's work on climate-smart rangeland management (Output 2.2).	• Insights into farmer and pastoralist engagement and uptake of sustainable land management technologies will inform community mobilisation and training strategies (Outputs 2.2 and 1.4). • EARNSS will use best practices, technical designs and operational models developed by Biyoole I to inform the implementation of water infrastructure and rangeland activities (Outputs 2.1 and 2.2). This includes reviewing infrastructure performance data and community management structures established by the project. • Coordination will be through capacity-sharing with institutions and stakeholders engaged in Biyoole I, including technical staff from MoPIED and community-level actors involved in planning and managing small-scale water infrastructure. • Proposed project will participate in inter-agency forums or technical working groups linked to the WB's broader rural resilience portfolio (Output 3.1).
Somalia Water for Rural Resilience Project (Biyoole II/Barwaaqo, 2023–2028. **Funding:** WB. **IA:** Somalia's Ministry of Planning, Investment and Economic Development (MoPIED) a • Biyoole II builds on Biyoole I, improving water access and climate resilience in dryland communities by delivering low-cost, conflict-sensitive water infrastructure, including sand dams. • Promotes sustainable land and water management using an environmental catchment approach and strengthens	• Biyoole II's construction and rehabilitation of sand dams aligns with the proposed project's drought resilience infrastructure (Output 2.1), offering context-specific experience in design, siting and implementation in Somalia. Biyoole II's climate-smart agriculture complements watershed restoration and erosion interventions in Output 2.3. • Both projects promote sustainable land management and NbS. EARNSS offers a complementary model for scaling NbS across Somalia using hybrid infrastructure, urban-	• The proposed project will coordinate with Biyoole II through joint participation in technical working groups, planning meetings and national-level dialogues on NbS, land management and dryland water infrastructure. Capacity-building activities conducted under Biyoole II —particularly on the Wadi Evaluation Tool (WET) and the World Bank's Water Harvester Explorer — will inform the proposed project's training programmes for government and community institutions (Outputs 1.1 and 1.4). • Operations and maintenance guidelines for water infrastructure being standardised under Biyoole II will be adapted to guide the proposed project's sand dam and solar pumping interventions

[178] UNDP. 2018. Strengthening National Capacities for improved Decision-making and Mainstreaming of Global Environmental Obligations, GEF, Washington DC, USA. https://www.thegef.org/projects-operations/projects/9651. Accessed on: 2 May 2025.

agricultural and livestock production via customised extension services. Project activities are expanding in South-West State and extending to Jubaland and Hirshabelle.	rural integration and a replication and investment promotion strategy (Outcome 3). • Biyoole II's support to national and Federal Member State agencies includes provision of equipment, procurement design frameworks and culturally embedded implementation models. These resources will contribute to NbS implementation (Outcome 2).	(Output 2.1). Best practices from solar-powered irrigation systems will also inform the deployment of the proposed project's solar-powered water supply infrastructure.
Support for Integrated Water Resources Management (IWRM) to Ensure Water Access and Disaster Reduction for Somalia's Pastoralists (LCDFII), 2019–2024[179,180]. **Budget:** ~US$78.6 million. **Funding:** GEF Least Developed Countries Fund (LDCF) **IA:** UNDP. • Supported integrated water resources development and management across Somalia, with a focus on improving water access and reducing disaster risk in drought-prone areas for agropastoralist communities.	• LDCFII established partnerships with the River Basin Management Authorities (RBMAs) for the Juba and Shabelle rivers, which supports the proposed project's implementation of catchment-scale flood management infrastructure. • LDCFII project's investment in groundwater extraction technologies complements multi-functional water infrastructure for drought resilience (Output 2.1). • Village-level training programmes on IWRM built capacity in watershed management.	• Best practices and lessons learned from village-level training programmes will support the formation of community watershed and urban greening committees in the proposed project (Output 1.4).
Promoting Resilience Through Integrated Approach to Water, Environment and Disaster Risk Management in Somalia, 2020–2024[181,182] **Budget:** ~US$17 million. **Funding:** Swedish International Development Cooperation Agency (SIDA), UNDP, the World Meteorological Organisation (WMO) and the Government of Germany **IA:** UNDP • Supported Somali authorities and communities in advancing sustainable and resilient development through targeted interventions in IWRM, environmental governance and disaster risk reduction (DRR).	• The project's capacity-building and training programmes on IWRM and environmental strategy complement the proposed project's focus on strengthening institutional and technical capacities for NbS and hybrid infrastructure for flood and drought management (Outputs 1.1–1.3). • A skill improvement programme for DRR in this project may have introduced elements of NbS for managing flood and drought risks, supporting the development of integrated, climate-resilient planning across outputs related to training and policy (Outputs 1.1–1.3).	• GIS unit established by the project will provide information for preparation of urban catchment plans and green infrastructure protocols (Outputs 1.2 and 1.3). Spatial data and training content from the project will be reviewed when designing institutional capacity programmes (Output 1.1), urban planning outputs (Outputs 1.2 and 1.3) and monitoring of restoration sites (Outputs 2.2–2.6). • Information from the GIS unit will assist with long-term monitoring of land use and restoration within landscape-focused outputs (Outputs 2.2–2.6) • EARNSS implementation will align with broader urban resilience and DRR interventions initiated by this project and maintain institutional consistency through national and local working groups.
Support for Strengthening Climate Change Adaptation Planning for the Federal Republic of Somalia, 2020–2025[183,184]. **Budget:** ~US$2.3 million. **Funding:** Green Climate Fund (GCF) **IA:** UNDP. • Developed national and state-level capacity and coordination mechanisms for climate change adaptation planning and implementation in Somalia, as part of the broader National Adaptation Plan Support Programme (NAP-SP)	• The national adaptation framework, developed under this project, provides a foundation for the proposed project to build upon, especially in implementing policy-related components under Outcome 3.	The proposed project will use several resources developed in the NAP-SP including: • capacity-building materials such as training manuals, institutional gap assessments and inter-agency collaboration models to inform stakeholder training and institutional development (Output 1.1); • standardised methodologies and adaptation plans, to support the preparation of urban catchments and greening strategies (Outputs 1.2 and 1.3); and • the gender toolkit, which will guide community engagement strategies and gender-responsive advocacy in the EARNSS (Outputs 1.4 and 3.2).

[179] UNDP. 2024. Support for IWRM to ensure water access and disaster reduction for Somalia's pastoralists. https://www.undp.org/somalia/projects/support-integrated-water-resources-management-ensure-water-access-and-disaster-reduction-somalias-agro-pastoralists. Accessed on: 2 May 2025

[180] UNDP. 2023. Mid-term evaluation of the Integrated Water Resource Management project. https://erc.undp.org/evaluation/documents/detail/22154. Accessed on:2 May 2025.

[181] UNDP. 2020. Project proposal: Promoting Resilience Through Integrated Approach to Water, Environment and Disaster Risk Management in Somalia. https://info.undp.org/docs/pdc/Documents/SOM/20200930_UNDP_proposal_for_Sida_Final_Draft.pdf. Accessed on: 2 May 2025.

[182] UNDP. 2025. Resilience through WaterEnvDRM. https://open.undp.org/projects/00128746. Accessed on: 2 May 2025.

[183] UNDP. 2019. Support for strengthening climate change adaptation planning for the Federal Republic of Somalia. GCF, Incheon, Republic of Korea. https://www.greenclimate.fund/sites/default/files/document/readiness-proposals-somalia-undp-adaptation-planning_0.pdf. Accessed on: 2 May 2025.

[184] UNDP. 2025. Support for Strengthening Climate Change. https://open.undp.org/projects/00126073. Accessed on: 2 May 2025.

Providing long-term durable solutions to displacement affected communities in a participatory and inclusive, people-centred, government-led, context-specific, gender and resilience-oriented process in Hirshabelle Region, 2018–2021[185] **Funding:** UN Peacebuilding Fund. **IA:** UNDP, International Organisation for Migration (IOM) and UN-Habitat. • Developed to provide sustainable solutions to displacement in Hirshabelle and Galmudug — particularly the urban centres of Jowhar, Balcad and Beledweyne. Activities were structured across four components: i) community empowerment; ii) urban resilience; iii) livelihoods and employment; and iv) gender and women's empowerment.	• Under the Urban Resilience component, the project developed tools, urban profiles, base maps and city resilience plans for Jowhar[186] — with a similar process planned for Afgooye[187]. • The Somalia Disaster Management Agency — with technical support from Sadar — subsequently produced a district-level resilience plan for Jowhar, identifying several NbS measures for flood and drought mitigation. • Proposed project expands on earlier work by targeting additional geographies — including Afgooye and rural catchments — and embedding mechanisms for national policy alignment and replication (Output 3.2).	• Knowledge products, resilience plans and technical assessments will inform the plans for sub-catchment management (Output 1.2) and urban greening (Output 1.3),both of which require spatial data and participatory diagnostics. • Community planning mechanisms and governance structures established by the UNDP project will be leveraged to support the training of local committees for NbS maintenance (Output 1.4). • In collaborative platforms the proposed project's planning protocols and institutional capacity-building measures (Output 1.1) will be aligned with guidelines developed under the urban resilience component. Gender-responsive approaches from the earlier project will be reviewed and adapted to enhance the proposed project's public awareness and advocacy efforts (Output 3.2).
The Joint Programme on Local Governance and Decentralised Service Delivery in Somalia (JPLG) 2018–2024[188] **Budget: US$150 million**. **Funding:** Denmark, the EU, Norway, Sweden Switzerland, USAID, the UK and the UN Peacebuilding Fund. **IA:** UN Capital Development Fund (UNCDF), the International Labour Organisation (ILO), UNDP, UN-Habitat and UNICEF. • Supports local governance across Somalia, focusing on policy reform, institutional capacity development and citizen inclusion. • Formed District Councils, establishing local governance structures for democratic and accountable governance.	• Developed an adaptation plan for local governments that identified NbS as a suitable measure for reducing flood and drought risks in target areas[189], contributing to an enabling environment for local adaptation action. • District-level planning in the JPLG provides a foundation for integrating the proposed project's Sub-catchment Management (Output 1.2) and Urban Greening Plans (Output 1.3), ensuring alignment with broader local development objectives. • Focused on improving institutional governance capacity — rather than technical design or infrastructure delivery.	• District Councils and participatory planning mechanisms directly support institutional coordination (Output 1.1) and local committee formation (Output 1.4) within the proposed project. These mechanisms enable efficient community-led implementation and long-term management of NbS interventions within proposed project sites
Programme for Sustainable Charcoal Reduction and Alternative Livelihoods (PROSCAL), 2016–2023[190] **Budget:** US$8.9 million. **Funding:** EU, Swedish and Italian cooperation. **IA:** UNEP, UNDP and FAO • Designed to i) reduce unsustainable charcoal production, trade and use; and ii) promote energy security and sustainable livelihoods. • Built government capacity, developed alternative energy sources, established nurseries and reforestation schemes and formed Regional Economic Partnerships to support the enforcement of Somalia's charcoal export bans.	• Although the project did not explicitly focus on climate adaptation or the use of NbS for flood and drought risk reduction, it used afforestation and rehabilitation of degraded land to improve energy access and support livelihoods.	• Nurseries established under PROSCAL and its experience with vegetation restoration provide useful reference points for the proposed project's activities focused on revegetating *desheks* and topographic depressions to increase infiltration and reduce flooding (Output 2.4).

[185] UNDP. 2019. Factsheet Midnimo-II (Unity): Support for the Attainment of Durable Solutions in Areas Impacted by Displacement and Returns, in Galmuduug and Hirshabelle. https://www.undp.org/sites/g/files/zskgke326/files/migration/so/db1d5ab8d8c6485325f23fabda74854179a7d1c189091ef33fe3a47d8a1c6991.pdf
[186] UN-Habitat. 2021. Jowhar: resilience plan. https://reliefweb.int/attachments/f871b0ca-5aa5-34d0-b5cd-95a96566629b/JOWHAR_resilience_plan_.pdf
[187] Maestre PF & UN HABITAT. 2020. Beledweyne Urban Profile Working Paper and Spatial Analyses for Urban Planning Consultations and Durable Solutions for Displacement Crises.
[188] UN Somalia Joint Fund. 2024. JPLG III integrated Final Report. https://mptf.undp.org/sites/default/files/documents/2024-07/jplg_iii_integrated_final_report_02.2024.pdf
[189] 16 districts in Somaliland, 11 districts in Puntland, 5 districts in Galmudug, 3 districts in Hirshabelle, 2 districts in Jubaland, 6 districts in South West and 16 districts in Mogadishu.
[190] UNEP. n.d. Programme for Sustainable Charcoal Reduction and Alternative Livelihoods (PROSCAL). https://wedocs.unep.org/bitstream/handle/20.500.11822/27700/ProscalFactSheet.pdf

Coordination with ongoing projects

Table 13. Coordination with ongoing projects.

Project	Complementarity	Coordination with other projects
Programme to Build Resilience for Food and Nutrition Security[191] (BREFONS), 2022–2029. **Budget:** ~US$18.9 million. **Funding:** African Development Bank (AfDB). **Implementing Agency (IA):** Intergovernmental Authority on Development (IGAD) • Focuses on improving living conditions of rural communities and their livestock by increasing access to water, pasture, animal health services and markets. • Part of a broader regional resilience strategy, targeting food and nutrition security across the Horn of Africa.	• Both projects support climate-resilient water access and rangeland management. BREFONS's work on constructing and rehabilitating water mobilisation infrastructure aligns with the proposed project's use of multi-functional NbS infrastructure for drought resilience (Output 2.1). BREFONS implemented rangeland rehabilitation and management activities, which provide practical insights for the proposed project's planned interventions under Output 2.2, including community-based land stewardship and restoration of degraded areas. • The proposed project has an expanded focus on urban–rural catchment planning, hybrid grey–green infrastructure and a dedicated framework for national scaling of NbS practices (Outcome 3), distinguishing it from BREFONS's primarily rural and livestock-focused interventions.	• Coordination through technical exchanges and regional platforms hosted by IGAD, particularly those focused on gender-responsive planning, institutional capacity-building and regional knowledge sharing. • Proposed project's focus on capacity development, gender-responsive public awareness and gender-inclusive implementation will engage with capacity training materials developed by BREFONS for government and institutional staff. These materials include modules on policy integration, analysis, EWS and the Gender Action Learning System (GALS). • Proposed project will engage with BREFONS's regional coordination teams on gender and social equity to align community engagement strategies and ensure policy consistency in addressing socio-cultural barriers in agropastoral systems (Outputs 3.2). • Collaboration through shared research outputs, gender assessments and advocacy materials will strengthen the proposed project's policy and communications strategy (Output 3.2). Joint participation in IGAD-led resilience forums will facilitate cross-project learning in Output 3.1.
Promoting Inclusive Water Management in Somalia's River Basins, 2023–2026 **Budget:** ~US$9.7 million. **Funding:** Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) and the EU. **IA:** Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). • Supports climate-resilient water management in the Juba and Shabelle River basins through institutional capacity-building, coordination strengthening and implementation of water strategies. • Interventions include flood protection using NbS, piloting water storage and distribution innovations and promoting gender-transformative practices in water governance, agriculture and enterprise development.	• Geographic overlap provides opportunities for synergy and scaling up of efforts towards flood resilience and sustainable water access • Earlier project's NbS-based flood mitigation infrastructure complements the proposed project's design and deployment of V-shaped weirs, sand dams and solar-powered water systems for reducing climate-related water risks (Output 2.1). • Development and expansion of water strategies in the earlier project aligns with the proposed project's support for policy reforms and institutional frameworks promoting NbS at national and sub-national levels (Output 3.1). • Both projects promote gender-responsive planning. Proposed project introduces a broader focus on participatory greening committees and advocacy platforms that extend beyond the water sector (Outputs 1.4 and 3.2) as well as a replication and investment mobilisation component (Outcome 3), This complements Water Innovation Centre and policy pilots in the GIZ project.	• Coordination through inter-agency platforms and technical working groups focused on river basin planning, flood resilience and institutional water governance will provide opportunities for joint planning, data exchange and alignment of infrastructure design and community engagement models (Outputs 2.1 and 1.4). • Proposed project will engage with the Water Innovation Centre, which serves as a shared space for piloting, testing and disseminating water management innovations. Engagement will support the integration of the proposed project's hybrid NbS technologies and promote their uptake through Outcome 3. • Baseline survey and gender-transformative approaches being implemented under the ongoing project will directly inform the proposed project's development of a gender-responsive public awareness and policy advocacy strategy (Output 3.2). • Collaborative forums will contribute to the proposed project's documentation, knowledge-sharing and scale-up processes under Outputs 3.1–3.2.
Building Resilient Communities in Somalia (BRCiS III), 2024–2028 **IA:** Consortium of NGOs and national partners. • Continuation of a long-term project to strengthen community resilience in Somalia,	• Both focus on reducing community vulnerability, with different approaches to resilience. BRCiS III supports broad-based resilience and social cohesion, while the proposed project focuses on climate risk reduction through NbS and hybrid infrastructure. Both projects	• Using lessons from BRCiS III's participatory structures and facilitation models, the proposed project will build on BRCiS III's existing efforts in community mobilisation. • Knowledge exchange through existing platforms, including the IGAD Support Platform on Durable Solutions, the Somalia NGO

[191] IGAD. 2021. Programme to Build Resilience for Food and Nutrition Security in the Horn of Africa. AfDB, Abidjan, Côte d'Ivoir. https://projectsportal.afdb.org/dataportal/VProject/show/P-Z1-C00-073. Accessed on: 2 May 2025.

• Supports locally led approaches to reducing vulnerability, with an emphasis on inclusive natural resource management, community regeneration and conflict-sensitive development.	promote community-led natural resource management and regeneration, offering conceptual alignment despite minimal expected geographic overlap. • Proposed project introduces a more specialised emphasis on ecosystem restoration with hybrid infrastructure and urban-rural catchment planning that complements the broader, multi-sectoral scope of BRCiS III.	Consortium and peer learning forums linked to national adaptation planning. To share experiences, tools and evidence from NbS interventions, EARNSS will participate in innovation-sharing mechanisms such as the Somali Resilience Innovation Hub (RIHUB), Somali Response Innovation Lab (SomRIL) and PANORAMA. • EARNSS will leverage and adapt training tools developed by BRCiS and build on existing community committees and engagement processes to avoid duplication and reduce transaction costs (Outputs 1.4 and 4.2).
Adaptive Agriculture and Rangeland Rehabilitation Project[192] (A2R2), 2023–2028 **Budget:** ~US$40 million **Funding:** GEF **IA:** International Fund for Agricultural Development (IFAD), the GEF7–LDCF and the Global Agriculture and Food Security Program (GAFSP). Project in Southern Somalia structured around four components, namely: • adaptive climate-resilient hydraulic infrastructure and productive livelihoods; • landscape approach to integrated management of rangeland and forest ecosystems for land degradation neutrality and biodiversity conservation; • institutional strengthening for sustainable land management and biodiversity protection; and • knowledge sharing for systematisation and scaling up of effective approaches.	• Both projects focus on landscape-scale restoration, drought resilience and climate-smart land management. While A2R2 did not include V-shaped weirs or sand dams, its hydraulic infrastructure and technical assessments will inform the proposed project's water system design and drought-resilience interventions (Output 2.1). • Both projects support rangeland rehabilitation using climate-smart and community-led methods. A2R2's work on restoration planning, native species inventories, sustainable pasture management and incorporation of indigenous knowledge offers valuable reference points for interventions proposed in Outputs 2.2 and 2.3. • While A2R2 places greater emphasis on agricultural production systems and biodiversity conservation, EARNSS introduces novel hybrid infrastructure solutions and a structured plan for scaling NbS (Outcome 3), which complements A2R2's knowledge sharing component.	• The proposed project will coordinate with A2R2 through technical exchanges on rangeland planning, where outputs such as the georeferenced land use tracking system, nursery infrastructure and pasture management plans may be applied or adapted to the proposed project's landscape activities (Outputs 2.2–2.5). Agroecological field schools established by A2R2 will be engaged to support training on climate-smart land management practices and to inform the proposed project's approaches to farmer engagement and institutional learning (Outputs 2.2 and 1.4). • Lessons learned from A2R2's monitoring and evaluation plan, grievance redress mechanisms and communication strategy will be reviewed and selectively adapted to the proposed project's own operational structures (Outputs 4.1 and 4.2). • Coordination will be pursued through joint knowledge platforms, forums hosted by IFAD or GEF implementing partners and other multi-project learning initiatives related to land degradation neutrality and adaptation planning.
Building Urban Resilience and Transitioning to Green Economy in Somalia, 2024–2026. **Budget: ~**US$50.3 million **Funding:** GEF **IA:** UNDP • Supports the implementation of NbS in climate-vulnerable urban areas through integrated spatial planning that engages urban institutions, communities and IDPs. • Promotes the incorporation of NbS into national and local urban planning processes and introduces the sponge city concept, which combines engineered systems with NbS to manage stormwater, reduce flood risks, create green corridors and improve heat resilience and urban well-being.	• Thematic overlap in the projects' support for urban resilience, NbS and climate-informed spatial planning. Both projects promote the use of green infrastructure and nature-based interventions to reduce urban flooding and heat stress, and both address the integration of NbS into planning and policy frameworks. • The adaptation of the sponge city concept in the UNDP project aligns with the proposed project's implementation of green corridors, drainage systems and multifunctional green infrastructure in urban areas (Outputs 1.2 and 1.3). The proposed project, however, introduces additional innovations by embedding hybrid infrastructure models that combine NbS with solar-powered pumping and water distribution systems for both urban and rural resilience (Output 2.1). EARNSS also includes a targeted strategy for upscaling, replication and investment promotion (Outcome 3), which complements but goes beyond the scope of this urban-focused GEF initiative.	• Coordination with ongoing project through engagement in the multi-sectoral coordination body being established to support cross-sectoral decision-making with gender parity. This platform will be used to align institutional strengthening efforts and enable joint planning across initiatives (Outputs 1.1 and 4.2). Technical exchange between implementing agencies will ensure synergy between NbS training programmes implemented in the GEF urban resilience project — particularly those focused on women's leadership — and training content and gender-responsive engagement activities in the proposed project (Outputs 1.1, 3.2 and 4.1). • Proposed project will collaborate on the national communications strategy and knowledge-sharing platform being developed to promote NbS. These platforms will enhance the dissemination of project results, methodologies and policy lessons from both projects, feeding into awareness, advocacy and replication efforts (Outputs 3.2 and 4.1). Ongoing coordination will ensure project interventions are consistent with national urban resilience priorities while applying NbS in rural and urban areas in the Shabelle River basin.
The Jowhar Offstream Storage Programme (JOSP, 2024–2029) **Funding:** the UK, USAID, the UN Peacebuilding Fund and the	• The proposed project and JOSP both focus on enhancing resilience in flood- and drought-prone areas of the Shabelle River Basin, particularly through nature-	• Coordination will be pursued through joint planning with JOSP's governance bodies and thematic working groups — including those on water governance, NbS and gender inclusion.

[192] IFAD. 2023. Adaptive Agriculture and Rangeland Rehabilitation Project (A2R2) — Somalia. GEF, Washington DC, USA. https://www.thegef.org/projects-operations/projects/10792

Somalia Joint Fund (SJF). **IA:** FAO, UNEP, UN-Habitat, IOM and UNIDO • Multi-partner initiative led by the Government of Somalia, particularly the Ministry of Agriculture and Irrigation (MoAI) and the Ministry of Energy and Water Resources (MoEWR). • Aims to mitigate drought and flood impacts and enhance food security and climate resilience along the Shabelle River through infrastructure rehabilitation, improved water governance and NbS. JOSP comprises four interlinked projects — RESTORE, TRANSFORM, MAAREYANTA and Youth-Act PBF — with combined interventions expected to benefit 1.65 million people across five districts in Hirshabelle and South-West States.	based infrastructure and inclusive water governance. However, the proposed project introduces additional innovations in NbS design, hybrid infrastructure and urban–rural integration. • While JOSP prioritises the rehabilitation of major irrigation systems and conflict-sensitive resource governance, the proposed project embeds a replication and investment mobilisation strategy (Outcome 3) to scale NbS across districts and sectors. It also expands intervention sites to include Afgooye and rural catchments not directly targeted by JOSP, while aligning closely with JOSP in areas such as Jowhar.	• Proposed project will draw on resilience baselines and SHARP+ data from JOSP to inform site selection, community mobilisation and capacity development programmes (Outputs 1.1–1.4). It will engage with JOSP's youth advisory platforms and institutional mechanisms to align local committees, avoid duplication and strengthen participatory implementation of NbS. • Best practices from JOSP on infrastructure maintenance, cooperative models and integrated land–water planning will inform the proposed project's deployment of multi-functional NbS infrastructure, such as sand dams and vegetated drainage systems (Outputs 2.1–2.4). Knowledge exchange will be supported through shared monitoring frameworks and learning platforms under Output 4.1.
Local Climate Adaptive Living Facility (LoCAL), 2011–ongoing • Global programme managed by the UNCDF which began implementation in Somalia in 2022. • Supports the localisation of climate adaptation by combining Performance-Based Climate Resilience Grants (PBCRGs) with technical assistance and institutional capacity-building. • Intends to strengthen local governance systems and integrate climate risk into subnational budgeting and planning processes. • Contributes to the implementation of Nationally Determined Contributions (NDCs) and NAP by enabling decentralised delivery of climate adaptation actions and vertical integration between national and local governance structures.	• LoCAL supports climate resilience by developing the institutional and fiscal architecture required for effective local adaptation. This approach complements the proposed project's activities under Outputs 1.1 and 1.4 by supporting the enabling environment for participatory planning, local committee formation and coordination mechanisms. LoCAL's efforts to align local-level action with national adaptation priorities reinforce the proposed project's focus on policy integration, replication and the scaling up of NbS (Outputs 3.1 and 4.1). • LoCAL does not finance or implement site-based interventions, distinguishing its scope and modalities from those of the proposed project, which focuses on implementing hybrid NbS.	• Interventions under the proposed project will offer tangible pathways to integrated water resource management and resilience against droughts and floods. Those outcomes will be pursued by constructing sand dams, V-shaped weirs and solar-powered water pumps Output 2.1) as well as by developing Sub-catchment Management Plans and Urban Greening Plans (Outputs 1.2 and 1.3).

I. Learning and knowledge management

The proposed project embeds a Knowledge Management Plan that promotes adaptive management and supports the replication and upscaling of Nature-based Solutions (NbS) and hybrid solutions across Somalia and neighbouring countries. Evidence-based examples and lessons learned to reduce vulnerability to droughts and floods will be provided to stakeholders[193] as part of the Knowledge Management Plan. The proposed project will disseminate these examples and lessons learned to stakeholders, enabling the replication of similar interventions across the broader region. The Project Management Unit (PMU), through the M&E Officer, will oversee knowledge management efforts across all three project components. An overview of the learning and knowledge management activities across project components is provided in Table 14.

The Knowledge Management Plan of the proposed project will be developed by the PMU during implementation. The plan will comprise: i) a results framework with target indicators tracking the gender-disaggregated number of stakeholders trained across institutions and communities, the number and type of knowledge products disseminated and the replication of NbS models in non-target areas; ii) a list of all knowledge products to be generated during implementation, including an approximate timeline for their delivery and explanation of stakeholders targeted; iii) a framework detailing which communication channels will be used to disseminate knowledge products, and how these will be used; iv) project branding ensuring compliance with UNEP's name and logo usage, and corporate communication guidelines and v) protocols on the operations and maintenance of the Knowledge Management Platform to be developed under Activity 3.1.3, including its role in supporting further NbS and hybrid solutions interventions following project completion. Regular review of the Knowledge Management Plan throughout implementation will ensure adaptive learning and refine the Plan based on feedback and evolving needs.

Throughout the project timeline, knowledge will be shared via radio, the knowledge management platform and social media. Knowledge products developed under Component 3 will be disseminated through platforms such as the Adaptation Learning platform, FEBA, UNEP's Global Adaptation Network and NbS knowledge platforms. Collaborations with institutions such as SWALIM and universities will provide ongoing support and information maintenance post-project, while also supporting research on effectiveness, benefit quantification and cost–benefit analysis. Collectively, these efforts ensure that knowledge generation, exchange and use are embedded across all components and stakeholder groups, enabling adaptive management and the sustained scaling of NbS.

[193] Stakeholders include government ministries and agencies, district authorities, community representatives, development partners, international and national NGOs, technical partners and the private sector in Somalia.

Table 14. Summary of learning and knowledge management activities across project components.

Component	Knowledge management outputs	Primary stakeholders	Outcome
Component 1 focuses on strengthening institutional and community capacity for the planning and implementation of NbS.	• Development of capacity development programmes that provide protocols for integrating NbS and hybrid solutions into flood and drought management (Output 1.1). • Preparation of rural and urban Adaptation Management Plans that consolidate local knowledge and climate risk information for use by governments and communities (Output 1.2–1.3). • Establishment or capacitation of six local committees to facilitate knowledge sharing and replication (Output 1.4). • Development of manuals, visual tools and training modules to address knowledge gaps among government and community stakeholders (Output 1.1). • Knowledge generated under Component 1 disseminated through peer exchange visits, radio programming and a digital Knowledge Management Platform to support sustained learning (developed under Outputs 3.1–3.2)	• Federal and state-level ministry staff including the Ministry of Environment and Climate Change, Ministry of Water Resources and Energy and Ministry of Planning and International Cooperation. Extension officers. • Community representatives including women's groups, youth and pastoralists. • District authorities and NGOs.	• Build institutional and community capacity for the planning and implementation of NbS. • Promote replication of participatory adaptation planning and local committee structures. Improve access to and use of context-specific adaptation knowledge.
Component 2 focuses on implementing NbS and hybrid solutions interventions and generating knowledge to support the protection of productive assets and livelihoods.	• Generation of field-based knowledge through pilot implementation of V-shaped weirs, sand dams and water systems (Output 2.1). • Integration of climate-smart rangeland management practices — such as rotational grazing and reseeding — into pastoralist training (Output 2.2). • Documentation of soil bunds, revegetated embankments and urban drainage interventions as learning sites (Outputs 2.3–2.6). • Production of technical posters and visual guides to support replication of Outputs 2.1–2.6. • Delivery of awareness campaigns on waste management that draw on urban Adaptation Management Plans to demonstrate good practices in flood prevention (Output 2.6).	• Technical staff • Local communities • Urban stakeholders • Pastoralist and agropastoralist groups	• Support hands-on learning and farmer-to-farmer exchange • Generate site-based lessons for replication • Promote behaviour change in waste management
Component 3 strengthens the enabling environment for upscaling and sustaining NbS and hybrid adaptation solutions by embedding learning, evidence and policy support into project implementation.	• Lessons learned and best practices documented and disseminated (Output 3.1) • Performance and cost-effectiveness evidence shared to inform investment (Output 3.1) • Policy reform and incentive packages developed and communicated (Output 3.2) • Gender-responsive awareness campaigns delivered (Output 3.3	• Policymakers • National and sub-national institutions • Development partners • Vulnerable communities	• Inform planning and investment decisions • Support national upscaling of NbS • Foster institutional learning and public support
Component 4 functions as the core knowledge management component.	• Implementation of the Knowledge Management Plan — including gender-sensitive products in English and Somali — and dissemination through both digital and in-person channels (Output 4.1). • Knowledge management and M&E systems used to track learning, performance and replication • Results shared to inform adaptive management and project reporting	• Project Management Unit • Implementing and executing entities • Government stakeholders • Development partners	• Improved quality, accessibility and uptake of knowledge products • Evidence-based adaptive management and replication

J. Consultative process

The consultative process for the proposed project was structured to ensure compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund. The process was led by the Sadar Development and Resilience Institute (Sadar) in partnership with the United Nations Environment Programme (UNEP), consulting a variety of stakeholders (Table 15) to ensure inclusivity, community ownership and alignment with local needs and international safeguards were prioritised.

Table 15. Distribution of stakeholder types consulted.

Categories of participants	Number of participants	Women (%)	Men (%)
Community Committee members, elder and other local leaders	14	14	86
National, state, district and municipal authorities	32	22	78
Women and youth group members	14	79	21
Farmers and agropastoralists	17	47	53
Private sector/businesspeople	5	0	100
Development organisations and NGOs	19	10	90
Other	40	50	50
Total	141	35	65

The proposed project interventions were presented to representatives of the Federal Government of Somalia, including the Ministries of Environment and Climate Change (MoECC) and Energy and Water Resources (MoEWR) at an Inception Workshop in Mogadishu on 5 May 2025. Following this, key informant interviews (KIIs) were held in Mogadishu and online with representatives from FAO, Sadar and other regional development agencies to inform site selection and guide the development of the proposed interventions.

Following the Inception Workshop, National Consultants (NCs) attended district consultations in Beledweyne Town, Jowhar Town and Afgooye Town. District Consultations were organised by Sadar and included representatives of appropriate departments and agencies within district governments. These were undertaken to identify high-level priorities for climate adaptation and obtain information on: i) district and community policy and strategy integration; ii) technical capacity of institutions; iii) monitoring and evaluation; and iv) knowledge management. The NCs subsequently visited proposed project sites in the Beledweyne, Jowhar and Afgooye districts to assess: i) gender considerations; ii) conflict risks and risk management approaches; iii) current adaptation interventions implemented or under implementation and their benefits and challenges; iv) recommendations for project activities; v) the presence and vulnerability of differential groups; and vi) the preferred methodology for ongoing engagement during implementation. The community consultations were restructured as focus group discussions (FGDs) targeted at a broad variety of community stakeholders, including farmers, pastoralists, community-based organisations (CBOs) and women and youth groups. These FGDs used a combination of structured and open-ended discussion points.

Prior to dissemination of questionnaires and commencement of FGDs and KIIs, stakeholders were informed about: i) who the consultants were; ii) what the project is about; iii) what the timeline will be; iv) any uncertainties related to the project; v) the reason the consultants are undertaking the interview; and vi) the next steps following the consultations. To mitigate potential stakeholder fatigue and enable community members to share their perspectives during consultations, an adaptive approach was used that targeted specific subsets of questions appropriate to each stakeholder group. For example, questions regarding the roles of and potential impacts on women in the proposed interventions were allocated more time in discussions with exclusively female groups.

A final Validation Workshop was held in Mogadishu on 7 July 2025, attended by stakeholders including ministry representatives at the national, federal member state and district level as well as Sadar and UNEP to confirm alignment of the project design with stakeholder priorities. The results of these consultations were used to: i) further revise and update project design and interventions; ii) assess possible environmental and social impacts; and iii) adapt intervention design to minimise negative impacts on local stakeholders. Refer to Annex 2: Stakeholder Engagement Plan for: i) descriptions of consultation techniques; and ii) a summary of the points raised by stakeholders during all consultations.

During the project implementation phase, further consultations and discussions will be held with all

community stakeholder groups included in the first set of community consultations, as well as potential further consultations at the federal state and district level[194]. This iterative approach to the consultative process will enable appropriate stakeholders to provide specific perspectives and details to guide implementation while also keeping stakeholder informed of the potential benefits and risks of the project and maintaining lines of communication, thereby increasing community ownership of and commitment to project interventions.

K. How the project draws on multiple perspectives on innovation

Researchers

The project relies on research undertaken by two groups of researchers: i) the Ministry of Energy and Water Resources (MoEWR) with technical assistance from the UNEP-DHI; and ii) UN-Habitat's urban profiles and urban resilience plans developed in partnership with the local governments (LGs) of Beledweyne[195,196] and Jowhar[197,198]. The MoEWR research focused on flood management strategies, flash flood risk assessments, and NbS for flood and drought mitigation. This research yielded a catalogue of tested NbS measures, identified V-notch weirs and sand dams as highly effective for aquifer recharge and flood mitigation and developed prioritisation indicators for NbS based on flood mitigation potential. The findings in the MoEWR research have informed the proposed project's selected NbS measures.

UN-Habitat conducted risk analyses for Beledweyne and Jowhar in their urban resilience plans, focusing on flood-prone areas, including IDP areas. The resilience plans recommended short, medium and long-term interventions to reduce vulnerabilities and increase resilience at various scales — from peri-urban areas to neighbourhoods. The project's Component 2 interventions are designed according to the short-term recommendations.

Technical staff from partner organisations, including line ministries, development partners, SWALIM, and NGOs like Sadar, provided inputs based on their knowledge of climate change challenges and adaptation in Somalia. These views were obtained during the consultation process of project design. The conclusion from these discussions was that NbS indeed provides a 'low risk' option for climate change adaptation in the country.

Lessons from other projects

The project has been informed by several lessons from similar initiatives (Table 13), particularly focusing on generating carbon credits from soil carbon. It will leverage experiences from initiatives such as the Northern Rangeland Trust of Kenya[199], and Boomitra[200], during the project's formulation and implementation phases. The carbon credit scheme has two objectives: i) to empower resource-poor pastoralists and agropastoralists by enabling them to build and sell carbon assets in a manner that regenerates land and soils while providing financial incentives for sustainable practices; and ii) to assist the Ministry of Environment and Climate Change (MoECC), along with other relevant institutions, in establishing the necessary conditions and policies for effective carbon trading regulation. Given the long-term nature of soil carbon projects (typically more than 30 years), the project will primarily focus on assessing the feasibility of the scheme and facilitating stakeholders to develop a forward-looking strategy.

Communities

Vulnerable communities played a significant role in identifying innovative adaptation measures that have in turn informed the design of this project. Draft community resilience plans will be formulated with technical support from Sadar during the project implementation phase to guide the development of watershed and catchment plans under Component 1 once intervention areas are identified.

The project design has particularly been informed by the Building Resilient Communities in Somalia (BRCiS) program, which emphasises a learning-by-doing approach and community-led interventions. BRCiS has

[194] Refer to Part III, Section A: Implementation Arrangements for details on the framework for stakeholder feedback during implementation.
[195] UN-Habitat. 2020. Beledweyne Urban Profile 2020. https://unhabitat.org/beletweyne-urban-profile-2020.
[196] UN-Habitat. 2020. Beledweyne Working Paper on Flood Risk and Urban Resilience. https://unhabitat.org/sites/default/files/2020/09/beledweyne_resilience_final.pdf.
[197] UN-HABITAT. 2020. Jowhar Urban Profile. https://unhabitat.org/sites/default/files/2020/12/jowhar_urban_profile_1.pdf.
[198] UN-Habitat. 2021. Jowhar Resilience Plan. https://unhabitat.org/jowhar-resilience-plan.
[199] Northern Rangeland Trust of Kenya projects include: i) Northern Kenya Rangelands Project; and ii) Northern Kenyan Rangelands Carbon Project.
[200] Boomitra. 2023. AI-powered soil carbon project launched in Kenya to support smallholder farmers. https://boomitra.com/soil-carbon-removal-project-kenya-smallholder-farmers/.

committed to a bottom-up decision-making model, empowering existing community structures to ensure that programming addresses the needs of vulnerable populations. By the end of its second Phase in 2022, BRCiS had established 194 Community Resilience Committees (CRCs) across 34 districts[201]. These CRCs serve as the core for volunteer committees and associations, representing community members in decision-making processes.

This approach has made the program flexible and responsive to community needs and experiences. This project will adopt this bottom-up, learning-by-doing model wherever relevant, thereby providing further opportunities for empowered communities to continue to innovate adaptation. As such, community consultations and training will occur throughout project implementation to form communities of NbS best practices, empower them to adopt NbS and educate community members on NbS protocols. In addition, the proposed project will involve communities in the implementation of several interventions and validate project planning with them to ensure important community data are captured and improve community buy-in.

L. Justification for funding request

Climate change impacts — combined with limited fiscal and technical capacity at all government levels — necessitate external support to implement Nature-based solutions (NbS) and hybrid adaptation solutions under the proposed project.

Baseline

Under the baseline scenario, technical and institutional capacity to plan and implement NbS remains inadequate, particularly in Hirshabelle, where instability has diverted resources toward humanitarian needs (Component 1)[202]. Agricultural productivity and water availability are declining as climate hazards worsen, while urban centres such as Beledweyne, Jowhar and Afgooye suffer from unmanaged flood risk due to infrastructure deficits, urban expansion and displaced populations (Component 2)[203]. The enabling environment for NbS remains constrained by fragmented policies, weak governance and limited financial incentives, deterring private sector engagement and long-term investment (Component 3). Additionally, a lack of systematic monitoring and evaluation impedes learning and limits the evidence base required to support replication and scaling (Component 4)[204,205].

Additionality

The requested US$5 million will enable climate adaptation in the three target districts across three project Components[206][207]. Capacity will be strengthened through inclusive training for communities, institutions and civil society, alongside the development of local governance frameworks and action plans (US$432,387). Climate-resilient infrastructure — including sand dams, weirs, restored embankments and sustainable urban drainage systems — will be established to protect productive assets and reduce flood and drought risks, while rangelands will be placed under climate-smart management practices (US$2,879,733). Structural barriers to NbS investment will be addressed by policy reform, the establishment of a soil carbon credit mechanism and cross-sector collaboration (US$566,451). Last, evidence on the performance, cost-effectiveness and sustainability of NbS and hybrid solutions will be generated and disseminated to inform future investment and policymaking (US$330,901).

M. Project sustainability

The long-term benefits of the proposed project will depend on its outcomes being sustained beyond the funding period. To support the sustainability of the proposed interventions, they will need to be embedded in institutional structures and have sustainable financing mechanisms. Additionally, interventions will need to be technically reliable, environmentally appropriate and aligned with the social and economic conditions of the target communities. The project is therefore structured to facilitate sustainability across four

[201] Norwegian Refugee Council, 2022: End Term Evaluation Report for – Building Resilient Communities in Somalia, Phase 2.
[202] World Bank Group. 2023. Somalia Climate Risk Review. https://documents1.worldbank.org/curated/en/099062923035034613/pdf/P17624603756190c409e570193ea2ae944d.pdf.
[203] Federal Government of Somalia. 2022. Somalia's National Adaptation Plan Framework. https://napglobalnetwork.org/wp-content/uploads/2022/11/napgn-en-2022-somalia-nap-framework.pdf.
[204] AfDB. 2023. Country Focus Report 2023 Somalia. https://www.afdb.org/sites/default/files/documents/publications/somalia_cfr_2023_web_.pdf.
[205] UNEP. 2022. Nature-based Solutions: Opportunities and Challenges for Scaling Up. https://wedocs.unep.org/bitstream/handle/20.500.11822/40783/nature_based_solutions.pdf
[206] Refer to Part II, Section A: Project components for details on the proposed project Components, Outputs and Activities
[207] Refer to Part III, Section E: Results framework for detailed adaptation benefit indicators, including direct and indirect beneficiaries.

interrelated aspects: institutional, financial, environmental and technical, as well as social and economic.

Institutional sustainability

Institutional sustainability will be achieved by strengthening the capacities of local institutions, communities and governance systems to implement and maintain the project's outcomes. Output 1.1 will deliver capacity development programmes to federal government stakeholders on integrating innovative nature-based solutions (NbS) and hybrid technologies for flood and drought management into rural and urban planning and policy development. These training workshops will provide high-level government stakeholders with the knowledge and skills to implement and manage adaptation interventions independently. Moreover, Output 1.4 will support the training of 12–15 local community committees — comprising both men and women — in participatory planning, implementation and monitoring of catchment, watershed and urban greening plans. These community-based structures provide institutional support to sustain local interventions beyond the project's lifespan.

Knowledge management and long-term learning mechanisms will further strengthen institutional sustainability, as Output 3.1 will facilitate the systematic collection and dissemination of lessons learned and best practices to support future implementation of NbS across the country. This knowledge management will be supported by continuous collaboration with national and regional institutions, enabling institutions to provide technical support and embed project outcomes in institutional frameworks and policies.

A detailed project exit strategy will be developed during the final two years of implementation. This strategy will: i) take stock of all project interventions for which operations and maintenance will be required in the long-term; ii) identify which stakeholders will continue operations and maintenance of specific interventions post-implementation, and sign agreements with them if not already done during implementation; iii) develop long-term management plans for the identified interventions, if not already developed during implementation; iv) develop a scaling up and replication strategy for project interventions; and v) identify funding sources of long-term operations and maintenance.

Financial sustainability

Financial sustainability will be supported by policy integration, investment mobilisation and local revenue generation. For example, Outputs 1.2 and 1.3 will produce three water catchment plans and three urban green infrastructure plans, each with detailed protocols for planning and implementing NbS and hybrid technologies. These outputs will provide frameworks for inclusion of NbS and hybrid solutions in local and national budgeting and development planning, while also decreasing economic losses to flooding and droughts, thereby creating fiscal space.

In addition to these city-level plans, Output 3.1 will make recommendations for policy reforms and incentive packages available at national, Federal Member State and local levels. These will support the replication and upscaling of NbS and hybrid solutions, while also guiding budget allocation and securing external funding from development partners. Demonstrating the cost-effectiveness of NbS will therefore be a necessary component of financial sustainability efforts. Similarly, Output 2.6 will demonstrate how improved waste management reduces flooding to strengthen the case for public and private sector investment.

The institutional frameworks developed as part of Output 3.1 will sustain a policy environment that supports investments into NbS. For example, in rural sites the implementation of a carbon credit mechanism for climate-smart rangeland management practices — such as VM0042[208] — will be explored under Output 3.1[209] to generate local revenue streams. These and other incentive mechanisms will provide communities with long-term incentives and income opportunities from sustainable land management.

Environmental and technical sustainability

Technical sustainability will be provided by the design and implementation of context-appropriate, evidence-based adaptation infrastructure and practices. The majority of NbS — including climate-smart agriculture and climate-smart rangeland management practices, soil bunds and revegetated embankments — will be simple and cost-effective to implement, maintain and replicate by local stakeholders. Appropriate training will be provided to community committees of local stakeholders under Output 1.4. The project will apply NbS approaches proven to be appropriate for the Shabelle River Basin context, informed by the UNEP-DHI NbS

[208] VM0042 refers to Verra's Methodology for Improved Agricultural Land Management. This methodology provides a framework for quantifying greenhouse gas emission reductions and removals achieved through the adoption of improved agricultural land management practices, including improved grazing management on rangelands.
[209] This carbon mechanism will be modelled after the successful Northern Kenya Rangelands Carbon Project.

catalogue[210]. Moreover, Outputs 1.2 and 1.3 will serve as technical guides for the implementation of flood and drought control systems at catchment and urban scales, integrating protocols that maintain infrastructure resilience and functionality over time.

The project will also improve ecosystem function using several restoration and conservation interventions, informed by an Environmental and Social Management Framework (ESMF)[211]. Under Output 2.3, at least 200 ha of soil bunds will be developed to reduce soil erosion and water runoff, whilst Output 2.4 will establish or restore at least 130 ha of flood control forests and hedgerows in riparian areas. The restoration of rangelands under Output 2.2 will also support soil regeneration and climate-smart land use. These interventions will strengthen the resilience of ecosystems to climate change hazards such as drought and flooding by increasing soil moisture retention, regulating local water cycles and reducing landscape degradation. More resilient ecosystems will consequently increase local biodiversity by creating or rehabilitating habitats for native flora and fauna, supporting ecological connectivity[212] and further restoring ecosystem resilience[213]. All infrastructure and ecosystem restoration efforts will be supported by technical capacity-building and embedded maintenance systems, supporting their continued function and environmental benefit beyond project implementation.

Social and economic sustainability

Social and economic sustainability will be advanced by inclusive planning, equitable resource distribution and livelihood support interventions, to be achieved by the development of a Gender Mainstreaming Plan[214], Stakeholder Engagement Plan (SEP)[215] and ESMF[216] prior to project implementation. These documents will guide implementation to ensure appropriate participation of marginalised groups, including IDPs, women, youth and people with disabilities.

The project will apply social procurement principles, particularly by using Cash-for Work (CfW) in the construction of NbS and hybrid infrastructure. These interventions will generate short-term employment and build community assets while contributing to local economic sustainability by providing skills development and temporary livelihoods. Moreover, these CfW programmes will be designed to promote gender equity and social inclusion, supported by monitoring to ensure fair, safe and representative labour conditions and maintain transparency in cash transfers. The CfW programme will thereby contribute to the representation and empowerment of marginalised groups within local social structures, which will have long-term benefits for community stability and complement the project's benefits of increased livelihood resilience.

Socially cohesive and resilient communities will be further supported by Outputs 3.1 and 3.3 — as Output 3.1 will promote the dissemination of inclusive practices and lessons learnt, whilst Output 3.1 will develop strategies for efficient, gender-responsive and equitable use of project resources. These outputs will sustain behavioural change and enable communities to continue adapting to climate variability and socio-political challenges.

N. Environmental and social risks and impacts

The proposed project's interventions were evaluated against both the United Nation Environment Programme's (UNEP) Environmental and Social Sustainability Framework (ESSF) and the Adaptation Fund's (AF) environmental and social principles (ESPs) to identify potential adverse impacts and risks on ecosystem functioning, biodiversity, local livelihoods and social structures that may emerge as a result of project activities. Although most project impacts on are projected to be positive, specific interventions generate limited risks and will potentially result in environmental and social impact. An evaluation of the project against each of the 15 AF ESPs is summarised in Table 16. Further information on this evaluation, including the screening against the UNEP ESSF is included in the ESMF[217] and Part III, Section C: Environmental and social risk management.

[210] UNEP-DHI. 2022. Sustainable Flood Management and Risk Reduction Action. Applicability of Nature-based Solutions for Flood and Drought Management in Somalia: Final Report. https://unepdhi.org/wp-content/uploads/sites/2/2022/05/Somalia_NbS_Final_NbS_Report.pdf. Accessed on: 23 April 2025.
[211] Refer to Annex 4: Environmental and Social Management Framework.
[212] The degree to which organisms and natural resources can move between environments and consequently facilitate ecosystem services across broad areas.
[213] Biodiversity has positive feedback on ecosystem resilience through, *inter alia*, ecological processes such as pollination, herbivore control, maintenance of food webs, control of vegetation and increased genetic diversity.
[214] Refer to Annex 5: Gender assessment and action plan (GAAP)
[215] Refer to Annex 3: Stakeholder Engagement Plan (SEP)
[216] Refer to Annex 4: Environmental and Social Management Framework (ESMF)
[217] Refer to Annex 4: Environmental and Social Management Framework (ESMF)

Based on the environmental and social screening, the Enhancing Adaptation and Resilience through nature-based solutions (EARNSS) project is classified as Category B under the AF ESP. This classification reflects the expectation that most project impacts will be positive, with any potential adverse impacts expected to be site-specific, reversible and readily mitigated.

Table 16. Checklist for compliance with environmental and social principles.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	X	
Access and Equity		X
Marginalised and Vulnerable Groups		X
Human Rights	X	
Gender Equity and Women's Empowerment		X
Core Labour Rights	X	
Indigenous Peoples	X	
Involuntary Resettlement		X
Protection of Natural Habitats		X
Conservation of Biological Diversity		X
Climate Change	X	
Pollution Prevention and Resource Efficiency	X	
Public Health		X
Physical and Cultural Heritage	X	
Lands and Soil Conservation		X

PART III: IMPLEMENTATION ARRANGEMENTS

A. Arrangements for project management and implementation

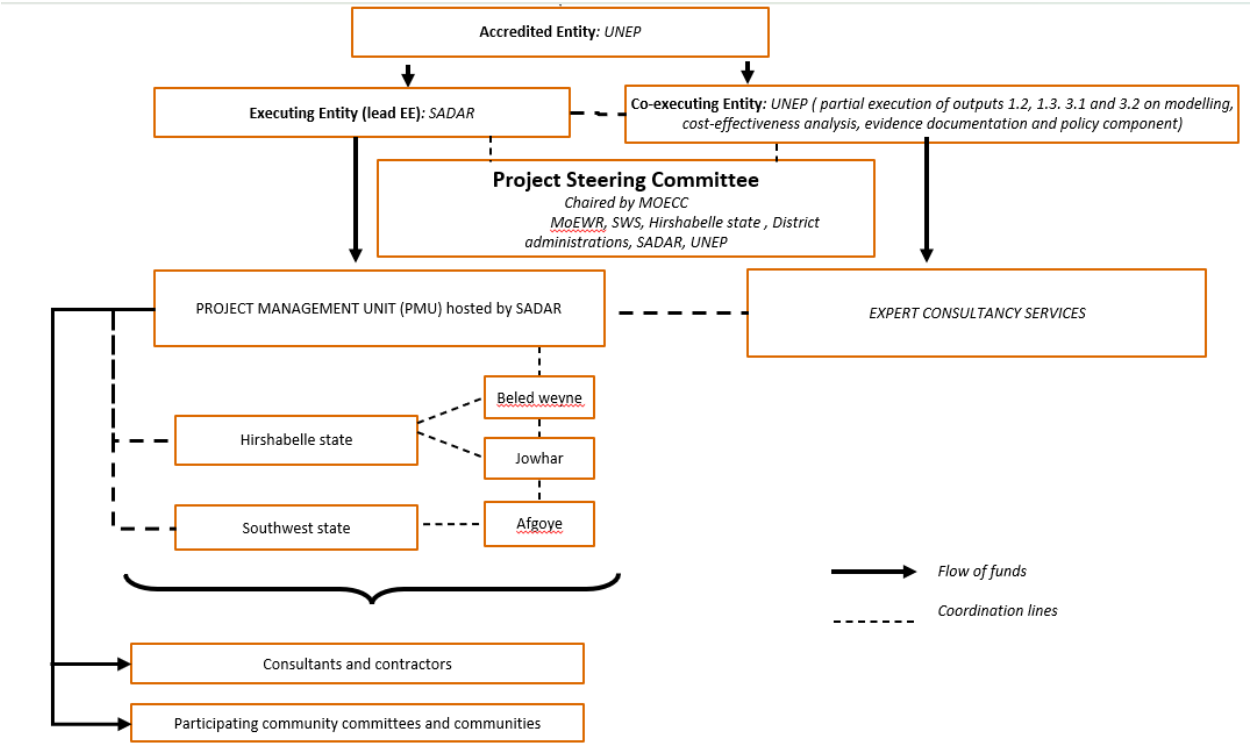

Figure 8. Implementation arrangements organogram.

Multilateral Implementing Entity

The United Nations Environment Programme (UNEP) will be the Multilateral Implementing Entity (MIE) for the proposed project. UNEP has implemented more than 90 projects on climate change adaptation at global, regional and national levels in more than 50 countries[218], including Least Developed Countries (LDCs) such as Somalia. These projects have developed innovative nature-based solutions (NbS) to adapt to the current and projected impacts of climate change and built the capacity of national and sub-national governments and local communities in ecosystem-based adaptation planning and implementation.

UNEP's knowledge base is derived from completed and ongoing projects supporting: i) methods and tools for decision-making; ii) prioritising, designing and implementing adaptation interventions; iii) enhancing climate resilience by restoring vulnerable ecosystems that underpin community livelihoods; and iv) monitoring the socio-economic and environmental benefits of adaptation interventions. As the MIE, UNEP will draw upon previous experiences and lessons learned during the implementation of the proposed innovation project, including the AFCIA project with CTCN.

UNEP's advantage over other accredited entities is its ability to provide robust scientific and technical advice regarding sustainable national planning and development processes. These skills are supplemented by UNEP's strong capacity in the field of climate change through implementation of climate change adaptation projects at global, regional and national levels. As the GCF AE for the proposed project, UNEP will therefore oversee the efficient and effective delivery of the project's objectives. Lastly, UNEP's in-house policies and expertise on gender mainstreaming as well as social and environmental safeguards will contribute towards gender- and environmentally-sensitive project implementation.

The following implementation services under the MIE modality will be provided by UNEP for the proposed project:

- overall coordination and management of UNEP's MIE functions and responsibilities, and the facilitation of interactions with the AF Board and related stakeholders;
- oversight of portfolio implementation and reporting on budget performance;
- quality assurance and accountability for outputs and deliverables at the project development phase, during implementation and on completion;
- receipt, management and disbursement of AF funds in accordance with the financial standards of the AF;
- information and communication management — including maintaining specific project databases to track and monitor financial and substantive progress — of project implementation; and
- incorporation of lessons learned and best practices into future UNEP projects in the region to support replication and upscaling.

Executing Entity

Sadar Development and Resilience Institute (SADAR) will be the lead executing entity (EE) for the proposed project, responsible for delivering the project outputs and activities. SADAR's comparative advantage lies in its extensive local presence, staffing capacity, and in-depth knowledge of the target areas in Somalia. With a team of 86 national staff across Somalia, SADAR has established strong institutional relations and access to key stakeholders at Federal, Federal member states and district levels, facilitating effective coordination and implementation in Somalia. Its proven track record includes successfully managing and executing a range of climate resilience and adaptation projects, such as Response Initiative for Somalia Emergencies, Food Security and Sustainability in Climate Fragile Situations and Investing in Climate-Smart Technologies in Somalia, Resilient Livelihood Action Against Covid-19 (RLAC-19) project all funded by International Fund for Agriculture Development (IFAD) and the World Bank. Additionally, SADAR's ongoing implementation of the GEF-funded Adaptive Agriculture and Rangeland Rehabilitation Project (A2R2), along with planned implementation of the Adaptation Fund's Green and Resilient Ecosystems for Somali Livelihoods Project (Hal-Abuur) approved in April 2025, demonstrates its capacity for managing climate adaptation and mitigation projects. Its expertise in multidisciplinary research and innovations addressing livelihoods, food security, and climate resilience and adaptation in fragile contexts further underscores its suitability as the lead executing entity for this project.

UNEP will enter into a contractual agreement with the Sadar Development and Resilience Institute (Sadar), reflecting the responsibilities of each party in accordance with the applicable UNEP and AF standards and procedures. As the lead EE, Sadar will be responsible for the execution of the project, including *inter alia*:

- establish and manage the Project Management Unit (PMU);

[218] UNEP. 2025. Adaptation and resilience. https://www.unep.org/topics/climate-action/adaptation. Accessed on: 5 June 2025.

- coordinating and managing the overall quality and timely delivery of project outputs and activities in accordance with the approved project document;
- managing national-level procurements of goods and services for project activities;
- recruitment of personnel and consultants for project implementation;
- providing technical advice on project activities and overseeing the work and performance of staff, consultants and contractors involved in project delivery;
- monitoring project outcomes and activities and documenting lessons learned;
- delivering quality, complete and timely technical and financial reports;
- knowledge management, communications and awareness raising;
- management of project environmental and social safeguards and the grievance redress mechanism; and
- development and implementation of the project stakeholder engagement plan.

SADAR will execute the project through a combination of its personnel, external consultants, and contracted service providers. The engagement of downstream NGO partners for implementation is not foreseen under the current arrangements. Through agreements with executing entity, SADAR, the Ministry of Environment and Climate Change (MOECC_ will play a role in the implementation of certain institutional activities, including supporting the development of the Adaptation Management Plans in the three districts (activities 1.2.3 and 1.3.2), the hosting of validation workshops on final sites and NbS/hybrid solutions (activities 1.2.3 and 1.3.3), the dissemination of knowledge products to government stakeholders to promote the integration of NbS and hybrid measures into planning instruments (activity 3.1.3) and the meetings related to the soil carbon credit viability assessment and policy recommendations (activities 3.2.3 and 3.2.4). The Ministry will also play a convening and oversight role in the implementation of the Stakeholder Engagement Plan, Gender Action Plan and Environmental and Social Management Framework, M&E Plan and Knowledge Management Plan.
District governments will have a coordination and monitoring role but will not hold direct implementation responsibilities. Community committees will be actively involved in the planning, implementation, and monitoring of project activities; however, they will not be responsible
for the management or administration of project funds.

In the specific context of this project, UNEP will assume a limited and targeted execution role, focusing on selected activities related to evidence generation and policy development, where UNEP offers a clear comparative advantage, as outlined below:

1) Hydrological modelling and evidence generation
UNEP will lead the implementation of hydrological modelling to assess:
- the flood attenuation potential and groundwater infiltration potential of Nature-based Solutions (NbS) in the project area,
- the cost-effectiveness analysis of proposed interventions; and
- the documentation and dissemination of results.

This work will build on UNEP-DHI's established experience in Somalia, notably their development of the Catalogue of NbS Measures and modeling of effective NbS options and indicators for flood mitigation under the Somalia National Water Resource Strategy (NWRS), launched by the Ministry of Energy and Water Resources (MOEWR) in April 2021.

2) Technical quality control and validation
UNEP's Senior Water Resources Management Specialist based in Somalia will be responsible for conducting independent quality control and validation of site assessments and technical designs prepared by national engineers. This will ensure technical rigor, alignment with international standards, and quality assurance in the project's infrastructure and NbS interventions.

3) Policy Recommendations and Incentive Packages
UNEP will oversee the development of recommendations for policy reforms and incentive mechanisms to support the uptake, replication, and upscaling of NbS and hybrid adaptation measures.

This work will be undertaken by a team of international and national expert consultants recruited by UNEP through a competitive tender process. UNEP policy experts will provide oversight and technical guidance to ensure the relevance and alignment of recommendations. The process will be conducted in close collaboration with the Ministry of Environment and Climate Change (MoECC), the Ministry of Energy and Water Resources (MOEWR), and the Somalia Disaster Risk Management Agency (SADAR) to ensure

ownership, institutional alignment, and policy coherence. These targeted execution activities complement the primary implementation arrangements and leverage UNEP's expertise, ensuring high-quality evidence generation, robust technical oversight, and policy-level support for sustainable and scalable adaptation outcomes.

Project Steering Committee

A Project Steering Committee (PSC) will be established to provide strategic guidance for the implementation of the entire proposed project. The Federal Ministry of Environment and Climate change (MoECC) will chair the Project Steering Committee (PSC). The PMU will serve as the PSC secretariat, preparing the agenda, meeting minutes, and submitting reports and annual planning documents for PSC consideration. The PSC will be comprised of representatives of:

- Federal MoECC;
- Federal Ministry of Energy and Water Resources (MoEWR)[219];
- UNEP;
- Sadar;
- Southwest state government;
- Hirshabelle state government; and
- District administrations from Beledweyne, Jowhar and Afgooye.

As the project's primary decision-making entity, the PSC will meet at least once per year to: i) evaluate progress on outcomes to maintain a high standard of technical quality; ii) approve the annual workplan and budget, as well as the progress reports and project reports; iii) strengthen linkages between this project and other relevant ongoing projects and programmes; iv) ensure the achievement of the main outcomes of the project, including sustainability, replication and upscaling; and v) coordinate the work of implementing partners within the framework of this project. In addition to scheduled annual meetings, *ad hoc* sessions will be organised and held virtually as required at the discretion of the MoECC.

The PSC will monitor the implementation progress to anticipate risks and factors that will potentially cause delays. If delays occur, the PSC will evaluate the barriers and constraining factors and will provide solutions that will be endorsed collectively. Moreover, the PSC will be responsible for ensuring that SADAR carries out timely reporting of project implementation progress to UNEP, who will report to the Adaptation Fund using the Fund's reporting tools.

The Project Management Unit

A Project Management Unit (PMU) will be established within SADAR led by the Project Manager who will report to SADAR Programmes Director. The PMU's main functions are to facilitate project management, coordination and implementation based on PSC-approved annual work plans and budgets. It will also: i) establish activity planning processes; ii) formulate and monitor budgets; iii) provide the terms for procurement and hiring procedures; iv) establish contracts and oversee performance and deliverables of contractors and consultants, v) establish guidance tools for administration, financial and budget management, monitoring and evaluation (M&E) procedures; and vi) carry out reporting and M&E of project interventions[220].

The PMU will be based in Mogadishu and will be led by a Project Manager. In addition, the PMU will include a Finance Officer, Procurement Officer, M&E Officer, Environmental and Social Safeguards (ESS) and Gender Officer as well as district- level technical personnel. The responsibilities of these specialists are listed in Table 17.

Table 17. Responsibilities of Project Management Unit (PMU) personnel.

PMU member	Responsibilities
Project Manager	• Oversee the implementation of all project interventions • Coordinate and manage the other PMU members • Guide the development of the annual workplan, budget and report • Deliver annual progress reports to the PSC
PMU technical staff (one per district)	• Liaise with local authorities, community committees and stakeholders. • Facilitate project planning, implementation and monitoring at district level. • Support community-based activities, including cash-for-work and training sessions.

[219] These Ministry representatives will serve as Focal Points on behalf of their respective institutions to ensure their involvement in high-level project oversight.
[220] Refer to Part III, Section D: Monitoring and Evaluation.

	• Report district-level progress and challenges to the Project Manager.
Finance Officer	• Maintain accurate financial records and manage project disbursements. • Support financial reporting to UNEP and the PSC. • Ensure compliance with AF financial standards. • Coordinate audit readiness and documentation.
Procurement Officer	• Prepare procurement documentation including specifications and bid evaluations. • Ensure transparency and compliance with UNEP and AF procurement guidelines. • Coordinate contracts for goods, works and services. • Maintain procurement records.
M&E Officer	• Coordinate development of a baseline study to be presented to the PMU • Lead ongoing monitoring, including potential community consultations during implementation, to evaluate progress on project outcomes • Identify potential risks and factors that are likely to cause delays in implementation and inform the PMU of these • Prepare mid-term and terminal evaluations
ESS and Gender Officer	• Support implementation of project activities to ensure their design is appropriate to the local environmental and social contexts and is gender-responsive • Evaluate progress reports by the M&E Officer to ensure that environmental and social impacts are within the scope of predicted risks • Evaluate progress reports by the M&E Officer on equitable benefit distribution to women • Advise on adjustments to implementation in the case of harmful projects impacts on the environment, local livelihoods or social cohesion, or potential inequitable distribution of project benefits and harmful impacts of project activities on women

B. Financial and project risk management

Risk management is viewed as an ongoing process integrated throughout the project lifecycle, from design to implementation and evaluation, ensuring that risk identification and mitigation are continuously updated and responsive to changing circumstances. All aspects of the project approach, including risk management, are designed to be participatory, gender-responsive and inclusive. This is expected to contribute to mitigating certain social and operational risks and includes actively engaging women, youth and marginalised groups in decision-making processes at all stages. Table 18 below summarises some key risks identified in the EARNSS project and provides a qualitative assessment of their potential likelihood, impact and overall seriousness based on the information presented.

Table 18. Financial and project risks.

Risk description	Risk rating	Mitigation measures
Security: The presence of insurgent groups such as Al-Shabaab, as well as recurring tensions between clans as well as between settled farmers/agropastoralists and nomadic pastoralists lead to intermittent periods of conflict in the Shabelle River Basin. Although currently the security situation is relatively stable in the specific target areas, the potential exists for such conflict to disrupt implementation, particularly of field activities such as ground-truthing, construction and consultations.	Moderate	The risk that social or political conflict could impede the implementation of project interventions cannot be avoided entirely. However, adaptive management incorporated into project design will enable for potential re-scheduling or even re-siting of interventions should specific areas become too unsafe for implementation. Moreover, the inclusion of elders — traditionally responsible for local conflict resolution — in community committees will provide opportunities to de-escalate conflict potentially jeopardising implementation.
Insufficient adoption of NbS and hybrid solutions: As NbS and hybrid solutions are relatively novel in the context of the Shabelle River Basin, local farmers and agropastoralists will potentially be hesitant to adopt these techniques.	Moderate	The proposed project will demonstrate the benefits of NbS interventions using demonstration plots and a targeted awareness campaign featuring case studies and interviews with successful adopters. Moreover, the project will provide expertise and inputs to potential adopters using the community committees, nurseries and awareness materials. This combination of incentives and long-term support will make adoption of NbS interventions likely. The economic sustainability of project interventions will be verified by technical assessments and cost-benefit analysis.. As NbS and hybrid solutions generate adaptation benefits at lower costs than traditional 'grey' infrastructure, it is likely that all NbS interventions will be cost-effective. In addition, by reducing the currently severe impacts of droughts and floods on communities in the target districts, the proposed project is expected to result in reduced economic losses.
Climate change: There exists a risk that climate change impacts in the Shabelle River Basin will become more severe than current IPCC projections show, such that NbS and hybrid solutions interventions implemented under the proposed project will not perform	Low	The risk of climate change impacts more severe than those predicted by IPCC models cannot be avoided entirely, as project modelling of NbS benefits will use these models. However, the project's focus on upscaling of NbS will, to a degree, enable adaptation to more severe climate change impacts by increasing implementation of successful NbS interventions. More severe climate change impacts would further

adequately to achieve the expected benefits.		incentivise NbS adoption and would potentially result in additional funding being provided by the Government of Somalia to upscale interventions to offset increased impacts. The NbS implementation protocols developed during project implementation will incorporate adaptive management principles, enabling their continued use under more severe climate change scenarios. For example, should temperature increases exceed the tolerances of native plants used for rangeland and riverine revegetation, it will be possible to instead select more temperature-resistant species.
Insufficient adoption of policy recommendations: There exists the risk that policy recommendations generated under the proposed project will not be adopted by government policy- and decision-makers as NbS and hybrid solutions are relatively novel in the context of Somalia.	Moderate	This risk cannot be mitigated entirely; however, the combination of evidence-based reporting, provision of incentive mechanisms and demonstration of adaptation benefits, including economic sustainability, will strongly incentivise adoption.
Governance: The coexistence of formal and informal governance systems with overlapping mandates results in disjointed planning and implementation pathways. This has the potential to delay project activities. At the district level, overlap in the authority of formal and traditional leadership may reduce coherence in project activities. The allocation of land, resources and administrative resources is typically mediated through dominant clan networks, making it subject to clan-related conflict.	Moderate	Roles and responsibilities will be formalised with key ministries (MoECC, MoEWR, MoAI and MoLFR). Regional Committees with clear terms of reference will be established, comprising officials, NGOs, CBOs and community groups.
Coordination and Communication: Weak coordination among institutions may result in fragmented or duplicated activities. Poor communication may hinder stakeholder engagement and feedback loops.	Moderate–High	The roles of the different institutions have been defined in coordination with the lead Ministry (MoECC) and it's expected that the existing institutional relationships will support alignment and coordination. The PSC meetings will facilitate institutional coordination and engagement in the project governance, while the PMU will ensure coordination with stakeholders implementing initiatives in the target areas to facilitate synergies and avoid duplication of efforts. Communication tools (e.g. newsletters, SMS, radio) and the dissemination of key project documents will facilitate information sharing and facilitate engagement.
Local Ownership: If project interventions do not reflect community priorities or exclude local actors from management roles, sustainability and impact may be undermined. Local ownership may also be limited if project information is inaccessible to marginalized groups, such as minority clans, or does not facilitate participation from women and youth.	Moderate	Project design included engagements with communities at all target sites to ensure their priorities and concerns were identified. Additionally, structured community engagements will inform intervention design and ensure alignment with local needs. To ensure inclusivity, stakeholder engagement will include translation services and will be monitored based on the participation of vulnerable or marginalised groups. A grievance redress mechanism (GRM) will be operationalised to facilitate accessible feedback.
Financial: Mismanagement of funds at sub-national levels could affect accountability and delivery of activities.	Low	The management of project funds will be the responsibility of SADAR and UNEP as co-executing entity, No transfer of funds to downstream partner is envisioned, hence the risk of mismanagement of funds at sub-national level is low. Financial Audits will be conducted by an independent audit authority on an annual basis. The audit report and recommendations shall include such comments as the auditor may deem appropriate in respect of AF- funded operations and in particular, shall clearly indicate that in their opinion: (i) AF funds were covered by the scope of the audit; (ii) Proper books of account have been maintained; (iii) All project expenditures are supported by vouchers and adequate documentation; (iv) Expenditures have been incurred in accordance with the objectives outlined in the project document; (v) The expenditure reports provide a true and fair view of the financial condition and performance of the project.
Financial: Exchange rate or inflation volatility may increase project costs.	Low–Moderate	Financial reviews will be conducted to adjust budget allocations as needed

C. Environmental and social risk management

Environmental and social impacts and risks have been identified for the proposed project in line with the Adaptation Fund's (AF) Environmental and Social Policy. Table 19 presents a summary of risks against each of the 15 Environmental and Social Principles, including associated mitigation measures. A full

environmental and social screening was conducted using UNEP's Environmental and Social Safeguards procedures. The proposed project is classified as Category B (moderate risk) under both the UNEP Environmental, Social and Sustainability Framework (ESSF) and the AF ESP.

Risks identified during the design phase include: i) potential exclusion of vulnerable groups; ii) conflict over access to land and resources; iii) minor biodiversity and soil disturbance during construction; iv) risks related to labour conditions and benefit sharing; and iv) economic displacement. No significant or irreversible impacts are anticipated and the project does not have activities affecting Indigenous Peoples as defined by the ESP.

The Environmental and Social Management Framework (ESMF) serves as the primary mechanism for incorporating environmental and social risk management measures into the project. The ESMF includes:

- a structured screening process for Unspecified Sub-Projects (USPs);
- a Livelihood Action Framework (LAF) to guide mitigation of any access-related or economic displacement risks;
- a Grievance Redress Mechanism (GRM) with district-level focal points;
- safeguards oversight by UNEP and the Project Management Unit (PMU); and
- integration of cross-cutting strategies such as stakeholder engagement, gender responsiveness and adaptive management.

These measures are embedded in the project's implementation arrangements and budget. Ongoing safeguards monitoring will be conducted by safeguards focal points at the national and district level, with oversight and periodic review by UNEP. Risks will be re-assessed as site-level planning proceeds and mitigation measures will be adjusted accordingly to ensure compliance with the ESP throughout implementation.

Table 19. Summary of environmental and social risks, screening outcomes and mitigation measures.

AF Environmental and Social Principle[221]	Triggered by the Project?	Assessment of Risks	Mitigation Measures Proposed in the Project
Principle 1: Compliance with the Law. Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international law.	Yes	While the project is designed to comply with Somali law and international commitments — such as International Labour Organisation (ILO) conventions — weak regulatory systems and informal land-use practices may result in inadvertent non-compliance or ambiguous legal interpretation.	• Screening of all project activities to identify legal obligations regarding land use, environmental impacts and labour • Oversight by UNEP and Sadar to verify compliance with national laws and safeguard obligations. • Alignment with ILO standards and Somalia's Labour Code in all cash-for-work (CfW) and contracted work arrangements.
Principle 2: Access and Equity. Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions and land rights. Projects/programmes should not exacerbate existing inequities, particularly with respect to marginalised or vulnerable groups.	Yes	There is a risk that CfW opportunities or shared infrastructure — such as sand dams and water tanks — may be inequitably distributed given existing social hierarchies or power imbalances. Gatekeeping by local elites or clan-based structures may limit participation by marginalised groups. Inaccessible or mistrusted grievance mechanisms may further entrench exclusion from project benefits.	• Inclusive stakeholder mapping and quota-based representation of women, internally displaced persons (IDPs) and ethnic minorities in committees (Output 1.4). • Participatory planning for infrastructure site selection and labour allocation. • Culturally appropriate engagement strategies such as gender-segregated consultations and providing resources in the Somali-language. • Operational GRM with district-level focal points to address access-related complaints.
Principle 3: Marginalised and Vulnerable Groups. Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalised and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups,	Yes	Groups such as the Somali Bantu, minority clans, IDPs and women may face exclusion from project benefits due to structural inequality, weak representation or discriminatory norms. Participatory processes risk reinforcing elite control or ignoring customary needs	• Targeted outreach through civil society, IDP committees and community elders to ensure participation of historically excluded groups. • Minimum representation thresholds for marginalised groups in local governance structures. • Training for facilitators on navigating

[221] Adaptation Fund. (n.d.). Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf

displaced people, refugees, people living with disabilities and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess and consider particular impacts on marginalised and vulnerable groups.		unless safeguards are deliberately applied.	power dynamics and inclusive dialogue. • Screening for exclusion risks integrated into site-level planning and implementation oversight. • Engagement with these groups will apply approaches consistent with the principles of Free, Prior and Informed Consent (FPIC)
Principle 4: Human Rights. Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.	Yes	Risks include exclusion from participation or benefits due to discrimination based on clan affiliation, gender, displacement status or ethnicity. Weak trust in formal accountability mechanisms and local gatekeeping may suppress participation or grievances from vulnerable groups.	• Inclusive engagement practices designed to mitigate discrimination, including quota-based representation and culturally appropriate consultation. • Training for community facilitators on non-discrimination, respectful dialogue and inclusion. • GRM designed to be accessible, confidential and responsive to rights-related complaints, including protection from retaliation. • Oversight by UNEP and Sadar to ensure adherence to human rights principles during implementation.
Principle 5: Gender Equality and Women's Empowerment. Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men: i) have equal opportunities to participate as per the AF gender policy; ii) receive comparable social and economic benefits; and iii) do not suffer disproportionate adverse effects during the development process.	Yes	Gender norms may restrict women's participation in CfW initiatives, community planning or leadership roles. Women may also face increased time burdens or exposure to sexual exploitation, abuse and harassment (SEAH) risks during implementation if gender-sensitive safeguards are not applied.	• Minimum representation thresholds for women in all local governance committees under Output 1.4. • Gender-sensitive consultation approaches such as holding gender-disaggregated meetings with dedicated female facilitators. • Gender-responsive labour recruitment, with attention to fair access for women and protection from discrimination. • SEAH awareness incorporated into orientation for workers and community members, with GRM referral pathways for survivors.
Principle 6: Core Labour Rights. Projects/programmes supported by the Fund shall meet the core labour standards as identified by the International Labour Organisation (ILO).	Yes	Risks include lack of written contracts for CfW or community labour, inadequate health and safety protections and possible child labour. Discrimination in hiring may arise due to hierarchical clan-based practices.	• Written contracts and basic labour terms applied for all CfW and community-based implementation arrangements. • Compliance with Somalia's Labour Code and ILO standards. • Age verification protocols and spot checks to prevent child labour. • Occupational health and safety measures, such as the provision of training, protective equipment and supervision. • Gender-sensitive and non-discriminatory recruitment practices monitored by safeguards focal points.
Principle 7: Indigenous Peoples. The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.	No	Not Applicable	• The project operates in areas where no groups meeting the criteria of Indigenous Peoples (IPs) — as defined under UNEP's ESSF[222] — have been identified. While the project includes marginalised groups such as Somali Bantu, occupational castes and displaced persons, these do not qualify as Indigenous Peoples under applicable standards. Their inclusion is addressed under Principle 3 on Vulnerable Groups. As such, while true a FPIC process is not triggered, project engagement will strive to reflect FPIC principles for specific groups that self-identify as having indigenous peoples characteristics (refer to Annex 3: Stakeholder Engagement Plan.
Principle 8: Involuntary Resettlement.	Yes	There is a risk of economic	• Participatory planning and site

[222] UNEP. 2020. Environmental and Social Sustainability Framework (ESSF). https://wedocs.unep.org/bitstream/handle/20.500.11822/32022/ESSFEN.pdf.

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimises the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options and offered technically, economically and socially feasible resettlement alternatives or fair and adequate compensation.		displacement where project activities — such as catchment planning and infrastructure site selection — restrict access to land or resources used by agropastoralist or displaced communities. Risk is context-dependent and varies by site.	validation with affected communities. • Site-level safeguards screening using the UNEP Safeguard Risk Identification Form (SRIF). • Development of Livelihood Action Plans (LAPs) where restriction of access is identified. • Exclusion of activities which would require involuntary physical displacement of communities. • Avoidance of contested areas or sites where consent cannot be assured.
Principle 9: Protection of Natural Habitats. The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are: i) legally protected; ii) officially proposed for protection; iii) recognised by authoritative sources for their high conservation value, including critical habitats; or iv) recognised as protected by traditional or indigenous local communities.	Yes	Interventions may cause localised disturbance to ecosystems or habitats if not implemented with adequate siting, timing and protection measures. Uncertainty about site conditions or land use increases the risk.	• Pre-implementation screening of all interventions using UNEP's SRIF and participatory validation processes. • Ecosystem sensitivity will be assessed through catchment planning and stakeholder consultation. • Use of indigenous or non-invasive species for restoration. • Exclusion of identified protected areas and key biodiversity zones.
Principle 10: Conservation of Biological Diversity. Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.	Yes	Landscape interventions — including embankment revegetation, climate-smart rangeland management, soil bunds and V-shaped weirs — may alter vegetation patterns or disturb fauna if biodiversity considerations are not incorporated into design and siting. Risks are site-specific but manageable with proper planning.	• Biodiversity considerations integrated into all site screening. • Avoidance of ecologically sensitive areas unless supported by ecological assessments. • Restoration works use native species and avoid monoculture approaches. • Monitoring of vegetation cover and key indicator species in target areas. • Training of implementing partners on NbS principles.
Principle 11: Climate Change. Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change	Yes	While the project is designed to increase resilience, there is residual risk of maladaptation if infrastructure is not designed for future climate scenarios if, *inter alia*, culverts are undersized, or interventions are located on sites with high erosion potential.	• Technical guidelines developed to ensure infrastructure resilience — including considerations of drainage capacity and slope stability. • Integration of adaptation planning into rural and urban Adaptation Management Plans. • Emphasis on nature-based and low-carbon solutions.
Principle 12: Pollution Prevention & Resource Efficiency.	Yes	Minor risks of solid and liquid waste, poor water efficiency or pollution from construction materials. These are short-term risks and can be managed through established environmental management practices.	• Construction guidelines include protocols for waste management and material handling. • Siting and design of infrastructure avoids contamination of water sources. • Community training on water conservation and system maintenance. • Procurement procedures encourage low-emission and resource-efficient technologies. • Environmental clauses incorporated into work contracts.
Principle 13: Public Health. Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.	Yes	Risks relate to community exposure to waterborne diseases arising from stagnant water near sand dams or drainage systems, as well as occupational health risks during labour-intensive works. Somalia's limited public health infrastructure compounds these vulnerabilities.	• Site design ensures effective drainage and avoids stagnant water pooling. • Occupational health and safety (OHS) protocols applied to all worksites. • Awareness campaigns on hygiene, sanitation and water safety. • Engagement with local health actors where feasible to coordinate early warning and referral.
Principle 14: Physical and Cultural Heritage.	Yes	While no physical or cultural heritage sites have been formally identified in the target	• Pre-activity screening of all interventions using UNEP's SRIF and participatory validation processes.

Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage or removal of any physical cultural resources, cultural sites and sites with unique natural values recognised as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.		areas, there remains a potential risk of disturbing undocumented heritage during excavation or other ground-disturbing activities.	Ecosystem sensitivity assessed through catchment and urban planning, as well as stakeholder consultation. • Chance-find procedures included in contractor guidance. • Avoidance of known or suspected heritage areas in project implementation unless unavoidable and approved.
Principle 15: Lands and Soil Conservation. Projects/programmes supported by the Fund shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.	Yes	Earthworks, grazing enclosures or poorly designed bunds could result in localised erosion, reduced soil fertility or disruption of natural hydrology if not appropriately managed.	• Design of restoration and water infrastructure incorporates soil stability and slope considerations. • Use of vegetation cover and erosion control techniques • Training of local implementers in soil and water conservation methods. • Site monitoring to ensure early detection of erosion or degradation.

D. Monitoring and evaluation

The proposed project will comply with formal guidelines, protocols and toolkits issued by the Adaptation Fund (AF), United Nations Environment Programme (UNEP) and the Government of Somalia (GoS). The Monitoring and Evaluation (M&E) of progress in achieving project results will be based on targets and indicators established in the Project Results Framework (Part II, Section E). Additionally, the Environmental Social Risks Management Framework (ESMF) (Annex 3), Gender Action Plan (Annex 4) and the financial and project risk management (Part III, Section B) will be monitored throughout the proposed project, using bi-annual progress reports, annual project performance reports, mid-term review and terminal evaluation report. Moreover, UNEP will oversee project implementation to ensure that the proposed project is conducted in accordance with AF standards and requirements and the Sadar Development and Resilience Institute (Sadar), as the Executing Entity (EE), will ensure the timeliness and quality of project implementation. The Project Management Unit (PMU) will implement project activities as the primary coordinating unit that will oversee project implementation and M&E activities discussed below. The M&E budget and breakdown of how Executing Entity fees will be used for M&E-related activities are presented in the detailed budget in Part III, Section G. The related targets and indicators are available in the project proposal results framework (Part III, Section E).

Project M&E will be conducted under the oversight of the Project Manager. In addition, M&E will be led by the M&E officer who will work closely with UNEP and Sadar to develop an M&E system, the functions of which will include: i) collecting data to assess progress against the result framework indicators as described in Part III, Section E: Results Framework, ii) collecting gender-disaggregated data to monitor the gender targets described in the Gender Action Plan; iii) producing, organising and disseminating information required for the strategic and adaptive management of the project; iv) documenting project results and lessons learned; iv) ; and v) providing inputs to the annual progress reports, independent result verification exercises and external evaluations.

In addition to formal M&E structures, community committees will support Participatory Monitoring and Evaluation (PME) of project interventions, building local capacity in data collection, planning, resource management and collaborative decision-making. Data generated through PME will inform adaptive management and be consolidated by the M&E Officer to support ongoing learning and replication.

M&E Plan activities:

Project Inception Workshop

One national workshop will be held within three months of the commencement of project implementation with a variety of stakeholders from the target communities and the GoS. This inception workshop will ensure ownership by these stakeholders in the M&E process and achievement of project results and will be used to develop the first-year annual work plan. In addition, the inception workshop will emphasise the: i) project implementation modalities; ii) M&E arrangements; and iii) expected results of project activities. Following the inception workshop, a report will be produced for submission to the UNEP. This report will include: i) a work plan detailing the activities and progress indicators that will guide implementation during the first year of the proposed project across four quarters; ii) a detailed project budget for the first full year of implementation, in line with the Annual Work Plan; iii) detail on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project-related partners; iv) information on progress to

date on project establishment and start-up activities; and v) any changed external conditions that will potentially influence project implementation.

Field monitoring and community consultations
The ESS & Gender Officer and the M&E Officer of the PMU will undertake annual Field Monitoring Missions in the project districts. These will involve follow-up consultations with a variety of stakeholders — including women, youth, IDPs and indigenous peoples — in rural and urban communities in the Beledweyne, Jowhar and Afgooye Districts. The objectives of these consultations will be to capture public perceptions of the project's implementation and effectiveness and evaluate the effectiveness of awareness-raising interventions. For additional information on the proposed consultation methodology during implementation, refer to Part II, Section H: Consultative Process and Annex 2: Stakeholder Engagement Plan.

Baseline Study
In addition to the inception workshop report, a baseline study will be conducted to collect baseline data for the project's results framework indicators. This study will be coordinated by the project M&E officer, who will verify the baselines for each project indicator and adjust targets if necessary.

Progress reports
Progress reports will be generated by the PMU quarterly. These progress reports will: i) ensure continuous monitoring of project activities and the identification of corrective measures where challenges are identified, thereby enabling adaptive management of project interventions; and ii) assist with the verification of the project targets outlined in the Results Framework. In addition, these reports will include progress and financial reporting, project revisions, technical assistance and risk management information to assist with ongoing M&E.

Annual Performance Reports
The project team will prepare an Annual Performance Report (APR) to document progress towards the proposed project's Annual Work Plan and assess performance towards its intended outcomes through outputs and partnerships[223]. The APRs will be presented to the PSC and will include[224]: i) an overview of project performance over the reporting period, including project milestones; ii) current financial information; iii) procurement data, Gender Policy compliance; vii) separate performance ratings by the implementing entity (IE) and EE; viii) the status of project indicators; ix) lessons learnt; and x) the AF results tracker. This reporting will be done at: i) inception, where baseline-related information will be submitted, as well as planned targets at project/programme completion; ii) at mid-term; and iii) at project completion, when the final APR will serve as a project completion report.

Independent Results Verification Exercises (RVE)
The objective of the independent Results Verification Exercises (RVE) is to measure and verify on the ground actual project results as reported against the project's results framework indicators and targets using most appropriate means of verification including the ones contained in the project results framework to assess the achievement of project outputs and outcomes. The final independent results verification exercises will be used to inform the mid-term review and the Terminal Evaluation.

Mid-term Review (MTR)
UNEP will be responsible for managing an interim evaluation Mid-Term Review (MTR) at the mid-point of the project's duration. UNEP will oversee the process of hiring an external consultant to carry out the MTR, which will provide an assessment of project performance at the project's mid-point. This will be a formative exercise and will include analysing whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. The Project Steering Committee will participate in the MTR process and develop a management response to the review's recommendations along with an implementation plan.

Terminal Evaluation
An independent ex-post Terminal Evaluation (TE) will take place once the project has reached operational completion. and typically initiated after the project's operational completion. The TE will include the project

[223] The project completion report (PPR) should be submitted on a rolling basis one year after the start of project implementation and PPRs shall be submitted no later than two months after the end of the reporting year. The last PPR should be submitted six months after project completion. In addition to the final PPR, implementing entities are requested to prepare a project completion summary.
[224] Adaptation Fund. 2020. Guidance Document to complete Project Performance Report (PPR) For Projects funded by the Adaptation Fund. https://www.adaptation-fund.org/wp-content/uploads/2020/03/Guidance-Document-to-Complete-PPR-2.pdf. Accessed on: 7 May 2025.

completion survey and will be undertaken in accordance with UNEP's Evaluation Policy and AF guidelines[225]. The Evaluation Office of UNEP will be responsible for the TE, which is a summative evaluation, and will liaise with the UNEP Task Manager and relevant stakeholders throughout the process. An independent assessment of project performance against standard evaluation criteria — such as strategic relevance, effectiveness, efficiency and likelihood of impact and sustainability — will be made based on documentary evidence, stakeholder interviews and the results of independent results verification mission in the field. Each evaluation criterion will be rated using a six-point rating scheme and a weighted average will be determined to provide an overall performance rating for the project as a whole. Where there are any differences in ratings between the evaluation team and the Evaluation Office a final determination will be made by the Evaluation Office when the evaluation report is finalised.

Details on responsible parties, timeframes and M&E budgeting are given in Table 20.

Table 20. Proposed budget for Monitoring and Evaluation[226].

Type of M&E Activities	Responsible Parties	Time Frame	Reporting Format	Budget (US$)
Inception Workshop	Project Management Unit (PMU)	Within first 3 months of project commencement	Inception reports	44,606
Baseline Study Report	PMU	Within 4 months of project commencement	Study Report	11,425
Field monitoring missions	M&E Officer ESS & Gender Officer	At least once a year to each district	Field visit report	59,625
Annual and semi-annual Progress Reports	PMU drafts UNEP revised PSC is informed	Annually	Annual project progress and performance reports	18,250
Project Performance Workshops	PMU UNEP PSC	Every six months, in the PSC meetings	Workshop report	34,895
Independent result verification (in the field)	PMU contracts independent monitoring services.	At mid-point of the project cycle. Informs the mid-term evaluation	Verification report	21,050
Mid-term Evaluation	UNEP (findings presented to PSC)	At mid-point of the project cycle	Review Report	60,000
Independent result verification (in the field)	PMU contracts independent monitoring services.	Before the technical project completion. Informs the terminal evaluation.	Verification report	21,050
Terminal Evaluation	UNEP	End of project	Terminal evaluation report	60,000
			Total	**330,901**

[225] Adaptation Fund. 2015. Guidelines for project/programme final evaluations. https://www.adaptation-fund.org/wp-content/uploads/2015/01/Guidelines%20for%20Proj_Prog%20Final%20Evaluations%20final%20compressed.pdf

[226] This budget excludes specialist and consultant fees, travel expenses and free, prior and informed consent (FPIC) process costs. For a full breakdown of the M&E budget, refer to Part III, Section G: Budget.

E. Results framework

Table 21. Results framework for the proposed project according to AF indicators.

AF Core indicators	Baseline	Target
Number of beneficiaries	• Direct: 0 youths, 0 adult women and 0 adult men • Indirect: 0 youths, 0 adult women and 0 adult men	• Direct: 20,870 total beneficiaries, including 11,867 youths, 4,524 adult women and 4,479 adult men • Indirect: 1,351,193 total beneficiaries, including 766,049 youths, 294,330 adult women and 290,814 adult men
Assets Produced, Developed, Improved or Strengthened	• 0 assets produced • The capacity of government ministries to adapt to climate change, including disaster risk reduction and climate-resilience is not improved (1)	• 6 sand dams with V-shaped weirs, protected wells, solar pumping systems, elevated storage tanks and gravity distribution systems • 3 nurseries producing seeds and saplings for revegetation. • Demonstration of SUDs in urban areas • The capacity of government ministries to adapt to climate change, including disaster risk reduction and climate-resilience is mostly improved (4) because of training delivered under the proposed project
Natural Assets Protected or Rehabilitated	• 0 ha of natural assets protected or rehabilitated • Targeted urban areas are polluted extensively by poor waste management and drainage (1)	• 4,000 ha of agropastoral land will be rehabilitated or placed under climate-smart rangeland management • 130 ha of riverine areas revegetated • 200 ha with soil bunds constructed on slopes, reducing soil erosion • Urban areas in target districts, including the Shabelle River, are polluted less extensively with improved waste management and drainage (4)

Table 22. Results framework according to project components.

Project strategy	Project objective indicators	Baseline	Target
Component 1. Capacity building for the replication and upscaling of innovative nature-based solution (NbS) and hybrid technologies in Somalia			
Outcome 1. Strengthened institutional capacity to use innovative NbS/hybrid solutions to reduce flood and drought risks	• Percentage change in the capacity of ministry staff to implement NbS solutions	• Limited capacity to implement NbS and hybrid solutions	• 20% increase in capacity scores of ministry staff
Output 1.1. Capacity development programmes for flood and drought management, integrating innovative NbS and hybrid technologies, developed and delivered for institutional stakeholders.	• Number of government, state and district-level authorities trained through programmes developed and delivered • Number of undergraduate and Masters modules in Sustainable Water Resources Management and Climate Change Adaptation developed • Number of ministerial staff enrolled in Master of Arts programme in Sustainable Water Resources Management and Climate Change Adaptation	• Limited knowledge on flood and drought management, integrating NbS and hybrid technologies at national, state and district levels	• 20 (including at least five women) ministry representatives at the state level and 10 (including at least three women) at the national level, as well as NGO/CSO personnel trained, for a total of 30 representatives • One undergraduate and one Masters module in Sustainable Water Resources Management and Climate Change Adaptation developed • 12 ministerial staff members and climate adaptation NGO/CSO personnel (including at least 4 women) enrolled in Master of Arts programme in Sustainable Water Resources Management and Climate Change Adaptation
Output 1.2. Three Adaptation Management Plans in prioritised sub-catchment and floodplain area, with protocols for planning and implementing NbS and hybrid technologies for adaptation generated	• Number of Adaptation Management Plans developed and validated • Number of NbS and hybrid technology protocols embedded within each Adaptation Management Plans	• No Adaptation Management Plans with a focus on NbS and hybrid adaptation technologies for the Shabelle River Basin	• Three Adaptation Management Plans developed and validated • Four NbS and hybrid technology protocols developed
Output 1.3. Three Adaptation Management Plans in prioritised urban areas, with protocols for planning and implementing	• Number of Adaptation Management Plans developed and validated	• Although resilience plans outline climate risks for Somalia's main urban centres, planning	• Three Adaptation Management Plans developed and validated

Project strategy	Project objective indicators	Baseline	Target
urban green infrastructure technologies in flood-prone areas generated.	• Number of urban green infrastructure technology protocols embedded within each Adaptation Management Plan	instruments with a focus on green infrastructure adaptation technologies for the Shabelle River Basin remain limited, particularly in Afgooye.	• Two NbS and hybrid solutions protocols embedded within each Adaptation Management Plan
Output 1.4. Six local community committees established or capacitated and trained on participatory planning, implementation and monitoring of rural and urban Adaptation Management Plans.	• Number of local community committees established or capacitated and trained on participatory planning, implementation and monitoring of Adaptation Management Plans • Number of community training workshops on implementation of catchment and urban greening plans developed and delivered	• Limited community-based organisations with capacity for participatory planning, implementation and monitoring of Adaptation Management Plans, particularly in Jowhar	• Six local community committees established or capacitated • Two training workshops developed and delivered
Component 2. Protection of productive assets and livelihoods by innovative and proven adaptation NbS and hybrid technologies			
Outcome 2. Enhanced resilience of vulnerable rural and urban populations to droughts and floods through the adoption of innovative adaptation practices, tools and technologies	• Number of beneficiaries with access to improved water supply and flood protection	• Limited access to rural NbS benefits	• 20,087 community members with access to rural NbS benefits achieved through the project
Output 2.1. Six combined V-shaped weirs and sand dams built and equipped with solar pumps, elevated storage tanks, and gravity distribution systems in Beledweyne.	• Number of fully equipped sand dams and V-shaped weirs built and equipped with solar water supply systems	• Limited climate-resilient water retention and flow regulation infrastructure in Beledweyne	• Six sand dams and V-shaped weirs built and equipped with solar water supply systems
Output 2.2. Rangelands brought under climate smart management practices through community empowerment in the three target districts	• Hectares of rangelands brought under climate smart management practices	• Degraded rangelands with sparse vegetation	• At least 4,000 ha of rangelands brought under climate smart management practices
Output 2.3. Soil bunds constructed to reduce soil erosion and water run-off at the watershed level in Beledweyne	• Hectares of soil bunds constructed	• Limited erosion control interventions in the Shabelle River Basin	• 200 ha of soil bunds constructed
Output 2.4. River embankments restored and riverine areas revegetated or restored for the reinforcing of river embankments and retention and infiltration of flood water in Jowhar and Afgooye	• Number of embankment breakage sites restored or strengthened • Hectares of riverine areas revegetated	• Degraded riverine areas with sparse vegetation	• 20 breakage sites restored or strengthened • At least 130 ha of riverine areas revegetated
Output 2.5. Sustainable urban drainage systems (SUDs) improve urban drainage network.	• Number of households benefiting from SUDS	• No households benefiting from SUDS; drainage is inadequate	• At least 100 households benefiting from SUDS
Output 2.6. Waste management and its flood reduction benefits demonstrated in urban neighbourhoods.	• Number of waste management demonstration sites established • Number of waste management workshops developed and delivered per district	• Limited urban waste management	• 10 waste management demonstration plots established in each district • One waste management workshop developed and delivered per district
Component 3. Improved enabling environment for investment in the replication and upscaling of adaptation NbS and hybrid solutions in Somalia			
Outcome 3. Enhanced policies, incentives and guidelines to promote the use of proven innovative NbS measures and soil carbon trading	• Number of incentive guidelines, policy recommendations and carbon credit viability assessments validated by government stakeholders	• No incentive guidelines, policy recommendations for NbS, or carbon credit viability assessment available	• At least one incentive guideline and policy recommendation provided for each relevant policy and one carbon credit viability assessment
Output 3.1. Lessons learned and best practices are codified and disseminated to promote investment in NbS.	• Number of progress reports with lessons learned compiled and disseminated • Number of knowledge products.disseminated	• Limited replication and scaling of adaptation interventions through the dissemination of best practices and lessons learned in the Shabelle River Basin	• One progress report with lessons learned compiled and disseminated annually • One report on the performance and cost-effectiveness of NbS and hybrid solutions implemented in the project disseminated
Output 3.2. Recommendations for policy reforms and incentive packages are available at federal, member state, and local government levels to promote the development, replication and upscaling of NbS and hybrid measures.	• Number of relevant policies analysed and policy recommendations generated to promote NbS and hybrid adaptation	• Outdated policies with limited detail on NbS and hybrid adaptation measures	• At least three climate change, land planning and water management policies with recommendations generated to promote NbS and hybrid adaptation
Output 3.3: Gender-responsive public awareness programmes developed and implemented.	• Number of community awareness events, SMS and radio programmes disseminated	• Limited awareness on NbS and hybrid adaptation measures in the Shabelle River Basin	• Six community awareness, 500,000 SMS and bi-weekly radio programme broadcast across two years

F. Alignment with Adaptation Fund results framework

The EARNSS project aligns with the Adaptation Fund's Strategic Results Framework (AF SRF) by strengthening climate resilience through NbS and combined approaches in the three target districts of the Shabelle watershed: Beledweyne, Jowhar and Afgooye. It contributes to both of the Fund's impact-level results: i) increased adaptive capacity of communities to respond to the impacts of climate change; and ii) increased ecosystem resilience in response to climate change-induced stresses. At the outcome level, the project supports six of the Fund's eight outcomes, including 2, 3, 5, 6, 7 and 8. In particular, the Project addresses vulnerability to floods, droughts and associated climate risks in the Shabelle River basin, focusing on strengthening resilience, improving water security and developing institutional capacity. The project outcomes ensure alignment with the AF SRF by contributing to enhanced adaptive capacity, reduced exposure to climate risks and improved resilience of built and natural assets. Accordingly, Table 23 below indicates the alignment of the Project's objectives and outcomes with the Adaptation Fund's outcomes and outputs.

Table 23. Alignment of project outcomes with the Adaptation Fund Results Framework.

Project Objective(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US$)
Increase the resilience and adaptive capacity of rural and urban communities in the Shabelle River basin through the effective replication and upscaling of established NbS and hybrid measures.	2. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses 5. Increased ecosystem resilience in response to climate change and variability-induced stress 7. Improved policies and regulations that promote and enforce resilience measures 8. Innovation for effective, long-term adaptation to climate change accelerated, encouraged, and enabled to scale up	2. Institutions with strengthened capacity to understand and better address climate risks and resilience 5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress 7. Policies, strategies, and/or plans adopted, implemented, and/or enforced that integrate climate risk and resilience considerations 8. Innovations successfully scaled that demonstrate local innovation participation and/or local innovation benefit	5,000,000
Project Outcome(s)	**Fund Output**	**Fund Output Indicator**	**Grant Amount (US$)**
Outcome 1: Strengthened institutional capacity to use innovative NbS/hybrid solutions to reduce flood and drought risks	2.1. Strengthened capacity of institutions to understand and better address climate risks	2.1.1. Institutions supported to strengthen capacity to understand and address climate risks and resilience	432,387
Outcome 2: Enhanced resilience of vulnerable rural and urban populations to droughts and floods through the adoption of innovative adaptation practices, tools and technologies	5.1. Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1.1. Ecosystems and natural resources targeted by activities to improve protection, restoration, and/or management	2,879,733
Outcome 3: Enhanced policies, incentives and guidelines to promote the use of proven innovative NbS measures and soil carbon trading.	7.1. Improved integration of climate-resilience strategies into country development plans	7.1.1. Policies, strategies, and/or plans developed or adjusted to integrate climate risk considerations	566,451.1
Outcome 4: Effective monitoring and evaluation and knowledge management implemented	8.2. Innovations identified and piloted which build the adaptation innovation evidence-base and institutional capacity	8.2.1. Innovation-focused knowledge products disseminated and/or learning events facilitated that support and enable innovation capacity at a local, national, and/or regional level	330,901

G. Budget

Activity	Category code	Category	Budget line code	Total	Y1	Y2	Y3	Y4	Y5	Implementing party	Budget note
					in $US	in $US	in $US	in $US	in $US		
Component 1: Capacity building for the replication and upscaling of innovative nature-based solution (NbS) and hybrid technologies in Somalia											
Outcome 1: Strengthened institutional capacity to use innovative NbS/hybrid solutions to reduce flood and drought risks											
Output 1.1: Capacity development programmes for flood and drought management, integrating innovative NbS and hybrid technologies, developed and delivered for institutional stakeholders.											
Activity 1.1.1: Develop and implement a capacity-building programme for Federal, State, and District level institutions on NbS and hybrid solutions planning and implementation based on capacity assessment findings.	1200	Consultants	1201	24,300.00	16,650.00	7,650.00				Sadar	A1
	3300	Meetings/conferences	3301	1,380.00	630.00	750.00				Sadar	A2
	5200	Reporting costs	5201	6,780.00	1,800.00	4,980.00				Sadar	A3
	1600	Travel on official business	1601	6,900.00		6,900.00				Sadar	A4
Activity 1.1.2: Develop protocols for NbS and hybrid solutions applicable to the context of Somalia	1200	Consultants	1202	21,000.00	13,500.00	7,500.00				Sadar	A5
	5200	Reporting costs	5202	2,160.00	1,080.00	1,080.00				Sadar	A6
Activity 1.1.3: Develop university modules in collaboration with the Somali national universities to disseminate NbS knowledge captured in Activity 1.1.2.	1200	Consultants	1203	10,500.00	5,250.00	5,250.00				Sadar	A7
	3300	Meetings/conferences	3302	500.00	250.00	250.00				Sadar	A8
	5300	Sundry	5301	60,000.00			30,000.00	30,000.00		Sadar	A9
Output 1.2: Three Rural Water Management Plans, with protocols for planning and implementing NbS and hybrid technologies for adaptation generated											
Activity 1.2.1: Conduct technical assessments and cost-effectiveness analysis to guide the development of three Adaptation Management Plans in prioritised sub-catchment and floodplain areas incorporating NbS and hybrid solutions.	1200	Consultants	1204	40,250.00	20,125.00	20,125.00				Sadar	A10
	1200	Consultants	1205	36,000.00	18,000.00	18,000.00				UNEP	A11
	5300	Sundry	5302	48,235.00	48,235.00					Sadar	A12
	1600	Travel on official business	1602	2,000.00	1,000.00	1,000.00				Sadar	A13
Activity 1.2.2: Develop three Adaptation Management Plans in prioritized sub-catchment and floodplain areas to guide the planning and implementation of NbS and hybrid measures in target districts.	1200	Consultants	1206	9,000.00	4,500.00	4,500.00				Sadar	A14
	5200	Reporting costs	5203	1,770.00	885.00	885.00				Sadar	A15
Activity 1.2.3: Host a validation workshop to assess the plans developed under Activity 1.2.2 and validate priority sites for implementing NbS and hybrid solutions.	1200	Consultants	1207	7,500.00		7,500.00				Sadar	A16
	3300	Meetings/conferences	3303	3,300.00		3,300.00				Sadar	A17
	5200	Reporting costs	5204	3,480.00		3,480.00				Sadar	A18
	1600	Travel on official business	1603	1,029.00		1,029.00				Sadar	A19
Output 1.3: Three Urban Area Plans, with protocols for planning and implementing urban green infrastructure technologies in flood-prone areas generated											
Activity 1.3.1: Conduct technical assessments and cost-effectiveness analysis to guide the development of three Adaptation Management Plans in prioritised urban areas incorporating NbS and hybrid solutions..	1200	Consultants	1208	40,250.00	20,125.00	20,125.00				Sadar	A20
	1200	Consultants	1209	36,000.00	18,000.00	18,000.00				UNEP	A21
	5300	Sundry	5303	6,005.00	6,005.00					Sadar	A22
	1600	Travel on official business	1604	2,000.00	1,000.00	1,000.00				Sadar	A23
Activity 1.3.2: Develop three Adaptation Management Plans in prioritised urban areas for the implementation of green infrastructure and waste management in the target districts based on the gaps identified under Activity 1.1.1.	1200	Consultants	1210	7,500.00	3,750.00	3,750.00				Sadar	A24
	5200	Reporting costs	5205	720.00	360.00	360.00				Sadar	A25
Activity 1.3.3: Host a validation meeting to assess the plans developed under Activity 1.3.2 and confirm priority urban areas for urban green infrastructure and waste management.	1200	Consultants	1211	7,500.00		7,500.00				Sadar	A26
	3300	Meetings/conferences	3304	1,800.00		1,800.00				Sadar	A27
	5200	Reporting costs	5206	2,760.00		2,760.00				Sadar	A28
	1600	Travel on official business	1605	474.00		474.00				Sadar	A29
Output 1.4: Six local community committees established or capacitated, and trained on participatory planning, implementation and monitoring of Rural Water Management Plans and Urban Area Plans.											
Activity 1.4.1: Capacitate existing community committees and establish new committees to ensure capacity in each	1200	Consultants	1211	4,500.00		2,250.00	2,250.00			Sadar	A30
	3200	Group training	3201	8,400.00		4,200.00	4,200.00			Sadar	A31

district to consolidate their participation in the Adaptation Management Plans, ensuring the presence of one rural and one urban committee in each district.	3300	Meetings/conferences	3305	5,730.00		2,865.00	2,865.00			Sadar	A32
	1100	Project personnel	1101	7,500.00		3,750.00	3,750.00			Sadar	A33
	5200	Reporting costs	5207	180.00		90.00	90.00			Sadar	A34
	1600	Travel on official business	1606	4,501.00		2,250.50	2,250.50			Sadar	A35
Activity 1.4.2: Host training workshops in the three target districts for 12 community committees — including agropastoral and water-user groups — on the planning, implementation and monitoring of catchment and urban Adaptation Management Plans.	1200	Consultants	1212	4,200.00		2,100.00	2,100.00			Sadar	A36
	3200	Group training	3202	5,550.00		2,775.00	2,775.00			Sadar	A37
	1100	Project personnel	1102	3,000.00		1,500.00	1,500.00			Sadar	A38
	5200	Reporting costs	5208	855.00		427.50	427.50			Sadar	A39
	1600	Travel on official business	1607	1,378.00		689.00	689.00			Sadar	A40
Sum (Component 1)				**432,387.00**	**178,895.00**	**170,595.00**	**52,897.00**	**30,000.00**	**0.00**		
Component 2: Protection of productive assets and livelihoods by innovative and proven adaptation NbS and hybrid technologies											
Outcome 2: Enhanced resilience of vulnerable rural and urban populations to droughts and floods through the adoption of innovative adaptation practices, tools and technologies											
Output 2.1: Six combined V-shaped weirs and sand dams built and equipped with solar pumps, elevated storage tanks, and gravity distribution systems in Beledweyne.											
Activity 2.1.1: Construct six combined V-shaped weirs and sand dams in five wadi catchments in Beledweyne.	1200	Consultants	1213	59,100.00	33,700.00	3,700.00	21,700.00			Sadar	B1
	4200	Non-expendable materials	4201	20,000.00		20,000.00				Sadar	B2
	1100	Project personnel	1103	46,465.00		19,482.50	26,982.50			Sadar	B3
	5200	Reporting costs	5209	1,440.00		1,440.00				Sadar	B4
	2300	Sub-contracts for commercial purposes	2301	856,800.00		826,800.00	30,000.00			Sadar	B5
	1600	Travel on official business	1608	3,450.00		3,450.00				Sadar	B6
Activity 2.1.2: Install one protected well in the throwback of each combined V-shaped weir and sand dam equipped with solar pumping system, elevated water storage tank, and a gravity-based water distribution system for domestic use and livestock for each sand dam in Beledweyne.	1200	Consultants	1214	20,400.00			18,900.00	1,500.00		Sadar	B7
	3200	Group training	3203	925.00				925.00		Sadar	B8
	3300	Meetings/conferences	3306	250.00			125.00	125.00		Sadar	B9
	1100	Project personnel	1104	7,500.00			3,750.00	3,750.00		Sadar	B10
	5200	Reporting costs	5210	240.00			240.00			Sadar	B11
	2300	Sub-contracts for commercial purposes	2302	630,000.00			567,000.00	63,000.00		Sadar	B12
	1600	Travel on official business	1609	1,475.00			830.00	645.00		Sadar	B13
Output 2.2: Rangelands brought under climate smart management practices through community empowerment in the three target districts											
Activity 2.2.1: Construct and stock one small-scale nursery in each of the three target districts for growing young plants for enrichment planting under Activity 2.2.3.	1200	Consultants	1215	3,000.00			3,000.00			Sadar	B14
	4100	Expendable materials	4101	7,125.00		3,562.50	3,562.50			Sadar	B15
	3200	Group training	3204	5,550.00			5,550.00			Sadar	B16
	4200	Non-expendable materials	4202	4,700.00		2,350.00	2,350.00			Sadar	B17
	5100	Operation and maintenance of equipment	5101	10,800.00			10,800.00			Sadar	B18
	1100	Project personnel	1105	20,000.00		2,500.00	17,500.00			Sadar	B19
	5300	Sundry	5304	16,200.00			16,200.00			Sadar	B20
	1600	Travel on official business	1610	1,878.00			1,878.00			Sadar	B21
Activity 2.2.2: Based on the Adaptation Management Plans in prioritised sub-catchment and floodplain developed under Output 1.2, build the capacity of agro-pastoralist and pastoralist to sustainably manage 4,000 ha of rangeland and demonstrate climate-smart management practices incorporating traditional knowledge and innovative practices.	1200	Consultants	1216	18,000.00			13,500.00	4,500.00		Sadar	B22
	3200	Group training	3205	41,465.00			24,765.00	16,700.00		Sadar	B23
	1100	Project personnel	1106	24,500.00			24,500.00			Sadar	B24
	1600	Travel on official business	1611	8,153.80			7,214.80	939.00		Sadar	B25

Output 2.3: Soil bunds constructed to reduce soil erosion and water run-off at the watershed level in Beledweyne.											
Activity 2.3.1: Provide training to community committees and distribute digging tools, including spades and hoes, to communities.	3200	Group training	3206	3,255.00			3,255.00			Sadar	B26
	4200	Non-expendable materials	4203	10,500.00			10,500.00			Sadar	B27
	1100	Project personnel	1107	35,000.00			35,000.00			Sadar	B28
Activity 2.3.2: Implement soil bunds on selected slopes in the target districts.	3200	Group training	3207	37,970.00			37,970.00			Sadar	B29
	1100	Project personnel	1108	2,500.00			2,500.00			Sadar	B30
	1600	Travel on official business	1612	3,546.80			3,546.80			Sadar	B31
Output 2.4: River embankments restored and riverine areas revegetated or restored for the reinforcing of river embankments and retention and infiltration of flood water in Jowhar and Afgooye											
Activity 2.4.1: Restore embankments with gabions and low-flow pipes in areas where breakages are anthropogenic.	1200	Consultants	1217	30,000.00		30,000.00				Sadar	B32
	1100	Project personnel	1109	32,000.00		16,000.00	16,000.00			Sadar	B33
	5200	Reporting costs	5211	90.00		90.00				Sadar	B34
	2300	Sub-contracts for commercial purposes	2303	300,000.00			300,000.00			Sadar	B35
	1600	Travel on official business	1613	1,059.00		1,059.00				Sadar	B36
Activity 2.4.2: Revegetate river embankments, banks of irrigation canals in Jowhar and Afgooye, and vegetate the paleochannel north of Jowhar town.	1200	Consultants	1218	2,700.00			900.00	900.00	900.00	Sadar	B37
	3200	Group training	3208	61,150.00			22,260.00	32,440.00	6,450.00	Sadar	B38
	1100	Project personnel	1110	77,000.00			21,000.00	18,000.00	38,000.00	Sadar	B39
	1600	Travel on official business	1614	5,079.80			4,170.80	285.00	624.00	Sadar	B40
Output 2.5: Sustainable urban drainage systems (SUDs) improve urban drainage network.											
Activity 2.5.1: Establish strategically placed ditches, detention basins and retention ponds in Beledweyne town, Jowhar town and Afgooye town.	1200	Consultants	1219	31,000.00			17,500.00	7,500.00	6,000.00	Sadar	B41
	3200	Group training	3209	5,640.00			2,820.00	2,820.00		Sadar	B42
	1100	Project personnel	1111	34 500.00			17,250.00	17,250.00		Sadar	B43
	2300	Sub-contracts for commercial purposes	2304	333,110.00			171,555.00	161,555.00		Sadar	B44
	1600	Travel on official business	1615	6,202.80			3,490.40	2,712.40		Sadar	B45
Output 2.6: Waste management and its flood reduction benefits demonstrated in urban neighbourhoods.											
Activity 2.6.1: Host training workshops in community buildings in Beledweyne, Jowhar and Afgooye Towns to present the importance and methods of waste collection in reducing flood impacts to local district authorities responsible for urban management.	1200	Consultants	1220	1,500.00		1,500.00				Sadar	B46
	3200	Group training	3210	1,980.00		1,980.00				Sadar	B47
	4200	Non-expendable materials	4204	6,000.00		6,000.00				Sadar	B48
	1100	Project personnel	1112	12,500.00		12,500.00				Sadar	B49
	1600	Travel on official business	1616	4,485.80		4,485.80				Sadar	B50
Activity 2.6.2: Conduct community-led waste collection drives to demonstrate, and involve community members in waste collection and proper disposal —to reduce flood impacts based on the plans developed under Output 1.3 — in Beledweyne, Jowhar and Afgooye town.	3200	Group training	3211	9,387.00		2,346.75	2,346.75	2,346.75	2,346.75	Sadar	B51
	4200	Non-expendable materials	4205	14,700.00		3,675.00	3,675.00	3,675.00	3,675.00	Sadar	B52
	1100	Project personnel	1113.5	6,500.00		1,625.00	1,625.00	1,625.00	1,625.00	Sadar	B53
	5200	Reporting costs	5212	960.00		240.00	240.00	240.00	240.00	Sadar	B54
		Sum (Component 2)		**2,879,733.00**	**33,700.00**	**964,786.55**	**1,477,952.55**	**343,433.15**	**59,860.75**		
Component 3: Improved enabling environment for investment in the replication and upscaling of adaptation NbS and hybrid solutions in Somalia											
Outcome 3: Enhanced policies, incentives and guidelines to promote the use of proven innovative NbS measures and soil carbon trading.											
Output 3.1: Lessons learned and best practices are codified and disseminated to promote investment in NbS.											
Activity 3.1.1: Document lessons learned and best practices during project implementation.	1200	Consultants	1221	1,800.00	150.00	150.00			1,500.00	Sadar	C1
	3200	Group training	3212	12,300.00	2,460.00	2,460.00	2,460.00	2,460.00	2,460.00	Sadar	C2
	5200	Meetings/conferences	5213	225.00	112.50	112.50				Sadar	C3
	5200	Reporting costs	5213	1,800.00	240.00	240.00	240.00	240.00	840.00	Sadar	C4

	1600	Travel on official business	1617	4,779.00	955.80	955.80	955.80	955.80	955.80	Sadar	C5
Activity 3.1.2: Develop and publish reports on the performance and cost-effectiveness of NbS and hybrid solutions implemented in the project.	1200	Consultants	1222	123,750.00			108,750.00	15,000.00		UNEP	C6
	5200	Reporting costs	5214	46,630.00			23,315.00	23,315.00		UNEP	C7
Activity 3.1.3: Disseminate knowledge products developed under Activities 3.2.1 and 3.2.2 to government stakeholders to promote the integration of NbS and hybrid measures into planning instruments.	5200	Reporting costs	5215	1,860.00			930.00	930.00		Sadar	C8
	2300	Sub-contracts for commercial purposes	2305	4,500.00	2,250.00	2,250.00				Sadar	C9
Output 3.2: Recommendations for policy reforms and incentive packages are available at federal, member state, and local government levels to promote the development, replication and upscaling of NbS and hybrid measures.											
Activity 3.2.1: Review relevant climate change, land planning and water management policies across to identify gaps and opportunities for integrating NbS and hybrid measures.	1200	Consultants	1223	88,000.00	44,000.00	44,000.00				UNEP	C10
	5200	Reporting costs	5216	720.00	360.00	360.00				UNEP	C11
	1600	Travel on official business	1618	10,000.00	5,000.00	5,000.00				UNEP	C12
Activity 3.2.2: Identify and evaluate community incentive mechanisms for uptake of NbS in consultation with local communities and key stakeholders and develop proposed incentive mechanism guidelines.	1200	Consultants	1224	3,300.00		1,650.00	1,650.00			Sadar	C13
	3200	Group training	3213	1,800.00		900.00	900.00			Sadar	C14
	1600	Travel on official business	1619	3,460.00		1,730.00	1,730.00			Sadar	C15
	1200	Consultants	1225	14,000.00		7,000.00	7,000.00			UNEP	C16
	5200	Reporting costs	5217	2,640.00		1,320.00	1,320.00			UNEP	C17
Activity 3.2.3: Develop and present viability assessment and business case for the development of a soil carbon credit scheme in Somalia to the Federal Government.	1200	Consultants	1226	86,500.00			23,500.00	43,250.00	19,750.00	UNEP	C18
	3300	Meetings/conferences	3307	325.00				162.50	162.50	UNEP	C19
	5200	Reporting costs	5218	7,020.00			2,550.00	3,510.00	960.00	UNEP	C20
	1600	Travel on official business	1620	16,378.00			5,000.00	8,189.00	3,189.00	UNEP	C21
Activity 3.2.4: Present recommendations for climate change, land planning and water management policy reforms based on the policy review (Activity 3.2.1), incentive mechanisms (Activity 3.2.2) and feasibility assessments (Activity 3.2.3) to federal government stakeholders in a workshop.	1200	Consultants	1227	10,500.00				5,250.00	5,250.00	UNEP	C22
	3300	Meetings/conferences	3308	800.00				400.00	400.00	UNEP	C23
	5200	Reporting costs	5219	480.00				240.00	240.00	UNEP	C24
Output 3.3: Gender-responsive public awareness programmes developed and implemented.											
Activity 3.3.1: Develop tailored awareness-raising strategies using educational resources, events, and media, including SMS, radio programmes and paper media (such as flyers and posters).	1200	Consultants	1228	45,000.00				22 500.00	22 500.00	Sadar	C25
	3200	Group training	3214	21,290.00				10 645.00	10 645.00	Sadar	C26
	1100	Project personnel	1115	30,000.00				15 000.00	15 000.00	Sadar	C27
	5200	Reporting costs	5220	6,270.00				3 135.00	3 135.00	Sadar	C28
	5300	Sundry	5305	11,000.00				5 500.00	5 500.00	Sadar	C29
	1600	Travel on official business	1621	9,324.00				4 662.00	4 662.00	Sadar	C30
Sum (Component 3)				**566,451.00**	**55,528.30**	**68,128.30**	**180,300.80**	**165,344.30**	**97,149.30**		
Component 4: M&E and Knowledge Management											
Activity 4.4.1: Deliver training, implement and monitor the Stakeholder Engagement Plan, Gender Action Plan and Environmental and Social Management Framework.	5500	Evaluation	5501	68,550.00	61,710.00	1,710.00	1 710.00	1 710.00	1 710.00	Sadar	D1
	3200	Group training	3215	250.00	250.00					Sadar	D2
	3300	Meetings/conferences	3309	5,750.00	5,750.00					Sadar	D3
	1100	Project personnel	1116	42,276.00	40,276.00	500.00	500.00	500.00	500.00	Sadar	D4
	5200	Reporting costs	5221	4,080.00	1,200.00	1,440.00	1 440.00			Sadar	D5
	1600	Travel on official business	1622	13,000.00	13,000.00					Sadar	D6
Activity 4.4.2: Implement the Monitoring and Evaluation Plan and Knowledge Management Plan.	5500	Evaluation	5502	162,100.00			81 050.00		81 050.00	Sadar	D7
	1100	Project personnel	1117	30,000.00	6,000.00	6,000.00	6 000.00	6 000.00	6 000.00	Sadar	D8
	5200	Reporting costs	5222	4,895.00	979.00	979.00	979.00	979.00	979.00	Sadar	D9
Sum (Component 4)				**330,901.00**	**129,165.00**	**10,629.00**	**91,679.00**	**9,189.00**	**90,239.00**		
Sub-total (A)				**4,209,472.00**	**397,288.30**	**1,214,138.85**	**1,802,829.35**	**547,966.45**	**247,249.05**		

Project Execution costs (EE fee)								
Programme Manager	238,359.00	47,671.80	47,671.80	47,671.80	47,671.80	47,671.80	Sadar	E1
M&E Officer	-	-	-	-	-	-	Sadar	E2
Procurement Officer	-	-	-	-	-	-	Sadar	E3
Finance Officer	75,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	Sadar	E4
ESS & Gender Officer	-	-	-	-	-	-	Sadar	E5
Technical Staff	-	-	-	-	-	-	Sadar	E6
Office Rent	60,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	Sadar	E7
Travel budget	2,464.00	492.80	492.80	492.80	492.80	492.80	Sadar	E8
PSC annual meeting	5,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	Sadar	E9
Office equipment	8,000.00	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00	Sadar	E10
Annual audits	10,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	Sadar	E11
Sum (B)	**398,823.00**	**79,764.60**	**79,764.60**	**79,764.60**	**79,764.60**	**79,764.60**		
Sub-total (A+B)	**4,608,295.00**	**477,052.90**	**1,293,903.45**	**1,882,593.95**	**627,731.05**	**327,013.65**		
Implementing Entity fee	**391,705.00**	**78,341.00**	**78,341.00**	**78,341.00**	**78,341.00**	**78,341.00**		
Total	**5,000,000.00**	**555,393.90**	**1,372,244.45**	**1,960,934.95**	**706,072.05**	**405,354.65**		

The detailed budget notes are provided in Annex 2.

MIE fee use is described in the table below.

Description	% Allocation	Amount
Staff costs for project coordination and oversight/ Finance and budget support	60%	235,023.00
Project preparation, technical support, implementation support, evaluation oversight	40%	156,682.00
M&E advice and support		
Legal support		
Audit and inspection support		
Project completion summary report		
Total		**391,705.00**

H. Disbursement schedule

	Y1	Y2	Y3	Y4	Y5	Total
Scheduled date	**January 2026**	**January 2027**	**January 2028**	**January 2029**	**January 2030**	
Project funds (US$)	397,288.30	1,214,138.85	1,802,829.35	547,966.45	247,249.05	4,209,472.00
Execution cost (US$)	79,764.60	79,764.60	79,764.60	79,764.60	79,764.60	398,823.00
MIE fee (US$)	78,341.00	78,341.00	78,341.00	78,341.00	78,341.00	391,705.00
Total (US$)	**557,644.00**	**1,372,244.45**	**1,960,934.95**	**706,072.05**	**405,355.00**	**5,000,000.00**

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government

Mr. Abdullahi Godah Barre Principal Adviser Ministry of Environment & Climate Change Somalia	July 31, 2025

B. Implementing Entity

C. certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing Somalia National Adaptation Plan (NAP) 2025, National Climate Change Policy (2023) and National Transformation Plan (NTP) 2025–2029 and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 *Mirey Atallah* Implementing Entity Coordinator	
Date: 1st August 2025	Tel. and email: mirey.atallah@un,org
Project Contact Person: Jessica Troni	
Tel. And Email: 0795751072 jessica.troni@un.org	