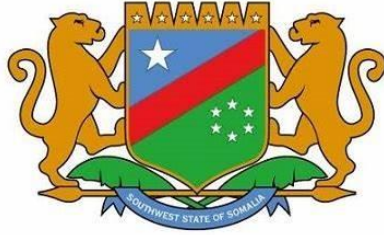




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SUPPORT FOR STRENGTHENING CLIMATE CHANGE ADAPTATION PLANNING FOR SOMALIA PROJECT

STATE-LEVEL CLIMATE VULNERABILITY ASSESSMENT (CVA) REPORT

SOUTH WEST FEDERAL STATE

**KAALO AID AND DEVELOPMENT (KAD)
ABDIYAREGEELAAYE ROAD, HALGAN VILLAGE,
GAROWE PUNTLAND SOMALIA**

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Executive Summary

South West state is comprised of the Bay, Bakool, and Lower Shabelle regions. The state is bordered to the north by Ethiopia, to the west by South West State, to the east by Hirshabelle, to the south by the Somali Sea and by Banaadir to the South East. SWS has a hot tropical climate, with high inter-annual rainfall variation and is subject to recurrent drought every 3-4 years, and more severe dry periods every 7-9 years. SWS has comparatively good seasonal precipitation with average annual rainfall ranging between 400-500mm. The weather is hot and calm between the monsoons (April and September). SWS has two distinguishable rainy seasons alternating with two marked dry seasons, the main - Gu - (April to June) and the second - Deyr - (October to December). The dry seasons are Xagaa - (July to September, littoral showers, but dry and cool) and Jilaal – (January to March, longer dry season).

Somalia has recently improved its Federal and State Level Climate Change Adaptation and Response policy, legislative and institutional frameworks. It has established critical institutions such as the Directorate of Environment and Climate Change (DECC); developed and adopted key policies such as the National Climate Change Policy, National Adaptation Framework, Initial National Communication 2018, Updated NDC 2021, and NDP 9 2020-2024. This Stakeholder Inclusive Vulnerability Risk Assessment (VRA) Report for South West state is a key step aimed at understanding the climate change vulnerabilities in the state; it highlights the vulnerabilities of different priority sectors, and informs planning, fund allocation and implementation of strategic Climate Change Adaptation interventions in South West state. The VRA assessed the sectoral risks and vulnerabilities to climate hazards (extreme temperatures, floods, drought, pest and disease, locust, tsunami, cyclone) in the State. The assessed sectors were water, health, agriculture and food security, livestock, biodiversity, coastal and marine are/resources, public works and education.

The VRA identified South West state's vulnerabilities as: (i) decreased crop production, (ii) loss of incomes and livelihoods, (iii) emergence of new and aggressive insects, pests and diseases, (iv) increased population displacements and loss of life. With the identified Climate Change Risks and Vulnerabilities in mind, VRA Report goes a step further and proposes Climate Change Adaptation Options for the South West state: (i) Enhance South West state's Early Warning Systems; (ii) build greater resilience to hydro and meteorological hazards; (iii) Strengthen sectoral climate change adaptation capacities through adoption of climate smart technologies and approaches; (v) Promote reforestation programmes thus restoring ecosystem health in South West state's rangelands; and (v) Support measures aim reducing gender inequalities focusing on key priority sectors such as agriculture, health, education, disaster management, etc.

This VRA report further identifies barriers to Climate Change Adaptation as: (i) lack of access to large areas of South West State due to insecurity and associated challenges thus limiting evaluation of climate risk vulnerabilities as well as the implementation of adaptation interventions; (ii) Poor institutional and enabling environment; (iii) low adaptive capacity and funding for Climate Change Adaptation; (iv) lack of consistent and updated state level data over time thus limiting effectiveness proposed strategies. As a stop gap measure, the VRA relied on data derived from the Coordinated Regional Downscaling Experiment (CORDEX) Africa experiment. The climate model projections are augmented with studies for East Africa and the Horn of Africa.

In line with the findings of vulnerability assessment, this CVA concludes that provision of vulnerable populations with climate-adaptive awareness, techniques and capacity building and strengthening of institutional and physical infrastructures will reduce the impacts of climate change across the South West state. This is because the low adaptive capacities to climate variability, which perpetuate vulnerabilities are replaced with sustainable alternatives and local climate-sensitive solutions. This assessment report, therefore, provides a window of opportunity for an outlook towards the future, and clearly the key take away message is that the potential climate-adaptive strategies and climate resilient infrastructures if not considered by the state, vulnerabilities in the priority sectors will be pushed to critical levels. Building on the study findings, several recommendations for the way forward are provided. These recommendations are organized around the key elements of enhancing adaptive capacities (inclusion of capacity building and support) for addressing key issues of climate hazards driving vulnerabilities across priority sectors; and overall way forward towards building a resilient South West State.

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List of Abbreviations

CCVA	Climate Change Vulnerabilities Assessments
FGD	Focus Group Discussion
FGS	Federal Government of Somalia
FMS	Federal Member States
GCF-NAP	Green Climate Fund National Adaptation Plan
INDC	Initial Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
MOECC	Ministry of Environment and Climate Change
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
Tour	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

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Definition of Terms

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Adaptive capacity: The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Climate: The average weather over a long period of time: it refers to the characteristic condition of the atmosphere deduced from repeated observations over a long period. More than a statistical average, climate is an aggregate of environmental conditions involving heat, moisture and motion. Climate studies must consider extremes in addition to means, trends, fluctuation, probabilities and their variations in time and space.

Climate change: Refers to a change in the climate system that is caused by significant changes in the concentration of greenhouse gases due to human activities, and which is in addition to the natural climate change that has been observed during a considerable period.

Climate change vulnerability: The degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with adverse impacts of climate change. Impact here refers to a specific change in a system caused by its exposure to climate change.

Sensitivity: Refers to whether the asset or system is located in an area experiencing direct effects of climate variables.

Mitigation: Refers to human interventions to prevent or slow down atmospheric GHG concentrations by limiting current or future emissions, and/or enhancing potential sinks for greenhouse gases.

Sensitivity: Refers to how the asset or system fares when exposed to a climate variable.

I: Introduction and Background

Overview

Climate change is a serious threat to socio-economic development in Somalia and South West State in particular. The effects of climate change are wide-reaching, touching nearly every aspect of Federal Government of Somalia's national development as well as the potential development of the South West State. The ordinary rural pastoral, and agro-pastoral communities in South West State are faced with the harsh reality of climate change through increasing frequency of extreme climate change events. South West State just like Somalia and the Horn of Africa in general are experiencing an increasing frequency and severity of back-to-back extreme climatic events: in Somalia it is either flooding or the country is facing a biting prolonged drought. The droughts have been increasing in frequency and intensity.

For the South West State, strategies aimed at effectively addressing the increasing threats posed by climate change and enhance mitigation and resilience measures require approaches that are targeted and that have specific objectives with clearly defined outcomes (they should be evaluated / monitored by quantifiable and verifiable indicators). Climate Change Vulnerabilities Assessments (CCVA) provide the necessary information needed for targeted approaches that drive the climate change adaptation process at country and state levels.

The need for CCVA is well documented at the global and national levels. The UNFCCC calls on the parties to the convention to take climate change considerations into account in their socio-political, economic, and environmental policies and actions. In doing this, the parties are expected to utilize evidence-based methods such as impact assessments with the aim of minimizing adverse effects of policies and actions on the economy and the environment thereby enhancing climate change mitigation and adaptation. The Paris Agreement requires parties to the Agreement to engage in adaptation planning processes and the implementation of actions including the development of relevant plans and policies; these may include the assessment of climate change impacts and vulnerability with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems.

Since 2012, Somalia has taken several important initiatives to adopt policies, regulations, and institutional reforms that are essential in the state-building process. Those linked to climate change related actions include the preparation of the 2013 National Adaptation Programme of Action (NAPA), the 2015 Initial Nationally Determined Contributions (INDC) Report to the UN Framework Convention on Climate Change (UNFCCC), draft 2021 National Climate Change Policy, the 2021 National Environment Policy, draft 2021 Environment Act, and the 2018 Initial National Communication (INC) to the UNFCCC. The Green Climate Fund National Adaptation Plan Project (GCF NAP) for Somalia consisted of the following outcomes: Strengthening institutional coordination and capacity for adaptation planning and implementation at the Federal and FMS Levels; Enhancing the technical, institutional, and managerial capacity for adaptation planning at the FMS level; Developing the capacities at the Federal Member State level by active engagement and contribution to technical and strategic analyses with expert and stakeholder input through a learning-by-doing approach; and the mainstreaming of climate change adaptation considerations into the investment planning processes.

Somalia and by extension South West State has been experiencing multiple crisis which include various forms of conflict that have driven a protracted humanitarian crisis. Somalia's humanitarian crisis is characterized by weak or insufficient governance structures, chronic food insecurity, massive population

displacements, inaccessibility of basic services among other issues. The situation is much tougher at the Federal Member States such as South West State owing to inadequate technical and governance capacities, lack of funding to deliver basic services as well as occupation of large parts of geographical territory by the Al Shabaab Militant Group.

Climate change has served to further increase destitution and vulnerability at the household, community, regional and federal levels. As such, the multiplicity of climate change impacts in Somalia and South West State calls for a coordinated and integrated approach to Climate Change Adaptation Planning and Implementation. To foster and support adaptation in South West State, the Federal Government of Somalia, and the UNDP, through the Ministry of Environment and Climate Change in the capacity of National Designated Authority (NDA) and KAALO Aid (KAD), are implementing the project **“Support for Strengthening Climate Change Adaptation Planning for Somalia”** funded by the Green Climate Fund (GCF). The project has supported the implementation of the NAP process by strengthening the capacities of academia, decision makers and communities to adapt to the varying climatic conditions, and by facilitating the exchange of knowledge and expertise.

Strategies to adapt to the present and future impacts of climate change by the South West State of Somalia will contribute to increased resilience of vulnerable communities in the State. Communities in the South West State whose livelihoods depend on climate-sensitive sectors, such as the agro-pastoralists, pastoralists, riverine and fishermen of in South West State will be the immediate beneficiaries. Thus, as part of the GCF-NAP project, a vulnerability assessment covering several sectors has been undertaken in the Southwest State of Somalia. The rationale for state level vulnerability assessment is based on the need for a comprehensive understanding of the key Climate Change risks and vulnerabilities for each Federal Member State. This will enable the South West State of Somalia to prioritize climate action.

Aims and Objectives of the Assessment.

The aim of the South West State VRA was to gain a comprehensive understanding South West State’s climate change risks and sectoral vulnerabilities which would in turn inform South West’s and Somalia’s Climate Change Adaptation planning process. The South West State’s VRA within the NAP Framework is informed by the need to: (i) Diagnose the magnitude of climate vulnerabilities in South West State as part of the National Adaptation Plan implementation process, and (ii) effectively coordinate federal level policies and legislation on climate change with FMS level climate change adaptation implementation efforts.

Besides, the findings of the vulnerability assessment provide an evidence basis / foundation upon which South West State’s climate change interventions and initiatives will be contextually designed thus enhancing their relevance and effectiveness. This means that evidence-based South West State’s Climate change initiatives have a higher likelihood of addressing contextually relevant community level vulnerabilities due to a better sectoral understanding of climate change risks and vulnerabilities. The findings of the South West State’s CCVRA will therefore: (i) inform participatory action planning processes that lead to community-driven and owned adaptation strategies and practices; (ii) enhance investments in climate smart livelihood upgrading processes; (iii) identify lower risk areas where climate-resilient alternative socio-economic activities could be established; and (iv) develop targeted early warning systems, training programs in environmental management and DRR, community capacity building,

alternative livelihood strategies, etc; (v) inform future advocacy planning; and (vi) select, prioritize, and design appropriate resilient development options in the South West State of Somalia.

The assessment was conceived and commissioned by the Ministry of Environment and Climate Change of the South West State of Somalia in collaboration with UNDP and KAALO to:

- (i) Identify the climate change risks, hazards and vulnerabilities in South West State state.
- (ii) Score / Measure the probability and impact of climatic hazards currently and in the future in the State.
- (iii) Identify the vulnerable sectors to climate change in the State and identify their respective adaptive capacities.
- (iv) Develop a climate change vulnerability and risk map of the State and develop a list of indicators for the vulnerability to climate change in the State.

Description of the Assessment Area

The assessment was conducted within the geographical boundaries of South West State. Due to access and funding constraints, data was collected from representative locations in **Baydhabo Sites** namely: Beeraha Carabta, Baydhabo livestock market, Dhanfaruur IDPs, Hassan muumin IDP, Warjinaay company, Abulla deerow school, Women organization, Baydhabo Local government, Human Right office and Gooyale IDP; and **Barawe District** namely (Barawe fisheries corporation, and Local government offices) in line with stakeholder consultations at the South West Ministry of Environment, the UNDP NAP Team and KAALO’s project implementation team.

1.1.1 Geographical profile

South West State is one of the Federal Member States in south-central Somalia and comprises the Bay, Bakool, and Lower Shabelle regions. The South West state is bordered to the north by Ethiopia, to the west by South West State, to the east by Hirshabelle, and to the south by the Somali Sea while it’s also bordered by Banaadir to the southeast. South West state has a total area of 98,863 km² (38,171 sq mi) (Figure 1). The official capital is the coastal city of Berawe in Lower Shabelle. However, Baidoa in the Bay region is now the provisional capital, with the state government based here due to security concerns. Table 1 below summarizes the main geographical features of South West State.

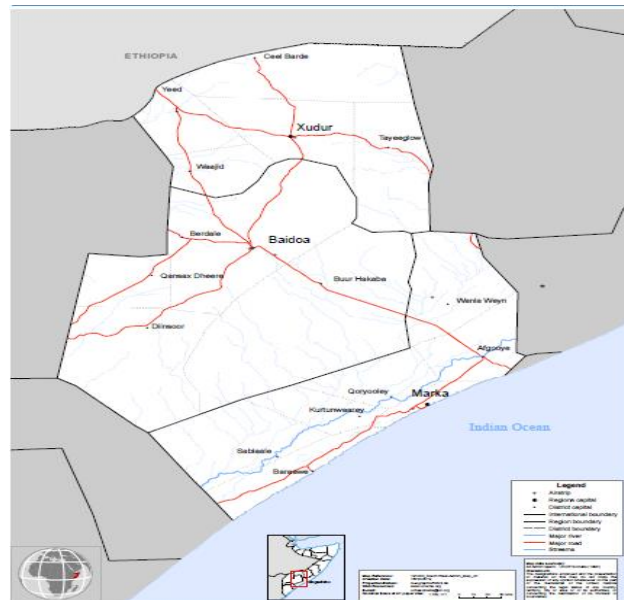


Figure 1: South West State administrative map

Table 1: Summary of the Geographical Information of South West (FAO-SWALIM, 2013)

Geographical features Details	
Location	South West state is comprised of the Bay, Bakool, and Lower Shabelle regions. The South West state is bordered to the north by Ethiopia, to the west by South West State, to the east by Hirshabelle, and to the south by the Somali Sea while it's also bordered by Banaadir to the southeast.
Land area	98,863 km ² (38,171 sq mi)
Rivers	SWS has one of the main perennial rivers of the Horn of Africa, flowing from the highlands of Ethiopia towards the Indian Ocean: Shabelle River (1 560 km of which are within Somalia, out of its almost 1 800 km total length).
Land form/soils	South West state is characterized by the following land features: Shabelle river valley that traverse the generally level, undulating morphology of the area; hilly topography in the middle of the region cut by wadis, and gently undulating wide plains toward the coast; and a coastal dune complex known as the Merka red dunes, which fringes the coast from beyond the Kenyan border, separating the narrow coastal belt from the Webi Shebeli alluvial plain (Carbone & Accordi, 2000). The region is dominated by low-lying alluvial plains, associated with the Shabelle river. These plains mainly have clayey soils, some of which have poor drainage and/or high content of salts. Some of the riverine areas are also liable to flooding.
Temperatures	Temperatures vary with the seasons, with the mean annual temperature ranging from 23°-30°C, with a maximum temperature of 41°C in March (Baardheere) and a minimum temperature of 24°C in July. In areas near the major rivers the relative humidity is high, ranging from about 70-80%, but further inland away from the rivers the air is much drier. Relative humidity is higher in the coastal areas, where it usually exceeds 87%.
Climate	South West state has a hot tropical climate, with little seasonal variation. In the first dry season (Xagaa) days are often cool and cloudy all over the region, with light showers in areas close to the coast. In the second dry season (Jilaal) days are hot, or very hot and dry. However, the hottest period coincides with the months of March and April. The region has a high inter-annual rainfall variation and is subject to recurrent drought every 3-4 years, and more severe dry periods every 7-9 years.
Rainfall	The state has low annual precipitation and four seasons: the rainy seasons are Gu' and Deyr, while the dry seasons are Hagaa and Jiilaal. SWS has comparatively good seasonal precipitation with average annual rainfall between 400-500mm. The weather is hot and calm between the monsoons (April and September). SWS has two distinguishable rainy seasons alternating with two marked dry seasons, the main - Gu - (April to June) and the second - Deyr - (October to December). The dry season are Xagaa - (July to September, littoral showers, but dry and cool) and Jilaal – (January to March, longer dry season).
Land Cover	Land cover consists mainly of natural vegetation. Other cover types include Crop fields (both rainfed and irrigated), Urban and Associated Areas (Settlement/Towns and Airport), Dunes and Bare lands and Natural Water bodies. The natural vegetation consists of riparian forest, bush lands and grasslands. Woody and herbaceous species include <i>Acacia brusseii</i> , <i>A. seyal</i> , <i>A. nilotica</i> , <i>A. tortilis</i> , <i>A. senegal</i> , <i>Chrysopogon auchieri</i> var. <i>quinqueplumis</i> , <i>Suaeda fruticosa</i> and <i>Salsola foetida</i> .
Land use	Land use in region consists mainly of grazing and wood collection for fuel and building material. Rangelands in the Shabelle catchments support livestock such as goats, sheep, cattle and camels. Livestock ownership is private, but grazing lands are communal, making it very difficult to regulate range use. Rangelands are utilised by herders using transhumance strategies (Shaie, 1997). Land cover associated with this land use includes forest, bushlands and grasslands (GTZ, 1990).

1.1.2 Climatic conditions

The climate in the South West state is tropical arid to dry and sub-humid, and is influenced by the north-easterly and south-easterly air flows of the Intertropical Convergence Zone (ITCZ) over the Ethiopian highlands (Oduori, et al 2007). North-easterly and south-easterly air masses meet in the Intertropical Front (ITF) and raise air upwards to produce rain. The annual movements of the ITCZ from north to south across Africa and back again, give rise to four different seasons in the State like rest of Somalia, comprising two distinguishable rainy seasons alternating with two marked dry seasons (FAO-SWLIM 2010), as follows:

- *Gu*: April to June, the main rainy season, like for all over Somalia
- *Xagaa*: July to September, littoral showers, but dry and cool in the hinterland
- *Deyr*: October to December, second rainy season, like for all over Somalia
- *Jilaal*: January to March, longer dry season, like for all over Somalia

Rainfall in the region is erratic, with a bimodal pattern except in the southern riverine areas close to the coast where some showers may occur even during the Xagaa. Rainfall varies considerably over the region, with the Gu delivering about 60% of total mean annual rainfall. Total mean annual rainfall ranges from 200 - 400 mm in areas bordering Ethiopia in Bakool region and 400 - 500 mm in the central Bay and northern part of Lower Shabelle Regions. Rainfall is characterized by intense, short rainstorms. The region has a high inter-annual rainfall variation and is subject to recurrent drought every 3-4 years, and more severe dry periods every 7-9 years.

Temperatures vary with the seasons and are influenced by altitude and by the strength of seasonal winds. In the first dry season (Xagaa) days are often cool and cloudy all over the region, with light showers in areas close to the coast. In the second dry season (Jilaal) days are hot, or very hot and dry. However, the hottest period coincides with the months of March and April. The annual average temperature is between 26°C and 28°C (Muchiri 2007). The average temperature difference between the hottest months (from December to March) and the coolest months (July and August) is only a few degrees, but it is somewhat greater in the inland areas than along the coast. In August, the temperature can drop to 16 °C (Luling 2002). The average maximum temperature per month is 35 °C. Relative humidity is higher in the coastal areas, where it usually exceeds 87%. Normally, the high relative humidity is compounded by higher temperatures.

The major winds experienced in the region are in response to the north and south seasonal movement of the Intertropical Convergence Zone, and in particular the Intertropical front. The winds in the South West state persistently blow from the northeast during Jilaal (December to February), when the weather is hot or very hot, and from the southwest during Xagaa, (June to August), when the weather is cool and cloudy.

The weather is hot and calm between the monsoons (part or whole of April and part or whole of September). In the Jilaal periods, prevailing winds are strong and blow in heavy dust storms from the Arabian Peninsula. Weaker winds generally occur during the intermonsoonal periods of April/May and October/November. Average wind speed varies between 2-6m per second.

The state has three broad climatic zones which are characterized by differences in patterns of rainfall:

- The coastal zone - with significant amount of rain occurring from July –August (Hagi rains) that lengthen the Gu season.
- The semi-arid zone – with two strongly defined rainy seasons and an additional light rainy season that may occur during July-August.

- The arid zone – with a lower annual rainfall and a dry period between July-August. The monsoon winds are the most important factor affecting the climate and the timing of the rainy periods. The south-west monsoon winds prevail during June, July and August. The north-east monsoon winds prevail during December, January and February.

1.1.3 Agri-ecological Zones (AEZs)

South West state just like the country can be divided into different agro-ecological zones, including Desert, Arid/Sahel, Semi-Arid and Highlands (of mid-altitude and high altitude)¹. Each of these zones is characterized by specific temperature and moisture regimes and, consequently, specific patterns of crop production and pastoral activities.

The state is considered more favored climatically as compared to the rest of Somalia, and vegetation rich. The region includes the main agricultural zones of Southern and Central Somalia, including the rainfed sorghum production areas of Bay and Bakool and the typically irrigated maize producing areas along the Shabelle River. Due to lack of state- wide data, this study provides an overview of areas in the riverine zones of Lower Shabelle basin which falls into four main Agro-Ecological Zones (AEZs) as reflected by and further explained by table 2 below.

The main vegetation types in the riverine zone include closed and open tree canopies on temporarily flooded areas, woodlands, open shrubs, herbaceous and savannah vegetation. Rain-fed farming occupies a large portion of the cultivated area and irrigated agriculture is confined to the flood plains adjacent to Lower Shabelle River (FAO-SWALIM, 2010).

¹ International Institute of Tropical Agriculture, “Agroecological Zones,” 2021. [Online]. Available: <https://csi.maps.arcgis.com/apps/MapSeries/index.html?appid=7539d22ab46147ce9888589aea4b1a11>.

Table 2: Agro-Ecological Zones of Shabelle River catchments, South West State

AEZ	Length of growing period in days		Soils		Land suitability <i>S1=Highly suitable; S2=Moderately suitable; S3=Marginally suitable; N=Not suitable</i>				Climate
	Gu	Deyr	Description	Classification	Rainfed agriculture	Irrigated Agriculture	Extensive Grazing	Forestry Plantations	
14G	<120	<45	<ul style="list-style-type: none"> poor drainage high salt content 	Gleysols, Stagnosols, Solonchaks	S2, S3	S2, S3	S2	S2	Moist semi-arid
14S	<120	<45	<ul style="list-style-type: none"> high salt content 	Solonetz, Solonchaks	S2, S3	N	S2	S2	
14V	<120	<45	<ul style="list-style-type: none"> Deep and clayey 	Vertisols	S2	S2, S3	S2	S1	
D	Dunes		<ul style="list-style-type: none"> Sandy 	Arenosols	N	N	S3/N	S3	Various

Length of Growing Period is the number of days that precipitations exceeds half potential evapotranspiration

1.1.4 Livelihood Profiles

South West state has four diverse livelihood systems: pastoralists, Agro-pastoralists, riverine farming, fishing by coastal communities, urban population including internally displaced people. The state, in particular the Lower Shabelle region, is one of the most fertile areas in Somalia with food production being the predominant means of making a living. Agriculture can be roughly divided into large estates and self-sufficient smallholdings. The agricultural area follows the Shabelle river. The area is characterized by an extensive irrigation system with canals and dams for watering the fields. In combination with rainfall, this system makes it possible to farm all year round. Maize, durra, sesame and bananas are among the crops grown (FAO-SWALIM 2010). Along the river there are intensive agricultural activities; maize, paddy rice, beans, sesame, vegetables are grown, along with perennial crops, mainly bananas and citrus plants, while the small dryland farmers or sporadically pastoralists cultivate sorghum or maize along the border between agricultural land and bushland, far away from the irrigated area or rarely in the bushland using shifting cultivation. Mangos and coconuts are also grown in some areas.

In the south-western part of the region and in the inland area bordering on the Bay region nomadic herding is predominant (WFP 2012). In the coastal area, including the port towns of Marka and Barawe, trade and fishing are the most common livelihoods (Lewis 2008).

Table 3: Main Livelihood Groups in South West State

Livelihood profiles	Main Sources of Food and Income		Primary livelihood asset
	Primary sources of income	Primary food sources	
Riverine livelihood	<ul style="list-style-type: none"> • sale of crops • agricultural labour • self-employment 	<ul style="list-style-type: none"> • Own crop and purchases 	<ul style="list-style-type: none"> • Agriculture land
Agropastoral Livelihoods (Agropastoral Maize/cattle)	<ul style="list-style-type: none"> • crop sale • agricultural labour • livestock and livestock product sales • self-employment • (fodder sales, firewood, construction materials, etc) 	<ul style="list-style-type: none"> • own production (maize) and purchases 	<ul style="list-style-type: none"> • Agricultural land
Agropastoral Livelihoods (Agropastoral Sorghum/cattle)	<ul style="list-style-type: none"> • crop sale • agricultural labour • livestock and livestock product sales • self-employment (fodder sales, firewood, construction materials, etc) 	<ul style="list-style-type: none"> • own production (Sorghum) and purchase 	<ul style="list-style-type: none"> • Agricultural land

II: Methodology

2.1 Overview

In undertaking the South West VRA, the Assessment team utilized primary and secondary data to gather key data and frame the VRA. From the beginning to the end of the VRA exercise, the consultant undertook extensive literature analysis and review for the purposes of framing the VRA study as well as for the collection of missing data and complementing the data collected during the field survey. In addition to the secondary data collected during literature review, climatological and weather databases were continuously utilized to draw analytical data and key metrics from which inference was made on climatic patterns over time. This formed the basis for identification of climate risk based on observed patterns and trends over the past 20 years as well as climate risk projections.

Socio-economic data was gleaned from secondary sources with a view to understanding the socio-economic characterization of South West and ideally identify areas of vulnerability within the socio-political and economic system of South West. Primary data was collected through the field exercise in form of KIIs and FGDs undertaken by South West's Ministry of Environment and KAALO with assistance and coordination support from UNDP NAP Team. The primary data was used to contextual identified vulnerabilities and risk factors with a focus on the 8 sectoral areas identified within Somalia's Climate Change Adaptation policy framework. Further, stakeholder input was important in framing the potential opportunities for adaptation strategies in the identified sectoral focus area. Quantitative data analysis approaches and in particular thematic analysis were utilized using the NVIVO Qualitative Data Analysis software.

The thematic focus area of the thematic analysis of the Qualitative Data focused on the following key themes: socio-economic factors and physical and environmental sensitivity factors which determine sensitivity / susceptibility of South West to the impacts / outcomes of climate change. The assessment followed the Inter-Governmental Panel on Climate Change (IPCC) 2014 climate risk and vulnerability assessment framework within the context of South West state. Following this approach, data was collected on pre-determined specific indicators that were designed to systematically analyze individual contributing factors of climate change vulnerability namely, adaptive capacity, sensitivity, and exposure.

2.1.1 Conceptualization of vulnerability

In line with Intergovernmental Panel on Climate Change (IPCC), AR4 conceptual framework, South West's Vulnerability to Climate Change defines the complex interaction of climate change effects and the susceptibility (risk exposure levels) of a South West's socio-economic and enviro-physical system to the impacts of Climate Change. The IPCC sought to elaborate and advance an approach for understanding vulnerability in its Fourth Assessment Report (AR4) as:

the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity|| (Intergovernmental Panel on Climate Change, 2007).

Within this perspective, South West State’s Vulnerability to Climate Change is a function of South West State’s climate change exposure, sensitivity, and adaptive capacity to cope with climate change effects, as illustrated below:

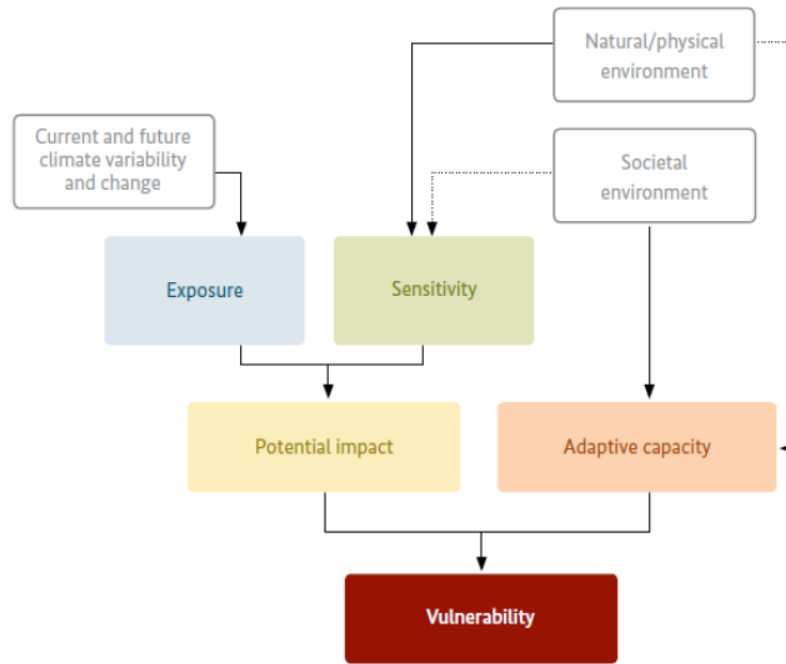


Figure 2 Vulnerability concept according to the IPCC AR4 (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 2014)

Within this conceptual framework:

- **South West’s Exposure** refers to changes in South West’s climatic parameters that might affect socio-ecological systems such as changes in the mean average, spatial and temporal distribution of temperature and precipitation over time.
- **South West’s Sensitivity** refers to the the susceptibility of South West’s physical and natural environment to climate change i.e. to its exposure as well as the ability of the system to withstand such exposure. For example, one of South West’s sensitivity factor is riverine agricultural land use systems which are highly susceptible to seasonal flooding. Riverine agricultural land use systems and communities are at a particularly high risk of exposure from increases in upstream rainfall which will result in beyond normal downstream flooding and crop loss including the potential for loss of life and displacements.
- **South West’s Potential Impact** is a factor of exposure and sensitivity. In the above example on sensitivity to flooding, increases in precipitation above the mean precipitation means that there is a high risk of crop and animal losses, as well as displacement and loss of human life coupled with AWD / Cholera due to extreme flooding events as has been witnessed from around Oct 2023 to Jan 2024 on account of El Nino and the Indian Ocean Dipole.
- **South West’s Adaptive Capacity** refers, to South West’s socio-political, economic and the physico-environmental system’s ability to adjust after exposure to increasing climate variability and

extremes, to moderate potential damages, to take advantage of opportunities, and / or to cope with the potential impacts.

2.2 The Assessment design and Approach

The vulnerability assessment was conducted within the geographical boundaries of South West state. The assessment methodology contextually developed for Somalia and is based on a common harmonized framework, indicators, methodology and guidelines which facilitate individual state-level vulnerability assessments in Somalia. This approach is considered appropriate to achieve comparable results among the FMS. The steps of assessment have been summarized in Annex 1.

2.2.1 Literature review

Climate change is a serious threat to socio-economic development globally and in Somalia. The effects of climate change are wide-reaching, touching nearly every aspect of Somali livelihood and impacting on vulnerable communities. To effectively address the threats posed by climate change and enhance resilience to its impacts, there needs to be a targeted approach with specific objectives and defined outcomes. Climate Change Vulnerabilities Assessments (CCVA) provide the necessary information needed for the targeted approaches. The need for CCVA is well documented at the global and national levels. The UNFCCC calls on the parties to the convention to take climate change considerations into account in their social, economic, and environmental policies and actions. In doing this, the parties are expected to employ appropriate methods such as impact assessments with the aim of minimizing adverse effects of policies and actions on the economy and the environment geared towards climate change mitigation and adaptation. The Paris Agreement requires parties to the Agreement to engage in adaptation planning processes and the implementation of actions including the development of relevant plans and policies; these may include the assessment of climate change impacts and vulnerability with a view to formulating nationally determined prioritized actions, taking into account vulnerable people, places and ecosystems.

Since 2012, Somalia has taken several important initiatives to adopt policies, regulations, and institutional reforms that are essential in the state-building process. Those linked to climate change related actions include the preparation of the 2013 National Adaptation Programme of Action (NAPA), the 2015 Initial Nationally Determined Contributions (INDC) Report to the UN Framework Convention on Climate Change (UNFCCC), draft 2021 National Climate Change Policy, the 2021 National Environment Policy, draft 2021 Environment Act, and the 2018 Initial National Communication (INC) to the UNFCCC. The Green Climate Fund National Adaptation Plan Project (GCF NAP) for Somalia consisted of the following outcomes: Strengthening institutional coordination and capacity for adaptation planning and implementation at the federal level; Enhancing the technical, institutional, and managerial capacity for adaptation planning at the state level; Developing the capacities at the Federal State level by active engagement and contribution to technical and strategic analyses with expert and stakeholder input through a learning-by-doing approach; and the mainstreaming of climate change adaptation considerations into the investment planning processes.

The multiplicity of challenges associated climate impacts and conflicts in a diverse country such as Somalia calls for a coordinated and integrated approach to adaptation planning and implementation at the federal level. To foster and support adaptation in the Federal Member States, the Federal Government of Somalia, and the UNDP, through the Ministry of Environment and Climate Change in the capacity of National Designated Authority (NDA) and KAAALO Aid (KAD), have implemented a project called Support for Strengthening Climate Change Adaptation Planning for Somalia funded by Green Climate Fund (GCF). The

project has supported the implementation of the NAP process by strengthening the capacities of academia, decision makers and communities to adapt to the varying climatic conditions, and by facilitating the exchange of knowledge and expertise. Adapting to the present and future impacts of climate change is crucial to secure little gains and increase the resilience of vulnerable communities, in particular for those whose livelihoods depend on climate-sensitive sectors, such as agriculture, nomadic pastoralism, water, energy, tourism, wildlife, and health.

2.2.2 Consultation with stakeholders.

Stakeholder engagement has been ensured through courtesy visits, KII sessions and focus group discussions, organized at crucial steps of the process, at both community and state levels across South West State (SWS). This fieldwork began with a consultation workshop on vulnerability assessment in SWS conducted in Baydhabo, Somalia on the 23rd December 2023. The workshop was organized by the Ministry of Environment, Resilience and Climate Change of South West in collaboration with the KAALO and UNDP-NAP team. The meeting brought together 30 (23 male, 7 female) experts was aimed at validating the different sectors for which climate vulnerability assessment was targeted. Deliberations with ministry officials during the meeting prioritized the following key sectors for the assessment in South West State: Water; Health; Agriculture; and food security; Livestock; Biodiversity; Coastal zone; Public works; Disaster Risk Reduction; and Gender and Education. Participants included Deputy Minister, Ministry of Environment, Resilience and Climate Change; NAP coordinator; and two MECC staffs. Other workshop participants were drawn from different sectors across South West State which include:

- Ministry of Environment, Range Land and Climate Change.
- Ministry of Disaster Management
- Ministry of Livestock, forestry and Rangeland
- Ministry of Disaster Management
- Ministry of Fisheries and Marine Resources
- Ministry of Women and Human Rights Development
- Ministry of Public Work
- Ministry of Health
- Ministry of Education
- Civil Society Organizations
- Academia



Figure 3: Enumerator Training Workshop during the South West State of Somalia's CCVRA

2.2.3 Data collection and Analysis

Data was collected from 24th -30th December 2023 through a structured questionnaire designed in Kobo Collect. The study used a combination of primary and secondary methods of data collection. Three methods of primary data collection were used. These were key informant interviews, focus group discussions and direct observations. Primary data collection generated qualitative data, as the focus was on capturing the narratives on the perceptions of changes in climate stress and the corresponding behavioral responses by various actors and stakeholders across the State. In addition, where possible and appropriate, secondary methods of data collection especially desk review were employed to generate secondary data.

The vulnerability assessment included mixed components (quantitative and qualitative):

- **A quantitative survey** was conducted using structured tools to assess how climate variability and change are experienced at the state level—directly/indirectly through its impact on the prioritized sectors. Ten (10) priority sectors were selected; and 37 respondents representing line ministries and CSOs were interviewed across South West State. The **key informant interviews** were conducted at the state level with state government, CSOs and

community representatives. The goal was to understand the local context.



Figure 4: Key informant interview with a female ministry staff in South West State

each priority sector, two FGDs were conducted separately, one with men and one with women, ensuring stakeholders engagement and generating a total of 13 FGDs with between 8 -10 participants per FGD.

- Qualitative focus group discussions (FGDs)** were conducted to discuss several topics on climate change vulnerability and determine more detailed perceptions of changes in climate stress and the corresponding behavioral responses. The outcome of the qualitative focus group sessions helps in the identification of general issues and needs, understanding of the participants' perceptions on climate change, current and potential future climate-related risks, and identification of capacities, local and indigenous knowledge and assets that can be enhanced to strengthen resilience. For
- Direct observation** - The relatively stable and peaceful conditions that characterize South West State allowed the study team to travel and physically observe some of the targeted communities in the region. The study team was able to visit IDP camps and peri-urban settlements including government offices. A more in-depth understanding of climate change context in South West was gained by direct observation as a research technique. Observable data included the flooding and displacement in IDP settlements.
- Validation workshop** - The validation workshop on Climate Vulnerability Assessment Report took place on the 24th



Figure 5: Focus group discussion (men and women) in South West State

Figure 6: Livestock keeping drought prone areas in South



West State

February 2024, in Baidoa, South West State of Somalia. The objective of the workshop was to deliberate on the draft findings and

validate the SWS CVA Report and discuss effective approach towards prioritization of identified adaptation options and its implementation.

The workshop was well attended with key ministry officials, deputy ministers, directors and technical staffs, SWS NAP coordinator, the CSOs and UNDP representative participating. The workshop saw the stakeholders were taken through the SWS CVA Report chapter by chapter guided by the Consultant. The workshop participants were then organised into distinct thematic groups for extensive, meaningful, and consensus building on the findings of sectorial analysis.

In the follow up group presentations upon completion of detailed review of the CVA Report and consultations on findings from sectoral analysis:

- The workshop participants agreed with the contents and analysis findings of the draft CVA Report as detailed in the document and provided addition information to address two key sectors - livestock and agriculture.
- Workshop participants recognized comprehensive analysis of sector

specific vulnerabilities and adaptation potentials in addition calling for more efforts towards its utilisation and awareness creation among climate change actors in SWS.

During the workshop, the line ministries and all other stakeholders from across South West State approved the CVA Report and agreed on its findings proving additional recommendations on actionable adaptation measures and projects particularly for addressing drought and floods as impacts the key sectors of South West State.



Figure 7: Plenary session during validation workshop in South West State

Table 4: Distribution of Stakeholders contacted in South West State

Mapped stakeholders and sites	Focus Group Discussions	Key Informant Interviews
<p>Baydhabo Sites</p> <ol style="list-style-type: none"> 1. All the respective Ministries of South West State 2. Beeraha Carabta 3. Baydhabo livestock market 4. Dhanfaruur IDPs 5. Hassan muumin IDP 6. Warjinaay company 7. Abulla deerow school 8. women organization 	<ul style="list-style-type: none"> ▪ Biodiversity (2 FGDs) ▪ Agriculture (2 FDG) ▪ Water (3 FGDs) ▪ Health (3 FGDs) ▪ Livestock (2 FGDs) ▪ Coastal Communities (2 FGDs) ▪ DRR (2 FDGs) 	<ul style="list-style-type: none"> • Biodiversity (3 KIIs) • Agriculture (3 KIIs) • Water (5 KIIs) • Health Centres (5 KIIs) • Livestock (2 KIIs) • Coastal Communities (2 KIIs) • Gender and Human Rights (3 KIIs) • Education (6 KIIs)

<ul style="list-style-type: none"> 9. Baydhabo Local government 10. Human Right office 11. Gooyale IDP <p>Barawe District</p> <ul style="list-style-type: none"> 1. Barawe fisheries corporation 2. Local government 	<ul style="list-style-type: none"> ▪ 	<ul style="list-style-type: none"> • Public work (5 KIIs) • DRR (3 KIIs)
	16 FGDs	37 KIIs

A team of ten (10) enumerators – all locals with extensive knowledge of South West state undertook the data collection and stakeholder engagement under the overall supervision of staff from the Ministry of Climate Environment and Climate in South West state, UNDP -NAP SP, NAP regional Coordinator SWS, and KAAALO’s Project Manager.

The data collected through surveys was uploaded onto the Kobo Collect server, acting as a repository, secured by a two-way authentication passcode. The data was downloaded in Microsoft Excel and analyzed through SPSS using descriptive statistical techniques. Qualitative data analysis involved identification, examination and interpretations of patterns and themes in the data.

Further, different approaches were used to analyze data necessitated by the use of several analytical tools in the study. These analyses carried out are presented below:

- **Analysis of the vulnerability of the physical environment to climate risks:** The analysis of the vulnerability of the physical environment of member states to climate risk based on methodological Guide for Mapping Vulnerability to Climate Risks proposed by the Sahel and Sahara Observatory (OSS, 2013). This method focuses on a combination of a series of vulnerability factors with particular attention on topography and land use. This choice of approach is justified by its suitability or adaption to the Sahelian zones but also to analyse the risks associated with climate change, as well as identifies the most vulnerable zones with a view to informed decision-makers on issues related to sustainable land management and the risks associated with climate change.
- **Analysis of climate rationale:** The scope of the analysis covers past and future climate variability/projections, climate vulnerability impacts; climate vulnerability; and identification, assessment, and prioritization of adaptation options/strategies. The study examined a number of issues key among them the behaviour of precipitation and temperature; climate risk for each sector identified; and identification and map out of relevant adaptation options or strategies used by the local population across sectors to cope with different climate risks in each of the four member states.

2.3 Methodological and Technical Limitations of the Vulnerability Assessment

2.3.1 Filed level data collection challenges

Challenges during the data collection include but not limited:

- Limited knowledge and understanding of climate change concept among the targeted local communities. This was mitigated through provision of explanations of key concepts before interviews and FGDs.
- High expectations for registration for support among KII and FGD participants. The field mission team emphasized the objective of the vulnerability assessment to help bring about common understanding.
- Limited participation of communities in FGDs and KIIs session owing to high mobility of the community in search of daily livelihoods.
- Insecurity in Baydhabo limiting data collection exercise within a radius of 5 km. In Barawe district, FDGs and KIIs field mission team were unable to conduct the sessions openly with participants requesting to remain unanimous citing their own securities.
- Lack of state specific long term and historical trend data on climate indicators as well as lack of state level information on climate change initiatives & dynamics.

2.3.2 Data gaps and/or unavailability

In this assessment, significant data gaps and/or data quality was a major challenge. As a result of missing / unavailable data, some analysis levels may be incomplete. In some cases, (for e.g. precipitation data), data was available at the national level which was then up scaled to the state level. In some instances findings have been generalized based on data availability and proxies.

Future maps were not produced as predicted sensitivity and adaptive capacity data is not available for South West State. This assessment should be seen as an attempt of systematically unraveling Somalia's vulnerability to climate change.

2.3.3 Projections of climate change

Due to observed data gaps and or/quality issues for climate change projection – for the climate variables of minimum and maximum temperatures and precipitation – for state level, this assessment relied on projections derived from the Coordinated Regional Downscaling Experiment (CORDEX) Africa experiment². The projections are augmented with studies for East Africa and the Horn of Africa.

It proved to be difficult to find data sets that indicate projections of climate impacts into the future for South West State. In general, some data are available on climatic exposure components, such as rainfall and temperature data.

² The CORDEX Africa experiment consists of multiple climate models using different Representative Concentration Pathways (RCPs); the RCPs broadly correspond with different emission pathways that could result in various degrees of mean global warming.

III: Results of the State-level Vulnerability Assessment

3.1 Climate Change Vulnerability and Risks Factors in South West State

Climate change vulnerability is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with adverse impacts of climate change (IPCC, 2010). South West state's VRA identified South West state's Climate Change Risk increases in the mean average temperatures over time which are manifested in terms of increasing aridity and desertification through increasing frequency of prolonged drought cycle. The VRA exercise further identified increase in seasonal precipitation at a point in time; manifested by sudden onset and unpredictable flooding events, tropical storms and cyclones as the second Climate Change Risk that South West state faces.

According to Reisinger et al, (2020), vulnerability to climate change risk will, results from dynamic interactions between climate-related hazards, exposure of a system to these hazards and the adaptive capacity of the human or ecological systems to the identified hazards / risks. For South West state its vulnerability is deeply tied to its socio-political, economic and ecological system. This means that while the identified climate related risks are the vulnerability triggers, systemic weaknesses / factors drive South West state's vulnerability. The VRA consequently identifies and increases understanding of the socio-political, economic and ecological drivers of its vulnerability to climate change. This assessment represents an important step in initiating South West state's climate change adaptation discourse and strategies. This section thus delves into the drivers of climate change vulnerability in South West state.

3.1.1 Drivers of South West State's Climate Change Vulnerability and Adaptive Capacity

Vulnerability and adaptive capacity are a function of the socio-political, economic and ecosystems factors. This section analyses the drivers of South West state's Climate Change Vulnerability and Adaptive Capacity. The section reviews the socio-political, economic and ecosystem characteristics and contextualizes them to South West state's vulnerability / adaptive capacity to climate change. These factors are discussed in the section below:

- **Political situation:** South West state is among the administrative zones that faces the most challenges in the South Central Somalia, where Al Shabaab (the militant organization) has its stronghold. This essentially means that most parts of the State are inaccessible and it is difficult / impossible to empower communities towards climate change awareness and adaptation measures. At the same time, the communities are more vulnerable as they do not have access to external resources and assistance to respond to climate change related disasters. Finally, the inaccessibility means that neither the Federal nor the Baidoa based government can implement government policy and directive in a large portion of the South West State's territory.

Natural vulnerabilities

This assessment revealed that South West State, under current climate conditions, is exposed to a multitude of natural hazards. Discussions with climate change stakeholders (experts in the line ministries, practitioners, and representatives from community groups, CSOs) identified floods, droughts, infestation

of invasive species (*Prosopis juliflora*), locust, cyclone / tropical storm surges as some of the climatic hazard that have occurred over the last 10 years in the region (Table 7).

- **Droughts:** Experts and community groups consulted in this study observed that drought is one of the biggest problems facing South West state which is recognized as the cereal basket of Somalia. Droughts usually occur every two to three years in the Dayr and every eight to ten years in both the Dayr and the Gu (FAO, 2006). Eight major droughts in the last four decades have severely affected crop and livestock production in South West, like in Somalia. The onset of drought in recent years has had a damaging effect on natural resources, notably by drying up water sources, increasing temperatures, disrupting farming practices and reducing agricultural productivity. According to the Food Security and Nutrition Analysis Unit (FSNAU) and the Famine Early Warning Systems Network (FEWS NET), the 2021 “Deyr” cereal output forecast indicated a drop of 50 to 70 percent below the 10-year average. Maize and sorghum crop production was 15-25 percent below the 10-year average in the 2020 Gu and 2020 Deyr seasons and 50 percent below average in the 2021 Gu season (FEWS NET/FSNAU).
- **Floods:** Flooding is the second most common natural disaster in South West state that causes greater levels of human vulnerability. Floods have a detrimental effect on people’s lives and livelihoods. It can result in the scarcity of drinking water; damage to sanitation systems; impact health facilities and services; loss of physical infrastructure such as houses, roads, and other facilities. For instance, the extreme rains in 2019 were very disruptive, and led to widespread floods, resulting in the displacement of people and causing crop and livestock losses that affected large population in the Southern region. These exceptionally moist conditions led to a massive locust outbreak that was the worst in 25 years in Somalia. The incidence of flooding in state is expected to increase in the future. As a result, the impact of floods in agriculture is expected to exacerbate human vulnerabilities. For example, in Lower Shabelle region in South West State, agriculture is the key source of employment and income. Both key informants and focus groups discussions revealed that human vulnerability is viewed to be high as, floods cause unemployment and/or underemployment. Besides, during the flood period, a number of vector and water borne diseases increase, resulting in morbidity and mortality among the affected population in South West State.
- **Locust outbreak:** The 2020 desert locust crisis has also challenged the people. It has had a big impact on food security, triggering further displacement among already vulnerable populations especially women and children. According to FAO Emergency Division, Crisis, desert locust crisis, (2020), the massive locusts could potentially cause large-scale crop damage and plunge the country into greater distress, pushing up malnutrition rates.

Projected Climate Impacts Based on Existing Assessments

Analysis of both KII and FGD data collected shown that climate change is projected to increase the state’s exposure to a multitude of natural hazards. The main indicator used to determine the exposure of the assessment area to the impacts of climate change is occurrence of natural hazards and vulnerability.

Table 5: Community perceptions and experiences on natural disasters

Focus Group Discussion Findings			
(based on local communities' observations of climate change impacts)			
Natural hazard	Occurrence in last 5-10 years	Likelihood of future occurrence (next 10 years)	Impact of climatic hazards
Floods	Yes	Likely	Severe
Droughts	Yes	Likely	Severe
Crops pest and diseases	Yes	Likely	Severe
Locusts infestation	Yes	Likely	Severe
Extreme temperatures	Yes	Likely	Severe
Infestation of invasive species (Prosopis juliflora)	Yes	Likely	Severe

Further, these observations by the community climate actors are corroborated by existing studies, indicating that these natural events are expected to become more frequent and severe in the coming decades, as a result of human-induced global warming.

- Seasonal rainfall patterns may become more variable and erratic aggravating severe drought over the study area (Lyon & DeWitt, 2012; Connolly-Boutin & Smit, 2016).
- The intensity of both tropical cyclones and storm surges are likely to increase with rising sea surface temperatures and sea level. The increases in extreme weather and sea conditions are linked to rises in sea surface temperature. A warmer ocean intensifies cyclone activity and heightens storm surges. The destructive impact will generally be greater when storm surges are accompanied by strong winds and make landfall during high tides (Brecht et al. 2012). Somalia, particularly the northern part experienced very severe tropical cyclone in November 2020 when Gati made landfall in the region becoming the first hurricane-equivalent storm to hit the Horn of Africa³.

3.1.2 Current and Future Trends of Climatic Variables in South West State

This assessment provides an insight of climate change projections for South West State. The assessment focuses specifically on temperature and rainfall (precipitation) and their associated impacts. Temperature

³ <https://earthobservatory.nasa.gov/images/147576/gati-makes-historic-landfall-in-somalia>

and Precipitation, and their combination, are the two defining parameters for the growth of natural resources including agriculture produce and rangeland vegetation, sustaining livelihoods of agro-pastoral communities in South West state. This assessment, therefore, tries to bridge current information gaps on the subject with the aim of assisting policy planners to address emerging impacts of climate change.

▪ **Current and Future Trends of Temperature:**

Lack of up to date state specific climatic data hampered our analysis. Studies conducted in the region found that in the first dry season (Xagaa) days are often cool and cloudy all over the region, with light showers in areas close to the coast. In the second dry season (Jilaal) days are hot, or very hot and dry. However, the hottest period coincides with the months of March and April. The annual average temperature is between 26°C and 28°C (Muchiri 2007). The average temperature difference between the hottest months (from December to March) and the coolest months (July and August) is only a few degrees, but it is somewhat greater in the inland areas than along the coast. In August, the temperature can drop to 16 °C (Luling 2002). The average maximum temperature per month is 35 °C.

The hottest period is in March and April, temperatures vary with the seasons, with the mean annual temperature ranging from 23°-30°C, a maximum temperature of 41°C in March and a minimum temperature of 24°C in July.

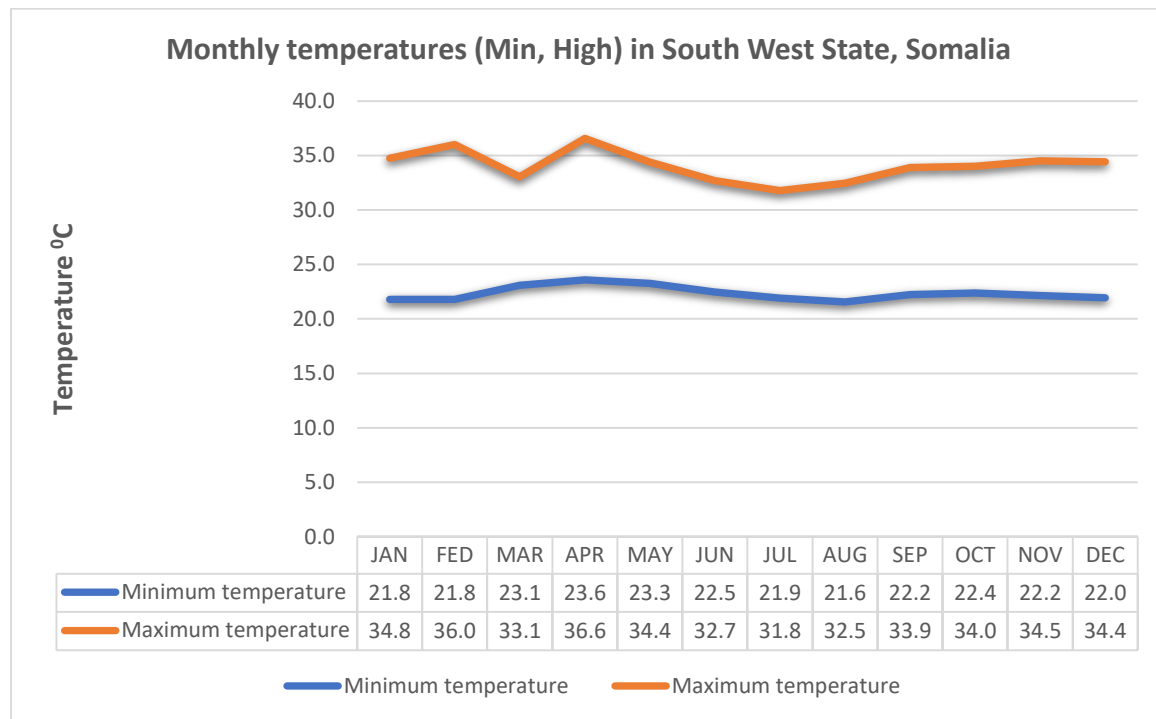


Figure 8: Monthly temperatures (Min, High) in South West State, Somalia

Somalia in general has an arid to semi-arid climate, with substantial localized differences throughout the country and areas with tropical arid to dry and sub-humid in the river basins. Temperatures across states vary with the seasons and are influenced by altitude and by the strength of seasonal winds. However,

analysis of climatic variables at state levels is hampered greatly by lack of up-to-date state specific data bringing about overreliance on national data.

Future projections for two time periods: the short term (2021–2040) and the midterm (2041-2060) show a likely increase in temperatures. The CORDEX Africa multi-model median projections indicate increases in maximum and minimum temperatures are apparent in all seasons over the short and medium terms under both RCP4.5 and RCP8 when compared to 1986–2005 observations. The magnitude of warming at night (TN) is greater than that of daytime (TX) warming.

The CORDEX Africa multi-model median projections indicate that the number of extreme heat days in which maximum daytime temperatures exceed 40°C is likely to increase in South West state. Each year, by the 2030s, the region could experience between 4 and 30 days of temperatures exceeding this threshold, predominantly during February-April (World Bank, 2023; Gutierrez, et al., 2021).

Table 6: Projected Changes in Multi-Model Median Maximum (TX) and Minimum (TN) temperatures indifferent seasons over short (2021–2040) and medium (2041–2060) terms

Season	Term	Model	Maximum temperatures (TX)	Minimum temperatures (TN)
Jan - Feb	Short term (2021–2040)	RCP4.5	increases of between 0.9°C and 1.0°C nationally, while Lower Shabelle region could experience slightly less.	1.1°–1.3°C. warming
		RCP8.5	experiences of 1.0°–1.3°C warming	1.3°– 1.4°C warming
	Medium term (2041–2060)	RCP4.5	could experience increases of 1.5°–1.7°C or greater	1.7°C nationally; while southwest shows more pronounced warming of 1.7°– 2.0°C.
		RCP8.5	increases of between 1.8°C and 2.2°C nationally; while southern warm less warming of 1.5°–1.8°C.	increase of 1.8°C to 2.0°C
March - June	Short term (2021–2040)	RCP4.5	Warming ranges from 0.9°–1.0°C	Between 0.9°C and 1.0°C.
		RCP8.5	Warming ranges from 1.0°–1.1°C	Warming of 1.1°–1.3°C
	Medium term (2041–2060)	RCP4.5	Warming ranges from 1.5°C to 1.7°C	Warming from 1.5°C to 1.7°C
		RCP8.5	Warming between 1.7°C and 1.8°C.	Warming of 2.0°–2.2°C
July - August	Short term (2021–2040)	RCP4.5	Up to 0.9°C	between 0.9°C and 1.0°C
		RCP8.5	increases of up to 1.3°C	Between 1.0°C and 1.1°C.
	Medium term (2041–2060)	RCP4.5	Increases of 1.5°C.	1.5°–1.7°C warmer
		RCP8.5	Warming of 1.5°–1.7°C	1.8°–2.0°C warmer
September - December	Short term (2021–2040)	RCP4.5	Experience warming of 0.7°– 0.8°C	between 0.9°C and 1.0°C.
		RCP8.5	Warm between 0.8°C and 0.9°C.	1.1°–1.3°C warming
	Medium term (2041–2060)	RCP4.5	Range from 1.5°C to 1.7°C	Warming from 1.5°C to 1.7°C
		RCP8.5	Range from 1.5°C to 1.7°C	1.8°–2.0°C warmer

Studies have also shown an increasing trend in both minimum and maximum temperatures in the assessment area and at a global and regional level (King’uyu, Ogallo, & Anyamba, 2000; Easterling, et al., 2009; IPCC, 2014; Ogallo, et al., 2017). Results also correlate with studies on the Horn of Africa region that shows an increase in temperature (King’uyu, et al., 2000). IPCC among many other past studies have linked global temperature increase worldwide to climate change induced global warming. Forward into the future, temperature in Somalia is projected to very likely rise between 1.4 - 1.9 °C by 2030, 1.5 - 2.3 °C by 2050 and 1.4 - 3.4 °C by 2080⁴. The projected increase in temperature increases future drought risk in the State of South West State.

▪ **Current and Future Trends of Precipitation (rainfall).**

South West State, like the rest of Somalia, has low annual precipitation and four seasons: the rainy seasons are Gu’ (April to June) and Deyr (October to November which sometimes includes September), while the dry seasons are Haggaa/Xagga (July to September) and Jiilaal (December to March). This assessment concentrated within the two main rainfall seasons namely Gu’ and Deyr. The focus was on Shabelle basins in South West State owing to limited availability of up to date data. The mean annual rainfall for the Shabelle basins is between 300 mm/year and 500 mm/year. As the rainfall in Shabelle catchments varies significantly from year to year, it causes severe droughts every seven to ten years (FAO, 2005).

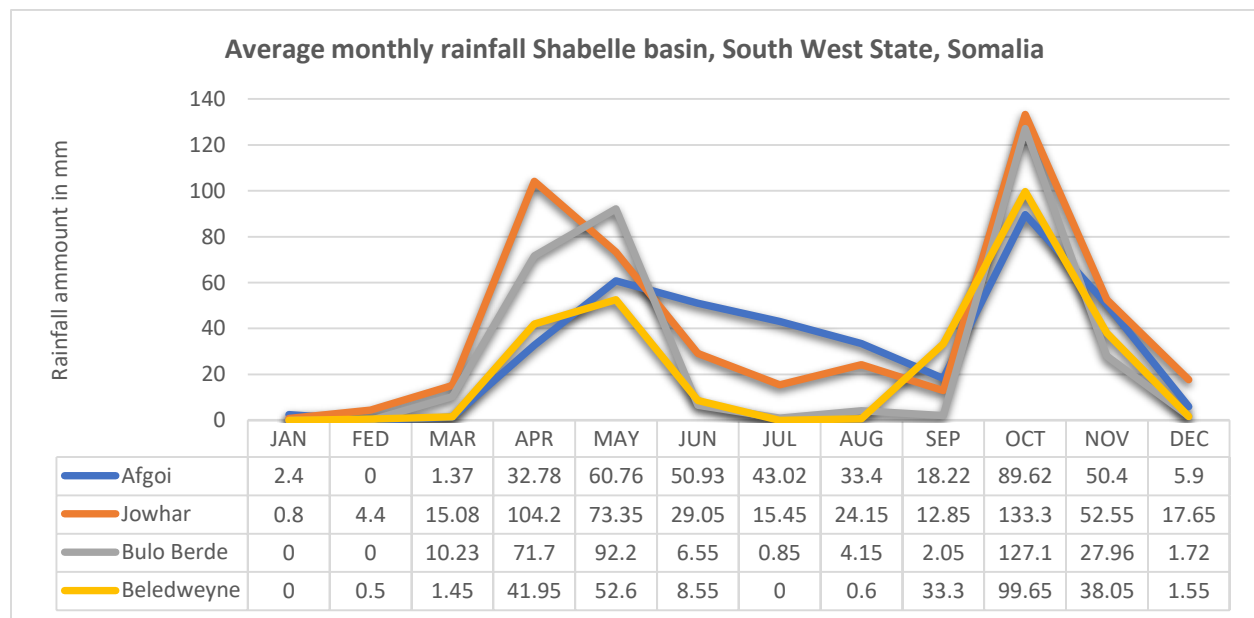


Figure 9: Average monthly rainfall Shabelle basin, South West State

Rainfall in South West State is also affected mainly by the Inter-Tropical Convergence Zone (ITCZ), monsoonal winds and ocean currents, jet-streams including the ‘Somali Jetstream’, easterly waves, tropical cyclones, the Indian Ocean and Red Sea conditions, as well as teleconnections with various regional and

4

https://weatheringrisk.org/sites/default/files/document/Climate_Risk_Profile_Somalia_Summary_for_Policymakers.pdf

global scale climate systems. The rainfall is further affected by Quasi-biennial Oscillation (QBO), El-Niño/Southern Oscillation (ENSO), Indian Ocean Dipole (IOD), and intra-seasonal waves (NAPA, 2013).

Future projections for two time periods: the short term (2021–2040) and the midterm (2041–2060) show a likely increase in precipitation. The CORDEX Africa multi-model median projections indicate that changes in the Gu and Deyr seasonal rains are likely to be minimal over the short term (2021–2040) and that there might be small increases over the medium term (2041–2060) when compared to 1986–2005 observations.

Table 7: CORDEX Africa Median Projections for Percent Change in Precipitation over various regions of Somalia

Season	Term	Median projection across Somalia (% change)
Gu	Short term (2021–2040)	RCP4.5: 0 to 15%
		RCP8.5: 0 to 15%
	Medium term (2041–2060)	RCP4.5: 0 to 10%
		RCP8.5: 0 to 10%
Deyr	Short term (2021–2040)	RCP4.5: 5 to 15%
		RCP8.5: 0 to 15%
	Medium term (2041–2060)	RCP4.5: 5 to 20%
		RCP8.5: 10 to 25%

Table 8 above presents multi-model median projections value for climate variable for two time periods: short and medium term periods. The projections are presented as absolute change in temperature, as calculated against the historical climate reference period of 1986-2005.

- The Jilaal dry season (roughly December–February, depending on the part of the country) is projected to experience an increase in seasonal precipitations. This could indicate that the Gu rains might begin earlier (as seen in the potential increases over the January– February season by the medium term (Richardson et al., 2022) or that precipitation could increase over these two months in the lead up to Gu. However, there is high model uncertainty over potential changes in totals for the Gu season over the short to long terms (Dosio et al., 2021), but other models are projecting that it could start and end earlier (Richardson et al., 2022).
- By the medium term, however, more models show that the Deyr rains could start and end later, with an overall increase in the season’s precipitation totals. Climate projection models for the region indicate potential decreasing precipitation (Dosio et al., 2019; 2021).
- Projection models are agreement that variability in precipitation is likely to increase over the short and medium terms (Richardson et al., 2022; Dosio et al., 2019; 2021). Heavy rainfall events, which contribute to flooding and soil erosion, among other impacts, are likely to increase in intensity and frequency as is the frequency of drought. Somalia will have to contend with both drier years and more frequent, severe storms.

Further, other studies have observed increases and decreases in precipitation in regions of Somalia in the recent past. The studies have shown high degree of interannual variability with recurrences in high/low value extremes that are often associated with floods / droughts (Easterling, et al., 2009; IPCC, 2014; Ogallo, et al., 2017). Some of these extremes occurred during El Nino /La Nina years.

However, models show quite some variance in their projections in particular in how strong and reliable this trend will be. What the models agree on is that there will very likely be high inter-annual variability in the amount of precipitation, meaning that there will be both, wetter and drier years. Precipitation rates determine the occurrence of both drought and flood hazards. The projected increase in precipitation for the region, increases future flood risk in some parts in regions of South West state.

3.2 Climate Change Risks, Hazards and Vulnerabilities in South West State

3.3.1 Climate Change Risks and Hazards in South West State

Hazard refers to the potential occurrence of climate-related physical events or trends that may cause damage and loss. The most common climatic hazards in South West state were identified by the experts and community groups. The potential risks from these hazards were also identified. As previously stated in this report, floods and droughts are the most common climate related hazards that occur in the region. In Table 10 below, precipitation and temperature are the climate variables whose impacts results in the identified hazards that have negative impacts on the human and ecological systems in South West state. The interaction of the climatic hazards with the exposed human and ecological systems in the region results into climate change risks identified in table 10 below. It is observed that precipitation can lead to either of the two identified climatic hazards depending on the magnitude and intensity. For instance, low precipitation leads to drought hazard while high precipitation leads to flood hazard. The risks associated with either occurrence of the precipitation variable is the occurrence of floods and droughts and rise in the river water levels (including South West coastlines) in the case of high (extreme) precipitation. The temperature variable is mostly associated with drought hazard in the region which exposes South West state to the risk of frequent drought incidences.

Community Perceptions and Experiences on Climatic Change Risks and Hazards

Discussions held with community groups across sampled study sites in South West state observed that floods and droughts are the most common climate related hazards that occur in the region. These climate change risks not only result from changes in temperature, precipitation or other climate variables or hazards but also from the interaction of these with local communities’ socio-economic development and land use trajectories, and other human-mediated environmental degradation and change.

Summary of potential risks from climate hazards occurring in the region were identified and are also described in table 10 below.

Table 8: Common climate related hazards and potential risks in South West state

Climatic variable	Climatic hazard	Climatic change risk
Precipitation	Floods	<ul style="list-style-type: none"> • Increased flooding incidences • Rise in water levels • Increases of vector and water borne diseases
<ul style="list-style-type: none"> • High 		
<ul style="list-style-type: none"> • Low 	Droughts	<ul style="list-style-type: none"> • Occurrence of droughts • Disease Outbreaks
Temperature (heat stress)	Droughts	<ul style="list-style-type: none"> • Increased Drought incidence

3.3.2 Climate Change Vulnerabilities

Climate change vulnerabilities contribute to the risk of the occurrence of climate change impacts. South West state’s climate change vulnerabilities manifest in various forms including decreased crop production, loss of income, emergence of new and aggressive insects, pests and diseases, loss of livelihoods and loss of life among others. The analysis focused on a set of most common climate change risks identified by the key informants and community groups contacted during this assessment (Table 11).

Table 9: Climate Change Vulnerabilities in South West State

Climate Change Risks	Vulnerabilities
(Precipitation) Flooding Rise in water levels	<ul style="list-style-type: none"> • Decreased crop production • Food scarcity including pasture • Emergence of new and aggressive insects and pests • Loss of income • Low milk productivity • Livestock diseases • Loss of income • Loss of livelihoods • Inadequate water supply • Spread of infectious and contagious infections • Loss of life
(Temperature) Droughts Airborne diseases	<ul style="list-style-type: none"> • Decreased productivity • Emergence of aggressive and invasive insects and pests • Loss of productive agricultural land • Loss of income • Declining livestock productivity • Loss of livelihoods • Inadequate water for human and livestock use • Loss of life • Spread of contagious and infectious diseases

3.3 Sectoral Climate Change Analysis

3.3.3 Analysis of vulnerabilities of key sectors to Climate Change

Based on expert group discussions with stakeholders (experts in the line ministries, practitioners, and representatives from community groups, CSOs) across priority sectors including Agriculture (crop, livestock, and fisheries), Water and Health are identified as vulnerable sectors to the impacts of climate change as shown in Table 12 below. The assets impacted by climate change in the sectors are categorized into natural, physical, human, social and financial assets as indicated in the table below. The assessment further gives a description of the various assets in each sector.

Table 10: Identification of the vulnerable sectors to climate change in South West State

CLIMATE CHANGE Risks	EXPOSED SECTOR	ASSETS	ASSETS DESCRIPTION	IMPACTED	DESCRIPTION OF IMPACTS ON SECTORAL ASSETS
Precipitation • Flooding • Drought	Agriculture (Crops)	Natural	Crops and sources of water for crop farming	Yes	<ul style="list-style-type: none"> • Damage to crops in the fields during flooding. • Outbreak of crop diseases and pests. • Loss of productive agricultural land due to rise in water levels.
		Physical	Access to markets (roads), means of transportation, supporting infrastructure	Yes	
		Human	Level of crop farming knowledge, availability of information on crop farming	No	
		Social	Access to social network e.g. membership to farmer groups, access to extension services	No	
		Financial	Income from crop farming, access to credit	Yes	
	Livestock	Natural	Availability of pasture/fodder and grazing fields.	Yes	<ul style="list-style-type: none"> • Loss of livestock grazing fields due to flooding • Outbreak of fungal diseases due to flooding • Unhygienic conditions in livestock holding spaces/shades due to flooding
		Physical	Access to markets	Yes	
		Human	Knowledge and skills in livestock rearing	No	
		Social	Access to community evacuation centers	No	
		Financial	Income from livestock keeping	Yes	
	Water	Natural	Sources of water	Yes	<ul style="list-style-type: none"> • Destruction of water and sanitation infrastructure due to flooding • Increased difficulty in accessing water sources due to destruction of roads by floods
		Physical	Access to water	Yes	
		Human	Skill and knowledge in water sector services; access to traditional water management practices and technologies	No	
		Social	Access to community evacuation centers	No	
		Financial	Income from water and investments in the water sector	No	
	Health	Natural	Occurrence of diseases and types of diseases	Yes	<ul style="list-style-type: none"> • Increased incidences of waterborne diseases due to floods • Destruction of health facilities in flood prone areas • Increased incidences of infectious diseases in dry periods
		Physical	Access to health facilities and availability of health facilities	Yes	
		Human	Knowledge and skills in health	No	
		Social	Access to social health support (community Emergency management programs)	No	
		Financial	Investments in the health sector.	Yes	

					<ul style="list-style-type: none"> • Increased incidences of injuries and deaths due to flooding • Increased vulnerability of those living with terminal diseases
Temperature <ul style="list-style-type: none"> • Droughts • Airborne diseases 	Agriculture (Crops)	Natural	Crops and sources of water for crop farming	Yes	<ul style="list-style-type: none"> • Extreme loss of soil moisture due to elevated temperatures • Crop failures due to drought and extreme heat • Outbreak of crop pests and diseases. • Loss of crop productivity due to long dry spells and droughts
		Physical	Access to markets (roads), means of transportation, supporting infrastructure	No	
		Human	Level of crop farming knowledge, availability of information on crop farming	No	
		Social	Access to social network e.g. membership to farmer groups, access to extension services	No	
		Financial	Income from crop farming, access to credit	Yes	
	Livestock	Natural	Availability of pasture/fodder and grazing fields.	Yes	<ul style="list-style-type: none"> • Depletion of livestock water sources due to prolonged droughts and dry spells • Loss of income to livestock farmers • Loss of pasture and grazing fields
		Physical	Access to markets	No	
		Human	Knowledge and skills in livestock rearing	No	
		Social	Access to community evacuation centers	No	
		Financial	Income from livestock keeping	Yes	
	Water	Natural	Sources of water	Yes	<ul style="list-style-type: none"> • Depletion of underground water sources due to prolonged droughts and dry spells • Drying up of rivers due to prolonged dry spells and droughts
		Physical	Access to water	Yes	
		Human	Skill and knowledge in water sector services; access to traditional water management practices and technologies	No	
		Social	Access to community evacuation centers	No	
		Financial	Income from water and investments in the water sector	No	
	Health	Natural	Occurrence of diseases and types of diseases	Yes	<ul style="list-style-type: none"> • Increased pressure on the health system due to increased incidences of communicable diseases mainly caused by general water scarcity • Reduced productivity of the population due to heat stress
		Physical	Access to health facilities and availability of health facilities	No	
		Human	Knowledge and skills in health	No	
		Social	Access to social health support (community Emergency management programs)	No	
		Financial	Investments in the health sector.	Yes	

3.3.4 Climate Change Impact on the Sectors and their Respective Adaptive Options

1. Agriculture sector

This assessment established that maize, sorghum, cowpea and sesame are the dominant crops grown by farmers in South West state. Maize is the dominant crop grown during Gu and Deyr rainy season in most crop producing regions of South West state. Both livestock and crop subsectors and the associated livelihoods have been continuously buffeted by increasingly fragile and degraded natural environment and more frequent and severe cycles of drought and floods. These factors have severely impacted food security and livelihoods in the State. The assessment VRA established that livestock and crops continue to be the main sources of economic activity, employment and livelihoods in the region especially in the rural population. FGD participants observed that households grow crops for semi-commercial (a part is for own use and another part is sold) purposes.

Climate Change Impacts on the Agriculture Sector

Analysis has established that agriculture sector remains threatened with changes in climate, associated extreme hazards. Climatic hazards such as floods and droughts directly impact the sector especially on production activities hence the livelihoods of people in the region. Floods predominantly affect the low-lying areas. Droughts have affected most parts of the region due to the intermittent rainfall patterns occasioned by long dry spells. Flooding has led to the loss of productive agricultural land and loss of crop productivity. Flooding has been observed to encourage the outbreak of fungal diseases in livestock, destruction of livestock grazing fields and pasture and inundates livestock holding areas, leading to unhygienic conditions in those spaces. Loss of soil moisture and soil fertility have been connected to incessant droughts in the region. The sector further faces other challenges including an increase in invasive species that out-compete native grasses, and reduced diversity of plant species. Invasive species such as the *Prosopis juliflora* tree that hinder access to the grazing grounds also affect livestock activities. The sector has also been impacted by desert locust infestations and outbreaks destroying cropland and pastures.

Key message on adaptive capacities/ on climatic impacts adoption options for agriculture sector

Local communities and experts contacted both perceive probability of increased occurrence of extreme weather events such as floods, droughts and storms in the state. Similarly, climate projection models for the region predicts more weather events such as days with high or very low temperatures, and extreme precipitation. With the increased occurrence of extreme weather events, losses in agricultural sector and the supporting sectors can increase worsening vulnerabilities.

Despite the exposure of the agriculture sector, local communities have very low adaptive capacities which have either been built from progressive efforts or are in various stages of planning and implementation.

This study provides general consensus on how to adapt and mitigate adverse effects of climate change for the agricultural sector. Keeping in view the perceived climatic risks discussed during the validation workshop, participants proposed the following measures for building adaptive capacities:

Table 11: Climate change impacts and potential adaptation options in Agriculture Sector

Impact	Adaptation options
Inadequate water supply for irrigation	<ul style="list-style-type: none"> • Rehabilitate and/or build medium- to large-scale infrastructure, including dams, diversions for irrigation, livestock watering points, and boreholes. • Build or rehabilitate community-level infrastructure, including berkedes, shallow wells, ponds, and other technologies, ensuring that a mechanism for maintenance is in place. • Soil and water conservation Practices
Low/decreased crop production	<ul style="list-style-type: none"> • Farmers awareness schemes, to educate farmers about climate change risks, best agriculture practice, efficient irrigation systems, use of best available seeds variety, changes in cropping patterns etc, • Adaptation of best agricultural practices; recommendation / use of least water intensive crops, use of climate resilient crops, and water efficient irrigation systems such as sprinkler and drip irrigation, particularly where traditional methods are still being used; and • Capacity building of line department staff, to educate farmers about climate change risks, climate smart agriculture practices, etc

2. Livestock Sector

Livestock are the mainstay of rural people’s livelihood strategies in South West State. Interviews conducted with stakeholders in livestock sector revealed that livestock production represents a key source of livelihood for the population. The main purposes for rearing livestock include: milk and meat production, and animal draught power that provide incomes for their subsistence and to support income generation. The main animals reared were goats, sheep, camel among others. The main sources of fodder for livestock were maize and grass (traditional grazing), and natural seasonal pasture.

The sector is however faced with several constraints, especially climate change. The state has been ravaged by extreme weather events which bring destruction of livestock and crops fields. Additionally, livestock sector is faced with threats from extreme degradation of natural vegetation resulting in major reduction in the quantity and nutritional quality of the vegetation available for grazing in the rangelands. Degradation of natural vegetation is as a result of expansion of localized deserts and barren areas due to overgrazing, intensive collection of fuelwood and building materials, coupled with the increasing expansion of private enclosures into the communal grazing areas.

Climate Change Impacts on the Livestock Sector

Livestock sector is faced with threats of climate change. Climatic hazards such as floods and droughts directly impact the sector especially on production activities hence the livelihoods of people in the region.

Across the study sites, the communities reported loss of livestock to droughts and floods during the past 5-10 years. Also, over the same period participants in all FGDs reported experiencing destruction of the rangeland and forest landscapes in the region which affected the availability of forage and water storage for livestock leading to the reduced potential of livestock sector productivity, translating into loss of livelihoods of local communities.

Key message on adaptive capacities/ on climatic impacts adoption options for livestock sector

Overall, the findings of the assessment clearly demonstrate low adaptive capacities among local communities which have either been built from progressive efforts or are in various stages of planning and implementation of government led initiatives. However, there are significant government initiative taken to address these constraints, including those led by individuals engaged in livestock activities. The adaptive measures deployed include: capacity building trainings for instance on fodder production and water harvesting and storage, support to livestock farmers towards enhancing access to improved breed and breed improvement. However, for pastoralism to be sustainable, effective rangeland management and ecosystem protection programs must be initiated to increase the resilience of these communities and achieve continuous good livestock production. The following adaption measures are proposed for building adaptive capacities in South West state:

Table 12: Climate change impacts and potential adaptation options in Livestock Sector

Impact	Adaptation options
Pasture shortage and grass/browse	<ul style="list-style-type: none"> • Enhance fodder production – promotion and adoption of FMNR techniques, seed balking etc • Build storage facilities for fodder, including stockpiles of emergency relief items. • Establish systems for range, forest, and wildlife management. • Promote sustainable rangeland management methods, such as grass banks, drought refuges, conservation easements, and reciprocal grazing arrangements. • Capacity building to promote rangeland management practices
Low production	<ul style="list-style-type: none"> • Enhancement of training of agro-pastoralists on Good agricultural and animal husbandry • Enhanced awareness campaigns about breeding techniques adapted to climate change • Creation or strengthening of existing institutions or bodies with mandates (at different levels) to enforce policies, laws and traditional systems to rehabilitate and manage rangelands already increasingly becoming degraded • Rearing improved varieties of cow, poultry, goat and sheep
Livestock diseases outbreak	<ul style="list-style-type: none"> • Improve livestock health services and increase productivity (both smallholders and large producers). • Strengthen investments in animal health and disease prevention through improved provision of veterinary services

	<ul style="list-style-type: none"> • Improve animal nutrition (including exploration of various feed sources and watering)
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3. Water Sector

Both key informant discussion and FGDs participants observed that climate change has exacerbated water shortage for agricultural production and domestic use in the region. Communities have insufficient water infrastructures. However, numerous efforts have been made to expand water access but those efforts have often been unsustainable and have additionally not been strategically developed with climate change resilience and adaptation in mind. For instance, no institution has developed a contingency plan that ensures water availability to the population during an emergency (e.g. floods, droughts).

- ✓ In the Wadajir/ Hassan Mumin IDPs, participants indicated that the most significant problem is the lack of reliable source of water in their community for agricultural production and an increase in demand for water. Lack of access to water sources has caused community overreliance on water donations leading to increased livelihood vulnerabilities.
- ✓ In Baidoa region, FGD participants mentioned a —water crisis involving two aspects: abundant rainfall and lack of rainfall in an unpredictable climate. Too much rain causes flooding, making the land unsuitable for production activities, as in the recent flooding experienced in the area. On the other hand, too little rain and rising temperatures make it difficult for crops to grow and survive.

The emerging scenario in the region depicts a situation in which agricultural production and domestic water demand has been affected / unmet. Deteriorated water infrastructure, coupled with lack of rainwater harvesting skills and capacity have impacted rainfed farming. Under rainfed farming, the local smallholder farmers have relied on a production system geared mainly to meet subsistence needs of households with the major crops grown identified as sorghum, cowpea, and, to a lesser extent, maize and sesame.

Impacts of Climate Change on the Water Sector

With the direct heavy dependence of the population on natural water sources, the water sector remains highly exposed to the impacts of climate change. Analysis has shown that all respondents contacted during the assessment recognized the impact of climate hazards on the water sector in the past 5-10 years in the State. These climatic hazards were identified as extreme temperature, drought, floods and tsunamis. The impact of climate hazards is mostly related to water shortage, limited water availability, destruction of water infrastructure (floods), etc.

Climate-related events result in increased water logging, affecting water, and sanitation and hygiene systems (WASH), access to safe and clean drinking water, access to water for domestic cooking and cleaning purposes, and access to water for irrigation.

Key message on adaptive capacities/ on climatic impacts adoption options for Water sector

Enhanced availability of and access to water remains crucial for local communities in the state. Despite some efforts towards this, the State has a large part of its population accessing water from unsafe sources

(water trucking water donations) with parts of the majority of the population facing acute water shortages due to overdependence on rainwater and also lack of water storage options.

- None of community’s main water source is available all year round
- An increase in duration and intensity of droughts may result in greater irrigation needs for crops and may also hamper crop production in the region.
- Low rainfall in the dry period is expected to further dry up rivers and water sources.

The multiple impacts of climate change across sectors most severely affects the poor, marginalized, women and children, PLWDs and the IDPs, resulting in forced migration, increased vulnerabilities, and death. This situation is aggravated by the heavy degradation of water infrastructure that supplies households with water coupled with insufficient urban and rural water harvesting and treatment infrastructure. At the same time, there is lack of a harmonized strategy towards the development of water infrastructure in South West state resulting to an ad hoc unsustainable developments and investments in South West state’s water sector. Overall, this VRA indicates that local communities have inadequate knowledge and adaptive capacity in the water sector. Urgent potential adaptation options for the water sector are therefore required outlined as:

Table 13: Climate change impacts and potential adaptation options in Water Sector

Impact	Adaptation options
Loss of water for irrigation	<ul style="list-style-type: none"> • Improve water resource management through watershed management, and water harvesting techniques • Capacity building initiative at an institutional and communities level to increase knowledge relating to climate change impacts. • Rehabilitation/expansion of water infrastructure based on climate change inclusive hydrological modelling, considering climatic risks to water infrastructure in the region • Adaptation of best water management practice, such as rain water harvesting technologies • Establish well managed operation and maintenance for water sector actors, to avoid water losses • Improve natural resource management, for instance, growing of more trees to control temperature and to reduce water losses •
Water shortage for domestic use	<ul style="list-style-type: none"> • Establish strategic water points (boreholes) to increase water availability during dry seasons. • Improve groundwater recharge and discourage groundwater abstractions • Capacity building of local communities, to enhance urban and rural rain water harvesting – water storage systems • Strengthen climate change education and awareness creation

Destruction of sanitation and hygiene systems (WASH)	<ul style="list-style-type: none"> • Improve maintenance and promote the use of climate-resistant materials in the construction of water supply systems. •
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4. Health

The assessment findings indicate that impacts of climate hazards on health sectors are diverse in South West state. They are mostly at the origin of increasing disease prevalence and loss of life because during floods, health diseases like cholera and malaria increase due to water pollution and water scarcity. The assessment also found that floods contribute to the increase vectors borne diseases and gastro-intestinal diseases because of the increased prevalence of vectors.

Impacts of Climate Change on the Health Sector

Both KIIs and FGDs participants have been able to identify major health-related climate change impacts as the increase in respiratory illnesses and waterborne diseases caused by climatic hazards such as droughts and floods. For instance, participants reported observing an increase in occurrence of droughts and flooding which caused diseases such as cholera which thrives in both dry and wet conditions resulting from the compromised hygiene situations that prevail whenever there is a large-scale occurrence of droughts and flooding.

The second major impact of changing climatic conditions observed, has been the increase in heat waves, and subsequently heat strokes in the region, particularly during the dry season. The increase in prolonged and frequent heat waves causes heat-related ailments e.g. heat stress and stroke, and even death as has been established in this assessment. The assessment has shown that the state has been experiencing prolonged droughts for the past 5 years, resulting in further depletion of water resources. Changing climate conditions have enforced limitations on crop cultivation, affecting food security and restricting the availability of nutritious food choices. These factors contribute to the incidence of malnutrition and chronic diseases such as diabetes.

Focus Group Discussion Findings				
(based on local communities' observations of climate change impacts)				
FGDs conducted with communities revealed that annual deaths of family members from respiratory illnesses and waterborne diseases. Summarized cases of reported illness/deaths caused by climatic hazards such as droughts and floods for the past 5 years are highlighted below.				
Village/comm unity	Extreme temperature-related illnesses or deaths	Drought- related illnesses or deaths	Floods-related illnesses or deaths	illnesses or deaths- related to malaria, Degue or RVF
Wadajir/ Gooyaale	-	-	3	8

Baidoa/ Gooyaale	10	100	10	50
Baidoa /Horseed/Dha nfarur IDP	4	6	7	7
Daafuur	100	85	38	70

Key Message Climate Change Impacts and Adaptive Capacities / Options for South West’s Health Sector

Major health-related climate change impacts as the increase in respiratory illnesses and waterborne diseases caused by climatic hazards such as droughts and floods are prevalent in the state. These are attributed to the incidences of extreme precipitation that results in floods that destroy the existing health facilities in the flood prone areas.

Reduced rainfall and inadequate food availability increase malnutrition risks. Pregnant and lactating women, young children and the elderly are particularly vulnerable to malnutrition, which can have long-term developmental consequences for children, resulting in stunted growth and development. Uneven accessibility, affordability and quality of health services across the State only exacerbates climate-related health risks. Older people, especially older women and people with a disability, face additional challenges accessing health services.

Table 14: List of climate change impacts and adaptation options

Climatic impacts	Potential adaptation options
<ol style="list-style-type: none"> 1. Malnutrition 2. Heat stroke/ excessive sweating 3. Emerging and reemerging infectious diseases [dengue, malaria etc] 4. Water-borne diseases (diarrhoea, typhoid, skin diseases) 5. Increase in chronic disease 	<ol style="list-style-type: none"> 1. Promote public health awareness campaigns targeted to rural areas 2. Raising funds for climate-induced disease response 3. Enhance waste management capacity 4. Introduce and promote ingenious/ traditional crop varieties 5. Improve coordination between stakeholders [NGO, Govt., communities] 6. Develop human resources and skills

5. Education

Main climatic hazards impacting education sector in the state include floods, drought and extreme temperature. The assessment team visited Dr Abdula Derow Golis School in Baidoa, Bay University, Baidoa international University including Somali Girls Rights Developing Organization and Ministry of education for consultations. The vulnerability assessment focused on education access by learners including education infrastructure. The education sector is a pillar of development in the State.

Impacts of Climate Change on the Education Sector

Climate hazards impact the education sector in different ways. Drought-related displacement has drastically affected learners’ access to education services. As a consequence of the prolonged drought, the sector experienced the following effects: disruption of school calendar in the region; scarcity of adequate

safe water in schools; scarcity of nutritious food for children and their families; and increased enrollments in displacement destinations resulting in stretched existing school resources.

Parents were impacted through loss of livelihoods, decrease of income of families leading to inability to pay school fees, displacement and migration, and health problems. For school staff, the climate hazard has resulted in loss of livelihoods, low morale, displacement, migration, and health problems. For school infrastructure, climatic hazards have mainly damaged the school infrastructure and water supply.

Extreme temperatures have resulted in reduced contact hours between teacher-pupil, roofs wasting away/rusting, increased water needs, among others. Flooding has resulted to classrooms destruction, buildings destruction and waterways destruction.

Key message on adaptive capacities/ on climatic impacts adoption options for Education sector

Damage to physical infrastructure from climate-related events and natural calamities impacts the regular operation of schools and other educational services. With increased occurrence of climatic hazards such as droughts and flooding, discontinuation of education and an increase in school dropout rates are likely to increase in the region.

Table 15: Climate change impacts and potential adaptation options in Education Sector

Climatic impacts	Potential adaptation options
<ol style="list-style-type: none"> 1. Damage of educational institutions 2. Discontinuation of education/school drop-outs 3. Migration/displacement 4. Loss of livelihoods (parents) 5. Damage to local roads due to floods 	<ul style="list-style-type: none"> • Establish temporary learning spaces • Rehabilitation and construction of new learning facilities • Innovative mobile/distance learning initiatives • Psychosocial support for both learners and teachers • Enhancing education – community awareness on climate change • Better planning for construction (improved school infrastructure) • Rehabilitation of drainage of road networks increase water flow • Construction of flood proof/resilient housing/school infrastructure • Establish early warning and early response systems

6. Public works

The assessment team observed that Climatic hazards such as extreme temperatures or heat stress, droughts, floods, tropical storm, among others hazards to have significant impacts on the public works sector in areas visited.

Impacts of Climate Change on the Public Sector

The major impact of changing climatic conditions observed are in the form of flash floods causing damages to educational institutions, houses, and local earthen roads which are inundated or blocked by flood water. The most impacted are vulnerable groups including women, children, elderly people, students, and low-income people. The continuing deterioration of physical infrastructure in the region makes access to farms

and market outlets costly, and unprofitable. Such conditions also make interventions by aid agencies extremely challenging in supporting other interventions in other sectors.

Climatic impacts and potential adaptation options for the resilient development of physical infrastructure vulnerability are identified as follows:

Table 16: Climate change impacts and potential adaptation options in Public Sector

Climatic impacts	Potential adaptation options
<ol style="list-style-type: none"> 1. Damage of educational institutions 2. Loss due to floods in some areas 3. Damage to bridges, culverts and roads 4. Loss due to riverbank erosion 5. Damage of houses and livestock holding areas 6. Damage to local roads due to floods 	<ul style="list-style-type: none"> • Rehabilitation of drainage of road networks increase water flow • More bridges or culverts for increasing flow in the floodplains • Better planning for construction (improved school infrastructure) • Flood proof/resilient housing • Land use planning

Key Climate Change Impact and Adaptive Capacity Messages for South West state’s Public Infrastructure Sector

Planned development of infrastructure in this region must be prioritized as the most important adaptation option. Unplanned development coupled with the lack of regular maintenance and repairs of physical infrastructure especially water and roads due to the prolonged insecurity, weak government institutions, and the absence of effective community organizations will only serve to exacerbate the impacts of climate change across the state.

7. Biodiversity

The stakeholders during assessment observed that climatic hazards such as extreme temperatures or heat stress, droughts, floods, among others hazards have significant impacts on the biodiversity sector in the region.

Impacts of Climate Change on Biodiversity

According to the participants, climate change is destroying habitats of fauna and flora in assessment area. The participants reported biodiversity loss and degradation of rangeland as a significant impact of climatic hazards on rangelands (natural grasslands, wetlands, etc.) in the areas. For the forest biodiversity (flora and fauna), main impacts of different climate hazards on this sector included biodiversity loss, wildlife habitat destruction. Detailed climate change impacts and the adaptive capacity of biodiversity is presented in table 16 below.

Table 17: Climate change impacts and potential adaptation options in Biodiversity

Climatic impacts	Adaptation options
<ol style="list-style-type: none"> 1. Damage to ecosystems 2. Change in patterns of ecosystems. 3. Penetration by invasive alien species which threaten existing indigenous species. 	<ul style="list-style-type: none"> • Increase the coordination and capacity of implementing agencies. • Prepare and implement plan for the conservation of biodiversity.

<ol style="list-style-type: none"> 4. Change of habitats. 5. Degradation of rangeland/biodiversity loss. 6. Forced change in livelihood options. 7. Possible increase of epidemic diseases 	<ul style="list-style-type: none"> • Implement different rules and regulations – including local/traditional • Build awareness and capacities of the communities - conservation • Incorporate biodiversity in all development planning. • Increase the forest lands through afforestation – ingenious trees
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Key message on adaptive capacities/ on climatic impacts adoption options for Biodiversity sector

Climate change is destroying biodiversity in South West state. It is thus necessary to protect the existing habitats of fauna and flora and create new suitable habitats for the endangered species. Droughts, floods, among others hazards are major barrier for development of the region; therefore, proper management of the climatic hazards should be strengthened. Community participation in local initiatives to protect biodiversity is paramount to enhance protection of the biodiversity. Community participation can be enhanced through training, awareness campaigns, local stakeholder meetings, IEC material distribution, etc.

8. Coastal and Marine Areas / Resources

Impacts of Climate Change on Coastal Marine resources

Discussion with Ministry of Fisheries and Blue Economy staff and local community the study established that adverse impacts of climate change on coastal and marine resources are perceived differently among the local communities in the state. Identified adverse impacts of climate change include fish reduction, migration, and extinction of some species leading to loss of livelihoods among the fishing households. The impact was also felt on the mangroves by their reduction and destruction of coral reefs habitat among others. The impact of floods on the coastal communities were also visible with reduction of fishing activities, fishing species, fish availability, and loss of livelihoods.

Table 18: List of climate change impact and adaptation options

Potential impacts	Adaptation options
<ol style="list-style-type: none"> 1) Reduced production of fish species. 2) Increase in fish diseases due to the climate change induced salinity. 3) Change in fish breeding season (early breeding). 4) Change in habitat of fish/migration of aquatic animal. 5) 	<ul style="list-style-type: none"> • Capacity building initiatives for fishing communities and organized groups • Innovation and dissemination of resilient fish varieties • Development of policies regarding the management of marine resources; shoreline management and coastal protection action plans • Conduct training of fisheries on knowledge of climate change • Arrange training for the fishers on fish culture and management.

	<ul style="list-style-type: none"> • Undertake fisheries resource inventory to create baseline data. • The fisher folks be provided with stronger boats equipped early warning systems tools
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Key Messages on Climate Change Impacts and Adaptive Capacities for Coastal Marine Resources

- Projected increases in sea temperature and sea level will negatively affect coastal fish nesting and fishing grounds and increase the frequency and severity of flooding of low-lying coastal lands.
- There is severe degradation of both marine and coastal environments occasioned by weak or absent of governments and lack of active fishery management.
- Need for regular and massive training for fishermen so that they are educated and skilled enough to capture and culture fish in a more environmentally sound and sustainable manner.
- Capacity building of line ministries to champion development and execution of policy and laws is critical regard for successful implementation of adaptation options.

3.3.5 Gender issues and Adaptive capacity to climate change

Women actively participate and engage in all key productive sectors, especially in agricultural value chains from production to sale and end-use of the produce. This assessment has established existence of institutional weakness that have contributed increased vulnerabilities of women to climate-related events in the state.

Participants during KII session reported a lack of affirmative action within their respective institutions aimed at strengthening the capacity of women and girls to fight or adapt to climate hazards in different sectors in the state. For instance, none of the institution has in place a gender policy or strategy despite of working together with other government or non-governmental institutions in providing support to communities during periods of climate disasters (e.g. floods, droughts, etc).

Key Messages on Climate Change Impacts and Adaptive Capacities in addressing Gender vulnerabilities

Women are more affected by the natural disasters in South West state which increases their vulnerability to climate change, as climate change is expected to increase the number of disasters. The need for a gender focused initiatives to increase women’s adaptive capacity and decrease their sensitivity is emphasized. However, if gender sensitive development projects are not taken up in time, women would experience displacement and hunger, while facing additional burdens due to climate change and disasters.

This study presents specific measures necessary as supportive options in addressing Gender vulnerabilities and improving adaptive capacity as follows:

- Supportive measures are required to reduce gender inequalities in the state, focusing on key priority sectors such as agriculture, health, education, disaster management, etc.
- Need for gender mainstreaming in development initiatives, plans and policies to address climate change impacts.
- Institutional and technical support for local institutions championing women agenda would go a long way in increasing capacity of the local women.

IV: Conclusion and Recommendations

Conclusion

The VRA for South West state is a key milestone in reviewing, summarizing, and understanding the climate change vulnerabilities that the people of South West state are facing. The VRA focused on different priority sectors i.e. water, health, agriculture and food security, livestock, biodiversity, coastal and marine are/resources, public works, and education. The VRA linked the sectoral exposure to differentiated climate change risks / hazards i.e. extreme temperatures, floods, drought, pest and disease, locust, tsunami, tropical storms/cyclones etc and ultimately identified not only the vulnerability inducing factors but also potential adaptation pathways.

This exercise is an essential step to establish South West state-level climate risk profile. The established South West state climate risk profile is an important guiding and decision tool for decision-makers to better understand the vulnerabilities of different priority sectors, and inform planning, fund allocation and implementation of South West state's humanitarian and development interventions accordingly. At the same time, the VRA is a critical evidence base which can be used to by policy makers to guide strategic climate change responsive policies that will enhance sustainable development and resilience building in the state.

The VRA findings for South West state point to a high vulnerability profile to impacts of climate change, across the selected sectors. The assessment identified vulnerabilities in the considered priority sectors that were targeted in VRA exercise i.e. i.e. water, health, agriculture and food security, livestock, biodiversity, coastal and marine are/resources, public works, and education. Further, the assessment identified adaptation options that should be considered as a response to the identified vulnerabilities. Water resources are fast depleting, agriculture and livestock sectors are heavily affected, and local populations are highly disaster prone. Extreme temperatures will be a major issue in the coming decades. With the information on the outlook towards the future, if the State does not adapt to climate change, vulnerability will be pushed to critical levels.

Key Messages

Given the findings from VRA exercise, the key messages for South West state are:

1. Climatological data and trends point to a continuation and worsening of climate change risk especially in the Horn of Africa and South West state in particular. Without adaptation measures being put in place and given the high exposure risks for South West state and the weak socio-political, economic and environmental systems, the entire state is highly vulnerable.
2. South West state's socio-political, economic, and environmental challenges are key drivers of the state's vulnerability to climate change risk. Urgent concerted efforts must be made to address these challenges across household, community, regional and state levels. A stakeholder driven contextual approach to building South West state's adaptation capacity to climate change will be critical.
3. South West state's stakeholders should intensify ongoing efforts by local communities and institutional initiatives to cope with the adverse impacts of climate change. There is a general sense of urgency among the actors and stakeholders that the State needs to intensify its efforts to become less vulnerable to climate change.

4. South West state should endeavor to increase investments in its adaptive capacity thus reducing vulnerability. Measures to reduce exposure to hazards, for instance investment in increasing the adaptive capacity of people and sectors including the State are available, such as provision of weather information, extension services, livelihood support programs (provision of planting materials to farmers) and so on.
5. Systemic marginalization is deepening societal vulnerabilities to Climate Change Risk in South West state. As such, stakeholder inclusive measures must be taken to address systemic marginalization and reduce gender imbalances and other marginalization bottlenecks that leave a significant proportion of South West state's society (women, girls, youth, minority clans, IDPs, PWDs etc) highly vulnerable to climate change impacts.
6. The good will among stakeholders to provide sound information about climate vulnerability is much needed to support decision making for adaptation planning in the State.
7. This assessment provides the possibility to compare the climate vulnerability of different sectors so that funding allocation of new projects under various streams of climate finance can be supported.

Recommendations to Build a Climate Resilient South West State

The VRA points to a high vulnerability score to the impacts of climate change, across the selected sectors (water, health, agriculture and food security, livestock, biodiversity, coastal and marine are/resources, public works, and education). The assessment has identified vulnerabilities and further identified contextual South West state specific adaptation options that should be considered in response to the identified vulnerabilities. Clearly, with the information on the outlook towards the future, if the State does not adapt to climate change, vulnerability will be pushed to critical levels. Based on the VRA findings, the following are the key recommendations for building/enhancing climate resilience in the state of South West State:

- I. Climate Risk Management and Action**
 - a. Develop a climate risk map/atlas – a risk-informed decision-making toolkit to be used to map critical vulnerabilities at the local administrative levels.
 - b. Establish a climate risk commission or department with mandate to mainstream climate risks in a decentralized manner.
 - c. Enhance Early Warning Systems to build greater resilience to hydro and meteorological hazards.
 - d. Enhance local knowledge and biological cues management on forecasting weather and taking proper actions before the intervention of the public sector.
- II. Focused Investments Towards Climate Change Adaptation**
 - a. Develop Climate Smart Agriculture to strengthen resilience in the agriculture and food, livestock Sectors.
 - b. Integrate climate vulnerability-based financing instruments into investment decision-making.
 - c. Build climate risk-informed infrastructure (roads, schools, and health institutions), improve awareness raising among the local people living on disaster prone areas, and provide support for resettlement.
- III. Deal with Systemic Climate Change Adaptation Bottlenecks**
 - a. Develop and enhance the funding opportunities for the at-risk people; both financial institutions (suppliers) and demanders (farmers organisations, cooperatives,

entrepreneurs, small businesses operators (SMEs), women and youth on green climate financing to enable the at-risk local people access loans for their small businesses.

- b. Develop enabling environment and instruments that will foster coordination between the relevant ministries in the priority sectors seriously affected by climate disasters, with the support of relevant stakeholders (private sector, civil society organisations, INGOs, Bilateral and Multilaterals, Funding mechanisms, etc.
- c. Restore the landscape to rehabilitate and reintegrate natural ecosystems by trees planting, creating forest and rangeland ecosystems.

IV. Collaborative and Synergistic Stakeholder Engagement for Climate Change Adaptation

- a. Encourage ownership by community mobilization of local development problems as they relate to climate related events so that they become more active participants in developing solutions.
- b. Improve participation on issues of climate change from conceptualization to realization and restitution.
- c. Encourage the creation of sustainable advocacy platforms through capacity building in the domain.

V. Address Gender vulnerabilities in all key priority sectors

- a. Support measures aim reducing gender inequalities focusing on key priority sectors such as agriculture, health, education, disaster management, etc.
- b. Undertake gender mainstreaming in development initiatives, plans and policies to address climate change impacts.
- c. Provide institutional and technical support for local institutions championing women agenda to increase capacity of the local women

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ANNEX

Annex 1: Steps in vulnerability assessment

Step	Approach	<ul style="list-style-type: none"> • Methodology/Details of vulnerability assessment
Planning the assessment	Setting of scope	<ul style="list-style-type: none"> • This is the first step in adaptation planning. Current climate vulnerability will be considered. • To develop vulnerability indicators for states and highlight the drivers of vulnerability.
	Selection of type of vulnerability assessment	<ul style="list-style-type: none"> • Integrated vulnerability assessment (based on biophysical, socio-economic, and institution and infrastructure-related vulnerability indicators). • Evaluate the existing tools on vulnerability and disaster risk assessment in terms of their alignment with the 4th Assessment Report of Intergovernmental Panel on Climate Change (IPCC-AR4) and the framework adapted; and to align with the National Adaptation Plan (NAP).
	Selection of sector, spatial scale, community/system, and period of vulnerability assessment	<ul style="list-style-type: none"> • Sectors: Climate-related sectors particularly: Water, Health, Agriculture and food security, Livestock, Biodiversity, Coastal zone, Public works, Education, Disaster Risk Reduction, Gender and Education; and general indicators; • Spatial scale: State-level assessment conducted • Period: Based on the availability of data
	Identification and selection of indicators for vulnerability assessment	<ul style="list-style-type: none"> • State-specific assessments will be based on sets of common indicators to capture state-specific characteristics.
Gathering data	Data collection methods	<ul style="list-style-type: none"> • A mix of primary and secondary data
	Field assessment and stakeholder consultations	<ul style="list-style-type: none"> • Will be carried out using participatory methods such as focused group discussions (with local community), one to one consultations in the form of key informant interviews (with line ministries, NGOs and local authorities), etc. • Field assessments will also be used for identifying potential adaptation measures and also capture mitigation benefits (as co-benefits) options.

Analysis and interpretation	<p>Quantification and measurement of indicators</p> <p>Representation of vulnerability</p> <p>Identification of drivers of vulnerability for adaptation planning</p>	<ul style="list-style-type: none"> • All indicators will be quantified using a mix of primary and secondary sources of data, where appropriate. The database used in the assessment along with its sources will be provided in main report. • Table, graphs, and spatial maps will be used to represent vulnerability and its drivers.
Elaborating the VRA report	Potential adaptation measures/options	<ul style="list-style-type: none"> • These options will be prioritized based on – Environmental and Social (E&S) and gender impacts as identified from field assessment by the local community and other stakeholders consulted. • Vulnerability assessment reports with state-level indicators generated and presented per member state but based on the availability of data
VRA report validation	Validation workshop	<ul style="list-style-type: none"> • State-level validation workshop will be conducted per federal member state where relevant stakeholders from line Ministries and Departments will be invited including other key stakeholders. •
Revised and final report	Report preparation and revision	<ul style="list-style-type: none"> • Based on the inputs received, the consultant will finalise the VRA reports incorporating all comments, recommendations received from all consultation workshops, KAALO, UNDP team, and line ministries.

Annex 2: Schedule followed for field work data collection in South West State







DATE & TIME	ACTIVITY DESCRIPTION	RESPONSIBLE/PARTICIPANTS
8:00am- 5:pm		
8:00am-12:30pm		
26 th – 28 th Nov , 2023	Uploading VRA tools to KOBOCollection	KAALO (Abdirashid and Ismail)
10:00-11:00am		
27 th Nov , 2023	Online meeting with the NAP coordinators , Amoud university, UNDP and KAALO for the Prensation of the VRA PLAN in the respective states and shared the Schedule of the Mission per state.	KAALO/UNDP/NAP coordinators
19 th Dec 2023	Travel to - Baydhabo, South west state	Ismail/UNDP –Aden
9:00am-12:00pm		
20th Dec 2023	Meeting with Ministry Environment and climate change of SWS on the Discussion of the VRA as well as the invitation respective sectors and Nominations of the Enumerators team.	Ismail/Abdirashid /NAP coordinator/UNDP – Aden
8:30-4:00Pm		
21st Dec 2023	Preparation and arrangement of the Assessments (enumerators, Vehicles, Workshop)	KAALO/MECC
23rd Dec 2023.	Consultations workshop and Training Data collection enumerators in SWS.	Ismail/NAP coordinator/UNDP – Aden
8:00am-12:30pm		
24th Dec 2023	16Klls Data collection for line ministries and CSOs in SWS	Enumerators/ Ismail/NAP coordinator/UNDP – Aden



DATE & TIME	ACTIVITY DESCRIPTION	RESPONSIBLE/PARTICIPANTS
8:00am-12:30pm		
25 th Dec 2023	Biodiversity/Ministry of Environment Visit to One communities residing in areas hosting biodiversity resources - 2FGDs/ 1 KIIs with community leaders, community members including men, women, and youths	Enumerators/ Ismail/Abdirashid /NAP coordinator/UNDP – Aden
25 th Dec 2023	Vulnerability assessment – agriculture and food security: Visit to 1 community – 2 FGDs/ 1 KIIs with community members including men, women, and youths.	Enumerators/ Ismail/Abdirashid /NAP coordinator/UNDP – Aden
8:00am-12:30pm		
26 th Dec 2023	Vulnerability assessment – Water sector Visit to 1 communities 2FGDs/ 1KIIs with community members including men, women, and youths.	Enumerators/ Ismail/NAP coordinator/UNDP – Aden
26 th Dec 2023	Vulnerability assessment – health Visit to - one IDPs communities 2FGDs/ 1KIIs with community members including men, women, and youths.	Enumerators/ Ismail/NAP coordinator/UNDP – Aden
8:00am-12:30pm		
27 th Dec 2023	Vulnerability assessment- Ministry of Livestock and animal husbandry. Visit to - One communities 2FGDs/1KIIs with community members including men, women, and youths and Communities.	Enumerators/ Ismail/NAP coordinator/UNDP – Aden
8:00am-12:30pm		
27 th Dec 2023	Vulnerability assessment – Marine and coastal resources - Visit to - one communities 2FGDs/ 1KIIs with community members including men, women, and youths and Communities.	Enumerators/ Ismail/ /NAP coordinator/UNDP – Aden

DATE & TIME	ACTIVITY DESCRIPTION	RESPONSIBLE/PARTICIPANTS
28 th Dec 2023	Vulnerability assessment- Ministry of Women and Human Rights Development- Visit to - women organizations and CSOs - 2 Kils	Enumerators/ Ismail/ /NAP coordinator/UNDP – Aden
8:00am-12:30pm		
28 th Dec 2023	Vulnerability assessment- Ministry of Education Visit to – 1 Schools and 1 Regional education offices 2 Kils	Enumerators/ Ismail/ /NAP coordinator/UNDP – Aden
30 th Dec 2023	Vulnerability assessment – Public work/ DRR Field visit One Communities 2 Kils with companies rehabilitating the roads, and in charge of DRR response.	Enumerators/ Ismail/ /NAP coordinator/UNDP – Aden
31 st Dec 2023 – 14 th Jan 2024	Analysis of collected Data and share the 1st First VRA Draft Report in SWS	Consultant
25 th Jan 2024.	State-level validation workshop in SWS	MECC SWS state







Annex 3: Tool used for data collection





PART A: For COMMUNITIES (FGDs and KIIs)

-  Agriculture Part A.docx
-  Biodiversity Part A.docx
-  Coastal Sector Part A.docx
-  Disaster Risk Reduction-Part A.docx
-  Health Sector- Part A.docx
-  Livestock Sector_Part A.docx

-  Water Sector Part A.docx
-  Education Sector Part A.docx

PART B: Line ministries, Civil Society Organizations engaged in conservation (KIIs)

-  Agriculture Part B.docx
-  Biodiversity Part B.docx
-  Coastal Sector Part B.docx
-  Disaster Risk Reduction B.docx
-  Education Part B.docx
-  Health Sector Part B.docx

-  Livestock Part B.docx
-  WATER Sector Part B.docx
-  Public Work_PART .docx
-  Gender.docx