



**Ethiopian Forestry
Development**



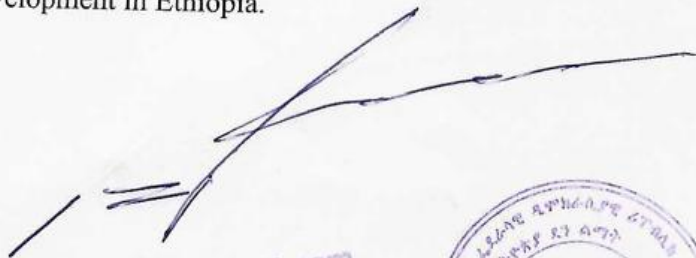
**NATIONAL
DROUGHT
RESILIENCE PLAN
2025**

FORWARD

Ethiopia stands as one of the most vulnerable countries to climate-induced drought, a challenge that has become increasingly recurrent and devastating. The impacts of these droughts affect millions of lowland pastoral communities, threatening their livelihoods and exacerbating food insecurity. In recognition of this pressing issue, the preparation of a comprehensive national drought plan is not only timely but essential for safeguarding our communities and enhancing resilience against future climate shocks.

The Ethiopian Forestry Development, as a focal institution to United Nations Convention to Combat Desertification (UNCCD) has been actively engaged in series of negotiations on drought issue at the Conference of Parties. As a result of years of dedicated dialogue and collaboration effort, we proudly accepted the establishment of the Riyadh Drought Resilient Partnership. Ethiopia plays a critical role in this initiative, particularly in the Horn of Africa, where regional cooperation is vital for establishing an effective drought resilience strategy.

We are particularly grateful for the financial support provided by the Global Mechanism, which has been instrumental in the preparation of this plan. Their commitment to enhancing our drought management capacities underscores the importance of international collaboration in tackling climate challenge induced drought. As we move forward, it is imperative that we unite our efforts, leveraging this plan to foster resilience among our communities. Together, we can mitigate the impacts of drought building resilience and pave the way for sustainable development in Ethiopia.



Kebede Yimam
Director general



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We would like to express our sincere gratitude to the United Nations Convention to Combat Desertification (UNCCD), the Global Mechanism for its invaluable financial support in the development of the initial Drought Resilience Plan. This initiative has been crucial in addressing the multifaceted challenges posed by drought in our nation, particularly in enhancing resilience and promoting sustainable land management practices.

Together, with the continued support of UNCCD and the collective efforts of all stakeholders, we aim to implement effectively the various strategies identified in this plan to enhance resilience against drought impacts in Ethiopia and beyond. Through collaboration of Riyadh drought resilience partnership, we are hopeful that this plan will serve as a beacon of resilience and a catalyst for sustainable development in the region and the world.

Executive Summary

Climate change is globally intensifying the frequency and severity of extreme weather events, particularly prolonged drought, posing profound socio-economic and environmental challenges worldwide. Developing countries are disproportionately affected by the negative impacts of climate change. Ethiopia, with its developing economy and communities intrinsically linked to natural resources, stands at the forefront of this global crisis. Ethiopia's high susceptibility to drought, with an annual probability exceeding 40% for moderate to severe events, is underscored by nearly 70% of its land being classified as dry lands. This makes the country highly vulnerable to climate variability, with historical data showing an alarming increase in drought occurrences since 1950, now striking approximately every two years. The consequences of drought are dire: undermining crop yields, critical water and feed shortages, widespread food insecurity, and persistent poverty. Beyond immediate impacts on the economy and livelihoods and the consequent humanitarian needs, recurrent droughts exacerbate land degradation, deforestation, and diminish the capacity of ecosystems to provide essential services, perpetuating a vicious cycle of vulnerability.

The Government of Ethiopia has been actively engaging in climate change and droughts management through a comprehensive UNCCD framework of policies and strategies. The major policies and strategies include the National Adaptation Plan (NAP), the Climate Resilient Green Economy (CRGE) Strategy, the Nationally Determined Contribution (NDC), and the Long-Term Low Emission Economic Development Strategy (LT-LEDS). These are complemented by vital sector-specific policies on disaster risk management, land, forest, water, and agriculture, all designed to counter the severe impacts of climate extremes. The government has also been designing and implementing transformative initiatives like the Green Legacy Initiative, a flagship Nature-based Solution, exemplifying the nation's commitment to climate change mitigation, adaptation, and sustainable development. The continued vulnerability to the negative impacts of climate change necessitated the preparation of specific National Drought Resilience Plan (NDRP) which is strategically aligned with existing policies and strategies. Under UNCCD framework it also signifying a crucial shift from reactive crisis management to a proactive, multi-sectoral, and integrated approach focused on building long-term resilience. The NDRP's overarching goal is to significantly enhance the resilience and adaptive capacity of Ethiopia's vulnerable populations, especially smallholder farmers and pastoral communities. It establishes a predictable, multi-sectoral framework for drought response, ensuring coordinated, swift, and effective mitigation and recovery efforts. A core principle of the NDRP is to manage droughts while protecting natural resources and infrastructure, thereby safeguarding community livelihoods, ensuring food security, and promoting sustainable national development. The purposes of the NDRP include:

- **Scaling Up Nature-Based Solutions and Sustainable Land Management:** The plan emphasizes the importance of nature-based solutions through the Green Legacy Initiative, which involves eco-friendly practices like integrated forest landscape restoration and sustainable land management. This approach aims to revitalize degraded ecosystems, thereby increasing community resilience to climate change.
- **Strengthening Early Warning Systems & Capacity Building:** It is to enhance existing Early Warning Systems (EWS) that improve climate monitoring and data dissemination. It also includes investing in infrastructure and human resources training and knowledge management such as weather stations and satellite systems to facilitate timely and accurate information sharing among stakeholders, enabling better preparedness and decision-making.

- **Policy Alignment and Drought Mainstreaming in key Sectors:** The plan calls for aligning land policies as cross-sectoral to multi-sectors with national resilience objectives to promote sustainable land use. Effective land use policies will enhance appropriate investment on land through effective land use planning for development, ultimately boosting land administration, agricultural productivity and community resilience.
- **Promoting Climate-Smart Agriculture:** It is crucial for improving food security and livelihoods of the smallholder farmers and pastoral communities. Hence, addressing land degradation through sustainable practices, the plan aims to combat soil erosion and declining fertility, ensuring food and nutrition security for smallholder farmers and pastoral communities.
- **Sustainable Water Resources Management:** Central to the plan is the promotion of sustainable water development and management over and under the surface as practices to enhance water availability and ecosystem resilience, equipping communities to effectively address drought impacts.
- **Development of Alternative Rural Energy:** As climate vulnerabilities increase, the plan prioritizes sustainable alternative and technology-based energy sources to bolster resilience and economic development in pastoral and rural areas.
- **Research and innovation for promotion of Sustainable and multi-Sectoral livelihood diversification options:** Finally, the plan encourages the implementation of multi-sectoral livelihood diversification options through research and innovation. These initiatives aim to integrate environmental sustainability with economic viability, thereby enhancing the resilience of pastoral communities and supporting long-term development and income generation.

Key Strategies of the NDRP: The NDRP identifies comprehensive and forward-looking strategies that are aligned strategically with international frameworks like the Riyadh Drought Resilience Partnership and Ethiopia's policies and strategies and overall development agendas. It is designed to address the root causes of drought and promote long-term environmental sustainability, encompassing major drought-affected sectors such as agriculture, water and energy, natural resources, irrigation and lowland and disaster risk management. These strategies include:

- **Scaling up Nature based Solutions & Tree based Land Restoration and Natural Resources Management:** This strategic direction enables Ethiopia to effectively reduce vulnerability and promote sustainable tree-based landscape restoration, a primary objective is to scale up nature-based solutions through the Green Legacy Initiative. This entails the extensive implementation of eco-friendly practices, including integrated landscape restoration, sustainable land and forest management practices. Hence, by adopting these practices, communities can revitalize degraded ecosystems, enhancing their resilience against the adverse effects of climate change shocks and improving their overall capacity to withstand drought impacts.
- **Strengthening Early Warning, Climate Monitoring, and Capacity Development:** It aims to strengthen existing Early Warning Systems (EWS) to address their current limitations. It involves proactive monitoring of climate and environmental data, ensuring timely dissemination of drought-related information to all stakeholders. Key steps include investing in robust data collection infrastructure, such as weather stations, hydrological sensors, and satellite imagery systems, to gather accurate real-time data necessary for developing

sophisticated predictive models. Additionally, enhancing governance and knowledge management system at federal and regional levels will also support effective and evidence based decision-making and community preparedness.

- **Policy Alignment, Drought Mainstreaming, and Enforcement:** it focuses on aligning land policy and legislation with national drought resilience plans which is essential to facilitate sustainable land use and resource management. This strategy anticipates the mainstreaming an effective land-use planning to all sectors at all levels of administration. Given Ethiopia's vulnerability to recurrent droughts, effective land policies must promote practices that enhance appropriate utilization of land for specific purpose which reduces deforestation and soil and land degradation, ultimately improving agricultural productivity and community resilience. This includes promoting sustainable land and natural resource management to conserve forest resources, critical for biodiversity, climate regulation, and livelihoods.
- **Promoting Climate-Smart Agriculture:** Promotion of climate-smart agriculture is vital for enhancing productivity and livelihoods of pastoral community in Ethiopia, as the lowland ecosystem is heavily reliant on agriculture and pastoralism. Addressing the degradation of farmlands and rangelands due to unsustainable practices and climate change is crucial. Implementing practices that combat climate change impact through carbon sequestration, soil erosion, acidification, and declining soil fertility that will support efforts to achieve food and nutrition security for millions of smallholder farmers and pastoral communities.
- **Promoting Sustainable Water Resources Management:** Sustainable water resources management is a cornerstone strategy within Ethiopia's National Drought Resilience Plan. This objective focuses on enhancing water availability, improving ecosystem resilience, and building community capacity to combat the impacts of drought effectively. Improving all water points for livestock management and irrigation development can enhance drought resilience in long term.
- **Sustainable Development of Alternative Rural Energy:** As climate change exacerbates vulnerabilities, promoting sustainable alternative rural energy sources which are technology based including solar and other energy sources are prioritized within Ethiopia's drought resilience plan. This initiative aims to enhance both resilience and economic development for pastoral and rural communities to reduce the utilization of biomass energy sources.
- **Research and innovation for promotion of Sustainable and multi-sectoral livelihood diversification options:** Implementing sustainable and multi-sectoral livelihood diversification options through research and innovation is essential for enhancing the resilience of pastoral communities. This includes developing alternative rural energy sources, agroforestry, agricultural livelihoods and promoting practices that integrate environmental sustainability with economic viability, thereby supporting long-term sustainable development and income generation.

By integrating these strategies and fostering broad collaboration among key stakeholders and partners, through this Plan Ethiopia aims to transform its approach to drought, moving from reactive emergency response to proactive, resilient development, safeguarding its communities, ecosystems, and fostering a more secure and prosperous future.

1. Introduction

Ethiopia, a nation deeply intertwined with its natural environment and rich cultural heritage, faces an escalating and existential crisis driven by climate change-induced droughts. These recurrent, prolonged periods of abnormally low rainfall are no longer mere meteorological events; they represent a profound threat to the livelihoods, food security, and socio-economic stability of millions across the country. Particularly, the most vulnerable Ethiopians are millions of smallholder farmers and pastoral communities, whose very existence and traditional ways of life are intrinsically linked to consistent rainfall patterns and healthy and productive ecosystems.

1.1. Climate Change Trends and their Influence on Drought Behavior

The intensification and increased frequency of droughts in Ethiopia are directly driven by shifting precipitation patterns and rising temperatures. Analysis of meteorological data reveals a clear warming trend: the mean annual temperature in Ethiopia increased by approximately by 1.3°C between 1960 and 2006, at an average rate of 0.28°C per decade¹. Projections indicate this warming trend will continue, with mean monthly temperatures expected to rise by 1.8°C by the 2050s and a staggering 3.7°C by the end of the century under high-emission scenarios².

This warming is directly linked to a prevailing rise in drought intensity, duration, and frequency across the country. For instance, studies in areas like Borana projects a significant rise in hydrological drought occurrences between 2025 and 2074. Even the capital, Addis Ababa, has experienced an average of three months of extreme drought annually over the past two decades, with projections indicating a 53% increase in extreme drought events by 2040-2060³.

The broader consequences of climate change extend beyond direct temperature and rainfall anomalies. They severely hinder long-term resilience and adaptation efforts. Traditional coping mechanisms, once effective, are now overwhelmed by the unprecedented scale and frequency of these events. Rural populations struggle to implement sustainable agricultural and land and natural resources management practices due to persistent barriers, including limited access to financial resources, essential training, and appropriate technologies. These challenges are compounded by inadequate infrastructure and insufficient support from various levels of government structures.

Moreover, the impact of climate change is often complicated by severe land and natural resource degradation. According to a study by WRI, more than 54 million hectares of land in Ethiopia (almost half of the country's landmass) has shown different levels of degradation, with about 11 million hectares potentially turning into desert without urgent restoration interventions. The sustainable management of Ethiopia's natural resources, particularly its expansive forest resources and precious biodiversity and water resources, is a major means of building community resilience. Forest resources

¹Ethiopia's Second National Communication (SNC) to the United Nations Framework Convention on Climate Change (UNFCCC). This is a primary source for observed climate trends and future projections for Ethiopia.

² The Federal Democratic Republic of Ethiopia, Ministry of Environment and Forest (MoEF). (2015). Ethiopia's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). Addis Ababa, Ethiopia.

³ World Bank Ethiopia Country Climate and Development Report (CCDR) (February 2024), Addis Ababa.

are crucial for maintaining the hydrological cycle, influencing local climates, and providing essential ecosystem services and resources for millions of communities before, during, and after drought incidences. However, the relentless impacts of climate change and advancing desertification have resulted in significant degradation and deforestation of these vital resources. Rising temperatures and unpredictable rainfall patterns undermine forest health, reduce natural regeneration and biomass, and impair the forests' critical ability to sequester carbon. Frequent droughts and degradation not only diminish the state of forests and biodiversity but also undermine their capacity to deliver critical ecosystem services and goods, such as water regulation and soil conservation, access to clean water, fodder, wood, and food, further exacerbating the challenges posed by drought and directly threatening the very foundations of smallholders' and pastoralists' livelihoods and their rich cultural heritage.

1.2. Overview of Drought Occurrence in Ethiopia

Ethiopia is highly vulnerable to drought, with an annual probability exceeding 40% for moderate to severe drought during the rainy season. Approximately 70% of the country's land is classified as drylands, characterized by low and irregular rainfall, leading to periodic droughts⁴. Historically, most famines in Ethiopia have been linked to drought, with the National Meteorological Service Agency (NMSA) documenting significant drought events through various historical records, including chronicles, travelers' diaries, and archival data.

Drought periods have been categorized into four distinct eras, revealing a long history of drought and famine:

- **Pre-1500 AD:** Droughts occurred roughly every nine years, with 177 documented instances.
- **1500-1950 AD:** The frequency decreased to about one drought every seven years, with catastrophic famines such as Quachine and Kifuken causing widespread devastation.
- **Post-1950 AD:** The occurrence of droughts has intensified, with events happening approximately every two years.
- **1970-1980 AD:** This decade was particularly disastrous, marked by seven years of significant drought, leading to severe humanitarian crises in subsequent decades.

The increasing intensity and frequency of droughts since the mid-1970s can be attributed to climate variability and global climate change. Notably, the 1975 drought was especially severe, impacting over half of Ethiopia's administrative regions due to the failure of short rains. This pattern underscores the urgent need for effective drought management strategies to mitigate the impacts on vulnerable communities and ensure food security.

1.2.1. Understanding Drought: Definitions and Types

Drought is defined by a prolonged period of abnormally low rainfall, leading to a significant shortage of water or moisture. This phenomenon is typically categorized into four types:

- **Meteorological drought:** Characterized by a deficit in rainfall over a specific period compared to average conditions.

⁴ Ethiopian Institute of Agricultural Research. 2012. "Impacts of Climate Variability and Change on Agricultural Systems of Semi-Arid Area of Ethiopia". Edited by Habtamu Admassu, Mezgebu Getinet and Abebe Kirub. ISBN: 978-99944-53-58-X.

- **Agricultural drought:** Occurs when insufficient soil moisture impacts crop growth and agricultural productivity.
- **Hydrological drought:** Marked by below-normal stream flow and depleted water reservoirs.
- **Socio-economic drought:** Relates to an imbalance between water supply and demand for economic goods, often worsening during scarcity.

Beyond just rainfall quantity, the timing and effectiveness of precipitation are crucial. Delays in the rainy season or insufficient rainfall during critical crop growth stages can severely impact agricultural output. The decline in agricultural productivity will exert massive pressure on remaining natural resources such as forests. Because each drought year presents unique climatic characteristics and challenges, tailored strategies are essential for effective mitigation and building community resilience.

1.3. Impacts of Drought in Ethiopia

The consequences of drought in Ethiopia are dire and multifaceted, pushing communities, mainly smallholder farmers and pastoral households deeper into a cycle of vulnerability. Historically, the most severe impact has been humanitarian crises, well-recorded in the country's history, particularly in the 1970s and 1980s. The 1988 drought in particular led to the historic and deadly famine, where several people in drought-affected northern and northeastern parts of the country died, and 90% of their animals perished⁵.

More recently, between 2000 and 2017, six significant drought episodes were registered, with the latest two (in 2011 and 2016/17) devastating pastoral and agro-pastoral livelihoods. Herders' continued reliance on natural, rain-fed pasture, coupled with accelerating resource scarcity, has severely reduced their ability to cope with shocks like drought. Successive poor/failed rains in 2016 and 2017 impacted pasture and water availability which causing abnormal migrations, deteriorating livestock body conditions, weakened immune systems, and increased cases of opportunistic diseases and parasites, further pushing up mortality rates. Milk production in cattle declined by as much as 80 percent, with significant losses also recorded in camels and goats, raising serious concerns over already high malnutrition rates given the close link between milk availability and human nutrition in pastoral communities.

Preliminary estimates indicate that between November 2016 and April 2017, more than 1.5 million livestock perished in southern and southeastern parts of the country, representing an economic loss of over USD 350 million. With low livestock production and unfavorable terms of trade, extreme coping mechanisms – such as reducing the number and size of meals, selling remaining productive assets, and, in increasing numbers of cases, destitution and displacement due to the complete loss of livestock assets – have been observed throughout affected areas. As far as pastoralist areas are concerned, the longest recorded drought lasted for 63 months in Borana Zone in southern Ethiopia during the 1983-2012 periods.

1.3.1. Economic Impacts

Droughts have a significant effect on the national economy. The economic impact of drought in Ethiopia is best demonstrated by its influence on the variability of the country's Gross Domestic

⁵ FDRE, 2018. Humanitarian and Disaster Resilience Plan, a Joint Government and Humanitarian Partners' Document

Product (GDP). Figure 1 illustrates how GDP growth tracks rainfall variability in Ethiopia⁶.

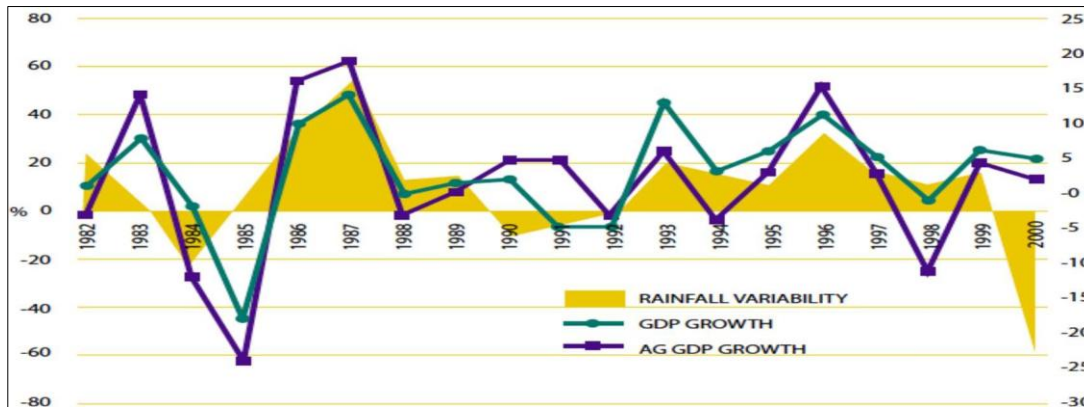


Figure 1- illustrates how GDP growth tracks rainfall variability in Ethiopia.

Emergency aid for droughts has averaged US\$509 million per year over the last 10 years (excluding the cost of refugee operations for major camps on the border with Somalia), according to the Financial Tracking Service (FTS) at UNOCHA. Oxfam estimates that drought alone costs the country US\$1.1 billion per year. By comparison, in 2011, Ethiopia’s GDP was US\$95 billion. In 2015-2016, Ethiopia experienced a severe drought that required the delivery of US\$1.7 billion in food assistance to nearly 17 million people. This drought was concentrated in the crop-producing regions in the north and west, leading to a significant shortfall in food availability. Following the 2015-2016 El Niño drought, in January 2017, the United Nations appealed for an additional US\$900 million to support roughly five million more people, this time with the most severe impacts felt in the pastoral regions of southern Ethiopia.

According to the World Bank, the average annual recurrent drought expenditure between 1997/98 and 2005/06 was roughly \$696 million.

In the rain-fed agricultural system of Ethiopia, the amount and temporal distribution of rainfall are generally the single most important determinants of internal fluctuations in national crop production levels. According to von Braun (1991), for instance, a 10% decrease in seasonal rainfall from the long-term average generally translates into a 4.4% decrease in the country’s food production. In 2002, reductions in maize and sorghum production in drought-affected lowland areas were estimated between 70% and 100%. Some surplus-producing parts of the country were also adversely affected. The overall national food availability in the country was thus low. In coffee-producing areas, the country’s main cash crop on which almost 15 million people depend, the harvest declined by 30% in 2002/03 due to drought (Fewes.net). Preliminary production assessment results indicated that total annual crop production in 2002 decreased by 21% compared to the five previous years (DPPC, 2002).

1.3.2. Humanitarian and Social Impacts

⁶ De Jong, the World Bank (2005) in World Bank (2010) “The economics of Adaptation to climate change in Ethiopia”. The World Bank Group Washington anager (2010) 24:1441-1460 DOI 10.1007/s11269-009-9508-0.

Droughts directly undermine agricultural productivity, crippling crop yields and forcing pastoral and agro-pastoral communities to confront critical shortages of water and feed for their livestock. This leads to pervasive food insecurity and heightened poverty levels. The devastating loss of livestock, often the primary source of income and sustenance for pastoralists who constitute 12-15% of Ethiopia's population, directly impacts their ability to meet basic needs, in some cases resulting in malnutrition⁷. Recent estimates show an increasing number of people facing drought-related food insecurity, with some reports indicating as many as 20 million people in Ethiopia are experiencing food insecurity. Furthermore, the intensified competition for dwindling natural resources frequently ignites inter-communal conflicts, eroding social cohesion and stability within and among communities.

The nutrition status of a country is also greatly affected by the occurrence of droughts. Back in 2014, Ethiopia ranked first in having the highest number of people in a state of undernourishment, with 32.1 million people. The World Food Program found long-term effects of chronic malnutrition cost Ethiopia approximately 16.5 percent of its GDP each year. The number of food-insecure people in the country is increasing from time to time, estimated at 2.9 million in 2014, 4.5 million in August 2015, and by the end of the same year, this figure had more than doubled to 10.2 million food-insecure people⁸.

Table 1-. Summary of people in need of assistance: 2010-2016

Regions	2010 and 2011	2010-2016				2015-2016
		years	Maximum	sum	mean	
Tigray	499378	7	1239755	4102851	586122	942343
Afar	149008	7	774463	1964488	280641	606841
Amhara	768620	7	2298494	6384030	912004	1858215
Oromia	1548262	7	3755347	12483451	1783350	3326495
Somali	1386205	7	1562000	8503248	1214750	1528746
Benishangul Gumuz	78942	7	125213	324912	46416	54108
SNNP	715672	7	836850	3080019	440003	622390
Gambella	42180	7	84360	321741	45963	50341
DireDawa	29623	7	65903	290571	41510	61337
Harari	4645	7	65510	133401	19057	23534

⁷ FAO, 2017. Drought response plan and priorities in 2017, Ethiopia

⁸ MoWR and UN-DESA 2009. Strengthening Water Sector Monitoring and Information System in Ethiopia GIRWI-Ethiopia Project report. (Global Initiative for Rationalizing Water Information and Monitoring). Ministry of Water Resources and United Nations Department of Economic and Social Affairs.

Table 2 details the humanitarian impacts during notable drought years, providing a historical perspective on the severity and widespread consequences of these events.

Table 2- Humanitarian Impact during notable drought years

Year Interval/Years	Impact	Remark
1990-1992	0.5 million people were affected in the northern, eastern and southeastern Ethiopia.	A severely dry spring in 1992 occurred causing extreme drought on the 12 months scale of SPI in the southern and southeastern lowlands. In the southern lowlands, spring 1992 was the worst during 1972-2011, and in the southeastern lowlands the second most. (Viste et al, 2012,)
1999-2000	During 1999–2000, Ethiopia was brought to the edge of a major disaster, with some 10 million people estimated to be in need of food assistance at the height of the crisis. A repeat of the catastrophic famine of 1984–5 was avoided, but the numbers of people affected, the loss of life and the destruction of livelihoods made this one of the most serious crises in the H The label ‘famine averted’ seems to summarise the crisis to the satisfaction of most parties involved in of Africa in the past 15 years.	The years 1998, 1999 and 2000 were all dry in the south, mainly due to dry spring seasons. The worst drought in the Southern Lowlands occurred in 1999–2000. Similarly, the combination of 1999 and 2000 made this the driest period on the 24-month timescale. The spring season in 1999 was dry in all of Ethiopia in both years In the Northern, Northeastern and Central Highlands the 1999 spring was the driest during the record. The spatial anomaly pattern for 2000 is strikingly similar to that of 1999, with a dry spring followed by a wet summer in the north, this time with a wet fall season everywhere, except in the southwest. (Viste et al, 2012,)
2002-2003	About 13 million people needed food assistance. In 2002, about 14.2 million people (over 20% of the total population) were affected by drought (World Bank 2007).	Due to a dry spring followed by a dry summer, 2002 became one of the driest years during 1972–2011. In the Southwestern Rain Forest, this was the driest year, and in the Central Rift Valley, the Central Highlands (IX), and the Southern Highlands the second driest. After a dry spring in 2003, a wet summer brought some relief, but 2003 was also drier than normal. In the Southwestern Rain Forest (VI) the drought was extreme at all timescales from 3 to 24months, and at some timescales also in adjacent zones and in the Southern Highlands.

		<p>At the 12-month scale, moderate to severe drought persisted in most of the highlands and the Central Rift Valley from June–July 2002 through July 2003.</p> <p>(Viste et al, 2012,)</p>
2008-2011	<p>5.2 million people required emergency food assistance in the 2009-2010 period</p>	<p>The drought from 2008 up to 2011 was characterized by the repetition of dry spring seasons</p> <p>Dry springs affect all of Ethiopia, causing the largest relative precipitation deficits in the south, where this is the main rainy season. Among the recent years, In the Southern Highlands 2009 was the driest year in the record, and in the Northeastern Rift Valley and the Southern Rift Valley the second driest year. As shown in Figure 5, t</p> <p>The spring season was dry in both 2008 and 2009, with the exception of the westernmost part. In most of the country, at least one of these springs was among the three driest during 1972–2011.</p> <p>2009 was the only year during 1972–2011 when drought occurred on the annual scale in all of Ethiopia, in most zones ranging from Moderate to severe. I</p> <p>The drought in the south continued with a dry spring in 2011 (Figure 5), and at the end of the record in May 2011 the drought in the Southern and Southeastern Lowlands was still severe on timescales of 12 and 24 months. In the Eastern Highlands, the 2011 spring was the driest during 1972–2011.</p> <p>(Viste et al, 2012)</p>
2015-2016	<p>The drought affected nearly 10 million Ethiopians.</p> <p>The 2015 El Niño drought is one of the strongest droughts that have been recorded in Ethiopian history were more than 27 million people became food insecure and total population of 18.1 million people require food assistance in 2016.</p>	<p>The observed 2015 drought was an extremely rare event that is expected to happen in the central to north-eastern parts of Ethiopia only about once every few hundred years.</p>

1.4. Drought Risk and Vulnerability in Ethiopia

Almost all parts of Ethiopia have experienced some degree of drought over the past three thousand years, although the frequency, intensity, and duration vary from one region to another. The most drought-prone areas of Ethiopia have been the northern, north-eastern, and south-eastern parts of the country, including the eastern half and the southern parts (Comenetez and Caviedes, 2002; WoldeGiorgis et al., 2001; Wolde Mariam, 1986). These drought-prone areas are found entirely over the moisture-deficit semi-arid regions of the country. These areas are characterized by high variability of rainfall from year to year with a high coefficient of variability, and the length of the growing period is on average less than 3 months. Hence, the occurrence of a few weeks of dry spells or early cessation of rainfall can result in an agricultural drought. Thus, it is important to note that addressing drought vulnerability in Ethiopia should consider the semi-arid areas of the country as a whole. The semi-arid areas, when combined with the arid (not growing areas), make up the dryland areas of the country.

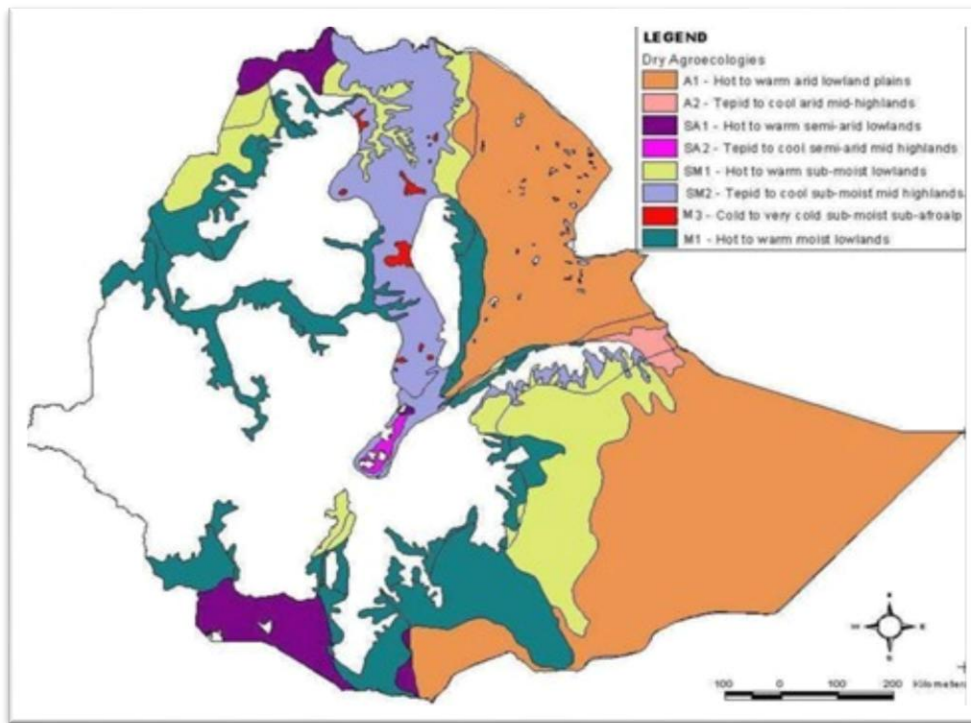


Figure 2- Dry land areas of Ethiopia

The dry land areas of Ethiopia have very wide and diversified agricultural environments and farming systems (MoA, 1998). The dry land areas cover eight of the 18 major agro-ecologies and have 20 sub-agro-ecologies, covering about 66.6% of the total landmass of the country. This includes arid, dry semi-arid, moist-semi-arid, and dry-sub humid zones.

Previous attempts to identify drought-prone areas include the National Meteorological Agency's work using the decile method for the March to October season (NMSA, 1996). However, this approach only considered the severe form of drought (rainfall below the second decile) and did not account for moderate drought. Furthermore, the resolution was very low and cannot be used for decision support at the zone or woreda level, and the data is over thirty years old.

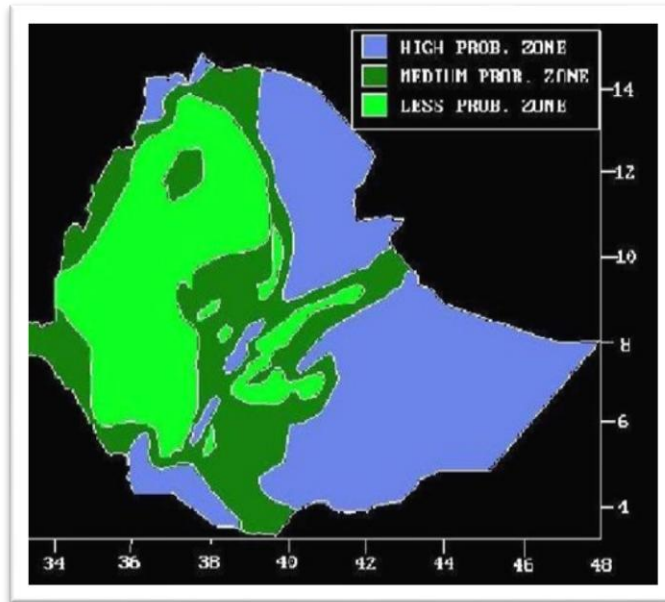


Figure 3- Drought probability map of Ethiopia (NMSA, 1996)

Another approach utilizes broad moisture regimes, where semi-arid moisture-deficient areas (Zone 4) are considered more drought-prone. Zones 2 and 3 generally have sufficient moisture for cereal and enset cultivation, respectively, while Zone 4 is prone to droughts. The arid lowlands in the east of the country (Zone 5) are referred to as no-growing areas (i.e., through rain-fed agricultural systems).

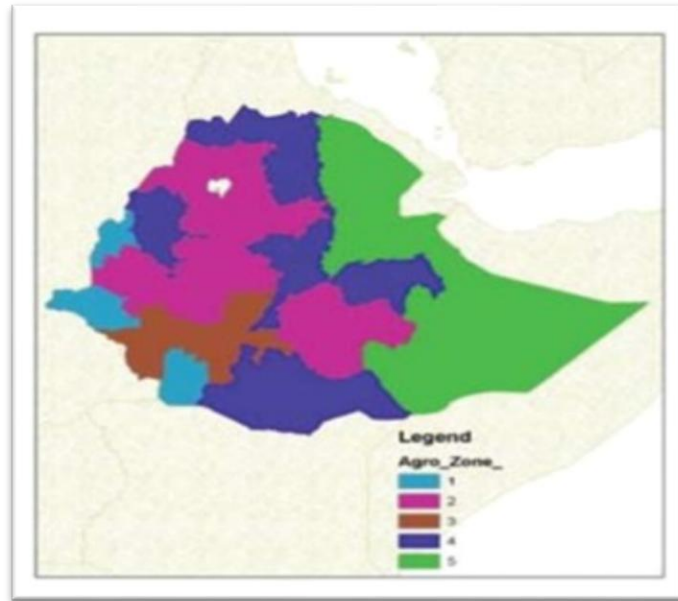


Figure 4- **Broad Moisture Zones of Ethiopia**

The Woreda Disaster Risk Profile developed by the Ethiopian Disaster Risk Management Commission also provides important qualitative information on drought vulnerability at the woreda level, based on hazard, vulnerability, and coping capacity indicators. However, for detailed drought planning, more quantitative information on the expected probability of drought occurrences for a given woreda is needed.

A drought susceptibility map based on 1975-2007 information (NDRMC) shows woredas that reported drought in more than 50% of the years. These are largely found over the northeastern, northern, eastern, and southeastern parts of the country, including the southern lowlands, with a few isolated cases over the northwestern parts. A major challenge with this data is the constant change in woreda boundaries.

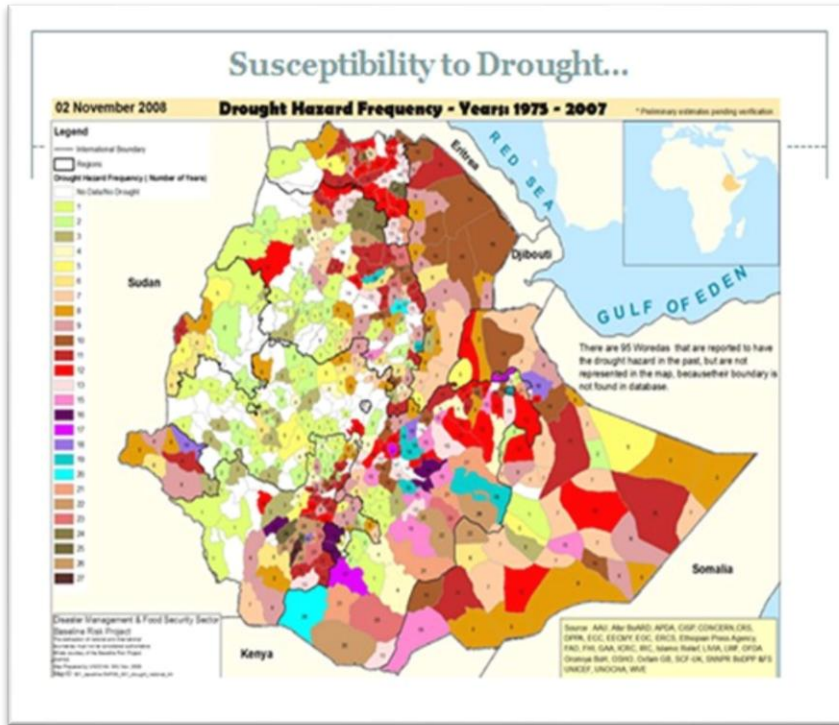


Figure 5- Drought Susceptibility map of Ethiopia (NDRMC)

The identification of drought-vulnerable areas during El Niño years is crucial for implementing necessary mitigation measures when an El Niño year is forecasted. Lessons from strong El Niño years, such as 2015, show that drought-affected areas can include regions not traditionally considered drought-prone.

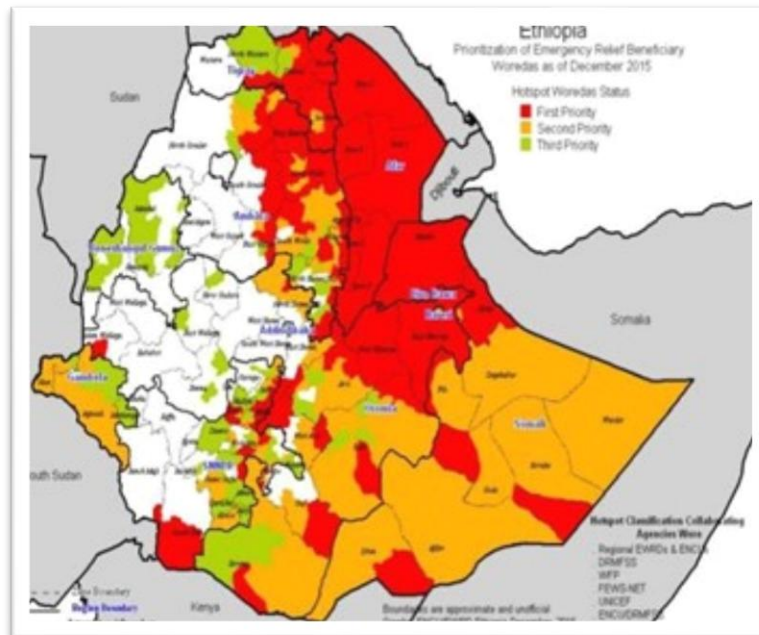


Figure 6- Hotspot Woredas during 2015 El Niño drought

PSNP (Productive Safety Net Program) woredas are typically chronically drought-prone areas, often also characterized by land degradation. These woredas should be a major target for long-lasting solutions within the drought mitigation plan. Figure 13 clearly shows that all PSNP woredas are found over central and eastern Tigray, the eastern half of Amhara, the whole of Afar and most parts of Somali, eastern parts of SNNPR, and eastern and southern parts of Oromia, probably comprising more than 50% of the country.

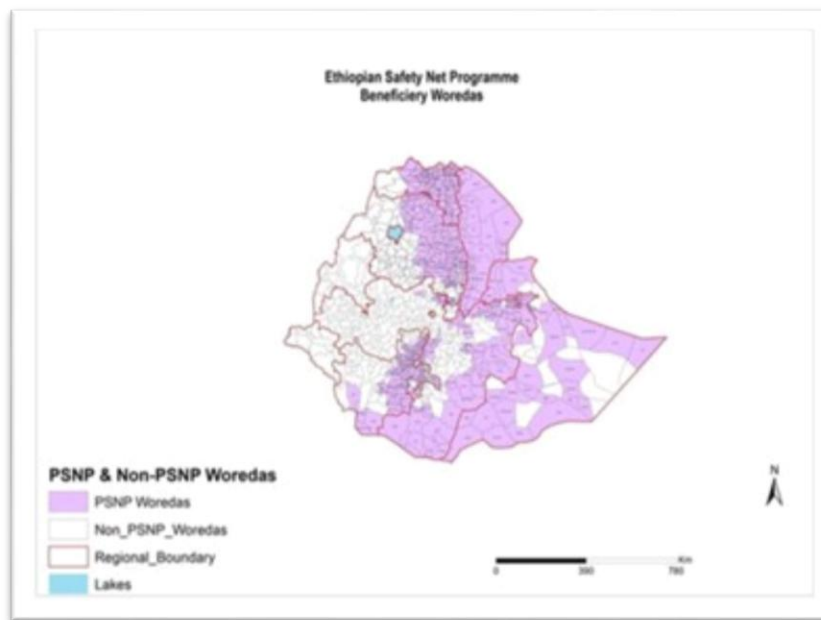


Figure 7- PSNP Woredas in Ethiopia

1.5. Identification and GIS Mapping of Drought Vulnerable Areas

To provide a more quantitative and up-to-date assessment of drought vulnerability, a GIS mapping approach was employed using robust meteorological data and a standardized methodology.

1.5.1. Data

The data utilized is the National Meteorological Agency's merged 10-daily satellite-gauge rainfall data for the period 1983 to 2014, covering 532 woredas/Districts. This high-resolution data (10km at ten daily grid databases) was a result of collaborative support from the International Research Institute (IRI) and the University of Reading. It greatly addresses the problem of uneven distribution of meteorological stations across the country and can be used to characterize observed recent climate variability and trends, as well as climate change signals for verification of climate change projections. This data is publicly accessible on the NMA website (www.ethiomet.gov.et).

1.5.2. Methodology

The methodology for mapping drought vulnerability involved a series of steps:

Step 1: Normalized Seasonal Rainfall Anomaly Computation

The Normalized Seasonal Rainfall Anomaly (NSRF Anom) was computed for each year using the formula: $NSRF\ Anom_{year\ i} = \frac{Obs.\ Seas.\ Rf_{year\ i} - Mean\ Seas\ RF}{Seasonal\ STD}$ Where:

- NSRF Anom_{year i} refers to the computed value of the Normalized Seasonal Rainfall Anomaly for a given year.
- Obs. Seas. Rf_{year i} for year i refers to the observed seasonal rainfall for the given year.
- Mean Seasonal RF refers to the computed value of the mean seasonal rainfall.
- Seasonal STD refers to the computed value of the standard deviation of the seasonal rainfall.

The rainfall seasonal classification used aligns with NMSA (1996), consisting of:

- **Belg Season:** February to May
- **Kiremt Season:** June to September
- **Bega Season:** October to January

The interpretation of NSRF values for identifying drought years was undertaken using the thresholds provided in Table 3. It's crucial to consider the moisture regime of a given area during map interpretation, as normalized rainfall anomaly is a simpler indicator for identifying drought years, especially with data durations of thirty years.

Table 3- Humanitarian Impact during notable drought years

NSRF value	Interpretation	Remark
Greater than 2	Very Wet year	Normalized rainfall anomaly is the simplest indicator that can be used to identify years of droughts by different researchers, especially with a data duration of thirty years. However during interpretation of the maps, it is important to take into account the moisture Regime of a given area.
Greater than 1 and less than 2	Wet year	
Greater than -0.5 and less than 1	Close to Normal	
Less than -0.5 and greater than -1	Mild Drought	
Less than -1 and greater than - 1.5	Moderate drought	
Less than -1.5 and greater than -2	Severe Drought	
Less than -2	Very Severe drought	

Step 2: Identification of Drought Years

Based on the thresholds in Table 11, each year was identified as a drought year for a given season. This was performed for all years in the 1983-2014 periods across all 532 woredas.

Step 3: Counting Drought Years

The number of drought years was counted for each woreda and season. For example, using a threshold of -1.5 identified all severe drought years.

Step 4: Computation of Drought Probability

The probability of drought occurrence (in percentage) was calculated using the formula: Probability in % = $(N_d/32) \times 100$, where N_d refers to the number of counted drought years, and 32 represents the total number of years in the analysis period (1983-2014).

Step 5: Mapping Drought Vulnerability Levels

The computed probabilities were mapped to identify different levels of drought vulnerability across various administrative areas.

1.6. Drought Risk Areas in Various Administrative Areas

The GIS mapping yielded valuable insights into drought risk across Ethiopia, considering different drought severities.

1.6.1. Scenario 1: Drought Vulnerability Assessment Including Mild Drought

The computation of drought probability using a standardized rainfall anomaly of -0.5 as a threshold (indicating mild drought occurrences) for the major rainfall seasons revealed that most parts of the country have a probability of experiencing mild agricultural drought at a probability of 30% to 50%.

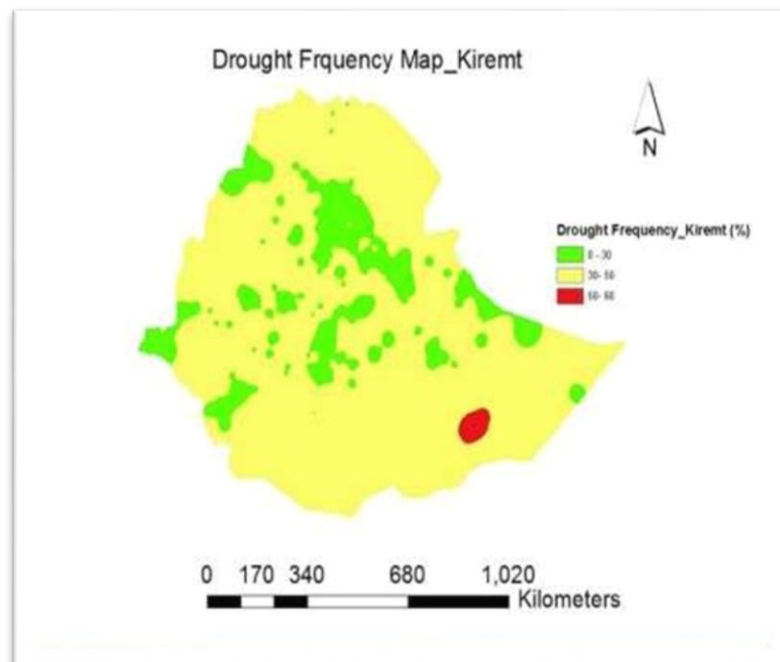


Figure 8- Drought Frequency map of Kiremt

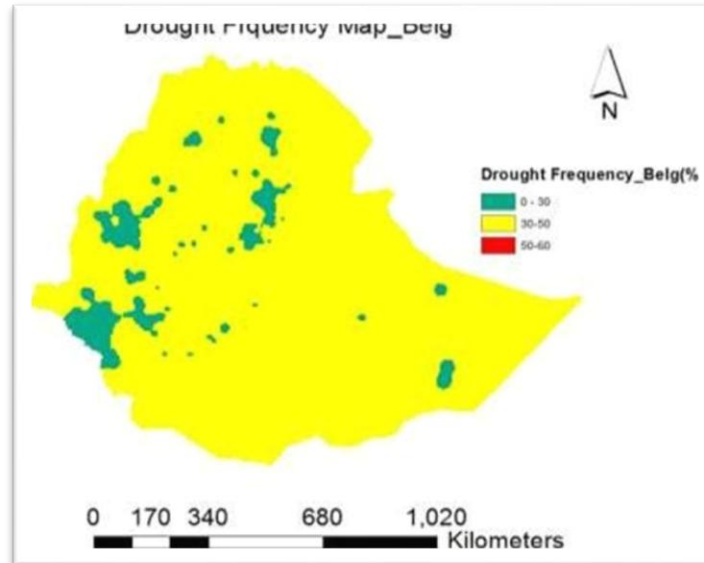


Figure 9- Drought Frequency map of Belg

1.6.2. Scenario 2: Drought Vulnerability Assessment Including Severe Drought

Understanding the probability of severe drought is critical for developing effective drought management strategies. This section details the findings from our vulnerability assessment, focusing on severe drought occurrences in both the **Kiremt** (main rainy season) and **Belg** (short rainy season) seasons, based on a standardized rainfall anomaly threshold of -1.

Kiremt Season Severe Drought Probability

During the Kiremt season, **hotspot areas** characterized by a recurrent severe drought probability of **20% to 30%** (meaning once in five years to once in three years) include:

- Northwestern and southeastern parts of Tigray, with a few isolated spots in the northeast.
- Eastern and western parts of Amhara.
- Isolated areas over northwestern, southwestern, and eastern Oromia.
- Northern parts of the previous SNNPR (Southern Nations, Nationalities, and Peoples' Region).
- Northern parts of Somali.

Major Finding: While most parts of the country can expect one severe drought year out of every five to ten years during the Kiremt season, a few specific locations face this severe impact more frequently—once every three to five years.

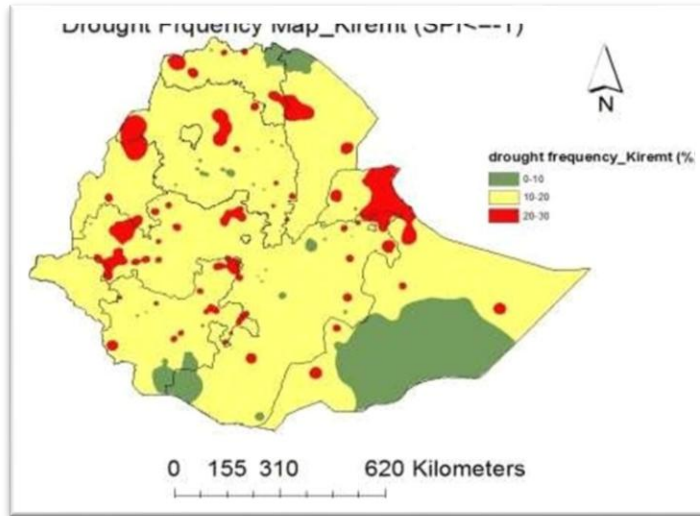


Figure 10- Severe drought probability map during Kiremt season

Belg Season Severe Drought Probability

For the Belg season, hotspot areas experiencing recurrent severe droughts are predominantly located in:

- Southern parts of Oromia.
- Southern parts of SNNPR, particularly agro-pastoral areas highly susceptible to livelihood loss.
- A few isolated spots across other regions, including parts of Benishangul-Gumuz and neighboring areas of Amhara, southern Afar, and northeastern Oromia.

A comprehensive list of these woredas will be provided in an annex.

Major Finding: Most parts of the country experience severe drought in the Belg season once every five to ten years. However, the identified hotspot areas in southern Oromia, southern SNNPR, parts of Benishangul, neighboring Amhara, southern Afar, and northeastern Oromia experience severe drought more frequently, typically once every three to five years.

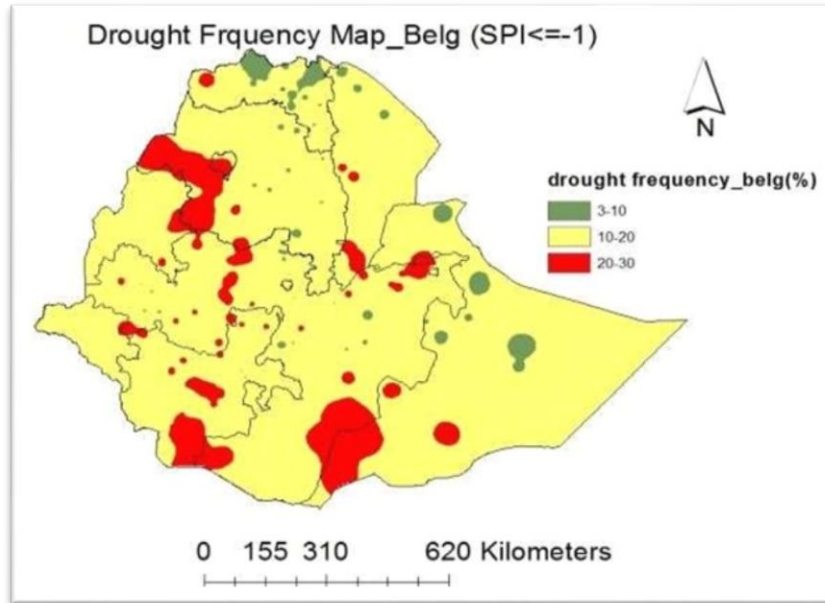


Figure 11- Severe drought probability map in the Belg season

The vulnerability mapping, considering both mild and severe drought scenarios, highlights distinct patterns across Ethiopia. While mild drought is becoming more regular over most parts of the country (expected every two to three years, as shown in Figures 11 and 12 in the previous section), necessitating consistent moisture conservation and management practices, the occurrence of severe droughts is prevalent in a three-to-five-year cycle for many areas. This more frequent severe drought occurrence may be interrelated with ENSO (El Niño-Southern Oscillation) phenomena.

Furthermore, although the Belg season generally exhibits greater rainfall instability across much of the country, the hotspot areas requiring focused attention for severe drought are more clearly defined during this season. These particularly vulnerable regions are predominantly found in the agro-pastoral areas, underscoring the urgent need for targeted interventions and robust drought management strategies in these critical zones.

2. Ethiopia's National Drought Resilience Plan and its Importance

2.1. Background

The Government of Ethiopia has enacted different policies and strategies and has been implementing different initiatives to mitigate off and adapt to the impacts of climate change. Cognizant of the increasing challenges of droughts at national and global level, the Government has prepared a comprehensive National Drought Resilience Plan/NDRP which will serve as an integrated framework guiding planning and implementation of interventions to mitigate off and adapt to droughts in the country. Given Ethiopia's profound vulnerability to recurrent droughts⁹ and its devastating impacts on the natural resources, ecosystem services, land production and productivity, food security, community well-being and overall economic growth, the development and implementation of this National Drought Plan (NDP) represents a pivotal shift for the country, transitioning the nation from a reactive stance of crisis management to a proactive approach focused on building long-term drought resilience. The NDRP outlines multi-sectoral interventions with a focus on promoting Nature-based Solutions to build ecosystem and community resilience to drought and build capacities and capabilities at strategic and operational levels. It represents Ethiopia's unwavering commitment to safeguarding its most vulnerable communities, preserving its vital ecosystems, and steering the nation towards a more secure, prosperous, and climate-resilient future.

The core element of the national drought resilience plan is to assert that if droughts happen, they should not lead to displacement and eventually to famine. By identifying key stakeholders and establishing a predictable and multi-sectoral response mechanism, the NDRP will serve as instrumental in enhancing national coordination and fostering collaboration among a diverse array of stakeholders such as Ministry of Finance, Ministry of Agriculture, Ministry of Water and Energy, Ethiopian Forestry Development and Disaster Risk Reduction Commission along with their regional counter parts and other key actors including multilateral development partners, CBOs and private sector, to provide collective, efficient, and impactful actions that will help the GoE to prevent catastrophic outcomes of droughts. Such proactive interventions will help to save lives and protect livelihoods that are perpetually at risk.

While facilitating relief during and post drought risks, the NDRP is designed to guide building long-term resilience of communities through sustainable management of ecosystems and ecosystem services and goods. Through the strategic integration of nature-based solutions, particularly sustainable forestry and land management practices, and by supporting the diversification of community livelihoods, the plan not only mitigates the immediate impacts of drought but also fundamentally strengthens the adaptive capacity of both populations and their environments. Such an integrated approach ensures communities are better equipped to withstand future climatic shocks. The also demonstrates that the NDRP is strongly linked with the major interventions in the National Determined Contribution and the Long-Term Low Emission Economy strategy of the country, both of which identify sustainable forest resources management as major area of intervention to achieve the ambitious climate change mitigation and adaptation targets.

Further, the paramount importance of this strategy lies in its commitment to mainstreaming drought risk management into sectoral plans and aligning with other key policies and strategies. It ensures that drought preparedness and response are not isolated endeavors but are deeply integrated into other national development plans and sectoral programs. This comprehensive approach fosters sustainable development and promotes environmental health across all sectors of national planning, embedding resilience as a core principle in Ethiopia's journey towards a more secure and prosperous future. The

⁹ UNDRR (2021). *Drought Special Report 2021*. United Nations Office for Disaster Risk Reduction.

plan also considers the importance of mobilizing additional resources to strengthen efforts to manage droughts risks. The strategy is hence designed to enable Ethiopia to prepare bankable proposals to mobilize funding from different sources including from the Riyadh Drought Resilience Partnership. These resources are critical for financing robust mitigation efforts such as planning and implementing nature-based solutions to build ecosystem resilience and providing necessary relief and recovery assistance to vulnerable communities.

2.2. Purpose, goal and objectives of the National Drought Resilience Plan

2.1.1. Purpose

The National Drought Resilience Plan for Ethiopia is designed to fundamentally change how the nation confronts and manages the increasing threat of drought. This comprehensive strategy moves beyond traditional emergency response, establishing a robust framework for long-term resilience and sustainable development. The primary purpose of the National Drought Resilience Plan is to develop and implement a master drought management and resilience strategy for Ethiopia through multi-sectoral coordination. As mentioned in different section of this strategy, Ethiopia faces significant challenges from prolonged and widespread drought, exacerbated by climate change, population growth, and ongoing conflicts, all of which intensify existing vulnerabilities. In response, the NDRP aims to integrate nature-based strategies into a broader framework for drought mitigation and adaptation, while also considering other interventions to be done before, during and after drought incidents. By enhancing integrated restoration of degraded landscapes and ecosystem services, by integrating trees on farm and rangelands and developing innovative value chains, by promoting sustainable management of land and natural resources including forest resources of the country, the NDRP seeks to improve resilience against drought, safeguard vital ecosystems, and support local livelihoods, with a focus on most affected communities and areas. The plan encourages proactive measures through effective risk assessment and early warning systems, empowering communities to better prepare for and respond to drought conditions.

The NDRP also emphasizes the critical interconnection between forestry and water resources management and agricultural practices. Scaling up and scaling out of best practices of the Green Legacy Initiative which include afforestation and reforestation, agroforestry, assisted natural regeneration, farmers managed natural regeneration and integrating soil and water conservation structures, can significantly enhance water availability and soil health, thereby enhancing mitigating the impacts of drought. The NDRP will also help strengthen food security and reduce dependency on external aid by promoting climate-resilient agricultural practices alongside forest development. Particularly, integrating fast growing trees, fruits and fodder species, not only help to diversify livelihoods of drought prone areas, but also help to improve ecosystem services and microclimate.

The plan more than anything will promote an integrated approach that fosters collaboration among government agencies, local communities, and development partners, ensuring that forestry initiatives align with national and international planning efforts. Furthermore, the plan supports private sector engagement essential in drought response. Private sector engagement to contribute to drought management can be initiated in areas of businesses development in sustainable forestry practices and in investing in eco-friendly technologies including in acquiring, analyzing and disseminating climate information. The NDRP also helps to scale up best practices related to innovative financing mechanisms, necessary for timely drought response and recovery efforts, while tailored insurance schemes for forestry and agriculture provide a crucial safety net for communities, reducing their vulnerability to climate-induced shocks.

Finally, through this comprehensive plan Ethiopian Forestry Development with a mandate from parliament and lead institution under the UNCCD framework be able to bring together key stakeholders including Ethiopian Disaster Risk Reduction Commission, line ministries and development partners to strengthen negotiations, partnership and mobilize additional resources to implement effective drought management projects and programs, ultimately enhancing long-term resilience for affected communities.

2.2.1. Goal and Objectives of the National Drought Resilience Plan

The overarching goal of Ethiopia's National Drought Plan is to enhance resilience and adaptive capacity among drought-affected communities. It seeks to establish a framework for a quality and predictable multi-sectoral response to drought occurrences across the nation, ensuring coordinated efforts that significantly expedite the mitigation, and recovery of communities impacted by drought. A core principle of the NDRP is that droughts need to be mitigated, and if it happens, it should be managed not harm natural resources and infrastructures, at least significantly, and ultimately safeguard food security and promoting sustainable development in the country. Specific objectives include:

- **Scaling-Up Nature Based Solutions & Tree-Based Land Restoration and Natural Resources Management:** This strategy enables the country to effectively reduce vulnerability and promote sustainable natural resources development; a primary objective is to scale up tree-based nature-based solutions through the Green Legacy Initiative. This entails the extensive implementation of eco-friendly practices, including integrated tree-based landscape restoration, sustainable land and forest participatory forest management and conservation. Hence, by adopting tree-based forest landscape restoration practices, communities can revitalize degraded ecosystems, enhancing their resilience against the adverse effects of climate change and improving their overall capacity to withstand drought.
- **Strengthening Early Warning, Climate Monitoring, and Capacity Development:** To strengthen existing Early Warning Systems (EWS) to address their current limitations with respect to climate information dissemination to alert the community. This involves proactive monitoring of climate and environmental data, ensuring timely dissemination of drought-related information to all stakeholders. Key steps include investing in robust data collection infrastructure, such as weather stations, hydrological sensors, and satellite imagery systems, to gather accurate real-time data necessary for developing sophisticated predictive models. Additionally, enhancing governance and knowledge management systems will support effective decision-making and community preparedness at federal and regional levels.
- **Policy Alignment, Drought Mainstreaming, and Enforcement:** -Aligning land policy and legislation with national drought resilience plans which is essential to facilitate sustainable land use and resource management. Effective land use planning is crucial for sustainable investment and development, particularly in the context of Ethiopia's drought resilience. Aligning land policy and legislation with national drought resilience plans facilitates sustainable land use and resource management. Given the country's vulnerability to recurrent droughts, it is vital that land policies promote practices that enhance specific land use for different sectoral development including agriculture, forestry, settlement and urban areas. These efforts ultimately improve agricultural productivity and community resilience. Moreover, they support sustainable land and natural resource management, which is essential for conserving forest resources that are critical for biodiversity, climate regulation, and livelihoods. This includes promoting sustainable land and

natural resource management to conserve forest resources, critical for biodiversity, climate regulation, and livelihoods.

- **Promoting Climate-Smart Agriculture:** Promoting climate-smart agriculture is vital for enhancing productivity and livelihoods of the pastoral community, as the lowland community are reliant on agriculture and pastoralism. Addressing the degradation of farmlands and rangelands due to unsustainable practices and climate change is crucial. Promoting climate-smart agriculture is a vital solution for mitigating the impacts of climate change and building resilience against drought. By implementing practices that enhance soil health, improve water efficiency, and diversify crops, communities can adapt to changing weather patterns while ensuring food security. Climate-smart agriculture not only reduces greenhouse gas emissions but also increases agricultural productivity and sustainability. As farmers adopt these innovative techniques, they can better withstand the adverse effects of drought, ultimately fostering stronger, more resilient livelihoods and ecosystems. This holistic approach contributes to long-term sustainability and supports efforts to combat climate change at both local and global levels.
- **Promoting Sustainable Water Resources Management:** Developing effective surface and groundwater management strategies is essential for mitigating the impacts of drought and building resilience in affected communities. As climate change intensifies the frequency and severity of droughts, sustainable water management practices become critical. By optimizing the use of available water resources, enhancing water conservation techniques, and implementing integrated watershed management, we can ensure a reliable supply of water for agriculture, drinking, and ecosystem health. Moreover, investing in infrastructure to capture and store rainwater, along with promoting community awareness and participation, can significantly reduce vulnerability to water scarcity. Ultimately, a proactive approach to water development and management not only safeguards against drought but also supports long-term economic stability and environmental sustainability.
- **Sustainable Development of Alternative Rural Energy:** As climate change exacerbates vulnerabilities, promoting sustainable alternative rural energy sources is prioritized within Ethiopia's drought resilience plan. This initiative aims to enhance both resilience and economic development for pastoral and rural communities. Utilizing alternative rural energy sources, particularly through biogas technologies and rural electrification, significantly reduces reliance on traditional biomass energy, thereby enhancing the sustainability and resilience of pastoral communities facing drought impacts. By harnessing organic waste for biogas production, these communities can generate clean, renewable energy for cooking, lighting, and other essential needs, decreasing pressure on local forests and reducing deforestation.
- **Research and Innovation for Promotion of Sustainable and Multi-Sectoral Livelihood Diversification Options:** Implementing sustainable and multi-sectoral livelihood diversification options is essential for enhancing the resilience of pastoral communities. This includes developing alternative rural energy sources and promoting practices that integrate environmental sustainability with economic viability, thereby supporting long-term sustainable development. Diversifying livelihood options across forestry, agriculture, energy, and water-based sectors is crucial for ensuring sustainable drought mitigation and resilience in pastoral communities. By integrating various income sources, such as agroforestry, sustainable agriculture practices, and renewable energy initiatives, these communities can reduce their vulnerability to climate variability and economic shocks.

2.2.2. Scope of the National Drought Resilience Plan

The National Drought Resilience Plan is a comprehensive and forward-looking strategy designed to fundamentally enhance Ethiopia's resilience to recurrent drought conditions. Its scope is deliberately made broad, encompassing a multi-sectoral approach that aligns strategically with the Riyadh Drought Resilience Partnership Plan and Ethiopia's climate policies and strategies and that of the overarching national development agendas. Under the leadership of the Ethiopian Forestry Development, designated as the focal institution for the United Nations Convention to Combat Desertification, the NDRP will guide coordinated efforts across key governmental bodies including Ministry of Finance, Ministry of Agriculture, Irrigation and lowland areas, Ministry of Water and Energy, Disaster Risk Reduction Commission and development partners. This integrated framework ensures that all relevant sectors contribute to a centralized national response. Geographically, major interventions of the plan will target drought-prone areas across Ethiopia, prioritizing areas identified as most vulnerable to climate shocks and food insecurity. The NDRP sets an ambitious implementation timeline from 2025 to 2035, allowing for sustained efforts in building long-term resilience, fostering sustainable development, and ensuring environmental protection.

Key operational scope of the plan extends to several critical areas:

- **Early Warning Systems and Proactive Response:** A core component of the NDP's scope is the establishment/strengthening of a robust, technologically advanced early warning system. This system will ensure timely and accurate information dissemination, enabling stakeholders at all levels, from national to local, to respond proactively and effectively to emerging drought threats.
- **Capacity Building and Community Empowerment:** The plan places significant emphasis on empowering local communities, institutions and stakeholders. This will be achieved through targeted training programs designed to equip farmers and pastoral communities, regional and local administration, and others with essential knowledge and skills in climate responses, sustainable land and natural resources management, and climate-smart agricultural practices. This grassroots approach aims to foster a culture of resilience, strengthen local economies, and promote environmental stewardship. In addition to improving human resources, the capacity building effort will include improving the hardware aspects of drought management, improving infrastructure that advance access to climate information and mobility.
- **Scaling up and scaling out best practices of Nature based Solutions:** In this case, Nature-based Solutions are a critical set of interventions implemented to manage drought. Such interventions leverage natural processes to address societal challenges effectively and adaptively, before, during and after drought incidents. For a highly vulnerable country such as Ethiopia, NBS offers sustainable and often cost-effective alternatives or complements to other development initiatives. Specific practices include afforestation, reforestation, forest and biodiversity conservation, management of invasive species, soil and water conservation practices and developing value chain development for selected nature-based products. Interventions also include domestication of drought resistant species and farming practices.
- **Innovative Water Resources Agricultural Practices:** This involves the widespread promotion of effective management of water bodies, ground water recharge, rainwater harvesting, expansion of efficient irrigation systems, use of drought-resistant crops, improving land management and soil health through agro-forestry practices and introducing robust rangeland and livestock management system. By leveraging the diverse expertise across ministries, the plan will create synergistic projects to maximize resource efficiency and minimize vulnerabilities in food and water security.

- **Monitoring, Evaluation, and Adaptive Management:** Integral to the effective implementation of the NDP is a rigorous monitoring and evaluation framework. This includes establishing clear indicators and performance metrics for regular assessments of progress, identification of challenges, and continuous learning. This adaptive management approach ensures that strategies remain relevant, effective, and responsive to evolving climatic conditions and on-the-ground realities.

3. Ten-Step Process of Drought Management Strategy and Action Plan Development

Drought does not affect all economic sectors in the same way. Therefore, this Plan is designed to recognize and respond to the differences in water supply availability and drought vulnerability for each sector and geographic area in Ethiopia. In light of this objective, the NDP contains a stepwise approach in drought plan that can be employed to mitigate the impacts of drought as well as response options that can be employed under increasing drought conditions. In developing the NDP, the ten-steps process is often used in drought plan preparation. The steps range from designating a national drought plan task force to setting a detailed set of procedures for plan evaluation and refinement. The ten-steps for drought plan preparation include:

Step 1- Appoint a drought task force: a key political leader appoints a multidisciplinary drought task force to supervise and coordinate development of the plan.

Step 2: State the purpose and objectives of the drought plan: The drought task force will state the general purpose and specific objectives for the drought plan. Objectives should reflect the unique characteristics of the country.

Step 3: Seek stakeholder participation and resolve conflict: Task force members should identify all groups that have a stake in drought planning and understand their interests.

Step 4- Inventory resources and identify groups at risk: An inventory of natural, biological, and human resources and their vulnerability to drought is undertaken; constraints to the planning process are identified.

Step 5- Establish and write drought plan: The drought plan has three primary components: (1) monitoring, early warning, and prediction; (2) risk and impact assessment; and (3) mitigation and response.

Step 6- Identify research needs and fill institutional gaps: The drought task force should compile a list of research needs and gaps in institutional responsibility and make recommendations on how to remedy them.

Step 7- Integrate science and policy: Scientists may not be familiar with policy constraints and policy makers may not understand scientific and technical issues associated with drought. Communication and understanding between scientists and policy makers must be enhanced.

Step 8- Publicize the drought plan-build public awareness and consensus: During drought, the task force should keep the public informed of the status of water supplies, conditions that might lead to requests for water use restrictions, and ways to access drought assistance.

Step 9- Develop education programs: The task force should create an education program to raise awareness of short- and long-term water supply issues.

Step 10- Evaluate and revise drought plan: Periodic testing, evaluation, and updating of the drought plan will keep the plan responsive to local, state, provincial, or national needs.

The NDP of Ethiopia started from review of plans and policies related to drought followed by a brief

account of drought in Ethiopia. It assessed responsibilities of sector institutions with regard to drought/ disaster, drought monitoring schemes, drought risks, and communication and mitigation measures. A description of the severity and vulnerability of drought conditions in different regions of the country and recommended response measures during the onset of future droughts is highlighted.

4. Alignment of the National Drought Resilience Plan with other Policies and Strategies

Ethiopia's National Drought Resilience Plan is strongly aligned with existing national development agendas and international commitments, fostering a cohesive and synergistic approach to build drought resilience. Despite Ethiopia has historically grappled with the pervasive impacts of drought, where some of them resulted in widespread food insecurity, economic hardship and some even to famine; and such loss of livelihoods often forces communities to exploit remaining natural resources, accelerating land degradation, deforestation and diminishing ecosystem resilience, thereby perpetuating a vicious cycle of vulnerability. There has been limitation in enacting specific drought strategy strongly alignment with other polices and strategies of the nation. If existed, previous drought mitigation strategies primarily focused on water and irrigation, weakly aligned with other sectoral policies, which in turn undermines multisectoral approach to effectively combat climate change-related challenges. Emphasis hence has been given to strongly align the NDRP with other national and global policies and strategies.

Nationally, the NDRP is strongly aligned with the Nationally Determined Contribution (NDC) of the country. Ethiopia's updated NDC outlines the country's commitment to global climate action, integrating both mitigation and adaptation targets within its national development aspirations, notably its 10-Year Development Plan. Similarly, the NDRP strongly aligned with Long-Term Low Emission strategy which aims to build a carbon neutral economy by 2050. This strategy also emphasizes implementing different mitigation and adaptation strategies well aligned to the interventions mentioned in the NDRP, meaning the NDRP will significantly contribute to the achievement of ambitious targets set in the LT-LEDS. Further, the scope of the NDRP is well aligned with the policies and strategies of the forestry, agriculture, water and energy sectors. Existing policies and strategies in the agriculture, water and forest sectors not only are strongly aligned with the NDRP but also benefit from the specific interventions prioritized by the NDRP.

The NDRP is also strongly aligned with development initiatives like the Green Legacy Initiative and the REED+ Investment Program, the Sustainable Land Management Program and more. The different interventions in the NDRP directly contribute to achieving the ambitious Green Legacy Initiative whose main objective is to restore degraded landscapes and sustainably manage natural resources and thereby improve food security and build a green economy. By contributing to sustainable water and energy management, the NDRP will also contribute to initiatives on sustainable water management and secure energy supply.

Beyond national policies and strategies, the NDRP is also strongly aligned with global frameworks for climate action, sustainable natural resources management and sustainable development, demonstrating Ethiopia's commitment to international cooperation in addressing shared environmental challenges. For instance, the NDRP is strongly aligned with the United Nations Convention to Combat Desertification's effort to combat desertification, land degradation, and drought. Such alignment enables Ethiopia to actively participate in international dialogues, leverage global expertise, and benefit from the Riyadh Drought Resilience Partnership and similar other initiatives. Similarly, the NDRP's strong emphasis on nature-based solutions and climate-smart

agricultural practices directly contributes to the Nationally Determined Contributions (NDCs) under the Paris Agreement. Further, the NDRP's objectives of restoring ecosystems are linked to the different goals of the Sustainable Development Goals, like SDG 1 (No Poverty), SDG 6 (Clean Water and Sanitation), SDG 13 (Climate Action) and SDG 15 (Life on Land). It is also important to note that the NDRP is strongly aligned with the recently enacted Green Legacy Initiative and Degraded Landscape Restoration Special Fund. The Proclamation that established the Special Fund seeks to mobilize additional financial resources to scale up and scale out best NbS to address environmental and socio-economic challenges in the country.

4.1. Gaps in Existing Drought Mitigation Strategies and Suggested Improvements

4.1.1. Gaps

Despite a long history of grappling with drought, Ethiopia's existing drought management approaches face significant challenges, gaps, and problems that hinder their effectiveness in building long-term resilience and mitigating the multifaceted impacts of climate change. While efforts have been made, particularly in addressing immediate humanitarian needs, a more holistic and integrated approach is critically needed. Below are some of the gaps that undermine the effectiveness of existing drought mitigation and management practices:

1. Sectoral Silos and Lack of Integrated Approach

- **Predominant Focus on Water and Agriculture:** As highlighted in various assessments, existing strategies have as such primarily focused on addressing water and irrigation issues, leaving significant gaps in other critical sectors. While these areas are crucial, however, such narrow focus overlooks the interconnectedness of drought impacts across various sectors.
- **Weak Cross-Sectoral Linkages:** Drought's negative effects on energy which triggers land and forest degradation due to wood fuel harvest, health issues due to malnutrition, disease outbreaks from water scarcity, and socio-economic issues such as loss of livelihoods, forced migration and the like are often addressed in isolation or reactively.
- **Limited Mainstreaming of Climate Change:** Despite the Climate Resilient Green Economy (CRGE) strategy of Ethiopia strongly suggested integration of climate change into national and sectoral plan, its full mainstreaming into all sector-specific drought plans and daily operational activities remains a challenge. There is a tendency to see drought as a separate crisis rather than an exacerbated symptom of climate change requiring fundamental shifts in development planning.

2. Reactive vs. Proactive Responses

- **Emphasis on Emergency Response:** Ethiopia's drought management has historically been characterized by a reactive approach, heavily reliant on humanitarian aid and emergency interventions. While such an approach has its own benefits, it however fails to address the root causes of vulnerability and build long-term resilience. Efforts would have focused on among others, enhancing ecosystem resilience, sustainable management of forests, biodiversity, minimization of deforestation, soil erosion and enhancement of trees on landscapes, climate smart agricultural practices, etc.
- **Insufficient Investment in Prevention and Preparedness:** Despite the improvements, there is still a serious gap in proactive measures such as widespread adoption of drought-resistant agricultural and natural resources management practices including water harvesting and

storage solutions, diversified livelihoods, and robust early warning systems that effectively trigger early action.

- **Limited Long-Term Development Integration:** The transition from emergency relief to long-term development is often a challenge, where communities may be hit by recurring droughts before they can fully recover and build resilience from the previous one, creating a vicious cycle of dependency.

3. Weak Early Warning Systems and Information Flow

- **Inadequate Linkage of Early Warning to Early Action:** While Ethiopia has recognized the need for early warning systems, there are often weaknesses in the translation of early warning information into timely and effective early actions at local levels. This can be due to institutional inefficiencies, lack of capacity, or insufficient resources.
- **Gaps in Data Collection and Dissemination:** There can be limitations in the collection of real-time, comprehensive, and disaggregated data on drought impacts across all sectors. Furthermore, effective mechanisms for disseminating this information to vulnerable communities in an accessible and actionable format may be lacking.
- **Limited Integration of Traditional Knowledge:** Traditional weather forecasting methods and indigenous knowledge systems, which have historically played a role in community-level adaptation, are not always systematically integrated with modern technologies for more accurate and localized predictions.

4. Institutional and Governance Challenges

- **Coordination Gaps:** While the Ethiopian Forestry Development (EFD) under the Ministry of Agriculture coordinates some efforts, effective inter-ministerial and inter-agency coordination for a truly multisectoral drought response remains a challenge. There can be overlaps in mandates, insufficient communication, and a lack of unified strategic direction.
- **Capacity Deficiencies:** Limitations in human and institutional capacity, particularly at regional and local government levels, hinder the effective planning, implementation, and monitoring of drought resilience measures. This includes technical expertise in areas like climate modeling, sustainable land management, and financial risk management.
- **Inadequate Funding and Finance Mechanisms:** Reliance on external aid for drought response, and limited domestic investment in drought mitigation and adaptation, leaves the country vulnerable. There's a gap in robust drought finance mechanisms and insurance options that empower communities to better withstand future shocks.

5. Community-Level Vulnerabilities and Adaptive Capacity

- **Limited Access to Resources and Services:** Vulnerable communities, particularly pastoralists and agro-pastoralists in lowland areas, often have limited access to basic services (water, health, education), financial resources, and diversified livelihood options, making them highly susceptible to drought impacts.
- **Environmental Degradation:** Practices like overgrazing and deforestation, often exacerbated by drought and population pressure, contribute to land degradation, further diminishing the resilience of ecosystems and the communities dependent on them.
- **Gender-Specific Impacts and Response Gaps:** Women and children disproportionately bear the brunt of drought impacts (e.g., increased burden of water collection, higher susceptibility to malnutrition and disease, increased risk of child marriage and school dropout). Existing

plans may not fully address these gendered vulnerabilities and integrate gender-responsive interventions.

4.1.2. Strengthening Ethiopia's Drought Resilience Plan

To effectively combat these above-mentioned multifaceted challenges, a multisectoral drought mitigation strategy is essential. The revised National Drought Resilience Plan encompasses a range of improvements that ensure a truly resilient future. The following strategies are recommended to make improvements to address gaps in the existing Plan:

1. Embrace a Holistic, Multisectoral, and Integrated Approach

- **Develop a National Drought Management Framework:** Move beyond sector-specific plans to a unified national framework that clearly outlines roles, responsibilities, and coordination mechanisms across all relevant ministries (Agriculture, Water, Health, Forestry, Environment, Finance), regional states, and local administrations.
- **Integrate Drought into National Development Plans:** Ensure that drought resilience is not an add-on but a core component of all national development strategies, poverty reduction programs, and sectorial plans.
- **Prioritize Nature-Based Solutions:** Elevate the role of tree-based landscape restoration, agroforestry, sustainable land management, and watershed management as foundational elements that provide co-benefits for climate change mitigation, biodiversity conservation, and enhanced ecosystem resilience. Scaling up and scaling out best practices of the Green Legacy Initiative can serve as entry point.
- **Promote Wis Water Development:** Implement strategies that balance water withdrawals and available supply, improve water use efficiency (especially in irrigation), and build water resilience through improved storage and transportation infrastructure, water trading, and crisis response mechanisms.

2. Shift from Reactive to Proactive and Risk-based Management

- **Strengthen Early Warning to Early Action:** Invest in robust, multi-hazard early warning systems that integrate meteorological, hydrological, agricultural, and socio-economic indicators. Crucially, establish clear thresholds and protocols for triggering timely and appropriate early actions (e.g., pre-emptive livestock destocking, provision of supplementary feed, early distribution of drought-resistant seeds, cash transfers).
- **Conduct Comprehensive Vulnerability and Risk Assessments:** Systematically identify and map drought hotspots, vulnerable populations, and critical sectors at risk. These assessments should be regularly updated and inform targeted interventions.
- **Invest in Drought Preparedness Measures:** Scale up investments in community-based preparedness plans, contingency funding mechanisms, and pre-arranged financing for drought response.
- **Diversify Livelihoods:** Support communities in diversifying their livelihood strategies beyond rain-fed agriculture and traditional pastoralism, promoting climate-smart agriculture, small-scale irrigation, and off-farm income-generating activities.

3. Enhance Institutional Capacity and Governance

- **Strengthen Coordination Mechanisms:** Ethiopian Forestry Development need to coordinate key stakeholders and establish a high-level, inter-ministerial coordination body with clear authority and resources to oversee the implementation of the National Drought Plan. Foster effective vertical and horizontal coordination among federal, regional, and local levels.
- **Build Technical and Human Capacity:** Invest in training and capacity building for staffs working at strategic and operational levels. The areas of training include drought risk management, early warning, climate-smart agriculture, water resource management, and natural resource management.
- **Improve Data Management and Information Sharing:** Develop a centralized, accessible, and user-friendly platform for collecting, analyzing, and disseminating drought-related data and information across all stakeholders. Promote data sharing agreements.
- **Foster Partnerships and Collaboration:** Strengthen collaboration with international organizations, NGOs, research institutions, and the private sector to leverage expertise, resources, and innovative solutions.

4. Mobilize Sustainable Financing and Promote Economic Resilience

- **Develop Drought Finance Mechanisms:** Explore and implement innovative financing mechanisms to mobilize resources from public, donor and private sectors, including establishing drought insurance schemes for farmers and pastoralists, contingency funds, and public-private partnerships.
- **Integrate Drought Risk into Budgeting:** Ensure that drought risk is consistently factored into national and regional budgeting processes, allocating sufficient resources for both preparedness and response.
- **Enhance Economic Resilience at Community Level:** Promote business responses, value chain development, and market access for drought-affected communities to enhance their economic resilience and reduce reliance on emergency aid.

5. Prioritize Community Engagement and Gender-Responsive Approaches

- **Empower Local Communities:** Engage local communities, including women, youth, and marginalized groups, in the design, implementation, and monitoring of drought management initiatives. Incorporate their traditional knowledge and adaptive strategies.
- **Implement Gender-Responsive Interventions:** Recognize and address the specific vulnerabilities and needs of women and girls in drought contexts. This includes ensuring their access to water, sanitation, health services, and education, and promoting their participation in decision-making processes.
- **Strengthen Social Safety Nets:** Enhance and expand existing social safety net programs, such as the Productive Safety Net Program (PSNP), to provide predictable support to vulnerable households during drought periods and enable them to invest in resilience-building activities.

5. Institutional Arrangement of Ethiopia’s Drought Resilience Plan

Effective drought management in Ethiopia demands a robust and well-coordinated institutional arrangement that transcends traditional sectoral boundaries. This plan establishes a comprehensive, multi-sectoral framework designed to foster proactive planning, rapid response, and long-term resilience across all levels of governance.

5.1. Guiding Principles of Institutional Arrangement

The institutional framework for the National Drought Resilience Plan is built on the following principles:

- **Shared Responsibility and Accountability:** All relevant ministries, agencies, regional governments, and stakeholders bear clear responsibilities and are accountable for their contributions to drought risk management.
- **Multi-Sectoral Integration:** Drought impacts are complex and interconnected, requiring coordinated action across agriculture, water, energy, environment, finance, health, disaster risk management, and other vital sectors.
- **Subsidiarity and Decentralization:** Where appropriate, decision-making and implementation authorities are delegated to the lowest effective level of governance (regional, zonal, woreda, kebele) to ensure relevance and responsiveness to local contexts.
- **Science-Policy Interface:** Decisions are informed by robust data, scientific analysis, and traditional knowledge, with strong linkages between research institutions and policymakers.
- **Transparency and Participation:** Open communication and active engagement of communities, civil society organizations, and the private sector are integral to the plan's success.

2. Coordinating Bodies and their Mandates

The National Drought Resilience Plan will be spearheaded by a clearly defined set of coordinating bodies, each with specific roles:

A. National Drought Management Steering Committee (NDMSC)

Chaired by the Ethiopian Forestry Development, a Steering Committee with representation from key line ministries such as Agriculture, Water & Energy, Finance, Finance, Planning and Development, Disaster Risk Management Commission, representatives of research and academic institutions, and potentially representatives from regional states and development partners will be established at federal level, and development partners. This structure will also be cascaded to regions as it fits their contexts.

The major Mandates of the SC includes:

- Provide overall strategic direction and oversight for the National Drought Resilience Plan.
- Approve national drought strategies and major investment plans.
- Ensure high-level political commitment and resource mobilization for drought resilience efforts.
- Facilitate inter-institutional coordination and resolve any jurisdictional issues.
- Review and approve national drought risk assessments and early warning advisories.

- Monitor the overall progress and impact of the plan.
- Support resources mobilizations.

B. Technical Working Group on Drought Management (TWG-DM)

Strong technical experts from the SC ministries and partners will be established at federal and regional level to provide technical support.

Key mandate of the Working groups include:

- Develop detailed operational plans and guidelines for drought management activities.
- Conduct in-depth drought risk assessments and vulnerability analyses.
- Strengthen and integrate early warning systems for drought (meteorological, hydrological, agricultural, health, socio-economic).
- Prepare technical advisories and recommendations for the NDMSC.
- Coordinate data collection, analysis, and information dissemination across sectors.
- Facilitate the implementation of specific drought mitigation and adaptation measures.
- Act as the primary interface for technical cooperation with international partners.

3. Key Sectoral Responsibilities and Contributions

Each relevant ministry and agency will have defined responsibilities within the framework, contributing expertise and resources to the holistic drought management effort:

Ethiopian Forestry Development (EFD): As stated in the law of the nation Regulation No. 555/2022 EFD is focal institution to UNCCD liaises global drought negotiation and partnership, Ethiopian Forestry Development (EFD) plays crucial role in implementing nature-based solutions such as the Green Legacy Initiative to enhance the resilience of smallholder farmers and pastoral communities affected by recurrent and severe droughts. By promoting integrated landscape restoration and sustainable management of forest resources, EFD improves ecosystem services, and enhances biodiversity. These efforts not only mitigate the impacts of drought but also empower communities by providing them with alternative livelihoods and resources. Through coordination with various stakeholders, including line ministries and regional counter parts, NGOs, and community groups, EFD ensures that these initiatives are tailored to the specific needs of pastoralists, integrating traditional knowledge with modern techniques to foster long-term resilience and adaptive capacity in the face of climate change. As the focal institution for UNCCD and a key player in the Riyadh Drought Resilience Partnership, EFD will play a pivotal role in coordinating the stakeholders, and championing sustainable natural resource management, including scaling up Green Legacy best practices, supporting integrated landscape restoration and conservation interventions to contribute to climate change mitigation, and adaptation efforts. EFD will also represent Ethiopia globally on drought-related platforms and initiatives and play pivotal role in resources mobilization.

- **Ministry of Agriculture:** Focus on promoting climate-resilient agriculture, sustainable land and natural resources management, livestock management, pasture development, irrigation scheme development, and agricultural extension services for smallholder farmers and pastoral communities.

- **Ministry of Water and Energy:** Responsible for water resource assessment, planning, development, and management; improving water supply and distribution systems; promoting water harvesting and conservation; and providing crucial climate data and hydrological information in collaboration with the Ethiopian Meteorology Institute.
- **Ministry of Irrigation and Dry lands area:** play a crucial role in managing water resources and promoting sustainable agricultural practices in lowland regions. Its primary responsibilities include the development and maintenance of irrigation systems, ensuring efficient water distribution, and enhancing agricultural productivity. By implementing policies and programs focused on water conservation and land management, the ministry aims to improve food security, support rural livelihoods, and mitigate the impacts of climate change.
- **Ministry of Finance:** Crucial for establishing innovative financing mechanisms, mobilizing resources from public, donor, and private sectors; overseeing budget allocation for drought resilience; and exploring drought insurance schemes and other financial risk transfer instruments.
- **Ministry of Planning and Development:** Support integration of drought resilience into national development strategies, monitor overall progress, and ensure alignment with national goals.
- **Disaster Risk Management Commission (DRMC):** Plays a critical role in coordinating emergency response, vulnerability assessment, strengthening early warning systems, developing contingency plans, and supporting community engagement initiatives for preparedness and response. They will be primary users and disseminators of early warning information.
- **Regional and Local Administrations:** Essential for localized risk assessment, community-level planning, implementation of resilience-building activities, and facilitating timely response. They serve as the direct link to affected communities.

4. Cross-Cutting Enablers

- **Research and Academic Institutions:** Provide scientific expertise, conduct research on drought impacts and solutions, and contribute to the development of innovative technologies and practices.
- **Civil Society Organizations (CSOs) and NGOs:** Play a vital role in community mobilization, capacity building, delivering humanitarian assistance, and advocating for vulnerable populations.
- **Private Sector:** Opportunities for private sector engagement in drought resilience include investments in water infrastructure, climate-smart agriculture technologies, renewable energy solutions, and insurance services.
- **Development Partners:** Provide technical assistance, financial support, and facilitate knowledge exchange in drought management best practices.

5. Strengthening the Institutional Framework

To strengthen this institutional arrangement, the following actions are paramount:

- **Formalize Mandates and Linkages:** Clearly define the roles, responsibilities, and reporting lines for each institution within the National Drought Resilience Plan through official decrees or memoranda of understanding.
- **Develop Standard Operating Procedures:** Create clear standards for inter-agency collaboration, information sharing, early warning dissemination, and coordinated response actions.

- **Invest in Capacity Building:** Provide targeted training and technical support to personnel across all levels of government and partner organizations in areas such as drought risk assessment, early warning systems, climate-smart agriculture, water resource management, and financial planning.
- **Allocate Dedicated Resources:** Ensure that adequate and predictable financial and human resources are allocated to the institutions responsible for implementing the National Drought Resilience Plan.
- **Establish a Robust Monitoring and Evaluation Framework:** Develop a clear framework with measurable indicators to track the performance of the institutional arrangement, the effectiveness of interventions, and the overall progress towards drought resilience goals. Regular reviews will allow for adaptive management and continuous improvement.

6. National Drought Resilience Strategies

This section of the National Drought Resilience Plan focuses on identifying and prioritizing strategies crucial for national adaptation to drought impacts and the safeguarding of food security, livelihoods, and economic stability. Noting the importance of strengthening Early Warning Systems and Climate Monitoring and Community Preparedness, the strategies encompass major drought-affected sectors such as agriculture, water and energy, natural resources, and finance. These interventions are designed to integrate sustainable land and natural resource management with water conservation, agricultural practices, and livelihood diversification, thereby addressing the root causes of drought and promoting environmental sustainability. Further, the prioritized strategies are well-aligned with ongoing national efforts such as the Green Legacy Initiative, hold international relevance, and are structured to foster collaboration among stakeholders, ultimately contributing to Ethiopia's long-term development amidst climate change.

6.1. Scaling up Nature-based Solutions & Sustainable Tree-based Landscape Restoration and Natural Resources Management

In order to reduce vulnerability and promote sustainable development, one of the key strategies for building resilience to drought and mitigating its impacts involves extensive implementation tree-based landscape restoration. This comprehensive approach includes integrated landscape restoration, sustainable land and forest management, and the efficient management of natural forests through participatory forest management. Hence, by adopting these practices, communities can revitalize degraded ecosystems and enhance their capacity to withstand the adverse effects of climate change and be able to be resilient to drought impacts.

Integrated tree-based landscape restoration focuses on rehabilitating and managing forest-based landscapes and ecosystems in a holistic manner, ensuring that land, water, and biodiversity are considered together. This approach not only restores ecological balance but also improves soil health and increases agricultural productivity, mitigates climate change through carbon sequestration. Sustainable land and forest management practices, such as agroforestry and controlled grazing can enhance carbon sequestration while providing essential resources for local populations of the pastoral community. Additionally, sustainable watershed management ensures that water is available even during dry spells, significantly reducing the vulnerability of communities to drought.

The Green Legacy Initiative of Ethiopia plays a crucial role in enhancing the sustainable resilience of drought-impacted lowland pastoral communities. These communities have faced recurrent droughts exacerbated by climate change, which threaten their livelihoods and food security. Hence, promoting

large-scale reforestation and afforestation efforts will restore degraded lands, increase biodiversity, and improve water retention. This not only helps in combating desertification but also provides essential resources such as fodder and fuel wood, thereby supporting the livelihoods of pastoralists who rely on these ecosystems for their food security.

Ethiopia's forest resources are essential for biodiversity conservation, climate regulation, and the livelihoods of millions that significantly impacts food security and the national economy, implying the significant contribution of forests in drought management. Forests play a crucial role both before, during and after drought incidents such as by way of providing alternative services and goods to vulnerable communities. However, forests are increasingly threatened by changing climate, degradation and deforestation, which undermine their natural perpetuation. The National Drought resilient plan emphasizes planning and implementation of integrated interventions including conservation and sustainable management of existing natural forests and protected areas through promoting legal recognition and participatory governance.

By Doing these efforts we will enhance the ecological functions of forests including their ability to mitigate climate change, occurrence of drought and regulation of water resources. Effective forest management will be done via ensuring community engagement such as in the form of Participatory Forest Management (PFM). The strategy also targets restoration of degraded forest lands, crucial for communities reliant on these ecosystems. By scaling up best afforestation, reforestation, assisted natural regeneration and soil conservation measures practices, the plan aims to recover lost ecosystem services while creating alternative opportunities to enhance community resilience. Community involvement in planning and executing restoration efforts ensures that the needs and knowledge of the communities are incorporated. Furthermore, the strategy seeks to improve the management of plantation forests, establishing well-managed production forests, and developing value chains, Ethiopia can reduce its dependence on imported wood products while increasing exports. Strengthening market connections and fostering entrepreneurship will create green jobs, diversify livelihoods, and bolster the local and national economy, ultimately contributing to a more sustainable and resilient future against drought.

6.2. Strengthening Early Warning, Climate Monitoring and Communication Systems and Capacity Development, Governance and Knowledge Management

Assessments show that, existing Early Warning System has many limitations, implying a crucial need to strengthen it. Strengthening Early Warning System involves proactive monitoring of climate and environmental data to timely disseminate drought-related information to all stakeholders. Key steps include investing in robust data collection infrastructure, among others, weather stations, hydrological sensors, and satellite imagery systems, to gather accurate real-time data, essential to develop sophisticated predictive models. These models use climate science to forecast the onset, intensity, and duration of droughts, looking at indicators like rainfall anomalies and vegetation health. Equally important is to establish clear communication protocols to ensure these warnings reach national, regional, and local authorities, as well as communities, through accessible channels like SMS alerts, community radio, and local meetings. Finally, building capacity through training meteorologists, hydrologists, natural resources experts, and local extension workers is vital for effective data interpretation and communication of these critical early warnings.

Ethiopia encounters significant challenges in its restoration and conservation efforts, particularly in the context of drought management. Weak institutional capacity, governance issues, and inadequate data management hinder effective landscape restoration initiatives. Addressing these limitations including governance gaps is vital for enhancing the country's resilience to drought and ensuring

sustainable land management practices. To tackle these challenges, the drought management strategy emphasizes building the institutional, financial, and operational capacities of key implementing entities at federal and regional levels. This includes providing comprehensive need-based training programs designed to enhance technical skills, in planning and implementation of interventions. Establishing platforms for stakeholder engagement will improve coordination among government agencies, local communities, and NGOs, ensuring that all relevant parties are actively involved in planning and implementing the National Drought resilient plan. This collaborative approach will enhance decision-making processes and lead to more efficient and successful delivery.

Additionally, implementing a robust knowledge management system is crucial for enhancing the effectiveness of the implementation of the Plan. This system will document and share best practices, success stories, and lessons learned, creating a centralized digital repository accessible to all stakeholders. By training professionals, government staff, and community members in effective knowledge management, the NDRP can build capacities and capabilities at strategic and operational levels to generate, analyze and utilize climate information and based on this to design mitigation and adaptation interventions. Furthermore, developing a Drought Monitoring System will enable tracking of drought incidents and provide real-time data that facilitate adaptive management.

6.3. Policy Alignment, Drought Mainstreaming and Enforcement

Land policy and legislation play a crucial role in effectively implementing the national drought resilient plan by enabling a framework for sustainable land use and resource management. Given the country's vulnerability to recurrent droughts, effective land policies can promote practices that enhance rainfall pattern, soil health, vegetation cover, water retention, and thereby improve agricultural productivity and resilience. By regulating land use and promoting sustainable practices, such policies and plans help minimize the impacts of drought, ensuring that communities are better equipped to manage scarcity that could be created by drought.

Furthermore, comprehensive land legislation facilitates the long-term protection of critical ecosystems such as forests and wetlands, which play a vital role in climate regulation and biodiversity conservation. These ecosystems are essential for maintaining hydrological cycles, which are affected during and after drought hazards. Land use policies enhance natural resilience to drought, and also encourage community involvement in land management decisions, fostering a sense of ownership and responsibility. When communities are actively engaged in managing their land, they are more likely to adopt sustainable practices that align with drought mitigation efforts. Participatory approaches not only enhance the effectiveness of land management strategies but also empower communities to develop adaptive measures tailored to their specific environmental challenges.

Lastly, strong land policies can attract international support and funding for drought management initiatives. By demonstrating a commitment to sustainable land use and resource management, Ethiopia can align its policies with global frameworks and attract investment for projects aimed at enhancing resilience to climate change. This alignment is essential for securing the necessary resources to implement effective drought management strategies that benefit both the environment and the livelihoods of vulnerable communities.

6.4. Promoting Climate Smart Agriculture

Ethiopia, as an agrarian nation, relies heavily on agriculture and pastoralism. However, the degradation of farmlands and rangelands due to unsustainable practices and climate change severely undermines productivity and the livelihoods of millions of smallholder farmers and pastoral

communities. Challenges such as soil erosion, acidification, salinity, and declining soil fertility compromise efforts to achieve food and nutrition security. As a result, the vulnerability of farmers and pastoral communities has increased over the past decades, quite a significant portion of them is forced to be dependent on aid, and where this is not possible, they migrate to other places.

The National Drought resilient plan identifies climate smart agriculture as one of the suitable strategies to manage the impacts of drought. Different environment friendly interventions including restoring degraded agricultural and rangeland landscapes by promoting soil and water conservation practices, scaling up and scaling out best agroforestry practices with a focus on promoting fruit and fodder-based agroforestry systems, where farmers will be supported to produce fodder for their livestock as they improve the management of existing rangelands. Various farmers managed natural regeneration interventions need to be integrated to improve crop lands, range lands and forest frontier lands. Managing invasive species also needs to be made an integral part of the interventions. As part of the livelihood diversification strategy, the development of values will be supported by engaging private sectors to establish different agri-businesses. The implementation of these practices will enhance agricultural production and productivity and eventually result in building long term resilience of millions of farmers and pastoral communities.

6.5. Promoting Sustainable Water Resources Management

Ethiopia's National Drought resilient plan hinges on sustainable water resources management as a cornerstone strategy to combat the impacts of drought, focusing on enhancing water availability, improving ecosystem resilience, and building community capacity. This comprehensive approach integrates the restoration of water bodies and wetlands, development of alternative water sources, robust watershed protection, continuous monitoring of water resources, and extensive public education.

The restoration of areas around the water body and wetlands is critical for enhancing water availability and improving ecosystem resilience. Wetlands are vital for regulating water cycles, filtering pollutants, and providing diverse habitats. Restoring these degraded areas increases groundwater recharge, improves water quality, and creates buffer zones against flooding and erosion. These restored areas significantly boost local water supplies, particularly during droughts, supporting agricultural productivity and community livelihoods. This also includes promoting native vegetation and improved land management to support biodiversity and strengthen food security, fostering community ownership and sustainable practices. Integrating this with broader climate adaptation strategies, including sustainable agricultural practices, ensures long-term environmental health and sustainability, thereby enhancing national resilience to climate change. Restoration of areas around water bodies and wetlands needs to be aligned with watershed protection, which is vital for maintaining water quality and availability. This can be achieved by implementing sustainable land management practices such as reforestation, soil conservation, and erosion control that enhance watershed resilience against drought impacts. Protecting these critical areas ensures a reliable water supply for agricultural and domestic use while supporting biodiversity and ecosystem health, crucial for sustaining rural livelihoods.

The restoration and protection efforts need to be supported by the development of alternative water sources, another critical strategy to enhance water security for vulnerable communities. This includes rainwater harvesting, groundwater recharge, and the utilization of treated wastewater, reducing reliance on traditional sources often insufficient during dry periods. Developing suitable infrastructure for these alternative sources improves access to safe drinking water and supports agricultural activities, enhancing food security and community resilience. This again requires engaging local populations in the planning and maintenance of these sources, which is influenced by

public education. Building the capacity of communities is equally important for watershed protection and drought management. Raising awareness about the significance of watersheds and the impacts of human activities fosters a conservation culture. Educational programs for farmers, community leaders, and schoolchildren promote sustainable practices like agroforestry and soil conservation across watersheds to mitigate erosion and improve water retention. Engaging communities in participatory workshops and training empowers them to actively protect their watersheds, enhancing local drought resilience.

Finally, monitoring surface and groundwater resources is crucial for effective water assessment and management. Implementing comprehensive monitoring systems allows for data collection on water levels, quality, and usage. Utilizing advanced technologies like satellite imagery, remote sensing, and groundwater modeling enhances assessment accuracy, providing real-time information for decision-making. This data is essential for identifying trends, predicting shortages, and optimizing water allocation for various uses, contributing to better drought preparedness and response. Fostering community involvement in monitoring efforts, through data collection and training programs, further enhances accuracy and promotes water conservation awareness, creating a robust monitoring framework for sustainable water management.

6.6. Sustainable Development of Alternatives Rural Energy

As climate change exacerbates vulnerability, Ethiopia's drought resilient plan prioritizes promoting sustainable alternative rural energy to enhance resilience and economic development. Investing in renewable energy sources like biomass, solar, wind, and biogas provides reliable energy, empowers communities, and supports water conservation and agricultural productivity. Alternative energy sources will also play a significant role in reducing forest degradation due to harvesting of fuelwood.

Promoting biomass-based energy, including improved cook stoves, and biogas technology in rural areas offers dual benefits: waste management and clean energy production. Converting agricultural waste and livestock manure into biogas provides clean energy for cooking and heating, reducing pressure on forests and mitigating deforestation while fostering sustainable agricultural practices.

Solar energy systems are particularly promising for rural communities, leveraging abundant sunlight to power irrigation, stabilize food production, and enhance food security even during dry periods. Solar energy also supports agricultural product processing, boosting local economies.

Wind energy offers another viable option, with turbines generating electricity for local use in consistent wind regions. This renewable source powers water pumps and essential infrastructure, ensuring clean water access during droughts. Diversifying energy sources reduces reliance on biomass and fossil fuels, lowering emissions and improving environmental health.

By strengthening the integration of these sustainable energy alternatives into national policies and community development plans, the country can improve its drought resilience and promote sustainable rural development that benefits both people and the environment.

6.7. Research and innovation for promotion of Sustainable and multi-sectoral livelihood diversification options

Sustainable and multi-sectoral livelihood diversification options are essential for enhancing the resilience of pastoral communities and promoting sustainable development. One of the key areas is the development of alternative rural energy sources. By investing in renewable energy technologies such as solar, wind, and biogas, pastoral communities can reduce their dependency on traditional fuels, which are often limited and environmentally damaging. Access to clean energy not only

improves living conditions but also enables communities to engage in productive activities, such as small-scale processing of agricultural products or other income-generating enterprises. This shift towards sustainable energy sources contributes to both economic stability and environmental conservation.

Sustainable water resources management is another critical component of livelihood diversification for pastoral communities. Given the frequent droughts that affect these regions, implementing efficient water management practices, such as rainwater harvesting, groundwater recharge, and the establishment of community-managed water points, is vital. These practices not only ensure a reliable water supply for livestock and agriculture but also enhance the resilience of communities against climate variability. By integrating water management with local governance and community participation, pastoralists can better manage their resources, ensure equitable access and promote collective stewardship of water resources.

Furthermore, climate-smart agriculture (CSA) and effective land and natural resources management play a pivotal role in sustainable livelihood diversification. CSA practices, including crop diversification, soil conservation techniques, and the use of drought-resistant crop varieties, enable pastoral communities to adapt to changing climatic conditions while improving food security. Additionally, sustainable land management practices, such as agroforestry and rotational grazing, enhance soil health and biodiversity, which are crucial for maintaining productive landscapes. By adopting a holistic approach that combines these strategies, pastoral communities can create resilient livelihoods that not only address immediate challenges but also contribute to long-term sustainable development and environmental sustainability.

Finally, adopting research proven drought-tolerant, export-oriented fruit trees presents a sustainable solution for enhancing livelihoods and promoting agroforestry in regions vulnerable to drought. These resilient species not only require less water, making them ideal for arid climates, but they also offer farmers an opportunity to diversify their income through the export of high-value fruits. By integrating these trees into agroforestry systems, communities can improve soil health, enhance biodiversity, and create microclimates that mitigate the effects of drought. This approach not only supports food security but also empowers local farmers to adapt to changing climatic conditions, fostering economic resilience and environmental sustainability.

To strengthen Ethiopia's proactive approach to drought risk management and enhance long-term climate resilience, this research initiative focuses on generating evidence, tools, and technologies that inform policy, improve practices, and empower communities through nature-based solutions. The primary aim is to develop, pilot, and model forest and tree-based systems that foster drought-resilient landscapes and livelihoods.

Research efforts will concentrate on creating site-specific forest and agroforestry technologies utilizing both native and adaptive exotic tree species. These technologies will be tailored to various ecological zones and socioeconomic contexts. The initiative will produce decision-support tools and guidelines for climate-smart land use planning, species selection, and restoration methods, addressing different drought scenarios. Additionally, actionable data on the biophysical and socioeconomic trade-offs related to restoration and agroforestry adoption will be compiled.

To facilitate integrated land use planning, models will be developed to evaluate the impacts of diverse forest and agroforestry systems on drought mitigation, soil moisture retention, water use efficiency, and biodiversity conservation. These models will also simulate the socioeconomic returns of tree-

based value chains and restoration efforts under future climate and drought conditions, incorporating factors such as forest hydrology, carbon storage, and ecosystem service flows at the landscape level.

Technology demonstration and innovation platforms will be crucial for validating and scaling practical interventions. This includes establishing demonstration sites for forest restoration, fruit and fodder-based agroforestry, and farmer-managed natural regeneration (FMNR) in drought-prone regions. Community-led initiatives—such as integrating rainwater harvesting with tree planting, establishing sustainable woodlots, and implementing agroecological zoning—will be piloted.

Inclusive innovation platforms will connect researchers, extension agents, farmers, and policymakers to test and refine adaptive technologies. To ensure that research informs actionable strategies, policy research will evaluate and enhance the enabling environment for embedding forest and agroforestry-based drought resilience into national and regional development plans. Evidence will be generated to demonstrate the effectiveness and scalability of nature-based solutions, influencing investment decisions, budget allocations, and land use policy reforms.

Institutional learning will be fostered through the creation of knowledge products and training curricula aimed at practitioners and decision-makers across various governance levels, ensuring that insights from research lead to tangible improvements in resilience on the ground.

7. National Drought Communication

Drought communication in Ethiopia plays a critical role in managing the impacts of poor seasonal conditions on communities. A drought declaration serves as an official acknowledgment by the government that specific areas are affected by these adverse conditions. According to the newly approved Government policy on Disaster Risk Management, the Disaster Risk Management Council, chaired by the Prime Minister Office, is responsible for making these declarations. This council includes representatives from key institutions such as the National Meteorological Agency, the Ministry of Agriculture, Ethiopian Forestry Development, the Ministry of Water and Energy, Ministry of Finance, and Ministry of Planning and Development ensuring that decisions are informed by a broad range of expertise.

To facilitate effective communication and coordination, the Disaster Risk Management Technical Working Group, led by the National Disaster Risk Management Commission (NDRMC), meets regularly to discuss and analyze drought conditions. This group comprises various stakeholders, including government agencies, UN organizations, NGOs, and donors. Meetings are held monthly, or more frequently as needed, to share early warning information and updates on meteorological conditions. The National Meteorological Agency provides essential forecasts and field reports, which guide discussions and decision-making processes regarding drought response.

To ensure timely and effective interventions, the communication strategy incorporates Early Warning signs and clearly defined triggers for action. These mechanisms are based on specific thresholds that help determine the appropriate alert stages for drought conditions. Recommendations from these collaborative meetings are communicated to the top management of the NDRMC and the Commissioner, enabling swift actions to mitigate potential impacts. This structured approach to drought communication is vital for ensuring that affected communities receive the support they need in a timely manner, ultimately enhancing resilience against future droughts.

7.1. Drought Communication Protocol

The drought Communication protocol in Ethiopia is based on the Disaster management policy and strategy, which came into effect from 2013 onwards and the operational guidelines developed at the Federal level and recently for Woreda level administrative areas.

The protocol can be categorized at three levels, i.e., the drought watch, drought alert and drought declaration levels. The drought watch level is initiated due to the advisory and seasonal climate forecast and probabilistic forecast of a possible drought event that is communicated by the National Meteorological Agency before the start of a rainfall season. This drought watch communication is not addressed to the public and as such is not made official due to its negative impact on crop price stability and thus this information is directly communicated to the Disaster Risk Management Commission, the Ministry of Agriculture and Livestock, the Ministry of Water, Irrigation and Energy, the Ministry of Health through the National Early Warning Working Group. This information is communicated to regional and Woreda officials and also NDRMC personnel at different administrative levels to undertake the close monitoring required and report to the center any relevant information, with regard to the drought watch case.

The Woreda level implemented guideline describes a set of activities to be done during the drought watch and alert and these are:

- Ensure that relevant guidelines with standards and for emergency responses are available at Woreda level for communication facilities and experts know them.
- To train specific staff for communication emergency response management
- Prepare communication plan for risk situation
- Identify the different possibilities and communication channels at wereda and kebele level and coordinate with the different ESF how communication can support them.
- Identify which are the best communication channels to communicate to the most vulnerable people
- Identify the mechanisms the Woreda will use in case there is need to communicate to the media.
- Train media people to communicate better disaster risk situations.
- Prepare adequate preventive messages for a likely scenario.

During the emergency stage, when drought has been declared officially. There are various types of communication channels which will be activated like the Woreda net including the mass media and others. ESF Objective is expressed as the communication ESF will cover the aspects of the humanitarian assistance related to the communication in order to inform properly the stakeholders, the different administrative levels and the community about the humanitarian situation

Upon Early Warning of Emergency triggers, activate and coordinate response activities of the Emergency Support Function, with more emphasis on the following:

- Disseminate preventive messages
- Coordinate with the different ESF the support of the communication ESF.
- Support the emergency response disseminating adequate messages to the most vulnerable people.
- Communication plan for risk situation activated.
- Monitor and evaluate the response of communication messages, creating an historical record

of the emergency. Documentation of experiences and practices.

Different mechanisms can be used to warn the population about a likely disaster. It is possible to use technology media like radio, phone, TV or internet, but also traditional mechanisms like going to the water points or to the market to spread relevant information. Also, there are local mechanisms like *Dagu*, used in the pastoralist areas where people exchange news and information when they meet on the road.

The Development of Woreda Connectivity program is one area where, the government has a plan to automate the existing data collection system at woreda level. The government has already started the automation service in 35 pilot woredas across the country. It is believed that in places where there is internet access, information will be exchanged through electronic communication media. This will facilitate the flow of EW information to be used for timely decisions.

7.2. Declaration of Drought Condition

A drought declaration is an official acknowledgment by the government that a specific area or property is impacted by poor seasonal conditions. According to the newly approved Government policy on Disaster Risk Management, the Disaster Risk Management Council is responsible for officially declaring disasters, as outlined in Article 93 of the Constitution. Chaired by the Prime Minister, this council includes members from key sectoral institutions such as the National Meteorological Agency, the Ministry of Agriculture and Livestock, the Ministry of Water and Energy, and the Ministry of Health, among others. Historically, the National Disaster Prevention and Preparedness Committee has been the entity to declare disaster occurrences.

The Disaster Risk Management Technical Working Group, led by the National Disaster Risk Management Commission (NDRMC), meets monthly to coordinate among various stakeholders. This group includes several Task Forces, which consist of representatives from government agencies, UN organizations, NGOs, and donors. Depending on the situation, these meetings can take place weekly or bi-monthly, with early warning information regularly shared among Disaster Risk Management partners. Given that drought is a significant issue, meteorological updates from the National Meteorological Agency are a regular agenda item, leading to in-depth discussions supported by field reports from other organizations.

To ensure effectiveness, scenarios must be combined with Early Warning signs and triggers for actions based on realistic timelines for emergency interventions. This approach facilitates timely responses and helps mitigate the potential impacts of disasters. The triggering of different alert stages is based on specific thresholds, which guide the decision-making process. Recommendations from these meetings inform the top management of the NDRMC and the Commissioner for further actions.

The Commissioner of the NDRMC serves as the secretary to the National Disaster Risk Management Council, which is tasked with officially declaring disasters in accordance with the new policy. The National Meteorological Agency, as a member of this council, provides critical updates on weather and climate assessments, seasonal rainfall forecasts, and field reports from relevant ministries. These inputs are essential for the council's declaration of drought crises, ensuring a coordinated and informed response to mitigate the impacts on affected communities.

8. Prospects of Ethiopia’s Drought Resilience Plan through International Co-operation

A. Context and Imperative for International Partnership

Drought represents a significant and escalating threat to Ethiopia, profoundly impacting its economy, environment, and the livelihoods of its population, particularly smallholder farmers and pastoral communities. The country has observed a consistent shift in rainfall patterns, with more frequent and intense drought events becoming common. These events are a primary cause of environmental degradation and economic downturns, with some studies indicating a potential reduction of over 10% in GDP. Such crises disproportionately affect vulnerable communities, with its impact getting severe in the lowland ecosystems, creating income disparities between poor and well-to-do households, further marginalizing women and youths. Consequently, robust drought management strategies that shift from a reactive to a proactive and resilient approach are essential. The UNCCD framework and international cooperation offer a critical pathway for Ethiopia to enhance its drought management efforts and secure sustainable development, by mobilizing more resources from the public, international community and the private sector.

B. Strategic Opportunities for Collaboration

Ethiopia's engagement with international partners, particularly through initiatives like the Riyadh Drought Resilience Partnership, offers several strategic opportunities to strengthen its drought resilience plan. Knowledge and Technology Transfer: Ethiopia can leverage shared knowledge and innovative solutions from global partners to enhance its drought preparedness and response strategies. This includes adopting best practices for vulnerability assessments, developing advanced early warning systems, and implementing sustainable agricultural practices. Ethiopia can also share with the global community consolidated lessons such as due to the implementation of the Green Legacy Initiative, the world’s largest integrated Nature-based Solution.

Financial Mobilization and Investment: International cooperation is instrumental in mobilizing the necessary financial resources to implement the plan. Engaging with partners provides access to diverse funding mechanisms, including grants and concessional loans, which are crucial for large-scale investments in nature-based solutions, resilient agricultural systems and water management infrastructure. This support is vital for mitigating the economic impacts of drought and fostering sustainable growth. This is based on the notion that, the economic returns on investment in drought resilience can be up to ten times greater than the initial costs, making this a financially sound strategy. Evidence-Based Implementation: Collaborations facilitate the integration of evidence-based practices into Ethiopia's national drought resilience plan. This ensures that prioritized interventions are well-aligned with scientific data and are more likely to achieve their intended outcomes.

C. Governance and Inclusivity

The success of international cooperation hinges on the establishment of inclusive governance frameworks. The Riyadh Partnership emphasizes the importance of transparency, equity, and local engagement. In this regard, Ethiopia’s National Drought Resilience Plan has two major peculiarities: Community-Centered Strategies: By involving local communities in decision-making, the plan enables Ethiopia to design and implement aligned strategies that are not only effective but also socially equitable and culturally sensitive. This approach enhances community buy-in and ensures the sustainability of drought resilience initiatives.

Multisectoral Approach: A collaborative framework enables a multisectoral approach to drought management, ensuring that the plan is implemented with the coordinated efforts of various institutions, with Ethiopian Forestry Development as the national focal institution for UNCCD will not only implement Nature-based Solutions, but also coordinate efforts to build resilience against drought.

D. Conclusion and Outlook

The prospects for international cooperation in strengthening Ethiopia's drought management strategies are highly promising. By leveraging global partnerships, Ethiopia can significantly enhance its capacity to address the multifaceted challenges posed by drought and degradation. The integration of evidence-based practices, financial resources, and inclusive governance will form a robust framework for sustainable drought management. As Ethiopia navigates its path toward achieving its national development goals, international cooperation will be essential for building enduring resilience against future drought events and securing the long-term well-being of its citizens.

Table 4- Ethiopia’s Long-Term Drought Management Implementation Action Plan (2025-2035)

No	Long Term Strategies	Key Interventions	Indicators	Target	10 Years Budget Estimated in (USD)
1	Scaling up Nature-based Solutions and tree based Sustainable Land and Natural Resources Management	Community Engagement and Awareness	Number of community meetings held; participant feedback scores	15 (one by region and city administration and one at federal level)	150,000,000
		Reforestation and Afforestation Initiatives	Hectares of land reforested; number of trees planted	2,000	
		Sustainable Land Management Practices	Number of farmers adopting practices; soil health improvement metrics	Twice a year	
		Biodiversity Conservation Programs	Number of species monitored; increase in biodiversity indices	10	
		Policy Advocacy and Support	Number of policy changes influenced; stakeholder engagement levels	5	
2	Strengthening Early Warning, Climate Monitoring and Communication Systems and Capacity Development, Governance and Knowledge Management	Development of Early Warning Systems	Number of alerts issued; response time to alerts	5	200,000
		Climate Data Collection and Monitoring	Volume of data collected; frequency of data updates	10	
		Capacity Building Workshops	Number of workshops conducted; participant satisfaction ratings	10	
		Communication Strategy Implementation	Number of communication materials produced; audience reach		
		Knowledge	Number of users accessing	20,000	

		Management Platform	the platform; frequency of updates and contributions		
3	Policy Alignment, Drought Mainstreaming and Enforcement	Policy Review and Analysis	Number of policies reviewed; gaps identified in existing frameworks	2	
		Stakeholder Consultation	Number of consultations held; diversity of stakeholders involved	5	
		Development of Drought Management Framework	Framework completion status; approval from relevant authorities	3	
		Training on Policy Implementation	Number of training sessions conducted; participant feedback	10	
		Monitoring and Evaluation of Policy Impact	Frequency of evaluation reports; policy impact metrics established	5	
4	Promoting Climate smart agriculture	Farmer Training Programs	Number of training sessions held; farmer participation rates	25,000 central nurseries 400 million seedlings	550,000,000
		Introduction of Drought-Resistant Crops	Hectares planted with drought-resistant varieties; yield improvements	3 million	
		Soil Health Improvement Initiatives	Soil quality assessments; increase in organic matter content	2	
		Water Management Strategies	Percentage reduction in water usage; area under improved irrigation	2	
		Market Access and Value Chain Development	Number of farmers connected to new markets; increase in income from climate-smart products	100,000	
5	Promoting Sustainable Water Resources Management	Water Conservation Training	Number of training sessions conducted, participant	3 million	620,000,000

			feedback scores		
		Implementation of Rainwater Harvesting Systems	Number of systems installed; volume of rainwater harvested	3 million	
		Watershed Management Practices	Hectares of watershed restored; biodiversity index improvements	15,000 central nurseries 200 million seedlings	
		Monitoring and Assessment of Water Quality	Frequency of water quality assessments; percentage of samples meeting quality standard	200,000	
		Community Water Management Committees	Number of committees established; community participation rates in management activities	10	
6	Sustainable Development of Alternatives Rural Energy	Promotion of Renewable Energy Technologies	Number of renewable energy systems installed; energy output generated	1 million	150,300,000
		Training and Capacity Building	Number of training sessions conducted; participant satisfaction rates	15 million	
		Access to Financing for Energy Solutions	Number of households receiving financial support; total amount disbursed	10	
		Development of Local Energy Cooperatives	Number of cooperatives formed; membership growth in cooperatives	100	
		Awareness Campaigns on Energy Efficiency	Number of campaigns held; increase in energy-saving practices adopted by households	20	

7	Research and innovation for promotion of Sustainable and multi-sectoral livelihood diversification options	Integrated Agroforestry Systems	Hectares of land converted to agroforestry; increase in crop yields	5	37,000,000
		Sustainable Forestry Practices	Area of forest under sustainable management; volume of timber harvested sustainably	2 million	
		Diversification of Energy Sources	Number of renewable energy systems installed; reduction in reliance on non-renewable sources	8	
		Water Resource Management Initiatives	Volume of water saved; area under improved water management practices	3	
		Capacity Building for Livelihood Diversification	Number of training sessions held; percentage of participants adopting new practices	20	
				Total Budget	1,507,300,000 USD

