

FROM DROUGHT TO DEVELOPMENT

**STRATEGIC INTERVENTIONS FOR
A CLIMATE-RESILIENT SOMALIA**

A WHITE PAPER



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EXECUTIVE SUMMARY

This white paper, "From Drought to Development: Strategic Interventions for a Climate-Resilient Somalia," provides an extensive examination of the diverse impacts of climate change on Somalia. The analysis focuses on the alarming trends of increasing temperatures, erratic rainfall patterns, and frequent droughts. These climatic shifts have precipitated severe economic and humanitarian crises, particularly impacting agriculture, livestock, and fisheries, which together constitute over 60% of Somalia's GDP. The paper delineates the direct link between climate variability and socio-economic instability, making a compelling case for the implementation of robust adaptive measures. It underscores the critical need for strategic interventions to mitigate the adverse effects of climate change and foster a more resilient socio-economic landscape in Somalia.

To confront the challenges posed by climate change, the paper proposes a series of strategic interventions. The first recommendation involves deploying advanced climate modeling and early warning systems by integrating high-resolution climate models with satellite and groundbased data, and implementing IoT-enabled weather stations for real-time data collection. This aims to enhance predictive capabilities for droughts and floods, thereby improving disaster preparedness and response. Another key intervention is the installation of agri-photovoltaic systems, combining solar energy production with agriculture, alongside deploying IoT devices for soil moisture monitoring and drones for crop health assessment to increase agricultural productivity and energy efficiency.

The paper also advocates for the development of climate-resilient housing and infrastructure through prefabricated modular housing units made from sustainable materials, incorporating renewable energy systems like rooftop solar panels and small-scale wind turbines. This initiative aims to ensure rapid deployment of resilient housing, improve living conditions, and reduce displacement. Additionally, the implementation of blockchain technology for transparent aid distribution, featuring immutable record-keeping and smart contracts for automated fund disbursement, is proposed to enhance transparency and efficiency, reducing fraud and increasing trust in aid processes.

Community-led ecosystem management is another strategic focus, involving training communities in GIS mapping and remote sensing for biodiversity monitoring, and developing agroforestry systems that integrate crops, livestock, and trees to improve ecosystem management, increase biodiversity, and enhance livelihoods. For urban resilience, investments in green urban infrastructure such as permeable pavements, green roofs, and walls, along with IoT sensors for environmental monitoring, are recommended to reduce urban heat island effects, improve stormwater management, and enhance urban resilience.

To address water scarcity, the deployment of advanced water purification units using membrane filtration technologies, and solar-powered desalination systems for coastal communities, is suggested to increase access to safe water and improve public health. Furthermore, tech-driven education and empowerment programs are proposed, including the development of e-learning platforms and mobile applications for climate resilience education, mentorship programs, and scholarships in STEM fields to empower women and girls with knowledge and skills in sustainable practices.

The paper emphasizes the importance of green supply chain innovations, recommending the implementation of lifecycle assessment tools and blockchain for carbon footprint tracking, promoting eco-friendly packaging, and certifying climate-smart agricultural products to enhance supply chain sustainability, improve market access, and reduce environmental impact. It also advocates for the development of regional climate governance frameworks, leveraging big data analytics for informed policy-making and climate risk assessment, to foster improved regional collaboration, effective climate governance, and enhanced resilience to climatic shocks.

Lastly, the paper focus on specific interventions for Capital market and listed company's transition to net zero and calls for developing and enforcing ESG regulations for listed companies aligned with global capital markets

Empowering Implementation

To overcome technical barriers in implementing these interventions, the paper recommends specialized services in advisory, consultancy, training, and facilitation. These services will provide strategic insights, technical expertise, and capacity building to ensure effective operationalization and sustainability of climate resilience initiatives.



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ABOUT SPECTRECO



We are a global sustainability, technology, advisory, and implementation company.

Spectreco is your partner in building a better world, offering an innovative, data-driven approach and ready-to-deploy solutions. Backed by a century of collective expertise and a global perspective, we streamline compliance across multiple jurisdictions, with a focus on built infrastructure across industries, transforming sustainability challenges into strategic advantages for investors, businesses, and governments alike.

Spectreco is a collaboration between Spectra Holdings LLC and Sustainability LLC, USA, offering expertise in Climate Action Agendas, ESG Investing, Built Infrastructure, Investment Management, Sustainable Supply Chain, Green Financial Instruments, Technology, and Data. We work closely with governments and the private sector, engaging in various initiatives such as economic growth & investment, climate policies, financing, circular economy principles, and more. Our board brings extensive experience in strategic initiatives, investment management, and financial analysis for both public and private enterprises. With a proven track record in delivering impactful ESG solutions, we are committed to assisting businesses in achieving their sustainability goals while ensuring simplicity, compliance, and adaptability across jurisdictions.

INTRODUCTION

Climate change has had a profound impact on Somalia, with its most severe manifestation being recurrent droughts. In 2022, more than 43,000 people lost their lives due to the country's worst drought in 40 years. This extreme weather event, exacerbated by climate change, led to widespread hunger, displacement, and inequity. The lack of rain has left millions struggling daily to find food and water. These droughts are not isolated incidents but part of a pattern of climatic instability that threatens the socio-economic progress of Somalia. The country's chronic food insecurity is worsened by failed crops and the loss of livestock, which are critical to the livelihoods of many Somalis.

The frequency and severity of droughts in Somalia have increased over the years. For example, the United Nations reported a "famine projection" for southern Somalia in 2022. This was a stark reminder of the increasing vulnerability of the region. According to the World Food Programme, the number of people facing famine in Somalia is now ten times higher than it was five years ago. The combination of conflict and climatic shocks has led to an estimated 8.3 million people needing humanitarian assistance, with 1.3 million more displaced in 2023 alone. This demonstrates a significant increase in the number of people affected by climate-related crises.

Climate change is fundamentally altering the landscape and living conditions in Somalia. The country is becoming more arid, with unstable water and food supplies leading to climate-induced displacement. Somalia is ranked 172 out of 182 countries on the ND-GAIN Index, making it one of the most vulnerable countries in the world to the impacts of climate change. This vulnerability is compounded by governance, security, and poverty issues that exacerbate the effects of climate change. Since 1991, Somalia has experienced a continuous increase in its mean annual temperature, which is among the highest globally. This increase in temperature, combined with erratic rainfall patterns, has led to recurrent droughts and occasional intense flooding, further destabilizing the region.

Projections indicate that Somalia's climate will continue to change, with mean annual temperatures expected to rise between 3.2°C to 4.3°C by the end of the century. The number of very hot days is also projected to increase, which will result in more heatwaves and higher heat-related mortality. Rainfall patterns are expected to become more unpredictable, with an overall increase in annual rainfall by 1% by 2030 and 3% by 2050. However, this increase in rainfall will come with greater variability, affecting critical sectors like agriculture, livestock, and fisheries. These changes will likely lead to more frequent and severe droughts and floods, putting additional strain on the already fragile ecosystems and economies.

El Niño's impact on Somalia has intensified an already critical humanitarian crisis, with unprecedented rainfall leading to severe flooding. Beledweyne, one of the worst affected areas, has seen the Shabelle River burst its banks, destroying infrastructure and displacing nearly 250,000 people. The floods have claimed lives and devastated essential services, increasing the risk of waterborne diseases. The Somali federal government declared a state of emergency as the extreme weather, exacerbated by El Niño, continues to cause

widespread destruction across the Horn of Africa, including Kenya and Ethiopia, with at least 130 deaths reported. Women and girls face heightened risks, including poverty and restricted access to essential services. The oscillation between drought and flooding underscores the urgent need for substantial international aid to support the millions affected and prevent further humanitarian disaster.

The economic impact of climate change on Somalia is profound, especially given the country's reliance on agriculture and livestock, which account for more than 60% of its GDP. The 2016- 2017 drought, for instance, resulted in losses and damages amounting to approximately \$3.25 billion, with the agriculture, livestock, and fisheries sectors being the hardest hit. The country's economy and food security are severely affected by the unpredictable weather patterns and natural disasters. This economic strain is compounded by the high poverty rates, with 68% of the population living below the poverty line as of 2017. The ongoing climatic shocks continue to hinder economic growth and stability, leading to increased poverty and food insecurity.

The humanitarian situation in Somalia is dire, with the latest drought leading to mass displacement and widespread food and water shortages. By early 2023, about 8 million people were without access to safe water and sanitation facilities, and drought-induced displacement had increased fivefold since the beginning of 2022. This drought crisis alone caused an estimated 43,000 excess deaths in 2022, with half of these deaths among children under five years old. The risk of a sixth consecutive failed rainy season looms, potentially exacerbating the food insecurity crisis further. Climate change has created a vicious cycle of drought, displacement, and death, making it imperative for international aid and resilience-building efforts to support the affected communities.

Apart from these issues, there is one more issue that has plagued Somali nation and that is terrorism. Al-Shabaab, an Islamist insurgent group in Somalia, emerged from al-Ittihad al-Islami (AIAI) in the 1990s and officially aligned with al-Qaeda in 2012. Despite being driven out of Mogadishu by an African Union (AU) military campaign supported by the U.S., the group controls large parts of southern Somalia and remains a significant security threat. Led by Ahmed Diriye since 2014, Al-Shabaab's membership is estimated between 7,000 and 12,000 fighters, generating around \$100 million annually through extortion, piracy, and other illicit activities. The group has carried out high-profile attacks, including the 2010 bombings in Uganda and the 2013 Nairobi mall attack, demonstrating its regional impact. Persistent instability has led the AU to extend its mission, ATMIS, until at least 2024. Despite international efforts, including over 275 U.S. airstrikes under the Trump administration, Al-Shabaab remains resilient and continues to challenge both Somali and international forces.



ANALYSIS OF SOMALIA'S NATIONAL CLIMATE POLICY

Somalia's National Climate Change Policy (NCCP) outlines the country's strategic approach to addressing the adverse impacts of climate change while promoting sustainable development. Developed under the Ministry of Environment and Climate Change with support from international partners like the UNDP and GEF, the policy aims to enhance resilience and improve adaptive capacities in vulnerable communities and ecosystems. The vision of the NCCP is to achieve a prosperous, climate-resilient economy through effective adaptation and mitigation measures. Key objectives include strengthening disaster risk reduction, promoting climate-resilient agriculture, and mainstreaming climate change considerations across various sectors. The policy emphasizes the integration of scientific research, community participation, and international cooperation to ensure comprehensive and sustainable climate action in Somalia.

However, the implementation of Somalia's National Climate Change Policy faces significant challenges due to the country's ongoing socio-economic and political instability. Limited financial resources, inadequate infrastructure, and weak institutional capacities further hinder effective climate action. Additionally, the high dependency on climate-sensitive sectors such as agriculture and livestock exacerbate the vulnerability of communities to climate-related shocks. Despite these hurdles, the NCCP advocates for a multi-faceted approach, including capacity building, technological innovation, and international partnerships, to overcome these barriers. By fostering collaboration among government entities, civil society, and international organizations, the policy aims to create a robust framework that not only addresses immediate climate risks but also lays the groundwork for long-term resilience and sustainable development in Somalia.

There are significant gaps in the policy which might hinder its effective implementation. The following table describes all those gaps.

Aspect	Key Points	Gaps in the policy
Overview and Rationale	Overview highlights climate change as a significant threat. The rationale emphasizes the necessity due to socioeconomic challenges and anthropogenic impacts	<ul style="list-style-type: none">The policy's overview identifies key vulnerabilities but lacks comprehensive quantitative data and projections.Detailed historical climate data, current climate trends, and future projections are needed to emphasize the urgency and tailor specific actions. Without this data, the policy may struggle to gain the necessary urgency and focus.

Vision and Goal

Vision aims for a prosperous and climate-resilient economy. The goal focuses on enhancing resilience and adaptive capacity

- The vision is ambitious but not accompanied by clear, measurable outcomes or timelines. This could lead to difficulties in assessing progress and success. Specific, measurable, achievable, relevant, and time-bound (SMART) goals should be defined to provide clear direction and benchmarks for progress.
- For instance, specific targets for greenhouse gas (GHG) reductions or the number of adaptive infrastructure projects completed annually would be beneficial.

Guiding Principles

Emphasizes sustainable development, integrated approach, prioritization of vulnerable groups, community ownership, and international partnerships

- The guiding principles are comprehensive and cover critical aspects of effective climate policy. However, the practical implementation of these principles may be hindered by existing governance challenges, such as political instability and limited institutional capacity.
- The policy could be strengthened by including specific strategies to overcome these barriers. For example, building strong local governance structures and enhancing community engagement practices could be detailed.

Policy Objectives

Focus on adaptation and disaster risk reduction measures, and mitigation.

- The objectives align well with the identified needs but lack specificity in terms of implementation strategies and success metrics. While adaptation is appropriately emphasized given Somalia's high vulnerability, the mitigation strategies are less detailed.
 - The policy could be improved by specifying particular adaptation and mitigation projects, detailing expected outcomes, and providing timelines for each. For instance, objectives could include the development of early warning systems for floods and droughts within a specified period.
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Adaptation Strategies

Includes measures for agriculture, livestock, water, marine resources, forestry, infrastructure, and urban settlements.

- Sector-specific strategies are well-detailed but appear fragmented, lacking integration and synergy. The policy does not sufficiently address how these strategies will be coordinated to create synergies and avoid overlaps. For example, water management strategies should be integrated with agricultural resilience efforts to ensure a holistic approach.
- Additionally, the dependency on international funding and technical assistance raises concerns about sustainability and local ownership. The policy should detail how it plans to build local capacity and gradually reduce dependency on external support.

Mitigation Efforts

Acknowledges low GHG emissions but commits to transitioning to a low-carbon economy. Focus on energy, agriculture, land use, industry, and waste.

- Mitigation efforts are outlined but lack depth and specificity. There is a need for detailed plans on reducing emissions in key sectors, particularly energy and industry. Incentives for private sector involvement and the promotion of renewable energy sources are not clearly defined.
- The policy could benefit from setting explicit targets for emission reductions and renewable energy adoption. For instance, a target to increase renewable energy use by a certain percentage within five years would provide clear direction.

Cross-Cutting Themes

Capacity-building, research and technology, regional and international cooperation, information and communication, education, and public awareness.

- Addressing cross-cutting themes is crucial, but the policy lacks detailed strategies for how these will be achieved, particularly given Somalia's limited higher education and research infrastructure. Effective coordination and sustained funding will be critical for success.
 - The policy should outline specific capacity-building programs, research initiatives, and technology transfer mechanisms. For example, partnerships with international research institutions and the establishment of local innovation hubs could be detailed.
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<p>Institutional Arrangements</p>	<p>Establishes state institutions and committees, involves nongovernmental and civil society organizations, and the private sector.</p>	<ul style="list-style-type: none"> • A multi-stakeholder approach is necessary but could lead to fragmented efforts without strong coordination mechanisms. There is a risk of overlapping roles and responsibilities leading to inefficiencies. • The policy should specify clear roles and responsibilities for each stakeholder, establish robust coordination mechanisms, and detail accountability measures. For example, a central coordination body with the authority to oversee and integrate efforts across sectors and levels of government could be established.
<p>Legal and Regulatory Framework</p>	<p>Links with the National Development Plan and existing policies. Recognizes international obligations.</p>	<ul style="list-style-type: none"> • Integration with national and international frameworks is essential but might face challenges in enforcement and compliance due to weak legal systems and corruption. • The policy should outline specific legal reforms needed to support climate action and detail enforcement mechanisms. This could include strengthening environmental laws, establishing clear penalties for non-compliance, and improving the capacity of the judiciary to handle environmental cases.
<p>Finance and Resource Mobilization</p>	<p>Identifies the need for domestic resources and international support, including bilateral, multilateral sources, and climate funds.</p>	<ul style="list-style-type: none"> • Heavy reliance on international funding is a significant vulnerability. There is insufficient detail on how to mobilize domestic resources and ensure financial sustainability. • The policy should include strategies to diversify funding sources, such as developing innovative financing mechanisms (e.g., green bonds), encouraging private sector investment, and establishing national climate funds. Clear plans for financial accountability and transparency are also needed to build trust and attract investment.
<p>Monitoring and Evaluation</p>	<p>Proposes systems for tracking climate change responses and policy interventions.</p>	<ul style="list-style-type: none"> • Monitoring and evaluation mechanisms are necessary for accountability but lack detail on specific indicators, data collection methodologies, and responsible entities. • The policy should establish a comprehensive monitoring and evaluation framework, specifying key performance indicators (KPIs), data sources, frequency of reporting, and responsible agencies. This could include annual progress reports, regular reviews, and public dissemination of findings to ensure transparency and accountability.

SOMALIA'S NEEDS ASSESSMENT TO ALLEVIATE CLIMATE CHANGE IMPACTS

Analyzing the impacts of Climate Change on Somalia and subsequent analysis of its climate change policy reveals the need to focus on capitalizing international development efforts, sustainable trade policies and inclusive economic growth, and Climate Change and Environmental Sustainability Initiatives.

Global Cooperation and Development Initiatives

- **Strategic Framework:** Integrating development into a broader foreign policy approach, Somalia should focus on establishing global economic, security, and development ties. This includes attracting reliable investments through partnerships that leverage financial expertise and the strengths of key financial hubs.
- **Humanitarian Efforts:** A commitment to humanitarian work is essential to prevent severe human suffering in Somalia. This includes leading efforts to develop more effective responses to humanitarian crises within the country.
- **Empowerment of Women and Girls:** Central to Somalia's development initiatives should be the empowerment of women and girls, unlocking their potential, providing education, supporting empowerment, and protecting them from violence. Specific initiatives could include programs to strengthen grassroots Women's Rights Organisations (WROs) and contributions to funds supporting WROs within the region.

Climate Change and Environmental Sustainability Initiatives

- **Climate Finance and Policy:** Somalia's climate initiatives should be guided by strategic frameworks outlining a commitment to securing significant financial contributions aimed at balancing adaptation and mitigation efforts. Moreover, Capital market and listed company transition to net zero should be facilitated and ESG regulations for listed companies aligned with global capital markets should be enforced.
- **Transition to Clean Energy:** Support is needed for transitioning to secure, clean, and affordable energy. Establishing partnerships to promote a fair transition away from fossil fuels and unlocking private finance for clean infrastructure will be crucial.
- **Biodiversity and Nature Protection:** Somalia can play a significant role in global biodiversity efforts by securing frameworks for biodiversity and committing funds to forest conservation. Additionally, initiatives should support climate-resilient and foodsecure coastal communities.

Trade and Sustainability Initiatives

- **Sustainable Trade Policies:** Somalia should actively promote trade policies that support sustainable development. This includes integrating climate action into trade policies, ensuring trade rules protect the natural world, and promoting a fair global trading system.
- **Inclusive Economic Growth:** An emphasis on inclusive economic growth is vital, ensuring that trade benefits are fairly distributed and that the burdens of economic transitions are shared equitably. This involves reforming subsidies, enhancing supply chain due diligence, and supporting the development of low-carbon economies

INTERVENTIONS TO ADDRESS SOMALIA'S NEEDS

Somalia's Challenges posed by Climate Change	Needs to address challenges	Interventions to address the needs
Recurrent Droughts and Climate Change Impact	Climate Finance and Policy	<p>Securing Climate Finance, Advanced Climate Modeling and Early Warning Systems</p> <ul style="list-style-type: none"> Climate financing strategy needs to be developed to secured required funding for relevant solutions High-resolution climate models should be developed using data assimilation techniques to integrate satellite observations with ground-based measurements. IoT-enabled weather stations can be implemented to gather real-time climate data. Machine learning algorithms for predictive analytics can be developed to forecast droughts and floods accurately. Community-based early warning systems should be established, using mobile alerts and local radio broadcasts for timely dissemination of information. Local training and capacity building should be facilitated to manage these systems effectively.
Food Insecurity and Livelihood Loss	Transition to Clean Energy	<p>Agri-Photovoltaics and Precision Agriculture</p> <ul style="list-style-type: none"> Agri-photovoltaic systems integrating solar panels with agricultural land should be installed, providing dual land use. Sensors and IoT devices can be utilized for soil moisture monitoring, optimizing irrigation schedules. Drone-based aerial imaging can be implemented for crop health monitoring and targeted pest control. AI-driven decision support systems can analyze data from various sources, including weather forecasts, soil sensors, and satellite imagery, to optimize planting schedules and crop management practices. The government should create policies supporting the integration of these technologies into agricultural practices and provide necessary infrastructure and training for farmers.

Displacement Due
to Climate Shocks

Humanitarian
Efforts

Climate-Resilient Housing and Infrastructure

- Prefabricated modular housing units designed for rapid deployment in disaster-prone areas should be developed, incorporating locally sourced, sustainable materials such as bamboo and recycled plastics.
- Renewable energy systems, including rooftop solar panels and small-scale wind turbines, should be integrated. Rainwater harvesting systems and greywater recycling should be implemented to ensure water sustainability.
- Infrastructure design standards should be updated to withstand extreme weather events, including elevated structures in floodprone areas and wind-resistant building techniques.

High Poverty Rates
and Economic
Instability

Inclusive
Economic
Growth

Blockchain for Transparent Aid Distribution

- Blockchain technology should be utilized to create immutable records of aid distribution, ensuring transparency and preventing fraud.
- Smart contracts can be developed for automated disbursement of funds based on predefined conditions.
- Digital platforms for local entrepreneurs should be created to showcase their products and connect with international buyers.
- Mobile-based microfinance applications should be implemented to provide access to credit and savings accounts, leveraging digital identity verification and transaction tracking to build financial inclusion.
- A regulatory framework supporting blockchain and digital finance technologies should be provided.

Vulnerability to
Climate Change

Biodiversity
and Nature
Protection

Community-Led Ecosystem Management

- Local communities should be trained in GIS mapping and remote sensing techniques for monitoring biodiversity and land use changes.
 - Participatory land use planning processes involving community members in decisionmaking should be implemented.
 - Agroforestry systems combining crops, livestock, and trees can enhance biodiversity and improve livelihoods.
 - Biochar technology should be used to improve soil fertility and carbon sequestration.
 - Seed banks and nurseries for native plant species should be established to support reforestation and habitat restoration efforts. These practices should be integrated into national environmental policies and programs.
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Increased Heatwaves and Unpredictable Rainfall

Climate Finance and Policy

Green Urban Infrastructure

- Investments in permeable pavements that allow rainwater to infiltrate the ground should be made to reduce runoff and mitigate flood risks.
- Green roofs and walls providing insulation, reducing urban heat island effects, and enhancing urban biodiversity should be developed.
- Smart city technologies, including IoT sensors for monitoring air quality, temperature, and humidity, should be implemented.
- Data analytics can optimize urban planning and infrastructure maintenance, ensuring climate resilience.
- Urban green spaces and parks should be promoted to provide cooling effects and recreational opportunities. These green infrastructure solutions should be integrated into urban development plans and policies.

Lack of Safe Water and Sanitation Facilities

Humanitarian Efforts

Decentralized Water Purification Technologies

- Decentralized water purification units using advanced membrane filtration technologies such as reverse osmosis and ultrafiltration should be deployed.
- Solar-powered desalination systems should be implemented for coastal communities. Community-based water management committees should be established to oversee the operation and maintenance of water infrastructure.
- IoT-enabled monitoring systems should track water quality and supply levels in real-time.
- Training for local technicians in water treatment and system maintenance should be provided to ensure sustainability. Water management policies should be developed and enforced to support these initiatives.

Empowerment of Women and Girls

Empowerment of Women and Girls

Tech-Driven Education and Empowerment Programs

- E-learning platforms with interactive content on climate resilience, sustainable practices, and financial literacy should be developed.
 - Mobile applications providing access to educational resources, health information, and financial services should be created.
 - Mentorship programs connecting young women with leaders in sustainability and climate action should be implemented.
 - Scholarships for girls in STEM fields, focusing on environmental sciences and engineering, should be provided.
 - Community centers equipped with internet access and digital literacy programs should be established to empower women and girls.
 - Gender-focused policies should be integrated into national education and economic development plans.
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Economic Strain
from Climate
induced Losses

Sustainable
Trade
Policies

Green Supply Chain Innovations

- Green supply chain management practices should be implemented, including lifecycle assessment tools to evaluate environmental impacts.
- Eco-friendly packaging materials and biodegradable alternatives should be promoted.
- Carbon footprint tracking systems using blockchain technology should be developed to ensure transparency and accountability.
- Certification of climate-smart agriculture products for export should be supported, ensuring adherence to international sustainability standards.
- Local producers should be trained on sustainable farming practices and market access strategies. Policies encouraging the adoption of green supply chain practices should be developed.

Governance and
Security Issues
Exacerbating
Climate Effects

International
Cooperation
and
Development

Regional Climate Governance Frameworks

- Regional frameworks for climate governance should be developed, facilitating coordinated responses to climate change.
- Big data analytics projects should be funded to inform policy-making and track progress on climate adaptation and mitigation.
- Regional climate risk insurance schemes should be established to protect against economic losses due to climate-induced disasters.
- Knowledge exchange and capacity-building programs among neighboring countries should be promoted.
- Joint climate action plans involving crossborder collaboration and integrated resource management strategies should be implemented.
- Governance and security policies should be improved to address the root causes of vulnerability to climate change.

Transition to Net
Zero for Listed
Companies

Climate
Finance and
Policy

Capital Market and Listed Company Transition to Net Zero

- The Somali Stock Exchange should support listed companies in transitioning to net zero emissions. This includes implementing sustainability reporting standards, offering incentives for green investments, and providing technical assistance for developing and executing net-zero strategies.
 - The government should enforce policies that encourage companies to set and achieve netzero targets, track their progress, and report transparently on their emissions and sustainability practices. Collaborative efforts with international organizations can help align these initiatives with global best practices.
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Unsustainable
Business Practices

Climate
Finance and
Policy

ESG Regulations for Listed Companies

- ESG (Environmental, Social, and Governance) regulations should be developed and enforced for listed companies on the Somali Stock Exchange. These regulations should align with global capital market standards to ensure transparency, sustainability, and ethical business practices.
- The government should establish a regulatory framework that mandates comprehensive ESG reporting and compliance. Training programs and resources should be provided to help companies understand and implement these regulations effectively. Continuous monitoring and evaluation systems should be set up to ensure adherence and promote continuous improvement.

OVERCOMING TECHNICAL IMPLEMENTATION BARRIERS

Addressing the complex challenges posed by climate change, food insecurity, and socio-economic instability in Somalia necessitates a multifaceted, technologically advanced, and strategically sound approach that requires highly specialized services that encompass a comprehensive suite of advisory, consultancy, training, and facilitation interventions. Advisory services will provide high-level strategic insights and recommendations for integrating cutting-edge technologies, such as advanced climate modeling and IoT-enabled early warning systems, into national frameworks. Consultancy services will deliver deep technical expertise and practical implementation support to ensure these strategies are operationalized effectively, leveraging best practices and innovative solutions tailored to the local context. Training programs are essential for building the technical capacity of local stakeholders, equipping them with the skills needed to operate and maintain new technologies and systems sustainably. Facilitation services will bridge the gap between local needs and global expertise, fostering partnerships and collaborations with international technology providers and experts. This holistic and expert-driven approach ensures that challenges are addressed while establishing a robust, resilient foundation for long-term sustainable development and climate resilience, thereby enhancing the overall socio-economic stability and environmental health of the country.

Somalia's Challenges	Technical Assistance Areas	Services needed to overcome technical barriers
Recurrent Droughts and Climate Change Impact	Securing Climate Finance, Climate Modeling and Early Warning Systems	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on selecting appropriate climate models and IoT-enabled weather stations. • Consultancy: Consultancy on integrating satellite and ground-based data into climate models. • Training: Conduction of workshops for local meteorologists and disaster management teams on system use and maintenance. • Facilitation: Connect local stakeholders with international providers of climate modeling and IoT technologies.

Food Insecurity and Livelihood Loss	Agri-Photovoltaics and Precision Agriculture	<ul style="list-style-type: none"> • Advisory: Advise on best practices for integrating solar panels with agricultural land. • Consultancy: Consultancy on deploying IoT devices for soil moisture monitoring and drones for crop health monitoring. • Training: Provision of training programs for farmers and technicians on precision agriculture techniques. • Facilitation: Connect local agricultural bodies with suppliers of agri-photovoltaic and precision agriculture technologies.
Displacement Due to Climate Shocks	Climate-Resilient Housing and Infrastructure	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on sustainable materials and resilient design standards for housing. • Consultancy: Project management consultancy to ensure adherence to resilience standards during construction. • Training: Conduction of training sessions for local builders and engineers on constructing climate-resilient housing. • Facilitation: Connection of local construction companies with suppliers of sustainable building materials.
High Poverty Rates and Economic Instability	Blockchain and Digital Platforms	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on developing blockchain frameworks for transparent aid distribution. • Consultancy: Consultancy on implementing blockchain technology for digital finance. • Training: Training programs on blockchain technology and its applications. • Facilitation: Connection of local financial institutions with international blockchain technology providers.
Vulnerability to Climate Change	Community-Led Ecosystem Management and Agroforestry Systems	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on using GIS and remote sensing for monitoring biodiversity. • Consultancy: Consultancy on participatory land use planning and agroforestry system design. • Training: Training programs on GIS, remote sensing, and agroforestry practices. • Facilitation: Connection of local communities with suppliers of GIS technology and agroforestry resources.

Increased Heatwaves and Unpredictable Rainfall	Green Urban Infrastructure and Smart City Technologies	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on green infrastructure solutions like permeable pavements and green roofs. • Consultancy: Consultancy on integrating IoT sensors for environmental monitoring. • Training: Training for urban planners and engineers on implementing green infrastructure and smart city technologies. • Facilitation: Connection of city planners with international experts and suppliers of green urban infrastructure technologies.
Lack of Safe Water and Sanitation Facilities	Decentralized Water Purification Technologies	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on selecting and implementing advanced water purification units. • Consultancy: Consultancy on setting up solarpowered desalination systems. • Training: Development and conduction of training programs for community-based water management committees and local technicians. • Facilitation: Connection of local communities with suppliers of decentralized water purification technologies.
Empowerment of Women and Girls	Tech-Driven Education and Empowerment Programs	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on developing e-learning platforms and mobile applications. • Consultancy: Consultancy on creating and maintaining educational content. • Training: Training programs for educators and developers on using e-learning and mobile platforms. • Facilitation: Connection of local organizations with international providers of e-learning and mobile technology.
Economic Strain from Climate-Induced Losses	Green Supply Chain Management and Climate-Smart Agriculture	<ul style="list-style-type: none"> • Advisory: Provision of strategic advice on lifecycle assessment tools and carbon footprint tracking. • Consultancy: Consultancy on developing ecofriendly packaging solutions and certification schemes for climate-smart agriculture products. • Training: Training programs for local producers on sustainable farming practices and market access strategies. • Facilitation: Connection of local producers with international certification bodies and suppliers of eco-friendly packaging.

Governance and Security Issues Exacerbating Climate Effects

Regional Climate Governance Frameworks and Big Data Analytics

- **Advisory:** Provision of strategic advice on developing regional climate governance frameworks.
- **Consultancy:** Consultancy on using big data platforms for environmental data analysis.
- **Training:** Training programs on big data analytics for policy-making and climate risk assessment.
- **Facilitation:** Connection of regional bodies with international experts in climate governance and data analytics.

Transition to Net Zero for Listed Companies

Capital Market and Listed Company Transition to Net Zero

- **Advisory:** Provision of strategic advice on developing net-zero transition plans and ESG reporting frameworks for listed companies and Somali Stock Exchange
- **Consultancy:** Consultancy on aligning corporate strategies with net-zero targets and global standards.
- **Training:** Development of training programs for company executives and sustainability officers on net-zero strategies and ESG reporting
- **Facilitation:** Connection of local listed companies with international consultants and certification bodies for net-zero transition.

Unsustainable Business Practices

ESG Regulations for Listed Companies

- **Advisory:** Provision of strategic advice on complying with emerging ESG regulations and standards.
 - **Consultancy:** Consultancy on implementing ESG compliance programs and reporting systems.
 - **Training:** Training sessions for corporate governance teams on ESG regulations and compliance requirements and ESG & DATA related technology platforms
 - **Facilitation:** Connection of local companies with regulatory bodies and international experts in ESG compliance.
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