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Climate Change Adaptation as a Panacea for Economic Development in Somalia.

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Abstract

Many famines, droughts, food shortages, and other climate-related problems are common in the Horn of Africa. The region's rural livelihoods in Ethiopia, Somalia, Kenya, and Djibouti, among other nations, have suffered greatly from the last five seasons of rainy failure (ReliefWeb, 2023).

Over 43,000 people lost their life in Somalia alone in 2022 as a result of the worst drought to strike the region in 40 years. Together with the consequences of climate change, the exceptionally low rainfall resulted in widespread acute hunger, homelessness, and inequality.

Pastoralism and climate-sensitive agriculture are the main sources of income for about 70% of Somalis. As long as Somalia has regular natural disasters including droughts, floods, and famine, there is an urgent need for a variety of strategies that can lessen farmers' and pastoralists' susceptibility to rising rainfall variability. The absence of land use policies exacerbates resource scarcity and climate change. Another unsurmountable obstacle is the same deficiency in catastrophe risk management at the federal and state levels. The local communities are not equipped financially, technically, or with the necessary knowledge to increase their resistance to the worsening effects of climate change. Rural women are the most vulnerable demographic in society. Due to the fact that traditionally, women are expected to find water, cook, and raise food (UNDP). Since households headed by women are constantly vulnerable to climate shocks.

Deforestation, overgrazing, water scarcity, garbage disposal, and ecosystems are the main environmental issues Somalia has been facing. Climate change has exacerbated the pre-existing issues brought on by environmental degradation, and these issues have significantly increased poverty, deteriorated health, and decreased the economy (Anja-Christina and Beier Eva Stephansson, 2012).

As the ability to prevent negative stressors and shocks from having a long-lasting effect on society as a whole, resilience is a complex phenomenon. Climate change serves as a metaphor for the shocks in the context of this study.

The ability to absorb, adapt, and transform shocks is known to be composed of three main parts: transformational, adaptive, and absorptive capacity. The combined ability to reduce exposure to stressors and shocks and to quickly assemble resources to recover from shocks when exposed to them is known as absorptive capacity. Proactively assuming that anticipated shocks will materialize is a key component of adaptive capability. Beyond self-sufficient resilience building in homes and communities, transformative capacity considers institutional elements including formal safety nets, community networks, markets, services, and infrastructure, as well as governance processes (National Economic Council, 2022).

Therefore, in order to safeguard Somalia's socioeconomic development, and food insecurity from the unpredictable effects of climate change, it is imperative to establish resilient communities and adaptable systems. The Federal Government of Somalia (FGS) has undertaken various initiatives to increase communities' ability to sustainably cope with the effects of climate change and to decrease their susceptibility to it. It is apparent, therefore, that Somalia lacks the tools necessary to manage severe climate risks and the systems in place to increase human resilience (Mintewab Bezabih, 2022).

Introduction

Somalia, nestled on the tip of the Horn of Africa, is like a land perpetually teetering on a tightrope. The climate there has always been tough, with long stretches of scorching sun and little rain. But lately, things have gotten even trickier (Beier & Stephansson, 2012). It's not unusual to see both extremes - months without a drop of rain followed by sudden, violent floods. Scientists say this is all thanks to climate change, making life even harder for the people who call Somalia home.

Imagine life on a tightrope, perpetually teetering between extremes. That's the reality for many Somalis. The land they call home has always been hot and dry, with rain a precious visitor. But lately, the climate has become even more unpredictable.

Erratic rainfall is the new normal. What used to be a predictable rhythm of wet and dry seasons has morphed into long, bone-dry stretches followed by sudden, violent floods. This disrupts the very lifeblood of Somalia: rain-fed agriculture. Crops fail, water becomes scarce, and livestock, crucial for many families, perish (Ogallo et al., 2017). The recent severe drought of 2011, worsened by climate change, is a stark reminder of the devastating consequences. Food security becomes a constant worry, and displacement a harsh reality.

These aren't the only challenges Somalia faces. Floods and cyclones, while less frequent, wreak havoc when they strike. Degradation of the environment, another consequence of climate change, further weakens the land's ability to cope with these extremes. It's a vicious cycle, but Somalis are a resilient people. By understanding and adapting to the changing climate, they can build a stronger future (Warsame et al., 2021).

Importance of climate change adaptation

Somalia can't escape the reality of climate change, but there are ways to adapt and build a stronger future. By implementing strategies that help communities bounce back from droughts, floods, and other extreme weather events, Somalia can become more resilient. This includes things like planting drought-resistant crops and improving water management to keep food on the table, and introducing new techniques for managing scarce resources so Somalis can continue their

traditional practices like raising livestock, even in the face of climate shocks Duale, 2023). By implementing effective climate change adaptation strategies, Somalia can not only improve its resilience but also unlock new pathways for economic development in agriculture, water management, and climate-resilient infrastructure.

Current Climate Change Scenario in Somalia

Somalia's arid climate has historically presented a significant challenge for its population and economic development. However, the intensifying effects of climate change are pushing this fragile ecosystem towards a tipping point (Ogallo et al., 2018). This section will delve deeper into the complex web of environmental and economic challenges arising from this evolving scenario.

Analysis of climate change impacts on Somalia's environment and economy:

Environmental Degradation: Rising temperatures and erratic rainfall patterns create a perfect storm for desertification. With less rain and scorching heat, once-fertile lands succumb to desertification. Vegetation struggles to survive, the parched earth loses its ability to retain moisture, and a vicious cycle takes hold. This not only reduces land productivity, making it difficult to grow crops or sustain livestock, but also weakens the natural regulatory capacity of ecosystems. Forests, previously acting as sponges that hold water and regulate rainfall patterns, begin to disappear. The land becomes more vulnerable to both floods and droughts, further exacerbating the challenges (Warsame et al., 2023).

Water Scarcity: Increased evaporation due to higher temperatures and changes in rainfall patterns lead to water scarcity. This isn't just about a lack of drinking water for human consumption. Reduced water availability impacts agriculture, with crops withering and yields plummeting. Livestock rearing also suffers as water sources dry up, forcing pastoral communities to migrate in search of sustenance. Competition for this vital resource intensifies, creating social tensions and jeopardizing livelihoods (Mohamed, 2022).

Loss of Biodiversity: Changing climate patterns disrupt ecosystems, leading to habitat loss and species decline. This isn't just a sad consequence of climate change; it disrupts the delicate ecological balance that sustains life. Forests, vital for maintaining healthy water cycles and providing habitat for a diverse range of species, are particularly vulnerable. As these ecosystems unravel, the services they provide, such as pollination and pest control, are jeopardized. Additionally, traditional livelihoods that depend on natural resources, like fishing or collecting medicinal plants, become increasingly unsustainable (Hartmann et al., 2009). The loss of biodiversity represents a silent tragedy, robbing Somalia of its natural heritage and impacting the well-being of both humans and wildlife.

Vulnerable sectors and communities:

Agriculture: Somalia's agricultural sector, heavily reliant on rain-fed crops, is particularly susceptible to climate change. Droughts, becoming more frequent and severe, devastate crops, leading to food insecurity and malnutrition. Rural communities, who directly depend on agriculture for their survival, face the brunt of these impacts. Hunger becomes a constant threat, and the nutritional health of children and pregnant women suffers disproportionately (Warsame et al 2021)

Pastoralist and nomads: Somali nomads, with their traditional way of life centered around livestock, are facing an existential crisis. Droughts and desertification threaten their grazing lands, turning once-fertile pastures into barren wastelands (Warsame et al., 2022). Water sources are drying up, forcing these communities to migrate further in search of sustenance. This desperate struggle for survival often leads to competition and conflict over increasingly scarce resources, creating a vicious cycle of instability.

Coastal Communities: Rising sea levels pose a significant threat to Somalia's coastal communities. Saltwater intrusion contaminates freshwater sources and agricultural land, jeopardizing food security and livelihoods (Michalscheck et al., 2016). Coastal infrastructure, like homes and businesses, is at risk of inundation during extreme weather events. This displacement disrupts communities, destroys homes, and forces inhabitants to abandon their traditional way of life.

The fishing industry, a vital source of food and income for many coastal residents, is also under threat as fish stocks dwindle due to changing ocean conditions.

Challenges posed by climate change for economic development:

Reduced Productivity: Climate change acts as a major economic setback. Erratic rainfall patterns, droughts, and rising temperatures directly impact all major economic sectors – agriculture, livestock rearing, and fisheries. Crop yields decline, livestock struggle to survive, and fish stocks dwindle. This translates to a decline in overall productivity and national income, hindering economic growth and trapping Somalia in a cycle of poverty (Said & Bashir, 2023). The agricultural sector, the backbone of the economy, is particularly vulnerable, as droughts devastate crops and threaten food security. Pastoralism, another vital source of income, faces similar challenges as desertification and water scarcity diminish grazing lands and livestock health.

Infrastructure Damage: Climate change isn't just about environmental degradation; it's a major threat to infrastructure. Floods and cyclones wreak havoc on vital infrastructure like roads, bridges, and irrigation systems. This disrupts transportation networks, hinders market access for farmers and businesses, and makes it difficult to deliver essential goods and services (Eklöv & Krampe, 2019). The damage to irrigation systems further exacerbates agricultural woes, making it even harder for farmers to recover from droughts. Rebuilding and maintaining infrastructure become a constant drain on resources, diverting funds away from other development projects.

Humanitarian Crisis: Perhaps the most immediate consequence of climate change is the humanitarian crisis it unleashes. Droughts and floods lead to food insecurity, forcing communities to rely on international aid. Climate-induced displacement adds another layer of complexity, as people flee their homes in search of food and water (Carty, 2017). This disrupts livelihoods, strains social services, and creates a breeding ground for disease outbreaks. Addressing these humanitarian emergencies places a huge strain on Somalia's already limited resources and hinders long-term development efforts.

Climate Change Adaptation

While climate change poses significant challenges, adaptation strategies, far from being a burden, are an investment in a more resilient and prosperous future for Somalia. Here's a breakdown of the economic benefits and opportunities:

Potential benefits of climate change adaptation for economic development:

Increased Resilience: Effective adaptation helps communities cope with droughts, floods, and other climate extremes. This translates to reduced infrastructure damage, improved crop yields, and decreased livestock losses, leading to overall economic stability (Gulati et al., 2023).

Enhanced Food Security: Investments in drought-resistant crops, improved water management systems, and early warning systems can stabilize food production and reduce dependence on external aid (Duale, 2023). This fosters self-sufficiency and creates economic opportunities within the agricultural sector.

Protection of Livelihoods: Adaptation strategies tailored towards pastoral communities, like improved rangeland management and drought-resistant fodder options, can help sustain traditional livelihoods and prevent displacement (Duale, 2023). This not only improves the well-being of these communities but also maintains their economic contributions to the nation.

Infrastructure Development: Investments in climate-resilient infrastructure, such as elevated roads and seawalls, can minimize damage from floods and rising sea levels. This not only protects existing economic activity but also creates new jobs in construction and maintenance sectors.

Case studies demonstrating the economic impacts of successful adaptation projects:

Ethiopia's Productive Safety Net Program (PSNP): This program provides cash or food transfers to chronically food-insecure households in exchange for participation in soil and water conservation activities. It not only improves food security but also restores degraded land, leading to increased agricultural productivity in the long run (Sharp et al., 2006).

Senegal's Great Green Wall Initiative: This ambitious project aims to restore degraded land across the Sahel region by planting a wall of trees. While primarily focused on environmental benefits,

the initiative has also created jobs in tree nurseries, planting activities, and sustainable land management practices, boosting local economies (Sacande et al., 2021).

Opportunities for new economic activities arising from adaptation efforts:

Renewable Energy Sector: Adaptation often necessitates a shift towards renewable energy sources like solar and wind power to reduce dependence on fossil fuels and mitigate water usage in hydropower generation (Lipper et al., 2014). This creates opportunities for businesses involved in installation, maintenance, and manufacturing of renewable energy technologies.

Climate-Smart Agriculture: Adaptation strategies promote the adoption of climate-smart agricultural practices like conservation agriculture and water-efficient irrigation systems (Sacande, et al., 2021). This opens doors for businesses specializing in providing training, tools, and technologies related to these practices.

Climate Risk Management Services: Increased demand for climate data analytics, early warning systems, and crop insurance tailored to climate risks can stimulate the growth of a service sector focused on climate risk management (Gulat et al., 2023). By proactively adapting to climate change, Somalia can not only build a more robust and resilient economy but also unlock new avenues for economic growth and create a brighter future for its people.

Policy Recommendations and Future Directions for Somalia

Somalia faces a monumental challenge in adapting to climate change while fostering economic development. Here's a roadmap for potential policy interventions and future directions:

Policy interventions to enhance climate change adaptation and economic development synergy:

Mainstreaming climate change adaptation into national development plans: All development strategies, from agriculture to infrastructure, need to integrate climate-resilient practices for long-term sustainability.

Incentivizing private sector investment in adaptation solutions: Tax breaks, subsidies, or loan guarantees can encourage private businesses to develop and implement climate-smart technologies and practices.

Market-based approaches for ecosystem management: Establishing payments for ecosystem services (PES) schemes can incentivize communities to protect and restore forests that play a crucial role in climate regulation and water management.

Strengthening institutional frameworks and capacity building:

Adaptation isn't just about securing financial resources and cutting-edge technologies. Building a truly resilient future requires a strong institutional framework and empowered communities. Here's how Somalia can achieve this:

Investing in Climate Data and Early Warning Systems: Robust climate monitoring systems are the foundation for effective adaptation. By collecting and analyzing climate data, Somalia can gain a deeper understanding of current trends and future projections. Establishing early warning mechanisms, like weather forecasting systems, allows communities to prepare for droughts, floods, and other extreme weather events. This proactive approach minimizes damage and loss of life, protecting livelihoods and economic activity.

Capacity Building for Local Stakeholders: The success of adaptation hinges on empowering local communities. Training programs for farmers, pastoralists, and local government officials on climate-smart practices are crucial. Farmers can learn about drought-resistant crops and water-efficient irrigation methods. Pastoralists can be trained on improved rangeland management techniques. Local officials can gain expertise in disaster preparedness and risk management. This empowers communities to take ownership of their adaptation journey and ensure its long-term sustainability.

Strengthening Inter-Agency Collaboration: A siloed approach to adaptation hinders progress. Effective adaptation necessitates seamless coordination between various government agencies. Collaboration between the ministries of environment, agriculture, finance, and infrastructure development is vital. For example, the Ministry of Environment can work with the Ministry of Agriculture to develop climate-resilient agricultural practices. Similarly, the Ministry of Finance can allocate resources for adaptation projects based on the needs identified by the Ministry of Environment. This holistic approach ensures that adaptation efforts are well-coordinated and address all aspects of climate vulnerability

Collaboration with international partners and stakeholders:

The responsibility for tackling climate change and its devastating impacts in Somalia extends far beyond its borders. The international community has a critical role to play in supporting adaptation efforts. This collaboration takes multiple forms:

Accessing International Climate Finance: Somalia can leverage international climate funds established by developed nations. These funds can finance large-scale adaptation projects, like building climate-resilient infrastructure or improving water management systems (Bird, 2014). Additionally, support from developed nations can bolster knowledge-sharing initiatives, allowing Somali experts to learn from international best practices.

Partnerships with Research Institutions: Collaboration with international research institutions provides access to cutting-edge climate science. This knowledge is crucial for developing targeted adaptation strategies, such as identifying drought-resistant crop varieties or predicting extreme weather events (Ali et al., 2020). Additionally, partnerships can facilitate access to innovative adaptation technologies, like drought-tolerant seeds or water-efficient irrigation systems.

South-South Cooperation: Somalia isn't alone in its fight against climate change. Sharing best practices and learning from other developing countries that have successfully implemented adaptation strategies can be invaluable (Stearns & Sucuoglu, 2017). This "South-South cooperation" fosters knowledge exchange and allows Somalia to adapt existing solutions to its

specific context. For example, Somalia can learn from countries like Ethiopia's Productive Safety Net Program, which empowers communities to restore degraded land while improving food security.

By fostering a united front against climate change, the international community can empower Somalia to build resilience and secure a brighter future. This collaborative approach, encompassing financial support, knowledge sharing, and technological innovation, is essential for Somalia's successful adaptation journey

Conclusion

Arid and unforgiving, Somalia's climate has always been a challenge. Now, climate change intensifies the threat, pushing ecosystems towards collapse and jeopardizing the nation's economic well-being. Yet, despair need not be the only story. Climate change adaptation offers a powerful tool for building a more resilient and prosperous future.

Investing in drought-resistant crops and improved water management can stabilize food production and reduce reliance on external aid. Adaptation strategies that support traditional livelihoods, like pastoralism, can ensure food security and safeguard cultural heritage. A shift towards renewable energy lessens dependence on fossil fuels and creates new clean energy jobs. Climate-resilient infrastructure protects existing economic activity and creates opportunities in construction and maintenance. Adaptation becomes an investment – in a future where economic growth and environmental health coexist.

The international community cannot stand idly by. Sharing knowledge, providing financial assistance, and collaborating on innovative technologies are all essential. Developed nations, major contributors to climate change, have a particular responsibility to help Somalia adapt.

Somalia's challenges are daunting, but the human spirit is stronger. By embracing adaptation, fostering national and international collaboration, and investing in a sustainable future, Somalia can chart a course towards a brighter tomorrow. Imagine a future where communities are prepared for climate extremes, farms flourish, and clean energy powers the nation. This vision requires

sustained efforts, but with commitment and a shared vision, Somalia can build a future where economic prosperity thrives alongside a healthy environment. It's a future worth fighting for, a future where Somalia emerges not just surviving, but thriving in a changing climate.

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