POLICY BRIEF

Climate-Induced Slow-Onset Processes and Human Security in Senegal

Introduction

In Senegal, the impacts of climate change are not a distant threat – they are a present and growing reality. Across the country, gradual but profound climate change is reshaping ecosystems, livelihoods, and communities' social fabric. Besides extreme weather events, **slow-onset climate processes** – such as **sea-level rise, salinization, desertification, land degradation, and biodiversity loss** – are continually undermining people's ability to live in safety and dignity, particularly in the country's most climate-exposed regions.

In northern and north-eastern Senegal, **advancing desertification and declining soil fertility** are diminishing agricultural productivity and pastoral resources. Along the coastline, **rising sea levels and salinization** are contaminating freshwater reserves, damaging infrastructure, and threatening livelihoods in fisheries, tourism, population health, and small-scale farming. Climate change impacts are also contributing to the **loss of biodiversity,** further undermining ecosystem resilience and the natural resources that communities depend on. These changes are occurring not as sudden shocks, but as creeping processes that in-creasingly erode the stability and sustainability of communities – especially in regions already marked by poverty, marginalization, and fragile governance.

While international and national responses to climate change have often focused on extreme weather events – such as floods or droughts – the less visible, long-term risks of slow-onset processes (SOPs) remain under-addressed. 1 This narrow focus risks sidelining the deeper, systemic impacts of climate change on **human security** – the social protection of individuals and communities across five interconnected dimensions: **personal, societal, governance, economic, and environmental.**

Understanding the dynamics of the climate crisis through the lens of human security provides a more effective and inclusive framework than militarized or securitized notions of safekeeping. Rather than framing climate change solely as a future risk of violent conflict, affecting foremost the state, the human security approach recognizes how climate change impacts like SOEs intersect with existing socio-economic vulnerabilities – such as inequality or institutional shortcomings – to produce compound risks that unfold gradually but deeply destabilize. The focus is on the individual or community. This framing also opens space for constructive action. When climate adaptation and resilience-building are designed with an emphasis on equity, inclusion, and peacebuilding, they can achieve more than just reducing physical risk: they can also strengthen governance, foster social cohesion, and prevent conflict. For Senegal, this means integrating human security principles into climate strategies – from rural development to urban planning and coastal protection – so that not only infrastructure but also into institutions and communities become more resilient. Conversely, climate change should be integrated into Senegal's security policy.

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[1] See our earlier publications on slow-onset processes and resulting loss and damage: https://www.germanwatch.org/de/19796 (Accessed 23 October 2025).

This policy brief adopts a **human security lens** to examine how climate-induced SOPs affect peace, stability, and development in Senegal. It advocates for taking human security into account when implementing adaptation and loss and damage strategies that are **conflict-sensitive and people-focused,** recognizing that addressing the root causes of vulnerability today is essential for preventing crisis tomorrow.

1 The impacts of SOPs on human security in Senegal

For assessing the impacts of climate-induced slow-onset processes, we identified **sea-level rise, desertification, and biodiversity loss** as the most relevant threats in Senegal. Before analyzing their interference with human security, this overview introduces the general threats that climate change poses to human security in Senegal:

- **Personal security** is compromised by growing food insecurity, rising malnutrition, loss of assets or cultural heritage, and increased exposure to climate-related health risks, such as heat stress and waterborne diseases.
- **Societal security** is threatened as environmental pressures drive internal migration, disrupt social cohesion and cultural values, and increase tensions over scarce natural resources.
- **National state, governance, and political security** are at risk as public institutions struggle to deliver basic services, maintain trust, and respond equitably to growing environmental stress.
- **Economic security** is threatened as key sectors – especially agriculture, fisheries, and livestock – suffer losses from ecosystem degradation, reducing incomes, increasing unemployment, and accelerating rural exodus.
- **Environmental security** continues to erode as biodiversity loss, coastal erosion, salinization and water scarcity reduce access to critical ecosystem services and livelihoods and render entire regions uninhabitable.

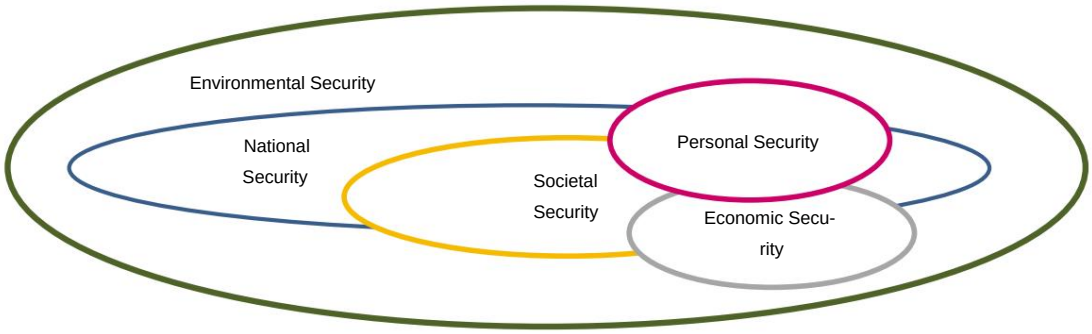

Figure 1: Categories of human security and their relationship, own chart

The following table focuses on three selected threats that SOPs hold for human security in Senegal. As the table shows, these threats across the three Rio Conventions pose real risks in Senegal today.

Table 1: Overview of human security risks by selected SOPs in Senegal, own compilation

Category of human security	Dimen-sion of human security	SOP Example 1: Sea-level rise (SLR), coastal erosion, and salinization	SOP Example 2: Desertification	SOP Example 3: Biodiversity loss
Personal	Food security	Losses and damages in agri-culture, like crop failure, due to salinization or flooding of agricultural land, salinization of groundwater due to marine intrusion, change in fish stock close to the coast	Losses and damages in agriculture, like crop failure, due to drought and desertification; unavailability of drink-ing water	Weakening of agricultural and fisheries ecosystems, dwindling of natural resources, and land degradation
	Health security	Increased undernutrition or malnutrition due to increas-food insecurity	Increase and frequency of lung diseases due to heavy pollution from the sand dust peak	Decrease of water quality and air pollution, increased undernutrition/malnutrition due to increasing food inse-curity
	Physical security	Injury or loss of life through coastal flooding and erosion	Threats to life and bodily integrity due to impacts of drought	Threats to life and bodily integrity due to ecosystem degradation and reduction in the availability of food resources.
	Cultural security	Loss of cultural and religious heritage along the coastline, losing sense of belonging, eg in the aftermath of climate-mate-change induced dis-placement away from the coast	Loss of cultural and religious heritage in areas affected by desertification, losing sense of belonging due to displace-ment	Threat to cultural knowledge and practices related to the management of natural resources (traditional agriculture and fishing, sacred forests, etc.) due to the loss of species diversity and the deg-radation of ecosystems
National/ State	Societal security	Societal conflicts (such as inter-ethnic or religious conflicts), due to eg resource scarcity, destruction of basic social infrastructure (school, health center, fishing dock, etc.) by the coast exacer-bated by sea-level rise; cli-mate-induced human mobil-ity	Societal conflicts (such as inter-ethnic or religious conflicts), due to eg water and land scarcity: resource scar-city and fuelling tensions over resource accessibility. Rivalries between communi-ties over water resources and tension between farmers and herders over control of land exist. Climate-induced hu-man mobility	Risk of population displacement and conflicts related to access to resources and threats of social unrest or conflict over access to clean water, fertile land, and natural foods, and migration due to ecosystem loss
	Political security	National instability due to the effects of SLR: increased pressure on local and national authorities to find so-lutions for impacted communities, impacts of climate change on human rights	Communities in affected areas eas, esp. pastoralists, tend to migrate with their herds to more humid areas, which is often a source of conflict rel-evant to national governance between pastoralists and farmers	Increased pressure on classi-fied forests and protected ar-eas contributing to social tensions and potential conflicts over access to natural resources sources

	Territorial security	Uninhabitability or submerg-ence of territory: The city of Saint-Louis, in northern Sen-egal, has had to deal with coastal erosion, particularly in the Barbarie Strip, result-ing in the loss of nearly 800 m³ of shoreline and damage to residential and hotel in-frastructure, ecosystems, and cultural sites. Significant material damage is regularly recorded, and between 2018 and 2019, more than 315 households were directly affected	Loss of suitable territory for agricultural land and eco-nomic zones; in the Saloum delta (Joal, Dionewar, Djirnda, Bassoul) the extent of land degradation linked to salinization has rendered more than 1,221 hectares of rice cultivation unusable since 1995. In the communes of Ndiébéne Gandiole, and Léona (in the north and northwest of Senegal) marked by onion cultivation, saline intrusion, reinforced by waves reaching up to 1 to 2 km inland, affects more than 822 hectares of land.	Reduction of arable land, especially in rural areas, and pressure on more favorable areas, which can lead to conflicts, particularly around natural resources, destruction of natural habitats, and degradation of ecosystems with strong urbanization, agricultural expansion, logging for firewood, overfishing
Economic	**Economic security**	Loss of territory and related economic zones and marine resources (eg fishing grounds) threaten livelihoods, infrastructure, industries, and tourism industry; reconstruction costs and ad-adaptation costs related to sea-level rise	Failing yields with consequences for local and national economy, costs of water management infrastructure and other adaptation measures	Threat to the economic security rity of communities, espe-cially rural ones, through eco-system degradation, erosion, salinization, and soil degradation, which limit the capacity for agricultural production and pastures
	Energy security	The Cap des Biches power plant is located close to the coast. Currently, stone dikes are being erected to improve the resilience of the infrastructure structure, but the waters have not yet reached the power plant.	During the dust peak period, there are significant deposits of dust on the PV solar panels, which often reduces the production of the PV solar panels. During this period, the solar panels require a lot of maintenance.	Decrease in the availability of biomass resources and agri-cultural residues, essential for renewable energies such as biogas or biofuels, due to land and forest degradation and the loss of natural habitat tats.
Ecological	**Ecological security**	In Saint Louis, in northern Senegal, coastal erosion, fol-lowing the opening and widening of the breach towards the south, has caused considerable shrinkage of the bird islet and the Langue de Barbarie National Park. Due to erosion, the surface area of the bird breeding islet de-creased from 1,625 hectares in 2002 to 1,040 hectares in August 2012, and to 0.8197 hectares in June 2013, a rate of 49.6% from 2002 to 2013. Furthermore, erosion has had an indirect negative impact on biogenesis through a decrease in attendance of many waterbirds and a re-duction in sea turtle nesting sites. This includes five species of breeding birds.	Droughts have consequences such as water scarcity and soil degradation, but they also impact basic ecosystem services and biodiversity, which influences the natural resources available for liveli-Hoods and human life. Inter-climate connectivity and biodiversity crises as well as the climate crisis and des-certification, which threatens ecological security.	Decrease in species diversity can disrupt natural balances and jeopardise water supplies and food production; decline in natural resources (fisheries, forests, soil.) can affect everything from soil fertility to the economy and liveli-hoods.

The above examples show that in Senegal the different dimensions of human security are threatened by climate change, particularly by slow-onset processes. Coastal erosion, as well as salinization of land and water, affect parts of the coastline with different impacts at the local level. However, the continued retreat of the coastline coupled with marine intrusion will continue to affect the lives of communities and their well-being. On the western coast, these processes result in the destruction of property, basic social infrastructure, displacement of coastal populations, and loss of ancestral practices, while in the northwest of the country, which is highly dependent on market gardening, there is a decline in agricultural yield and an increase in infertile land. These insecurities extend to other ecological, socio-economic, and national dimensions, which need to be addressed in interdisciplinary and inclusive policy-making.

2 Key policies, strategies, and stakeholders for tackling climate-induced human insecurity in Senegal

Tackling climate-induced human insecurity in Senegal involves an evolving landscape of national policies, regional strategies, and multi-level stakeholders working to address climate risks, particularly in the context of food insecurity, migration, coastal erosion, and rural livelihoods. Although the human security dimension is not yet effectively integrated into national policies to combat climate change, it is implicitly taken into account through adaptation and resilience strategies. These include two key policy frameworks: the national adaptation plan (NAP)2 , including the CDN 3.0 currently under development, and the National Transformation Agenda (Senegal 2050)3 . Adaptation strategies through the NAP contribute to strengthening-ing resilience in several sectors vulnerable to slow-onset processes (coastal areas, agriculture, fisheries, health, etc.). A strategy to combat disaster risks – both climatic and non-climatic – and a socioeconomic development framework have been jointly defined with implementation prospects. These are all measures that ultimately contribute to improving the well-being of populations at the national level. Beyond these key policies, the government has established a governance framework to strengthen human security.

These include the National Delegation for Social Protection4 , which is responsible for guiding the state to reduce social and economic shocks for the most vulnerable groups. Furthermore, the state, with the support of the World Bank, recently published its strategy for combating disaster risks5 . In this context, the Food Security and Resilience Commission (SCAR) was established to facilitate and make accessible aid for populations in the event of disasters (drought, famine, etc.). Also established was the Great Green Wall Agency, an ambitious initiative to combat desertification and land degradation in the Sahel region. In addition, resilience and climate adaptation projects and programs are being implemented.

Policy planning and implementation involves several categories of actors at different scales. Key actors include government bodies (Ministry of Environment and Ecological Transition, Ministry of Agriculture and Rural Equipment, Ministry of the Interior, Ministry of Family and Solidarity, etc.) and non-state actors, namely local authorities, local communities, civil society, and NGOs, as well as international actors (UNDP, UNEP, GIZ, JICA, World Bank, etc.).

[2] National Adaptation Plan, NAP Agriculture, 2024, Republic of Senegal, https://unfccc.int/sites/default/files/re-source/PNA_du_Secteur_de_l'Agriculture_2025_Senegal_FR.pdf (Accessed 23 October 2025).

[3] Senegal 2050: National Transformation Agenda, 2024, Republic of Senegal, https://investinsenegal.sn/senegal-2050-agenda-national-de-transformation/ (Accessed 23 October 2025).

4 National Delegation for Social Protection, 2012, Republic of Senegal, https://dgpsn.sn (Accessed 23 October 2025).

[5] World Bank, 2024, Senegal: Diagnostic on Climate and Disaster Risk Financing (French). Washington, DC: World Bank Group. http://documents.worldbank.org/curated/en/099032425123512723 (Accessed 23 October 2025).

Tackling climate-induced human insecurity in Senegal requires further alignment of adaptation policies (NAP) **and** socioeconomic development (PSE) with local action and international support. Success depends on:

- Cross-sector coordination
- Better consideration of climate issues in sectoral and territorial planning
- Inclusive local governance
- Preparing local stakeholders for the challenges of the human security and climate nexus
- Gender-sensitive, youth-oriented, and conflict-sensitive adaptation
- Regional cooperation for mobility, adaptation, food systems, and disaster response.

3 Recommendations for a better response to human security impacts of SOPs

Based on the above analysis, the following recommendations can be made to Senegalese decision makers:

General:

- **Foster integrated and conflict-sensitive human security policy approaches:** Senegal should move beyond siloed environmental or sectoral responses toward integrated climate-human security strategies. This includes, in particular, tools for conflict-sensitive adaptation, participatory governance, and social safety nets in climate-affected areas. Links need to be established be-tween climate and security for Senegalese communities, taking into account broader security concepts such as human security (economic, social, political, health, and environmental dimension).

- **Research and scientific evidence:** Decision makers should address shortcomings in the under-standing of issues related to slow-onset climate hazards, including insufficient data availability in the areas of soil salinization, desertification, terrestrial and marine biodiversity, water resources, forests and ecosystems, and infrastructure (housing, transport, tourism, and culture). **Analyzes of local perceptions** of climate insecurity in Senegalese communities are necessary to develop conflict-sensitive adaptation strategies based on contextual needs.
- **Integrate human security into public policies:** Whether in strategies to combat climate change or in socio-economic development, emphasis is always placed either on adaptation or on the management of climate disasters. However, human security in all its forms (social, economic, etc.) related to the climate must be better taken into account in the planning and implementation of policy measures.

On sea level rise:

- **Provide coastal communities with resilience strategies** that integrate several vital sectors that are highly vulnerable to rising sea levels — water resources, agriculture, market gardening — and essential to the safety of coastal communities. This will involve placing people at the heart of adaptation actions. In addition, breakwaters or dikes need to be constructed, and social protection initiatives adapted to the coastal context need to be developed, to reduce people's vulnerability to the impacts of coastal erosion.

- **Support communities displaced by rising sea levels** in their host region to minimize the economic, health, social, etc. impacts. Climate migrants need social support to compensate for the loss of cultural and religious values, which increases the insecurity of future generations.

On drought and desertification:

- In addition to efforts to recover land degraded by the effects of climate change, measures to **im-prove communities' living conditions** must consist of facilitating their access to arable land at a time when access to land is becoming increasingly difficult and a source of conflict.
- **Develop social safety nets** tailored to these areas to support households that are highly exposed to food insecurity, especially during lean periods. Environmental conditions that are unfavorable for agricultural practice make it difficult to develop economic activities to support household in-comes.

On biodiversity loss:

- Enhance community engagement in conservation efforts and resource management decisions. Communities' traditional knowledge and practices are crucial for sustainable resource management ment.
- Support dialogue among multiple stakeholders, including government, civil society, and the private sector, to create a collective dynamic for conservation.
- Implement education and awareness-raising programs for children and adults to increase an understanding and appreciation of biodiversity, local ecosystems, and the threats they face.

4 International support

To effectively support Senegal in addressing the human security challenges posed by slow-onset climate impacts, international actors – including the EU and their Member States, UN agencies such as the UN Security Council, the World Bank, GIZ, and others – should adopt the following strategic measures – particularly with regard to their interaction with Senegal, the African Union (AU), and other (western) African countries:

1. **Advance a holistic international response to climate change as a human security threat:** International partners should treat climate change not only as an environmental or develop-mental issue but also as a strategic risk to human security (thus avoiding the militarization and securitization of climate change). First, this requires integrating climate resilience into security policies, peacebuilding, and migration management, with long-term support for climate-vulnerable communities – at a level as high as the UN Security Council, UNFCCC's NDCs and NAPs, and IPCC's assessment reports. Second, it requires comprehensive assessments of climate action measures to evaluate their cross-sectoral impacts and to identify synergies that can strengthen and promote human security.

2. **Broaden the scope of climate finance by framing adaptation as a peace and stability diary:** Firstly, more international climate finance should be made available. Secondly, climate finance mechanisms should prioritize fragile, conflict-prone, and environmentally degraded regions. This would mean that adaptation and measures to address loss and damage would not only be considered as resilience-building but as a core component of preventive diplomacy, peacebuilding-ing, and human security. Adaptation and loss and damage finance should be used to support effective responses to SOPs, which should be informed by concerns for human security.
3. **Foster integrated, conflict-sensitive policy approaches:** Contributors and development partners must support integrated programs that combine climate adaptation, social protection, livelihood support, and conflict sensitivity. Strengthening local governance and inclusive decision-making in national planning – with particular consideration given to local knowledge, eg that of women, youth, and marginalized groups – will reduce tensions and enhance adaptive capacity beyond siloed environmental or sectoral responses, toward integrated climate-human security strategies. This includes tools for conflict-sensitive adaptation, participatory governance, and social safety nets in climate-affected areas.

4. **Invest in instruments that benefit climate action and human security:** International partners should invest in financial instruments that support a holistic human security approach while also aligning with climate action goals. One key area is social protection, which can shield communities from climate shocks while reducing their overall vulnerability.
5. **Strengthen regional and cross-border cooperation:** A human security approach highlights the transboundary nature of SOPs, such as shared water-sheds or migratory routes. International discussions can support regional dialogues and coordination (eg through ECOWAS or the African Union), where Senegal plays a key role.

These recommendations emphasize the need for coordinated, cross-sectoral international engagement that places human security and climate justice at the center of international discourse and support for adaptation and development efforts in Senegal.

Conclusions

Our paper shows that slow-onset climate processes have the potential to continually erode the foundations of peace, stability, and sustainable development in Senegal. Addressing these challenges through a human security lens shifts the focus to people-centered, equity-driven responses that tackle root vulnerabilities. By integrating this approach into climate strategies and policies, Senegal can build resilience not only in infrastructure, but in communities and governance systems as well. International actors should integrate human security and climate change policy themselves while supporting Senegal's efforts.

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