



Introduction

The forest sector—broadly defined to include timber production, agroforestry, non-timber forest products, nature-based tourism, and furniture production—remains an important sector of the Ghanaian economy. Apart from contributing directly to the country's GDP in the form of foreign exchange earnings, the forest sector provides employment and livelihood opportunities to millions of Ghanaians. Environmentally, forests serve as a natural habitat for critical biodiversity, including crop pollinators and wildlife, and sequester large amounts of CO₂ from the atmosphere, helping reduce global warming. They are also critical for water storage and soil fertility, as well as slope stabilization, which slows erosion and reduces the risk of landslides.

These economic, social, and environmental benefits are under threat from direct and indirect climate change impacts. Direct impacts—which arise from significant changes in rainfall patterns and temperature—include increased incidence of forest fires, changes in the habitats and distribution of critical biodiversity, and threats to nature-based tourism, which contributes to Ghana's GDP and local economies. Indirect impacts are mostly associated with climate change's effects on other sectors, such as agriculture and mining. For example, while deforestation in Ghana is not new, rates of deforestation are increasing because climatic changes—such as high temperatures and more frequent and severe weather events (floods, droughts)—are decreasing agricultural and land productivity, which, in turn, leads farmers to expand croplands into forests. It also pushes some farmers into alternative livelihoods such as illegal mining, which is degrading forests, polluting water sources, and altering ecosystem functioning and sustainability.

Addressing both the indirect and direct impacts of climate change on the forest sector requires the development of climate-resilient interventions to conserve forests and biodiversity and ensure the continued delivery of forests' economic, social, and environmental benefits.

Climate Change Assessment

This policy brief on the forest sector is part of the Ghana Policy LINK Activity's broader climate change assessment, which focused on six key areas—agriculture, water, energy, forest, coastal systems, and climate finance. The assessment methodology included a literature review as well as inclusive stakeholder consultations through interviews, focus group discussions, and sector workshops in Tamale and Accra. The Ghana Policy LINK Activity consulted 43 institutions and groups, including USAID and its implementing partners, other development partners, the Government of Ghana, academia, civil society organizations, farmer groups, the private sector, and the media. The policy briefs will be used to further engage stakeholders to prioritize transformative actions to achieve a climate resilient future.

This policy brief on the forest sector—part of a broader climate change assessment—details: (i) the impacts of climate change on the sector, (ii) the constraints to addressing these impacts, and (iii) recommended interventions to reduce these impacts and deliver a climate-resilient forest sector.

Climate Change Impacts on the Forest Sector

The climate change assessment revealed five main impacts of climate change on the forest sector. These impacts, which are summarized below, include effects farmers are already experiencing and impacts predicted by climate models.

Changing forest ecosystems and habitat loss. Shifting rainfall patterns and rising temperatures are changing the habitats of forest

“Climate-resilient interventions are needed to ensure the continued delivery of forests’ economic, social, and environmental benefits.”

species (flora and fauna), leading to adaptation (e.g., migration to a more conducive environment) or extinction. Frequent and severe weather events (floods, heat waves, droughts) are changing vegetation cover, degrading forests, and causing forest fires, which also drive species migration and extinction. In addition, as rivers become drier, riparian forests—which are important for fish habitation, flood attenuation, and slope stabilization—will shrink and shift. These changes affect species composition (including richness) and distribution, which have cascading effects on forest ecosystems’ functioning and performance and serious repercussions for agriculture, water, health, and biodiversity.

Deforestation. Although deforestation has been a challenge for centuries, deforestation rates are accelerating due to changing climate patterns. Droughts and soil degradation, for example, cause low agricultural productivity. To compensate for low yields, farmers often expand cropland into forest areas. Beyond leading to deforestation and forest degradation, climate-induced low agricultural productivity can force farmers to seek out alternative livelihoods such as illegal, small-scale gold mining (*galamsey*) or new sources of income that may threaten forest ecosystems. Studies have shown that some farmers sell their farmlands to illegal miners due to low productivity and a lack of interest in continuing to farm.¹ In addition, climate change impacts along the coast and the resultant loss of livelihoods (e.g., reduced fish catch) is leading to unsustainable resource exploitation (e.g., overfishing, cyanide fishing, dynamite fishing, ghost fishing) and high levels of mangrove degradation, which will exacerbate the degradation of the coastal ecosystem.

Increase in forest fires. While periodic forest fires are necessary for forest regeneration and ecosystem health, climate change is increasing the frequency and intensity of fires to an unsustainable level. Rising temperatures and significant shifts in seasonal rainfall patterns—which dry out the forest cover—are responsible for the increased number of forest fires (and their tendency to spread). Moreover, they cause fires to burn too hot, seriously reducing soil productivity and killing the seed stock required for faster regeneration. This impact is most pronounced in the transitional and semi-deciduous forest agroecological zones (mainly in the middle of the country).

Reduced nature-based tourism. The Government of Ghana has identified nature-based tourism as a high-growth sector that can support the country’s economic transformation. But ecotourism is already experiencing the impacts of climate change. Irregular rainfall patterns affect when wildlife emerges in national parks. Natural habitats such as pools for hippopotamuses are being altered, too, due to evaporation caused by high temperatures and declining rainfall

totals. These impacts make national parks and other ecotourism sites less attractive, leading to a reduction in the number of visitors and, consequently, declining revenue, employment opportunities, and socio-economic benefits to nearby communities. Other types of nature-based tourism that are not yet popular in Ghana (e.g., wildlife photography, rafting, camping, and biking) may all be impacted by climate change, robbing the country of valuable potential revenue. Given projected climatic changes, especially in rainfall and temperature, the growth potential of the tourism industry is likely to be significantly constrained.

Vulnerability of tree-seeding nurseries. Nurseries for tree seedlings are important for reforestation (planting trees on land that previously had forest cover) and afforestation (planting trees on land that previously had no forest cover). The Green Ghana Project, for example, which launched in March 2021, has already helped plant roughly five million tree seedlings. This and other reforestation and afforestation initiatives are under threat, however, as unpredictable and irregular rainfall and high temperatures negatively affect nurseries. In addition, limited or poor irrigation facilities across the country make this situation worse and threaten to undermine the country’s mitigation efforts.

Constraints to Addressing Climate Change Impacts on the Forest Sector

The assessment identified several constraints to addressing climate change in the forest sector.

Outdated policies and inadequate legal framework. Several policies were identified as outdated and in need of revision to reflect contemporary forest management principles and technologies (e.g., the National Wildfire Policy [2006] and the Forest and Wildlife Policy [2012]). In addition, some forest sector policies lack or have weak legal provisions. The Forest and Wildlife Policy (2012), for example, mentions the need for local participation in forest management but has no supporting legal framework to incentivize community participation. This limits the legal status and powers of innovative community participation models such as community resource management areas (CREMAs). In addition, the punitive measures for forest management violations prescribed by existing policies are not stringent enough to deter violators; nor are regulations routinely or consistently enforced. Finally, the



1 Mining the Cocoa Farm in Osino Community, Ghana | Asian Research Journal of Arts & Social Sciences (journalarjass.com).



responsibility for managing mangroves is shared by the Ministry of Lands and Natural Resources, the Ministry of Environment, Science, Technology and Innovation, and the Ministry of Fisheries and Aquaculture Development, which leads to confusion about structures, plans, and roles.

Limited capacity. Limited technical and human resource capacity is another constraint to fighting climate change impacts in the forest sector. Key gaps include: (i) inadequate technical capacity of state actors to adopt state-of-the-art technologies and tools for monitoring forest fires and illegal activities (e.g., remote sensing data, unmanned aerial vehicles, etc.), (ii) limited technical capacity and knowledge on nature-based solutions (NbS) and how to apply them in various forest ecosystems, (iii) limited human capacity, especially at sub-national levels, to enforce forest laws and regulations, and (iv) low capacity and participation of women in forest sector activities, despite their significant contributions to the sector.

Low levels of awareness and engagement. Awareness of forest sector policies and laws and the importance of the forest sector to the economy is limited among local actors, including community members, nongovernmental organizations (NGOs), civil society organizations (CSOs), and Ghanaian citizens. This lack of awareness leads to frequent violations of laws and regulations. It also means that community members—whose wellbeing is linked to the sustainability of the forest—are not fully engaged in playing a watchdog role or reporting violations to the authorities. Greater engagement of community members and traditional authorities is also important for integrating indigenous knowledge into scientific solutions for forest governance and management.

Weak coordination. Coordination among the various state and non-state actors involved in forest management is weak. Poor coordination was noted even among state institutions, while the relationship between state and non-state actors (especially CSOs) is often confrontational. Although some coordination platforms exist, they could be improved, including by making them more inclusive of marginalized groups and institutions.

Challenging political economy. Political economy issues also hamper efforts to address climate change's impacts on the forest sector. Examples cited by stakeholders included weak political will to enforce laws and regulations, alleged political interference in punishing individuals engaged in illegal activities (e.g., logging and unlicensed mining), abuse of office, and alleged corruption (e.g., selling portions of protected forests).

Recommended Interventions

Recommended interventions to reduce the impact of climate change on the forest sector are described below.

Conduct policy reviews. Stakeholders recommended revising forest management plans to better integrate climate risk and adaptation measures. They also suggested strengthening the legal and regulatory framework for community participation in forest management. The changes will enable the wider use of innovative community participation models such as CREMA, increase local ownership of policies

and regulations, and facilitate the integration of indigenous knowledge and institutions into forest management. Further, punitive measures for violating forest management regulations should be strengthened to deter would-be violators and increase compliance with the laws and regulations. Finally, it is important to streamline the institutional arrangements and mandates for mangrove management. Clearer structures, mandates, and responsibilities would facilitate better planning and coordination, improve management (including working with communities), and maximize resources.

Increase sectoral and cross-sectoral coordination. Stakeholders recommended strengthening and decentralizing coordination mechanisms and platforms to improve collaboration among state and non-state actors in the forest sector, from the national level to the sub-district level. Specific attention should be paid to coordination at the sub-national level, where existing mechanisms must be strengthened—or new ones established—so they can liaise effectively with regional and national structures. In addition, mechanisms and platforms such as the Environment and Natural Resources Advisory Council and National REDD+ Working Group should strengthen coordination between the forest sector and other sectors that influence, or are influenced, by the forest sector.

Promote landscape restoration. Stakeholders stressed the need to restore degraded landscapes and promote sustainable natural resource management. Lessons learned and successful practices from previous and ongoing interventions (e.g., [Sustainable Land and Water Management](#), [Ghana Landscape Restoration and Small-Scale Mining Project](#), [Ghana Shea Landscape Emissions Reduction Project](#), [Forest Carbon Partnership Facility](#)) should be promoted and scaled to other communities through education, sensitization, and capacity building. Stakeholders also recommended focusing on agroecological zones that have largely been neglected in terms of forest interventions, especially savanna, transitional, and coastal zones.

Strengthen capacity. Stakeholders recommended strengthening the capacity of forest sector actors to adopt state-of-the-art forest management approaches, tools, and technologies. State institutions, especially, need support to use new technologies for monitoring and combatting deforestation, wildfires, and illegal mining activities. At the sub-national level, increased human capacity is required to strengthen the enforcement of forest management laws and regulations. Improved capacity in modeling and impact assessments (e.g., on species richness and distribution) is also needed and can be achieved, in part, through stronger collaboration with research and academic institutions. Community members, meanwhile, need support to adopt sustainable forest management practices (e.g., through CREMAs). Communities also need exposure to more environmentally and climate-friendly alternative livelihoods.

Increase awareness and education. Stakeholders stressed the importance of raising awareness of forest sector policies, laws, and regulations among sector stakeholders, especially at the local level. Education and sensitization on the environmental and social impacts of unsustainable resource exploitation are especially important at the community level, as is guidance on adopting sustainable practices or technologies such as clean cooking stoves. Schools are an important partner in awareness-raising efforts, as they can promote behavior change related to forest management from an early age.

Invest in infrastructure. Investments in critical infrastructure can reduce the impact of climate change on the forest sector. Seedling nurseries, for example, need irrigation facilities to sustain and increase production for reforestation and afforestation interventions. Ghana would also benefit from investment in early warning systems for wildfires, droughts, and other hazards. Investments in data collection and analysis infrastructure could also strengthen the monitoring of biodiversity and ecosystem function changes (e.g., species movement, distribution, extinction).

