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Ghana Green Growth PASA

Ghana Country Forest Note

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Environment, Natural Resources, and the Blue Economy Global Practice

Acknowledgements

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Acronyms and Abbreviations

AAC	Annual Allowable Cut
ANS	Adjusted Net Savings
ASM	Artisanal and Small-Scale Mining
BAU	Business-As-Usual
CBA	Community-Based Adaptation Approach
CBD	Convention on Biological Diversity
CCDR	Country Climate and Development Report
CEA	Country Environmental Analysis
CFC	Community Forest Committee
CFN	Country Forest Note
COCOBOD	Ghana Cocoa Board
COP26	2021 United Nations Climate Change Conference
CPESDP	Coordinated Programme of Economic and Social Development Policies
CPIA	Country Policy and Institutional Assessment
CREMA	Community Resource Management Area
CWON	Changing Wealth of Nations
DGM	Dedicated Grant Mechanism
EBA	Ecosystem-Based Adaptation Approach
EPA	Environmental Protection Agency
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FC	Forestry Commission
FDMP	Forest Development Master Plan
FIP	Forest Investment Program
FLEGT	Forest Law Enforcement, Governance and Trade
FMIS	Forest Management Information System
FPDF	Forest Plantation Development Fund
FRL	Forest Reference Level
FSD	Forest Services Division (part of the Forestry Commission)
FWP	Forest and Wildlife Policy
GCFRP	Ghana Cocoa Forest REDD+ Programme
GDP	Gross Domestic Product
GFIP	Ghana Forest Investment Program
GFPS	Ghana Forest Plantation Strategy
GHG	Greenhouse Gas
GNI	Gross National Income
GoG	Government of Ghana
GRID	Green, Resilient, and Inclusive Development
HFZ	High Forest Zone

IFC	International Finance Corporation
IMCIM	Inter-Ministerial Committee on Illegal Mining
LMIC	Lower-Middle-Income Country
MAI	Mean Annual Increment
MESTI	Ministry of Environment, Science, Technology and Innovation
MLNR	Ministry of Lands and Natural Resources
NAP	National Adaptation Plan
NAPF	National Adaptation Plan Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCCAS	National Climate Change Adaptation Strategy
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NDPC	National Development Planning Commission
NEP	National Environment Policy
NPV	Net Present Value
NREG	Natural Resources and Environmental Governance
NSDF	National Spatial Development Framework
NSZ	Northern Savannah Zone
NTFP	Non-Timber Forest Product
PASA	Program for Advisory Services and Analytics
PFM	Participatory Forest Management
RCP	Representative Concentration Pathway
REDD	Reducing Emissions from Deforestation and Degradation
RISE	Resilience, Inclusion, Sustainability, and Efficiency
RMSC	Resource Management Support Centre (part of the Forestry Commission)
SP	Salvage Permit
SWAT	Soil and Water Assessment Tool
SZ	Savannah Zone
TIDD	Timber Industry Development Division (part of the Forestry Commission)
TUC	Timber Utilization Contract
TUP	Timber Utilization Permit
TZ	Transitional Zone
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VPA	Voluntary Partnership Agreement
WD	Wildlife Division (part of the Forestry Commission)
WTS	Wood Tracking System

01 Introduction and rationale

The World Bank Group supports countries in building a better future through green, resilient, and inclusive development (GRID). This includes countries' efforts to harness the potential of forests to reduce poverty, better integrate forests into their economies, and protect and strengthen the environmental role forests play—locally and globally.

The World Bank, in coordination with the Government of Ghana (GoG), recently completed a Country Environmental Analysis (CEA) for Ghana. The objective of the CEA is to analyze critical environmental and natural resources issues threatening sustainable economic growth and propose policy actions and investments to address them. The CEA identified loss of forest resources as a critical issue that is having a negative effect on resource productivity—affecting national economic growth drivers, jobs, and livelihoods—and ecosystem services.

The engagement of the World Bank in the forest sector is guided by its Forest Action Plan which is now being updated.[1] The Forest Action Plan promotes the development of Country Forest Notes (CFNs) to better understand the cross-sectoral dimensions of forestry and the relevance of forests for poverty and economic development, at the country level. This CFN, therefore, aims to provide a thorough overview of the current status of forests, the forestry sector, and the needs to sustainably manage this valuable renewable natural resource in Ghana. This CFN was partly guided by the World Bank's Resilience, Inclusion, Sustainability, and Efficiency (RISE) framework. The RISE framework provides a diagnostic and policy guidance tool to identify key development challenges and develop solutions to assist countries in building better.

This note was prepared through a desk review of existing publications and recent World Bank analytical work including the Systematic Country Diagnostic for Ghana (World Bank 2018b), the Ghana CEA (World Bank 2020b), the draft RISE Diagnostic (World Bank 2021c), and the Ghana Country Climate and Development Report (CCDR) (World Bank 2022b). This note first provides a general overview of the forest sector in Ghana and then a more detailed assessment of the status of forest and the forestry sector in Ghana in the context of the different pillars of the World Bank RISE framework.

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1   https://openknowledge.worldbank.org/handle/10986/24026.

02 Characteristics of Ghana's forests and forestry sector

2.1 Ghana's environmental, economic, and social context

Ghana has made major progress over the past three decades. Gross domestic product (GDP) per capita more than doubled over the past 15 years and in 2011 the country joined the ranks of lower-middle-income countries (LMICs). Macroeconomic momentum has been driven in part by higher prices for Ghana's main commodity exports, gold and cocoa, and the start of commercial oil production. This growth was accompanied by reduced poverty, allowing Ghana to halve its national poverty rate (from 52.7 to 24.2 percent during 1991–2012).

Natural resources have been key drivers of this development. Ghana lags its lower-middle-income peers on most indicators related to the sustainable use of resources and environmental health (World Bank 2020b). Deforestation is high and spatially concentrated in areas of high poverty. Low levels of renewable water per capita are compounded by poor capacity to treat wastewater, which, together with illegal mining, cause severe levels of pollution, making the actual resource available even more scarce. Air pollution, caused by outdated vehicles, waste burning, and indoor woodfire cooking, is a major cause of fatalities and disabilities, hampering human capital development. Due to unregulated overfishing, the stock has been decreasing steadily. As a result, coastal fishing communities struggle to maintain their livelihoods.

In 2017, the cost of environmental degradation in Ghana was estimated at US$6.3 billion (World Bank 2020b). Looking forward, Ghana's high population growth and increased demand for natural resources makes this an increasingly pressing concern, since a shrinking natural capital stock will need to be shared with larger future generations, hampering the capacity of remining ecosystems to deliver their services.

2.2 Forest cover and forest types

For international reporting on climate and forest, Ghana defines forests as areas with trees that have a minimum of 15 percent canopy cover, a minimum height of 5 m, and a minimum area of 1 ha. Forests are further subdivided into closed and open forests, based on the extent of canopy cover. The closed canopy forests are those with canopy cover exceeding 60 percent. Open canopy forest includes modified or disturbed natural forest which has 15–59 percent canopy. In Ghana's context, agricultural tree crops, including cocoa, citrus, oil palm (in smallholder or estate plantations), and rubber, are not considered to be forest trees. Timber tree plantations are considered forest.

Using this definition, forests in Ghana covered around 27 percent of its total land area in 2019.[2] The forest in Ghana can be divided into three main ecological zones: High Forest Zone (HFZ), Transitional Zone (TZ), and the Savannah Zone (SZ). The delineation of these zones is based on climatic factors, notably rainfall and temperature.

- **High Forest Zone.** This forest zone covers the southern third of the country and the area along the Akwapim-Togo Ranges. The average daytime temperature is about 32°C with a mean annual precipitation of around 1,500 mm per year, which is distributed throughout the year and two rainfall seasons. The HFZ falls within West Africa's Upper Guinean biodiversity hotspot and is a source of timber export species—including African whitewood, known locally as wawa *(Triplochiton scleroxylon)* and ceiba *(Ceiba pentandra)*—and non-timber forest products (NTFPs) as well as major agricultural products such as cocoa. Intact forests in the HFZ exist only within the 1.2 million ha of forest reserves and national parks.

- **Transitional Zone.** The TZ, covering the middle belt of the country, has expanded since the 1980s due to gradual drying of the subregion, drought events (El Niño), and the onset of climate change. Average annual rainfall is ~1,250 mm and generally occurs in two rainfall seasons. The fire-prone nature of the transitional forests has facilitated their conversion into plantations of timber (mainly teak - *Tectona spp., gmelina - Gmelina arborea*) and tree crops (cashew).

- **Savannah Zone.** The SZ is mainly found in the northern part of Ghana, although there is also savannah along the eastern coastal plain. The Northern Savannah is characterized by an average temperature of around 35°C and low annual precipitation, between 760 and 1,140 mm, which occurs in a single season and is followed by a period of drought. The north's SZ hosts significant wildlife resources and has the largest national park in the country—Mole National Park. Savannah woodlands are increasingly becoming a source of timber as well as NTFP species such as shea tree (*Vitellaria paradoxa*).

Figure 1 shows the different agro-ecological zones in Ghana where the rainforest and semi-deciduous forest together make up the HFZ.

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2   Based on the Ghana enhanced 2019 land use and land cover map. See footnote 3 for the link.

Figure 1. Ghana agro-ecological zones
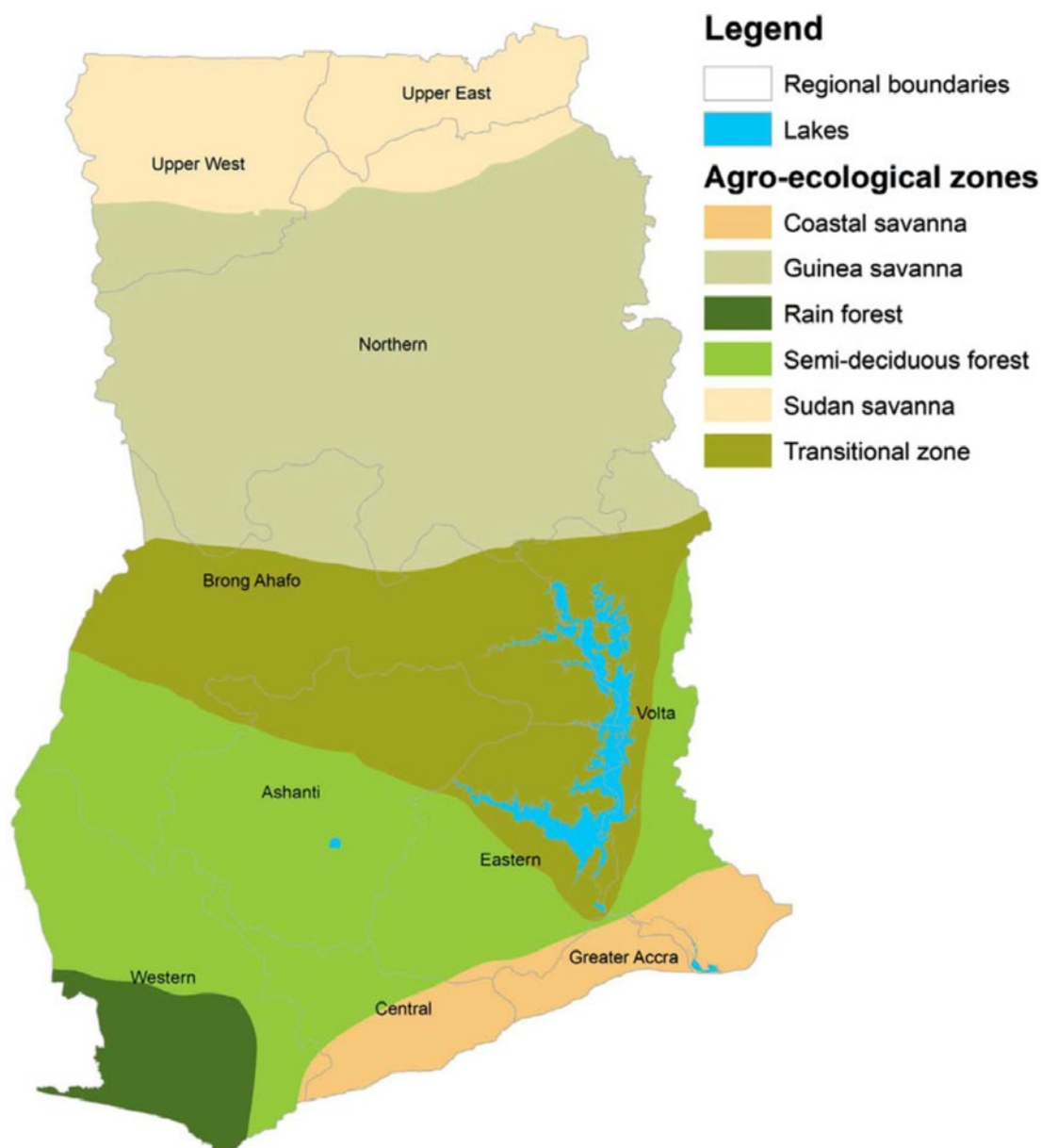
Source: Osei and Stein 2017.

The Forestry Commission of Ghana (FC) developed a National Map of Land Cover and Land Use[3] in 2019, with support from the UK Space Agency's International Partnership Programme. This map (Figure 2) shows the extent of forest in Ghana, distinguishing between closed and open forest.

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3   https://ghana-national-landuse.knust.ourecosystem.com/interface/.

Figure 2. 2019 enhanced national land use/land cover map for Ghana

2019 Enhance National Landuse / Landcover - Ghana

Filter legend...

- Close Forest
- Open Forest
- Waterbody
- Grassland
- Settlement / Bare Surface
- Mono Cocoa
- Shaded Cocoa
- Other Tree Crop
- Annual Crop
- Salt Mining
- Mangrove
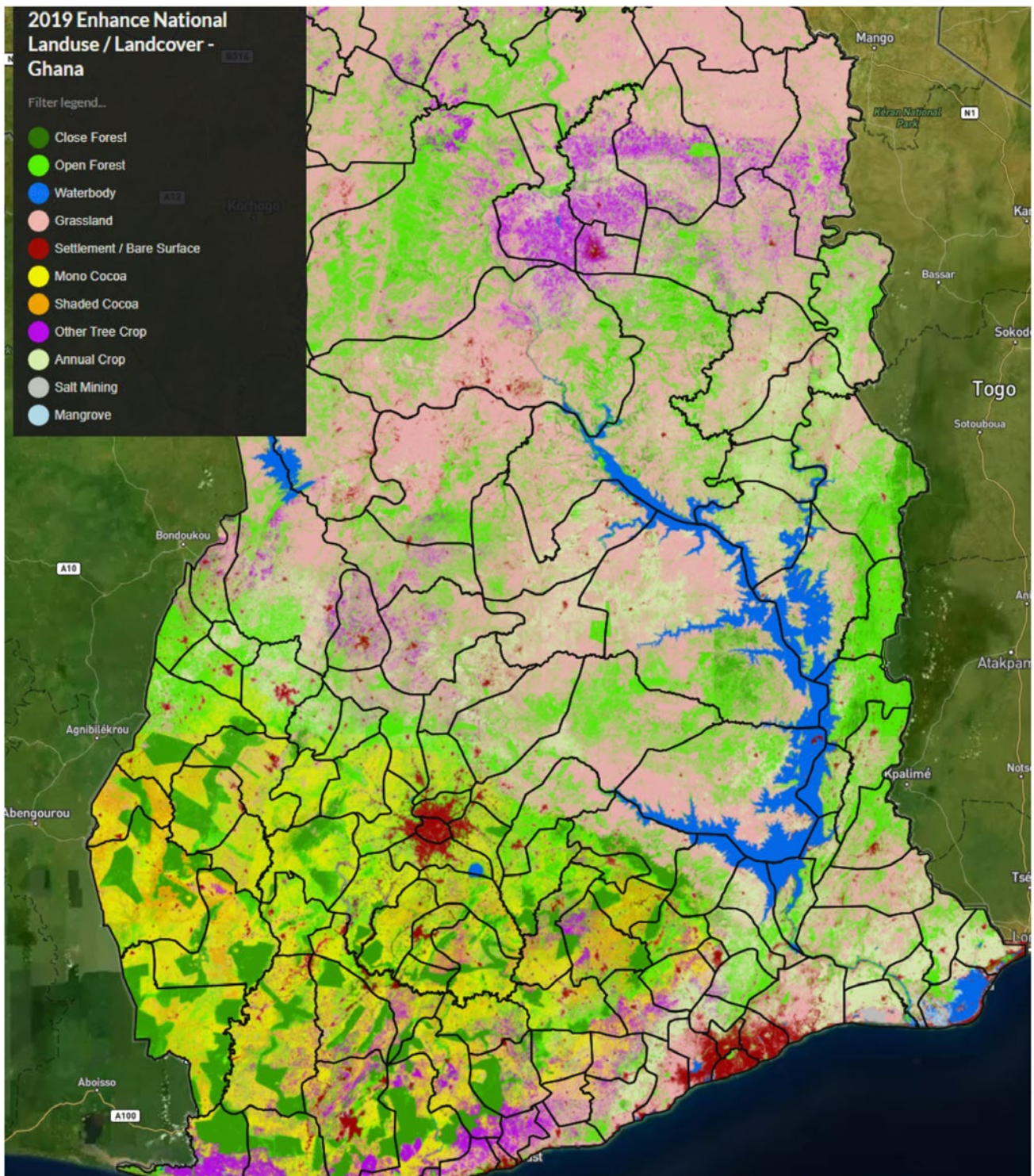
Source: https://ghana-national-landuse.knust.ourecosystem.com/interface/.

2.3 Ownership of land and control of natural resources in Ghana

Land ownership in Ghana comprises two broad classes: customary land and public lands. Public lands are lands that are vested in the president for public use. Customary lands are lands owned by stools, skins,[4] families, or clan, usually held in trust by the chief, head of family, clan, or land priests for the benefit of members of that group. An estimated 80 percent of land in Ghana is under the control of customary authorities, with chiefs responsible for allocating land. However, only a small proportion of land is registered and even where land is registered, there may be considerable uncertainties about other potential claims to it, depending on the registration regime. As a result, land transactions are complex and uncertain in many cases, and the regularization of land and streamlining of the legal procedures for leasing land for investment purposes has become an increasingly important public policy priority (World Bank 2021d).[5]

The forests of Ghana can be broadly classified as 'on-reserve' forests (gazetted forest reserves and wildlife protected areas), 'off-reserve' forests, and plantations. Forest reserves are protected by the State and if they are located on customary land, they are managed by the government in trust for the stool and skin landowners.

Independent of whether forests are in a gazetted reserve or not, Ghana's Constitution gives the State control over all natural resources of Ghana, stipulating that these natural resources are to be vested in the President on behalf of and in trust for the people as a whole. In that context, Ghanaian law makes a distinction between naturally occurring and planted trees. Economic rights to naturally occurring trees sit with the Ghanaian State. The Timber Resources Management Act 617 (2002) decrees that landowners and land users do not have the right to harvest naturally occurring trees for commercial or domestic purposes, although trees may be felled for noneconomic reasons such as clearing land for agricultural purposes.

The FC (see section 2.4) is entitled to issue permits to timber companies to harvest naturally occurring trees off-reserve. This often results in damage to the surrounding (tree) crops during felling. This has created a perverse incentive to the sustainable management of trees on farms since they could be harvested by others holding a permit. Under Act 617, ownership rights are conferred to a person who plants a tree, but the documentation for registering ownership of planted trees is a significant challenge. Despite movement toward a broader set of tree tenure reforms that would address naturally occurring trees, the government has not been able to implement policy or legislative reforms.

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4   Stool or skin lands are names given to land claimed by traditional owners in Ghana, where generally skin is the symbol of chief authority in northern Ghana, with stool being the equivalent in the south.

5   Ghana has made significant improvements in the land sector including restructuring the Lands Commission, carrying out national mapping, piloting boundary demarcation of customary areas, digitizing paper records to improve efficiency and data security, creating customer service centers in five regions, and establishing the Ghana Enterprise Land Information System to automate land administration services. The 2020 Ghana Land Act was recently adopted with an objective "to revise and consolidate the laws on land, with the view to harmonizing those laws to ensure sustainable land administration and management, effective land tenure and to provide for related matters."

2.4 Institutional arrangements for managing forest resources

The Ministry of Lands and Natural Resources (MLNR) is mandated with ensuring "the sustainable management and utilisation of Ghana's lands, forests, wildlife and mineral resources for socio-economic growth and development" including through the promotion of sustainable natural resource management and utilization. MLNR oversees several agencies and independent commissions that are responsible for the implementation activities of the ministry. This includes the FC, Minerals Commission, Lands Commission, and the Geological Survey Department. The ministry is primarily responsible for formulating policy, giving political direction, and performing monitoring and evaluation. The commissions have the mandate for the regulation and management of the natural resources concerned and the coordination of the policies in relation to them.

The FC has the constitutional mandate to regulate and manage the utilization and conservation of forest and wildlife resources. The Forestry Commission Act (Act 571, 1999) and Charter mandate it to operate as a non-decentralized autonomous business-oriented organization. The core of the FC consists of three main divisions: the Forest Services Division (FSD), the Timber Industry Development Division (TIDD), and the Wildlife Division (WD). The FSD oversees the management of the forest reserves as well as savannah woodland resources. TIDD is responsible for the regulation of the timber and wood products traded in Ghana and the development of an integrated timber and wood processing industry. The WD manages Ghana's protected areas and regulates the utilization of wildlife resources. There is also a Resource Management Support Centre (RMSC) as part of the FC that is responsible for forest monitoring. In 2020, the overall number of FC staff was 3,798, with 1,261 senior staff and 2,537 junior staff comprising 3,148 males and 650 females.

In terms of public expenditure on the forest sector, a review was done in 2015 by the Natural Resources and Environmental Governance (NREG) technical assistance project (NREG 2015). The content of that review focused on the FC which is traditionally considered as the public component of the forest sector in Ghana. In 2020, the total income of the FC was GH¢503,470,094 (Forestry Commission 2020) or around US$86.5 million based on the exchange rate in December 2020. This comprised government allocations (68.8 percent), internally generated funds (26.8 percent), and grants from donors (4.4 percent). Two-thirds of the government allocation was plantation grants from the Forest Plantation Development Fund (FPDF), which is managed by the MLNR. The internally generated funds included, among others, stumpage fees and other levies (32 percent of the internally generated funds), income from timber (23 percent), export levies (9 percent), and park entrance fees (3 percent). The FC tries to further expand its income and develop Ghana's forest and wildlife resources in different ways, including the following:

- Implementation of the Ghana Forest Plantation Strategy (GFPS) with the aim of restoring lost forest cover
- Development of bamboo and rattan
- Use of climate finance to implement actions related to climate variability and change
- Development of ecotourism.

The GoG is also trying to involve communities more in the management of forest resources. The 1994 forest and wildlife policy (FWP) promoted participatory management arrangements to allow forest-fringe communities to participate in decision-making for the productive management and protection of reserves through plantation development, establishment of firebreaks, cultivation of NWFPs, boundary maintenance, and research programs. In the south of the country, the FC mostly collaborates with forest-fringe communities through the establishment of community forest committees (CFCs). These groups are paid by the commission to undertake boundary cleaning of the forest reserves and to prevent illegal felling of timber but decisions on the management plan and benefit sharing of timber production remain the sole prerogative of the FC (Sarfo-Adu 2020). Another model for involving communities in resource management is the community resource management area (CREMA). It was developed by the WD of the FC to support community resource management in off-reserve (ungazetted) lands. As discussed in section 2.3, although ownership of the land often sits with the traditional authorities, the government has the right to manage the naturally occurring resources for economic gain. CREMAs can fill a critical gap by giving communities the right to manage and benefit economically from their natural resources (Asare, Kyei, and Mason 2013). The CREMA usually has a group of communities agreeing on the management regime of a common area. The CREMA works as a community-based organization with an executive structure, a constitution, and relevant bylaws that guide and regulate the resources from the area. CREMAs are traditionally implemented in communities in the proximity of protected areas, creating incentives for sustainable management by providing an opportunity for communities, landowners, and land users to govern and manage forest and wildlife resources within the boundaries of the CREMA and to benefit financially or in kind from the use of natural resources.

2.5   Economic contribution of the forest sector

Different types of licenses can be obtained for legally carrying out timber harvesting in Ghana:

- Timber Utilization Contract (TUC) is a written contract signed by the minister and ratified by the Parliament granting a timber harvesting right, except in the case of land with private forest plantations or lands with timber grown or owned by an individual or group.

- Salvage Permit (SP) is an administrative permit signed by the FC to salvage trees from an area undergoing development. To be considered legal, the permit needs to be covered by the application and an inspection report from Forest Service Division.

- Timber Utilization Permit (TUP) is a small-scale permit to harvest a defined number of trees for social or community purposes and signed by the FC. Timber from these permits cannot be sold or exported.

The TUC was introduced by the Timber Resources Management Act, 1997 (Act 547), which prohibits the harvesting of timber without a TUC. TUCs are allocated on the basis of public bidding and TUCs for forest reserves will have a term of 40 years, while TUCs for other lands have a term of 5 years. When the aforementioned act came into force, all existing timber rights were to be valid for only six months and all holders were to apply for TUCs within six months of the passage of the act. These were, however, not enforced even after two decades of the act coming into effect. Only in 2022, Ghana's cabinet approved the conversion of all

156 existing timber concessions and permits into TUCs.[6] In 2020, in addition to the existing concessions, 319 SPs (229 off-reserve and 90 on-reserve) and 155 permits for harvesting plantation timber were granted (Forestry Commission 2020).

In 2020, the legally recorded volume of natural forest timber harvested was 1,226,678 m³, of which 944,446 m³ was harvested on-reserve and 282,232 m³ off-reserve (Forestry Commission 2020). This represents 123 percent of the annual allowable cut (AAC), which is currently set at 1,000,000 m³, and is part of a trend of increased timber harvesting in natural forest, as shown in Figure 3. In addition, a total volume of 124,790 m³ (on-reserve - 71,997 m³ and off-reserve - 52,793 m³) plantation timber was harvested in 2020.

Figure 3. Volume of timber harvesting in (a) natural forest and (b) plantations

(a) Timber harvesting in natural forest

	2016	2017	2018	2019	2020
On-Reserve (m³)	507,813	613,140	572,472	862,409	944,446
Off-Reserve (m³)	238,933	41,365	112,548	294,820	282,232
Total Production (m³)	746,746	654,505	685,020	1,157,229	1,226,678
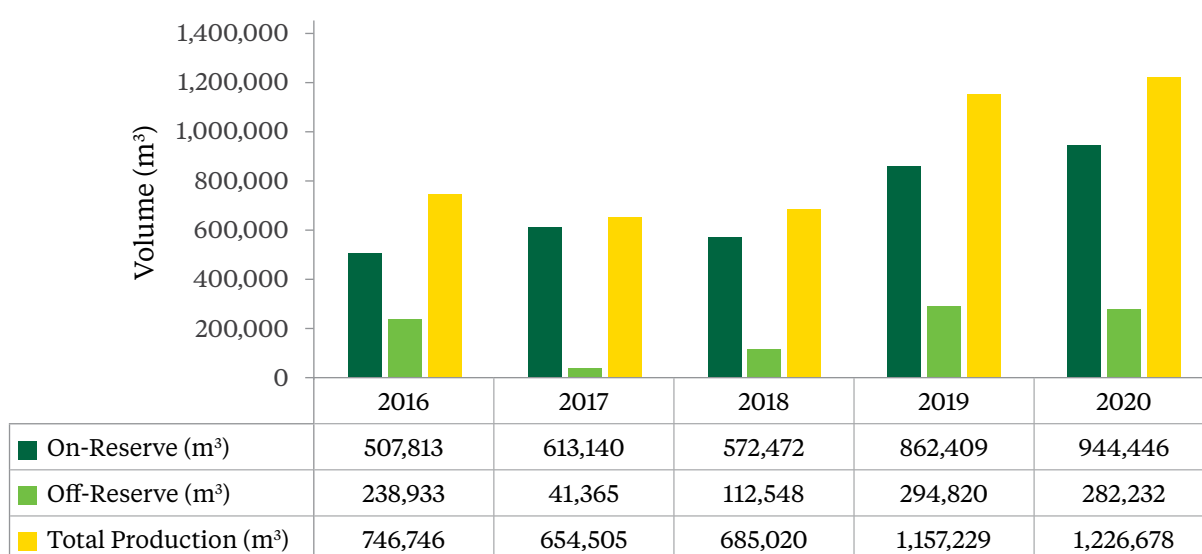
(b) Timber harvesting in plantations

	2016	2017	2018	2019	2020
On-Reserve (m³)	35,671	16,923	20,189	390,846	71,997
Off-Reserve (m³)	90,439	100,951	71,768	56,189	52,793
Total Production (m³)	126,110	117,874	91,957	447,035	124,790
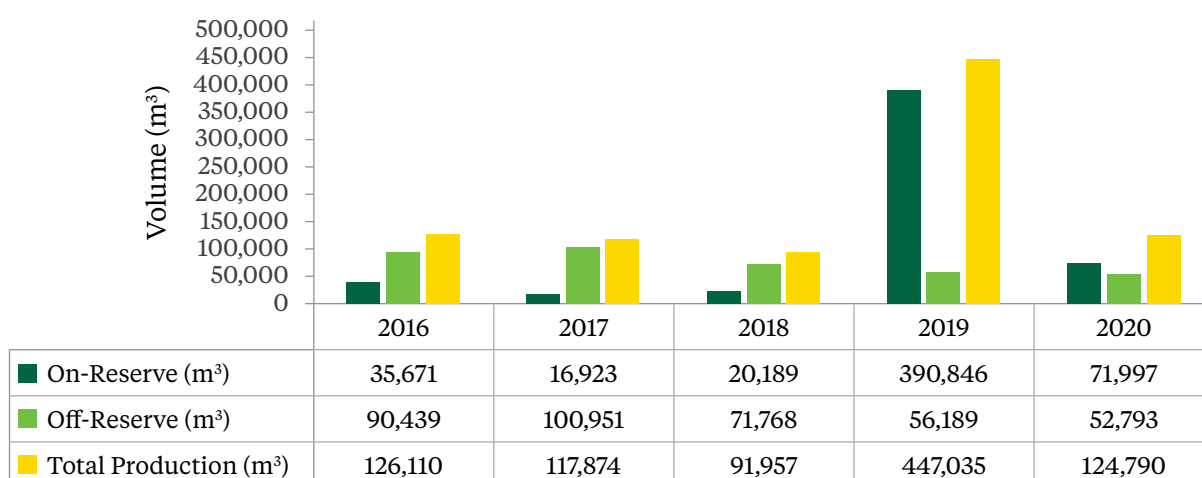
Source: Forestry Commission 2020.

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6   Tropenbos Ghana website.

A total volume of 226,158 m³ was exported in 2020. The total value of exports was €116 million which depicts a decline of 23 percent from the previous year's value of €151 million (Forestry Commission 2020) and is part of an overall decreasing trend (see Figure 4).

Figure 4. Ghana export of wood and timber products

	2016	2017	2018	2019	2020
Volume (m³)	396,991	339,227	332,927	303,190	226,158
Value (€m)	224.96	189.89	187.87	150.66	116.15

Source: Forestry Commission 2020.

In 2017, 97 percent of the export volume of wood products consisted of primary and secondary products such as logs and sawn wood while more high-end products (such as veneer and plywood) accounted only for 3.5 percent of these exports. Asia/Far East (61 percent) had the largest proportion of the export market in 2020. Europe comes next with 19 percent and Africa/Economic Community of West African States (ECOWAS) with 13 percent. The demand from Europe has been declining, which has been linked to Ghana's inability to meet the heightened transparency standards for timber certification under the Forest Law E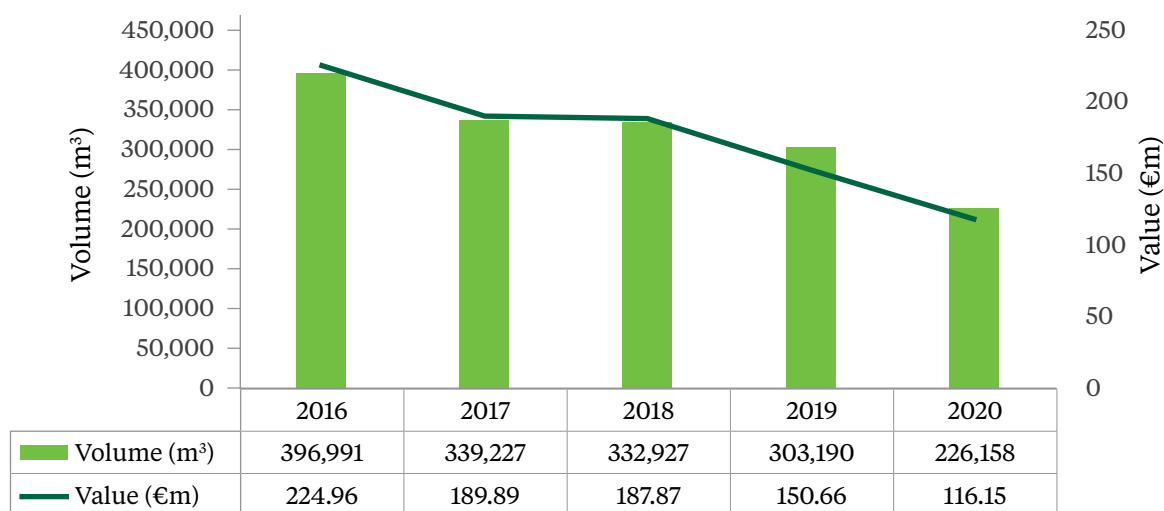nforcement, Governance and Trade/Voluntary Partnership Agreement (FLEGT/VPA) with the European Union (EU) (Acquah, Avuglah, and Harris 2015).

The contribution of forestry and logging to Ghana's GDP is indicated in Table 1, where the absolute number for forestry and logging is part of the larger number for agriculture. The table shows that although the absolute contribution of forestry and logging in Ghanaian cedi has increased, the relative contribution to GDP has been dropping because other sectors are growing. Looking at Figure 3 and Figure 4, it must be noted that the absolute increase in the contribution of forestry and logging in Ghanaian cedi might not necessarily be the result of increased productivity but of other effects such as the decreasing exchange rate of the cedi against the US dollar and the euro.

Forests in Ghana also provide important NTFPs. In Ghana, important NTPFs include shea nuts, shea butter, forest honey, and baobab fruit. Generally, the collection of NTFPs is not a significant economic activity but it does contribute to rural livelihoods by providing additional household income in times of need. However, shea has become a commercial product with Ghana being the largest exporter of unrefined shea butter. It is estimated that the exports of shea nuts reached 27,967 t in 2018 with a value of US$66 million (CBI 2021). Even with this important NTFP, for most rural households, farm income is more important

Table 1. GDP at current market prices by economic activity

		2013	2014	2015	2016	2017	2018	2019	2020
GDP at basic prices	(Gh¢, millions)	**118,314**	**144,237**	**168,141**	**203,023**	**244,394**	**286,964**	**333,626**	**360,494**
Agriculture	(Gh¢, millions)	25,356	31,076	36,673	45,773	51,408	55,967	61,765	73,840
	% of GDP	21.4	21.5	21.8	22.5	21.0	19.5	18.5	20.5
Forestry and logging	(Gh¢, millions)	2,014	2,844	3,398	3,483	3,988	4,168	4,257	4,128
	% of GDP	1.7	2.0	2.0	1.7	1.6	1.5	1.3	1.1

Source: Ghana Statistical Service 2021.

than NTFPs as the source of income. Further development of NTFP value chains is often hampered by transport problems and lack of access to market information and financial support including credit and loans (Ahenkan and Boon 2011; Malleson et al. 2014).

2.6 Forest loss and forest degradation

West Africa, including Liberia, Côte d'Ivoire, and Ghana, is considered as one of the world's deforestation hotspots (Pacheco et al. 2021). However, the estimation of the deforestation rate in Ghana differs between sources. In January 2017, Ghana had submitted a forest reference level[7] (FRL) to the United Nations Framework Convention on Climate Change (UNFCCC) to estimate its deforestation and related greenhouse gas (GHG) emissions. This was a national FRL which covered the activities 'reducing emissions from deforestation', 'reducing emissions from forest degradation', and 'enhancement of forest carbon stocks'. In that submission, Ghana's deforestation rate for 2001–2015 was estimated as 311,879.8 ha per year with a peak in 2012–2015 when the annual deforestation rate in Ghana rose to 524,489 ha per year. FRLs are usually updated periodically using a stepwise approach where countries can incorporate better data and improved methodologies. In January 2021, Ghana submitted a new FRL for the same period (2001–2015) covering the same activities (deforestation, forest degradation, and carbon stock enhancements). This FRL still needs to be technically assessed by the UNFCCC, but the document revises the estimated deforestation to 275,107 ha in 2001–2015 (or 18,340 ha per year). In addition, the new FRL estimates that 117,014 ha of forest was disturbed (degraded) between 2001 and 2015. The significant difference between the first and the second submission when it comes to the area of deforestation is the result of using improved methodologies for determining the areas of land use change. By comparison, Food and Agricultural Organization of the United Nations (FAO) (FAO 2020) estimates that the extent of forest in Ghana reduced by 90,600 ha between 2000 and 2010 and then increased by 4,300 ha between 2010 and 2020. Pacheco et al. (2021) estimate the combined forest loss in Liberia, Côte d'Ivoire, and Ghana as 57,000 ha per year for 2004–2017. Global Forest Watch estimates that between 2002 and 2019, Ghana lost 86,800 ha of humid primary forest and had a total tree cover loss[8] of 1.17 million ha.

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7   Forest reference levels are developed by developing countries implementing REDD+ activities and serve as benchmarks for assessing each country's performance in implementing these REDD+ activities. Reference levels should be transparent, considering historic data and be flexible so as to accommodate national circumstances and capabilities while pursuing environmental integrity and avoiding perverse incentives.

8   'Tree cover loss' refers to the removal of trees, which may be within natural forests, plantations, or tree crops. Accordingly, 'tree cover loss' does not necessarily equate to 'deforestation'.

Independent of the source, it is clear that Ghana has been losing forest at a significant scale. Under Ghana's voluntary commitments to the UNFCCC, sustainable forest management is therefore one of the priority areas. At the 2021 United Nations Climate Change Conference (COP26), Ghana reconfirmed its commitment to sustainable land use and to the conservation, protection, sustainable management and restoration of forests and other terrestrial ecosystems by signing the Glasgow Leaders' Declaration on Forests and Land Use.

Ghana has developed a Reducing Emissions from Deforestation and Degradation (REDD+) Strategy that outlines a broad plan to reduce deforestation and forest degradation (Republic of Ghana 2015). This REDD+ Strategy identified several direct and indirect drivers of deforestation and degradation, including the following:

- Direct drivers
  o Agricultural expansion
  o Logging
  o Fuelwood harvesting/charcoal production
  o Wildfires
  o Infrastructure development
  o Mining/sand winning.

- Indirect drivers
  o Population growth and development
  o Climate change
  o Global markets leading to increased demand for high-value timber species and agricultural commodities such as cocoa and palm oil
  o Weak law enforcement caused by weak institutional capacity and corruption
  o Tree tenure policies that create perverse incentives to remove on-farm trees
  o Low stumpage prices in the domestic timber market and proliferation of chainsaws and small-scale mills.

The importance of the direct drivers varies between the various forest zones. In the south, timber exploitation, mining, and agriculture expansion have been identified as predominant causes, while in the north, unsustainable charcoal and firewood production, forest fires, and agriculture expansion are considered as some of the main causes.

Most of the attention in Ghana has been focused on the deforestation in the cocoa forest mosaic landscape of the HFZ (mainly the Western, Brong-Ahafo, and Ashanti regions), although Afele et al. (2022) suggest that forest reserves in the drier ecological zones are also severely affected. Acheamponga et al. (2019) found that in the Ashanti region of Ghana, which extends across different forest zones, 78 percent of the forest loss in forest reserves in 1986–2015 was the result of the expansion of annual crop farms and tree crops (mostly cocoa and oil palm). They surveyed farmers and found that when the tree crops formed a closed canopy such that food crop cultivation was no longer possible, farmers extended their farms to areas with no tree cover to grow their food crops. This strategy had resulted in a gradual expansion of farms into the remaining forest reserves, mostly to the areas of the reserves that have already been logged or where the tree canopy is not yet closed.

Legal and illegal logging are also contributing to deforestation and forest degradation. Legal logging is performed by licensed logging firms which are privately owned business entities registered under the laws of Ghana to undertake timber harvesting and/or processing of logs to semifinished and finished timber products. They directly employ about 100,000 persons and indirectly provide livelihood support to about 2 million people. As already noted in section 2.5, in 2020 the recorded volume of legally harvested natural forest timber was 23 percent higher than the AAC, meaning more timber was harvested than the forest can sustain. Such overharvesting has occurred regularly in Ghana as discussed by, for example, Oduro et al. (2014) and happens despite the existence of management plans for the forest reserves. In addition, Boakye (2015) estimated that annual average illegal logging for 2000–2011 among the formal sector in Ghana is 0.78 million m³ or 104 percent of the legal harvest. Illegal logging in the informal sector occurs mainly through illegal chainsaw activities that are conducted by individuals and groups who have no license but who illegally harvest trees and convert them in situ to lumber for commercial purposes. It is estimated that this practice involves 97,000 persons along the entire production and marketing chain (Marfo and Acheampong 2011) and accounts for about 1.1 million m3 of lumber traded on the domestic market (Marfo et al. 2017). It is noted that the chainsaw operators can generally be described as very poor and the chainsaw operation is used either to supplement their income or as their main source of income.

Illegal small-scale mining, known as galamsey, as well as licensed large-scale exploration and production companies also contribute to deforestation and forest degradation. Schueler, Kuemmerle, and Schröder (2011) found that licensed large-scale mining leads directly to farmland loss and deforestation. In addition, since farmers are often forced to relocate, they frequently clear forests for new farmland, suggesting marked spillover effects of mining into adjacent areas. Furthermore, the same study found that gold surface mining resulted in the widespread loss of ecosystem services (for example, freshwater, NTFPs, and agricultural products) and environmental degradation (for example, pollution of surface waters, biodiversity loss), together pointing to rapidly eroding livelihood foundations. Artisanal and small-scale mining (ASM) is a livelihood activity that has existed in Ghana for centuries. It is estimated that it contributes 40 percent of all gold produced in the country in recent years and employs close to 60 percent of the labor force involved in the extraction of precious minerals in the country (Baddianaah, Baatuuwie, and Adongo 2022). Traditionally, galamsey involved Ghanaians in mining communities who extract gold without a license using rudimentary methods. However, the scale and impact of galamsey has been increasing since the early 2000s. Barenblitt et al. (2021) found that in southwestern Ghana, approximately 47,000 ha were converted to mining between 2005 and 2019 with ~50 percent of this mining occurring between 2014 and 2017. This increase has coincided with the arrival of about 50,000 Chinese gold miners who have migrated to Ghana to engage in small-scale mining (Boafo, Paalo, and Dotsey 2019). These Chinese miners have imported more sophisticated machines that have gradually replaced the rudimentary methods and implements used by their Ghanaian counterparts.

Fuelwood harvesting/charcoal production also remains an important driver since biomass, such as wood, grass, animal dung, and charcoal, have long been an important source of energy in Ghana. National statistics shows that biomass accounted for approximately 34 percent of the total energy consumed in 2020 (Ghana Energy Commission 2021). A recent World Bank (2022a) assessment estimated that the total national annual woodfuel demand for cooking is around 14,897,125 t per year in wood equivalent and that 15 percent of the total wood demand is being harvested in excess of the mean annual increment (MAI) (also see section 3.4.2).

2.7   Policy context

The National Development Planning Commission (NDPC) is the agency advising the President on development planning policy and strategy. The current medium-term National Development Policy Framework runs from 2018 to 2021 (NDPC 2017) and has a focus on restoring the economy and transforming agriculture and industry. This is accompanied by several other policies such as the Coordinated Programme of Economic and Social Development Policies (CPESDP) and the National Spatial Development Framework (NSDF).

The CPESDP 2017–2024 aims to double per capita GDP by 2024. The CPESDP identifies seven priority programs, of which Transforming Agriculture and Industry is one. The NSDF provides a spatial strategy for 2015–2035 for achieving the defined social, economic, and environmental policies.

The National Environment Policy (NEP) from 2014 seeks to redirect development toward more environmentally sustainable practices. The primary objective of the NEP is to improve the environment, living conditions, and quality of life for all of Ghana's citizens. To achieve this, the NEP aims to reconcile economic development with conservation and promote the sustainable use and maintenance of Ghana's natural resources. Furthermore, the policy aims to maintain ecosystem function, preserve biodiversity, and integrate environmental considerations into socioeconomic planning at the national, regional, district, and community levels. Implementation of the NEP is primarily the responsibility of the Environmental Protection Agency (EPA) under the Ministry of Environment, Science, Technology and Innovation (MESTI), with responsibilities assigned to separate institutions for environmental and natural resource development and management activities.

Specifically related to forest, the FWP which was updated in 2012 aims to (a) manage and enhance the ecological integrity of Ghana's forest resources; (b) promote the rehabilitation and restoration of degraded landscapes; (c) promote the development of viable forest and wildlife-based industries and livelihoods; (d) promote and develop mechanisms for transparent governance, equity sharing, and citizen participation in forest and wildlife resource management; and (e) promote training, research, and technology development for sustainable forest management. Based on this policy, Ghana developed a Forestry Development Master Plan (2016–2036) (MLNR 2016a). The Master Plan sets the goal of ensuring the conservation and sustainable development of forest and wildlife resources to create a balance between forest products, services, and marketing to satisfy domestic and international demands. Equally important, the plan emphasizes good governance and transparent forestry enterprise development, biodiversity conservation, and ecotourism development.

Other noteworthy policies that affect forests include the National Riparian Buffer Zone Policy (2011), National Climate Change Policy (NCCP, 2012), National Land Policy (1999), National Biodiversity Policy (2018), the national Climate-Smart Agriculture and Food Security Action Plan (2016–2020), the Food and Agriculture Sector Development Policy (2007), the Tree Crops Policy, the National Action Programme to Combat Drought and Desertification, and the Cocoa Sector Development Strategy II.

Some of the targets and commitments from these policies are summarized in Table 2.

Table 2. Ghana national targets and international commitments relevant to forestry and biodiversity

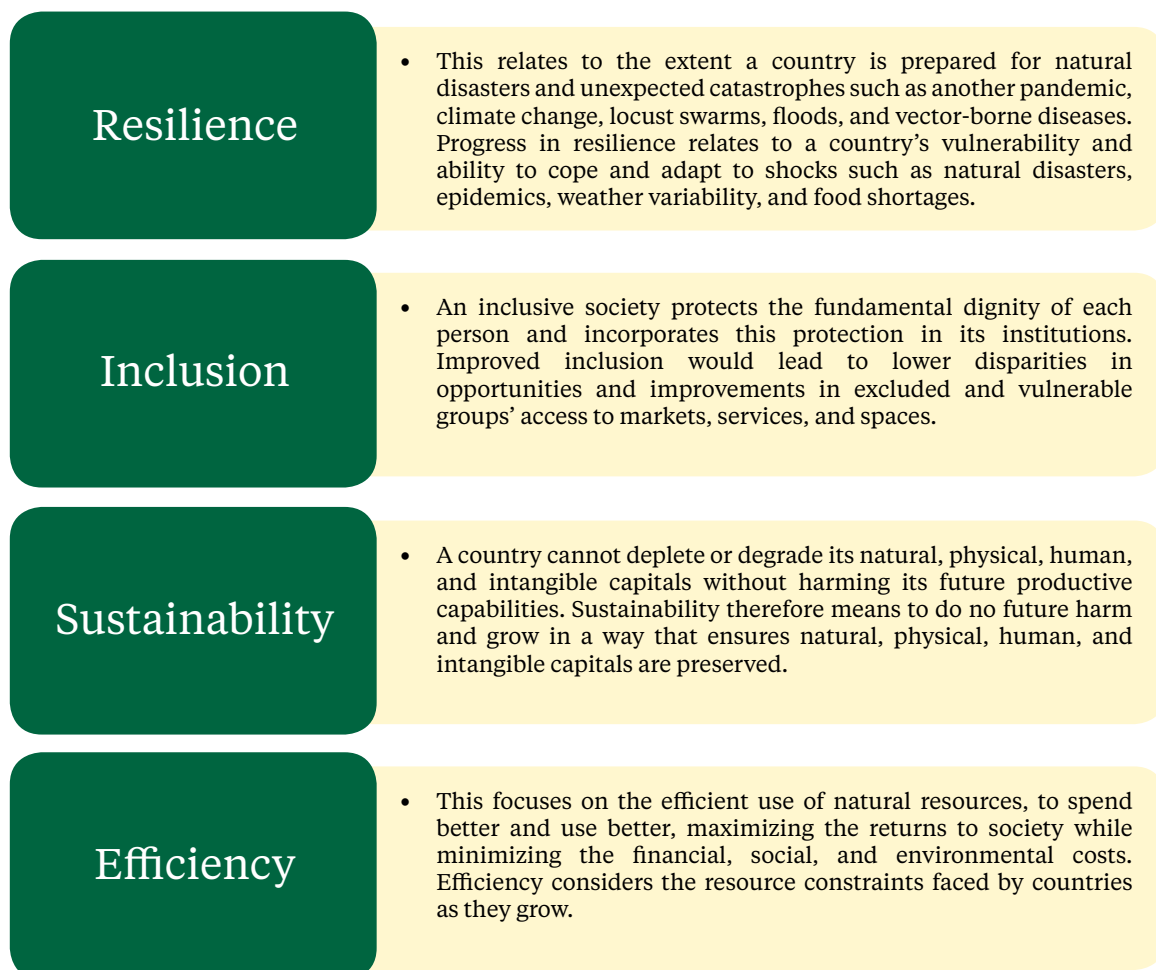| Type	Policy	Objectives and targets
International	Nationally Determined Contribution (NDC) under the UNFCCC	Cut emissions by 64 Mt CO2e by 2030 of which 23.5 Mt CO2e is expected to come from forest and 5.7 Mt CO2e through cleaner cooking solutions and sustainable charcoals.
	National Biodiversity Strategy and Action Plan (NBSAP) under the UN Convention on Biological Diversity (CBD)	The 2016 NBSAP outlines the following strategic objectives: improving the status of biodiversity by safeguarding ecosystems, species, and genetic diversity; enhancing the benefits of biodiversity to all sectors of the economy; and enhancing the implementation of the national biodiversity action plan through participatory planning, knowledge management, and capacity building. These objectives are to be achieved by 2040.
National	Ghana's National Strategy for REDD+	Reduce emissions from deforestation and forest degradation by 40% by 2025 while at the same time addressing threats that undermine ecosystem services and environmental integrity. This will be done through three key strategic options: • Improving land use and socioeconomic development in the HFZ and cocoa growing areas • Addressing wood harvesting and agricultural practices in the TZ and SZ • Formulating policy and legislative reforms to support REDD+ and a sustainable forestry sector.
	GFPS	The goal of the GFPS is "to achieve sustainable supply of planted forest goods and services to deliver a range of economic, social and environmental benefits." The three main interventions are the development of forest plantations, enrichment planting, and trees on-farm. An annual target of developing 25,000 ha of forest plantations was set for 2020. However, as a result of the impact of COVID-19, the annual target for 2020 was revised to 20,000 ha, which included 12,000 ha for the public sector to be established under the National Afforestation/Reforestation Programme. The private sector was required to establish the remaining 8,000 ha.
	Ghana Strategic Investment Framework (GSIF) for Sustainable Land Management (2011–2025)	GSIF is a programmatic approach to address land degradation issues and promote sustainable land management. The objectives are to (a) mainstream and upscale sustainable land management decisions, (b) secure ecosystem services, and (c) improve rural livelihoods in Ghana.
	FWP	This policy covers the conservation and sustainable development of forest and wildlife resources. This includes the conservation of flora and fauna and the maintained provision of forest ecosystem services. Objectives include the following: • Managing and enhancing the ecological integrity of Ghana's forest, savannah, wetlands, and other ecosystems • Promoting the rehabilitation and restoration of degraded landscapes through (a) forest plantation development, (b) enrichment planting, and (c) community forestry • Promoting the development of viable forest and wildlife-based industries and livelihoods • Promoting and developing mechanisms for transparent governance, equity sharing, and community participation in forest and wildlife resource management • Promoting training, research, and technology development that supports sustainable forest management.
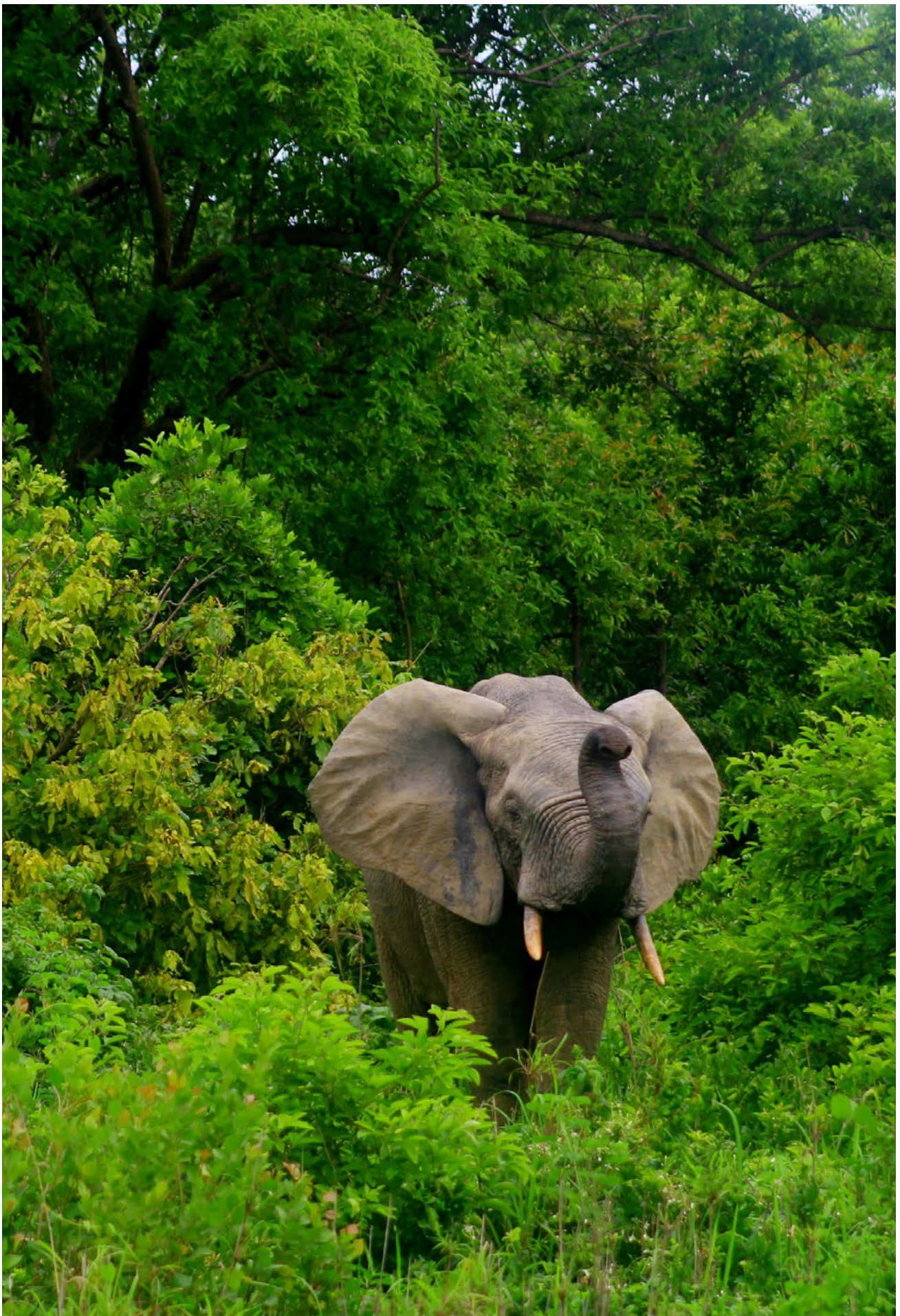
Photo by Julianna Corbett on Unsplash

03

Status of forests and the forestry sector in Ghana

This assessment of forests and the forestry sector in Ghana is organized using the World Bank's RISE framework. The RISE framework provides a diagnostic and policy guidance tool to identify key development challenges and develop solutions to assist countries in building better. These RISE pillars are key to achieving the goals of a fairer, more efficient, and sustainable economy.

Figure 5. RISE pillars

Resilience	• This relates to the extent a country is prepared for natural disasters and unexpected catastrophes such as another pandemic, climate change, locust swarms, floods, and vector-borne diseases. Progress in resilience relates to a country's vulnerability and ability to cope and adapt to shocks such as natural disasters, epidemics, weather variability, and food shortages.
Inclusion	• An inclusive society protects the fundamental dignity of each person and incorporates this protection in its institutions. Improved inclusion would lead to lower disparities in opportunities and improvements in excluded and vulnerable groups' access to markets, services, and spaces.
Sustainability	• A country cannot deplete or degrade its natural, physical, human, and intangible capitals without harming its future productive capabilities. Sustainability therefore means to do no future harm and grow in a way that ensures natural, physical, human, and intangible capitals are preserved.
Efficiency	• This focuses on the efficient use of natural resources, to spend better and use better, maximizing the returns to society while minimizing the financial, social, and environmental costs. Efficiency considers the resource constraints faced by countries as they grow.

The following sections discuss in more detail the challenges and contribution of forests in Ghana in the context of each of these pillars.

3.1 Resilience

Resilience refers to the ability of a country to spread and reduce risk and vulnerability to events such as climate change and weather variability, zoonotic disease risks, and recessions. A country with low resilience will often find itself recovering from the last shock instead of improving long-term prospects.

Compared to the best performing LMICs, Ghana performs reasonably well across many dimensions of resilience. For instance, risk to assets, risk to well-being, and food security are all close to that of the best performer in the income group (World Bank 2021c).

When it comes to forests and resilience, forests in Ghana provide critical ecosystem services that support agricultural production and water generation. In addition, many rural households depend on forest resources and agriculture for economic development and support for livelihoods. In rural areas, 71 percent of people are employed in agriculture, forestry, and fishing and it is estimated that forest provides 38 percent of total rural household income (Appiah et al. 2009). How forests are managed can therefore play a key role in building Ghana's resilience and help the country hedge against multiple and uncertain hazards such as climate change and zoonotic disease risk.

3.1.1 Climate change

Ghana's growing population already faces high risks from floods and droughts, deforestation and land degradation, poor air and water quality, rising heat stress, and depletion of natural resources (World Bank 2021c). It is expected that climate change will lead to rising heat, more frequent and extreme natural disasters, and more variable weather patterns. Studies specific to Ghana indicate that annual mean temperatures have already increased by 1°C (at an average rate of 0.21°C per decade) since 1960 (World Bank 2021a). While future precipitation patterns are uncertain, pessimistic models predict that total annual rainfall could decline by more than 12 percent by 2050. On the other hand, extreme precipitation events will become more frequent and of increased magnitude, increasing flood risk.[9] This is likely to result in adverse environmental impacts such as soil erosion, deforestation, recurrent droughts, desertification, land degradation, and the loss of biodiversity including wildlife. GFDRR (2018) ranked Ghana at 'High' risk for coastal floods, extreme heat, river floods, urban floods, and wildfires.

Rising temperatures will also reduce yields for most (though not all) of Ghana's crops, affecting producer incomes, raising costs of living for consumers, and harming cash crop exports. With RCP 8.5[10] temperature increases of 1.12°C by 2050, yields in Ghana would fall by 1–21 percent, depending on the crop variety, with most crops in the 2–6 percent range. Some estimates expect that a 3°C warming would raise most food prices in Ghana by 9–12 percent compared to a baseline scenario without climate damage. Yields of Ghana's leading

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[9]   Global Center on Adaptation 2021.

[10]   The Intergovernmental Panel on Climate Change (IPCC), in its Fifth Assessment Report (AR5), developed a number of representative concentration pathways (RCP). RCPs are pathways for GHG and aerosol concentrations, together with land use change, that are consistent with a set of broad climate outcomes used by the climate modelling community. The pathways are characterized by the radiative forcing produced by CO2 emissions by the end of the 21st century. The 8.5 pathway arises from little effort to reduce emissions and represents a failure to curb warming by 2100.

cash crop, cocoa, are expected to fall 5.5 percent by 2050 under RCP 8.5 warming, which will affect export revenues. Falling subsistence crop yields will raise domestic food prices, with detrimental effects for real incomes, poverty, and wages. Forests already provide livelihoods to over 2.5 million people, especially in rural areas,[11] and are an important social safety net when households experience natural and economic shocks and crises (World Bank 2020b). A study in Liberia (World Bank 2020a) showed that households used forest products to recover from economic and natural shocks such as rising food prices, death in the household, sickness, floods, and crop disease. Climate change could therefore further increase the reliance of rural populations on forests to support their livelihoods and provide a buffer against shocks such as drought and floods.

Besides the direct provision of forest products, forests can also play a role in managing the risks of floods and water scarcity. Forests help regulate the movement of water in the soil by reducing the intensity of runoff caused by extreme rainfall events. The World Bank, in coordination with the government, has recently completed a first CCDR for Ghana (World Bank 2022a). As part of this report, an analysis was performed to consider the impact of land use change on water availability in Ghana under a changing climate. For this, the impact of land use change was modelled using the Soil and Water Assessment Tool (SWAT). The climate and land use change scenario simulation indicated a large impact of climate change on the water balance in Ghana. The analysis illustrated that the chance of occurrence of extreme dry and flood conditions could be exacerbated by the decline in forestland although the effect of climate change is expected to be much more significant than the impact of land use change. A decline in forestland itself, however, would instigate higher runoff and less infiltration, which most likely increases the chance of occurrence of flash floods.

The other main risks for forests in Ghana due to climate change were assessed through the application of the International Finance Corporation (IFC) Forestry Climate Risk Screening Tool to generate projections on climate change-related hazards. Figure 6 gives a summary of the main hazard risk score for each of the forest zones and how this is expected to change until the year 2035. As can be seen from the figure, the risk of drought is expected to increase significantly in each of the zones. Other risks are expected to remain relatively constant with the risk of pests, water scarcity, and temperature rise being moderate across all zones. There is some increased risk of floods, but this risk is localized and might vary, depending on the location, within the zone.

Ghana's NCCP and National Climate Change Adaptation Strategy (NCCAS) both acknowledge the deterioration of the countries' natural resources and emphasize the need for more resilient ecosystems. Ghana's National Adaptation Plan Framework (NAPF) therefore prioritizes an ecosystem-based adaptation approach (EBA) that places ecosystems at the center of adaptation planning to strengthen ecosystems while conserving biodiversity. This is combined with a community-based adaptation approach (CBA) that seeks to empower local people by building resilience and adaptive capacity into their livelihood systems. CBA is in line with the FWP (2012), which similarly encourages community involvement in protecting forest resources.

The NAPF was completed in 2018 and it recognized that many of the key sectors, including forestry, have not yet identified, prioritized, and costed for climate change adaptation. The

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[11]   FAO website: https://www.fao.org/ghana/fao-in-ghana/ghana-at-a-glance/en/.

Figure 6.   Ghana: Main hazards risk score summary for the different forest zones

Climate hazard	Forest zone	Risk score		
		Year 2000	Year 2025	Year 2035
Forest fire	HFZ	0.16	0.18	0.20
	TZ	0.23	0.27	0.29
	SZ	0.74	0.76	0.76
Drought	HFZ	0.30	0.65	0.65
	TZ	0.29	0.40	0.65
	SZ	0.30	0.65	0.65
Floods	HFZ	0.15	0.15	0.15
	TZ	0.15	0.15	0.38
	SZ	0.15	0.15	0.15
Shifts in growing zones (Tree species)	HFZ *(Pinus radiata)*	1	1	1
	TZ *(Tectonis grandis)*	0.15	0.15	0.15
	SZ *(Eucalyptus grandis)*	1	1	1
Pests and pathogens	HFZ	n.a.	0.55	0.61
	TZ	n.a.	0.55	0.61
	SZ	n.a.	0.55	0.61
Water scarcity	HFZ	n.a.	0.5	0.5
	TZ	n.a.	0.5	0.5
	SZ	n.a.	0.5	0.5
Shift in temperature	HFZ	n.a.	0.49	0.49
	TZ	n.a.	0.49	0.49
	SZ	n.a.	0.49	0.49

Risk categorization

Very low	Low	Moderate-low	Moderate-high	High	Very high risk
0-0.15	0.15-0.35	0.35-0.50	0.50-0.65	0.65-0.85	0.85-1.0

NAPF stated that development of the National Adaptation Plan (NAP) should address this gap. The process to develop the NAP was launched in July 2020.[12]

In addition to the national processes, important sectors such as the cocoa sector are also considering the role of forests and trees in making production more resilient to climate change. The cocoa sector is already seeing prolonged periods of drought which are leading to seedling mortality and decreased pod filling (Hutchins et al. 2015). The Ghana Cocoa Board (COCOBOD)[13] has recognized that the cocoa forest mosaics play an important role in climate change adaptation through micro-climate generation of rainfall, temperature moderation, hosting of pollinators, and enhancement of soil and air moisture. The COCOBOD is therefore one of the main partners in the implementation of Ghana's strategy for REDD in an effort to protect the country's remaining forest.

3.1.2 Zoonotic disease risks

The Ebola epidemic and the 2019 SARS-CoV-2 pandemic (COVID-19) have shown that zoonotic diseases that originate from viruses and other pathogens infecting animals (often living in forests) are increasing around the world and are having a significant impact on the development of countries. The risk of zoonotic diseases in Africa is growing with increasing changes in land use, including the expansion of human settlements and agricultural lands into forests. Some are raising concerns that coastal West Africa might become a hotspot for zoonotic disease due to a combination of deforestation and increasing human and livestock populations.[14] Some suggest that this is already evidenced by the recent 2004–2014 outbreaks of the Ebola virus disease in West and Central Africa, which have also been associated with loss of closed forests (Olivero et al. 2017) and forest fragmentation (Rulli et al. 2017).

Forest loss and habitat fragmentation may increase exposure to zoonotic infections as it creates more forest edges which are a major point of spillover of novel viruses from their natural hosts into humans or livestock (Dobson et al. 2020; Gottwalt 2013). In Ghana, forest fragmentation has also been identified as a risk factor for Buruli ulcer disease, a skin infection caused by *Mycobacteria* (Wu and Smithwick 2016) and increasing malaria rates (Krefis et al. 2011).

The highest risk of an outbreak occurs at intermediate levels of deforestation, when 30–60 percent of the original forest cover is lost, and the effect is greatest for rodent, bat, and passerine birds (Faust et al. 2018). Especially in the HFZ, where forest is converted to cocoa and other tree crops, deforestation is leading to a highly heterogenous mosaic consisting of tree crops and forest fragments. This is illustrated in Figure 7 which is taken from global study by Hansen et al. (2020) on the increased likelihood of tropical forest loss due to decreasing fragment size. It includes a case study on Southern Ghana, which shows that although tree cover remains, the forest has become fragmented, therefore increasing opportunities for viral transmission.

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[12]   https://www.unep.org/news-and-stories/press-release/covid-19-wake-call-ghana-develop-national-plan-climate-adaptation.

[13]   The cocoa industry in Ghana is fully controlled by the GoG, which operates a monopoly over the purchase and export of cocoa beans through the COCOBOD. COCOBOD is tasked with managing the export and internal marketing of cocoa beans, agricultural research, hybridization of seeds, sale of seeds, extension services to farmers, and quality control. The internal purchasing of cocoa beans is done through private sector companies who are registered and licensed with COCOBOD.

[14]   IFPRI blog: Africa's growing risk of diseases that spread from animals to people.
Coronavirus: Africa increasingly vulnerable to zoonotic pathogens

Figure 7. Analysis of forest fragments in a heterogeneous forested landscape in Southern Ghana
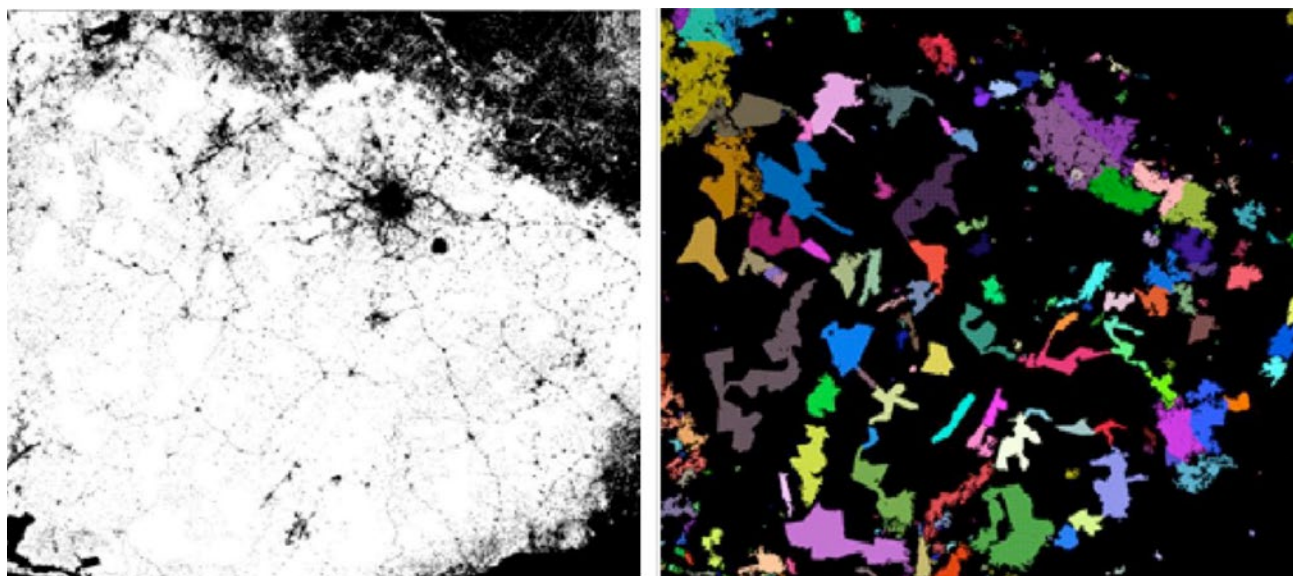
Source: Hansen et al. 2020.

Note: The image on the left shows areas with a tree cover of more than 30 percent in white; the colored fragments in the right-hand image indicate which parts of the landscape are considered as forest.

Rising human populations and increased access to the forest are also accelerating the consumption of bushmeat, including fruit bats (Kamins et al. 2011). Wet markets for bushmeat are found in Ghana and the trade continued after the Ebola outbreak, although the demand was negatively affected (Yeebo 2016). Habitat loss is also resulting in many wildlife species—including bats—adapting to peri-urban living, leading to closer interactions between humans and potentially infected animals. Accra itself is now home to more than 1 million fruit bats, and hunting and sales of these bats are important economic activities.

Finally, while many new diseases originate in wildlife, for some of the most serious diseases, livestock has been a connector or amplifier host. Increased deforestation and fragmentation, in combination with increased densities of humans and domestic animals, is enhancing the risks of transmitting diseases from wildlife to livestock and ultimately humans. Estimates from the FAO show that the number of livestock animals in Ghana have more than doubled between 2000 and 2019 to meet the demand for milk, meat, and eggs due to rising urbanization and incomes.[15]

Forest protection and decreasing fragmentation can be important to reduce the risk of a zoonotic disease in Ghana. Although reducing deforestation is part of Ghana's forest-related policies, including the strategy for REDD, further analysis might be required to consider this from the perspective of zoonotic disease risks.

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[15] Data on number of live animals from FAOStat.

3.2 Inclusion

Although economic growth improves aggregate welfare, the distribution of this growth is often skewed. If the inequality of access and opportunities increases, economic prosperity may become more fragile and less sustainable. A key principle underlying this is the idea of social inclusion—defined as the process of improving the ability, opportunity, and dignity of people disadvantaged on the basis of their identity to take part in society.

Ghana's development has shown a steady acceleration of economic growth leading to the achievement of middle-income status. Between 1991 and 2012, the national poverty rate declined from 51.7 to 24.2 percent (World Bank 2018b). This growth was based on political stability, high growth fueled by capital accumulation and rising productivity, investment in human capital (especially education), a large agricultural expansion driven by increased profitability of cocoa and some other cash crops, and rapid urbanization (World Bank 2018b). However, the Gini index indicates that inequality is high throughout the country and much worse than other LMICs. On the other hand, Ghana ranks relatively well in access to health and education services, although educational outreach and quality must still be improved (World Bank 2021c).

When it comes to forests and inclusion, 14 percent of the population lives in the proximity of forests and directly depends upon forests for one-third of its livelihood resources and income. Improving inclusion for these communities means increasing access to markets, services, and spaces to allow the development of their human capital, including for vulnerable groups such as women.

3.2.1 Inclusion of communities living in the proximity of forests

In Ghana, communities living in the proximity of forests are often still characterized by a predominance of subsistence farming activities, often complemented by cash crop such as cocoa and oil palm and the collection of NTFPs (Amoah and Wiafe 2012; Appiah 2009). However, there are significant spatial differences when it comes to poverty of communities living in the proximity of forests. This is illustrated in Figure 8 which puts the land cover

map (Figure 2) next to a map showing incidence of poverty in Ghana (Ghana Statistical Service 2015). It shows that poverty in the HFZ, where both a large portion of the remaining forest and cocoa production are concentrated, is relatively low. Beginning in the late 1990s, cocoa production rapidly grew due to favorable prices and as a result, the poverty rate among farmers in the HFZ significantly declined from 60 to 24 percent between 1991 and 2005 (World Bank 2018b). However, Figure 8 also shows that the same does not apply to rural communities in the proximity of forests but outside the cocoa growing areas. Poverty and vulnerability have become more concentrated in some of the forested areas in the Northern regions (Northern, Upper East, and Upper West) and the Volta region, where farmers are mainly engaged in rain-fed, traditional subsistence agriculture.

Figure 8. **Comparison of land cover and incidence of poverty**
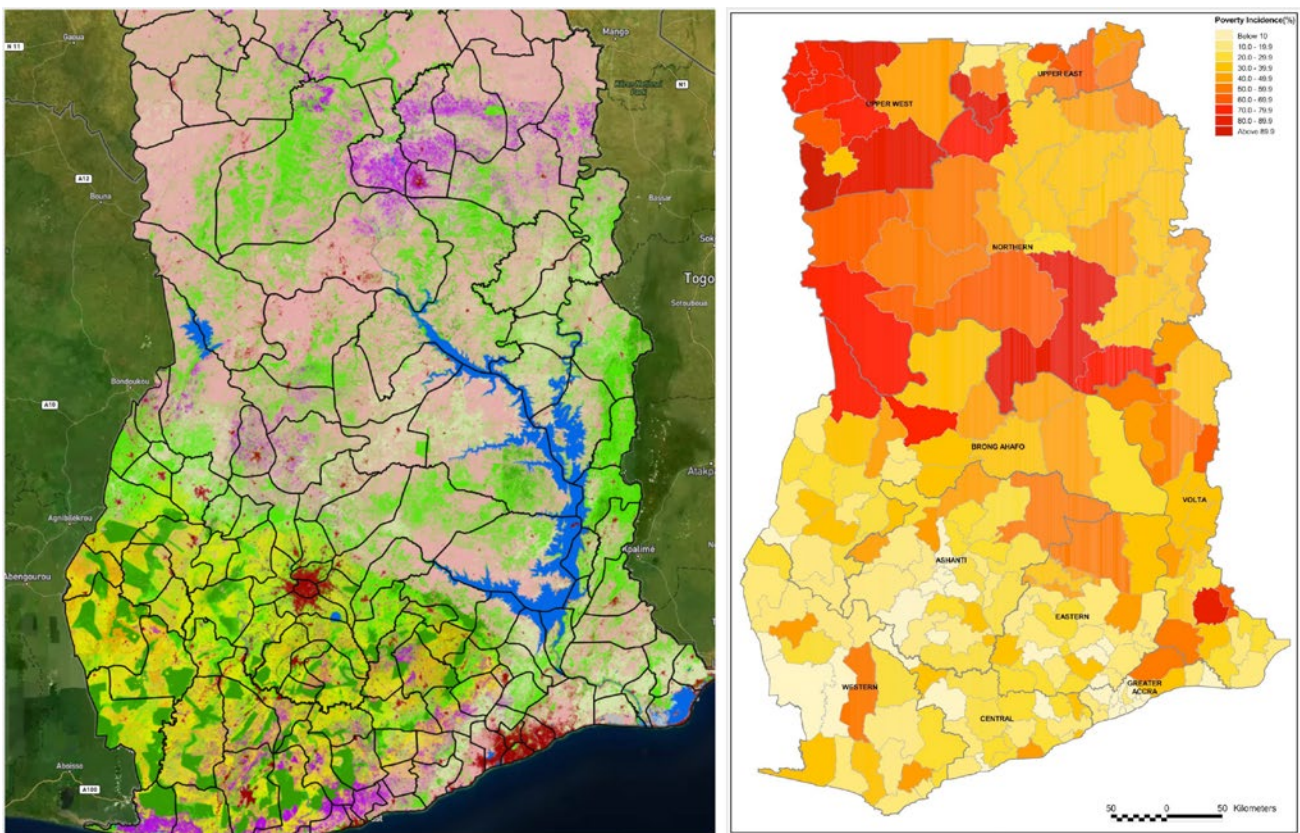
Source: Left hand map https://ghana-national-landuse.knust.ourecosystem.com/interface/ , right hand map Ghana Statistical Service (2015)

Even though incidence of poverty might have decreased for some communities living in the proximity of forests, poverty inequality is still high in many places, as shown in Figure 9.

Figure 9.   Poverty inequality in Ghana
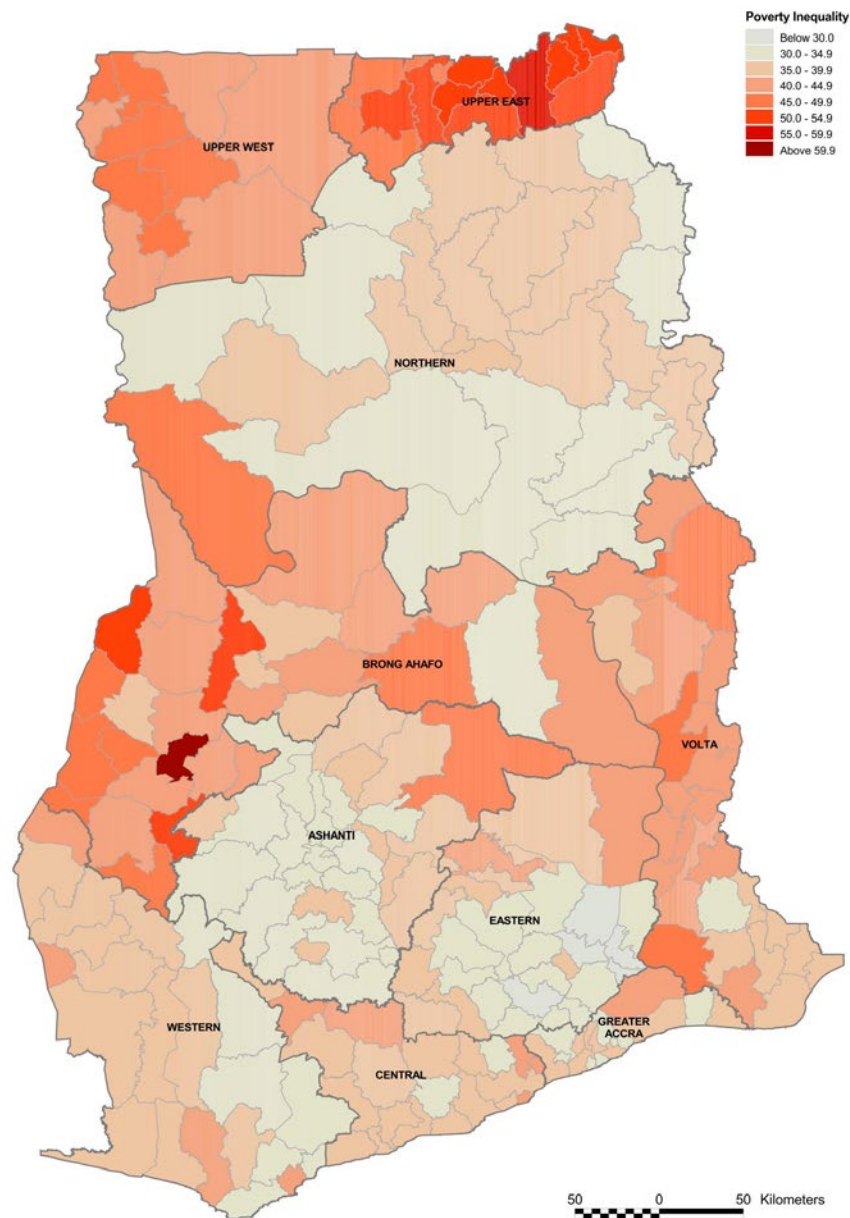
Source: Ghana Statistical Service 2015.

This is also the case for the estimated 800,000 small-scale cocoa farmers in the HFZ. Tyszler, Molt, and Laven (2018) performed an analysis of the income gap of cocoa producing households in Ghana against a Living Income Benchmark. The results are shown in Figure 10.

It shows a large portion of cocoa producing households having a low total household income. This is especially true for the typical male-headed and female-headed households. The majority of these farms are small with low yields. The typical male-headed households in the study have an average of 1.9 ha and a median of 1.8 ha of productive cocoa land. Female-headed households have a slightly higher average, 2.2 ha, but a lower median, 1.6 ha. The male-headed, large households with higher incomes start at 4 ha, with an average of 6.3 ha and a median of 5.7 ha of productive cocoa land.

Figure 10. Distribution of annual household income of cocoa producing households in Ghana

N (All) = 934, N (Male, typical) = 595, N (Male, large) = 195, N (Female) =144, bin size =500
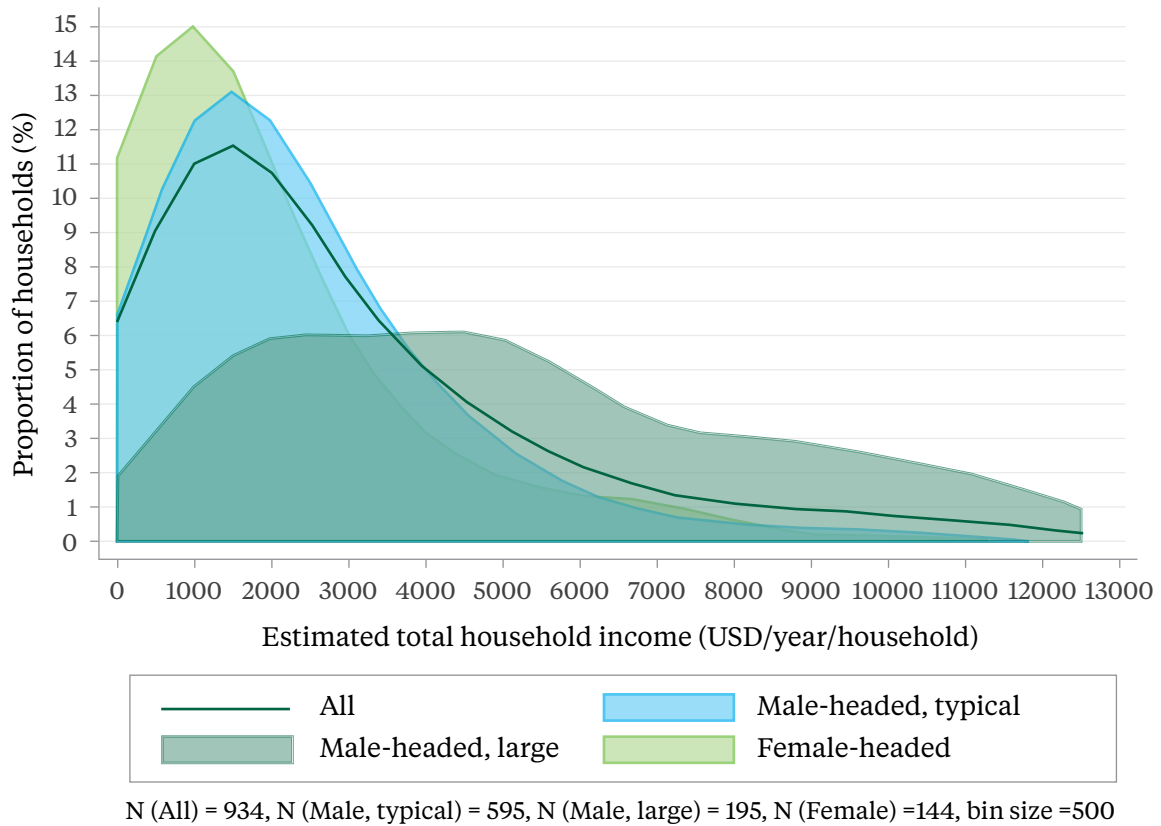
Source: Tyszler, Molt, and Laven 2018.

The smaller farmers with low incomes usually have little access to services that allow for large income increases. They often cannot invest enough to improve their low cocoa yields. In addition, these small farmers have low negotiation power and are therefore generally price takers. Diversification into other farm products is also hampered by farm size and the ability to invest. The seasonal nature of cocoa also means that incomes are not consistent year-round, resulting in heightened economic vulnerability and deepened poverty during off-seasons.

One important aspect affecting the inclusion of communities living in the proximity of forests is the situation regarding land ownership in Ghana (see section 2.3) and access to forest resources. Many farmers are not undertaking any capital investment in their agricultural land due to a lack of access to credit and tenure insecurity (World Bank 2018b), preventing them from increasing their yields. In addition, the majority of farmers that are present in or around off-reserve forests are considered migrants and not landowners and they are faced with timber contractors who destroy their farms during logging (Owubah et al. 2001). As part of the Ghana Forest Investment Program (GFIP), the MLNR has started a reform of the policy governing tree tenure rights and the associated benefit sharing arrangement.

3.2.2 Inclusion of women

The World Economic Forum ranked Ghana 117 out of 156 countries in the 2021 Global Gender Gap Index and 119 in economic participation and opportunity for women. Although Ghana's score has remained relatively constant compared to 2006, its position in this ranking has been dropping because other countries have made greater progress.[16] The World Bank's Country Policy and Institutional Assessment (CPIA)[17] considers social inclusion and equity as the highest scoring cluster in Ghana with 'gender equality' scoring 4 out of 6 while the United Nations Development Programme (UNDP) Human Development Report (2019) on Gender Inequality identified sharp inequalities in the power men and women exercise at home, in the workplace, and in politics.

Women are often excluded in decisions about natural resources, resulting in gender inequality in their roles and responsibilities. This is because the customary land tenure system and community-level governance system are often led by men, resulting in women receiving smaller parcels of land which often tend to be less productive and with less overall yield (MLNR 2021). As a result, there is a significant gender gap in Ghana when it comes to access to land, market, credit, and extension services, with women in the three Northern regions being specifically disadvantaged. In the north, women are by tradition excluded from land inheritance and only 2 percent of women own land, compared to 50 percent in the Ashanti region (World Bank 2018a). Women farmers also have lower yields because they leave land fallow for shorter periods. They are also more likely to have their land taken away due to weak tenure rights when they leave it fallow (Goldstein and Udry 2008).

Forests and trees are important for rural communities as they provide fuelwood and other NTFPs. Women play an important role in collecting these; in 2014, women spent an average of 23 minutes per day collecting firewood for domestic use (Ghana Statistical Service 2014). However, women are not equally involved in formal forest management activities and often cannot access higher paying positions in forestry activities or in commodity production along various resource value chains.

The GoG recognizes the contribution of forests to the income/livelihoods of rural peoples and the significant gender differences men and women have when it comes to the use and management of forest resources as well as to decision-making, participation, ownership, access, and control of resources such as land. Ghana has therefore developed a Gender Analysis and Action Plan (IUCN 2017a) as part of the development of the REDD+ Strategy. The aim is to mainstream gender considerations into the forestry sector, paying special attention to REDD+ processes. It aims to give both men and women equal opportunities to access, participate in, contribute to, and benefit from various REDD+ policies, programs, and funds and hence contribute to environmental and social sustainability.

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16   In 2006, Ghana was ranked 58 with a score of 0.665, while in 2021, it ranked 117 with a score of 0.666.

17   The CPIA is an annual diagnostic tool that measures the quality of policies and institutional frameworks and their ability to support sustainable growth and poverty reduction. Its criteria are grouped into four clusters: (a) economic management, (b) structural policies, (c) policies for social inclusion and equity, and (d) public sector management and institutions.

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Key points related to inclusion

- Forest-based activities in combination with agriculture and others such as cocoa production can contribute to poverty reduction. However, complicated tenure rights, including tree tenure rights, frequently constrain investments in land and forestry.

- Enabling local communities to become decision-makers in forestry and forest-based activities enables a fair and equitable distribution of benefits and incomes from forests and Ghana's participatory forest management (PFM) approach attempts to do this.

- Gender inequalities make it impossible to achieve environmental and social sustainability. In Ghana, there are significant gender differences in the use and management of forest resources as well as decision-making, participation, ownership, access, and control of resources such as land. The GoG recognizes the persistent gender gaps and has therefore developed a Gender Analysis and Action Plan, which aims to mainstream gender considerations into the forestry sector, paying special attention to REDD+ processes.

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3.3   Sustainability

Ghana's natural resources have been key drivers of economic growth over the past 30 years, a period during which GDP (real) has more than quadrupled. Macroeconomic momentum has been driven in part by higher prices for Ghana's main commodity exports such as gold, cocoa, and, recently, oil. Over this period, natural resource rents as a percentage of GDP have more than doubled (World Bank 2021b).

Using resources sustainably is critical for ensuring that past and current growth does not come at the expense of the future. This means that a country cannot run down all its natural capital (such as forests) as this could erode the economy's productive capabilities and create spillovers—leading to impacts on health, land productivity, and inequality. Renewable resources such as forests should therefore be managed in a way that ensures their economic dividends can pay off for generations in the future and the services they provide are sustainable. This applies both to the forest resource itself and the biodiversity associated with the forests.

3.3.1   Forest resources

Ghana's economic growth rate allowed the country to achieve lower-middle-income status in 2011. This growth was in part due to higher prices for Ghana's main commodity exports, notably gold and cocoa, and the start of commercial oil production in 2011. Increased agricultural production and human capital development, especially through investment in education, also helped deliver Ghana's rapid and steady decline in poverty (World Bank 2018b).

However, this economic growth was partly based on a depletion of forest resources driven by increased wood extraction in combination with conversion to agriculture, especially cocoa. This trend of expanding cultivated areas is further reinforced by a scarcity of cultivable land outside forest coupled with population growth (Brobbey, Agyei, and Osei-Tutu 2020). The depletion of forest resources is now starting to result in soil degradation and changes in

local climate (rainfall and temperature variability), which in turn are affecting agricultural productivity. This is also visible in the cocoa growing areas and Ghana's cocoa yield is among the lowest in the world, putting the sustainability of its economic progress into question.

The unsustainable loss of forest resources is also visible in the World Bank's Changing Wealth of Nations (CWON) reports. CWON looks at a country's comprehensive wealth and includes all produced capital (such as infrastructure), natural capital (such as forests and water), human capital, and net foreign assets. The methodology underlying these reports recognizes that the total wealth is the sum of all these different types of capital and that natural capital offers an opportunity to generate additional revenue that the government or the private sector can invest in the accumulation of other types of capital.

One of the indicators in the CWON reports that shows the effect of changes in different kinds of capital is the estimated adjusted net savings (ANS).[18] Figure 11 shows the ANS components for Ghana between 1995 and 2019 (World Bank 2021b). If ANS as a percentage of gross national income (GNI) is negative, it indicates that the country is consuming more than it is saving, which will undermine long-term sustainability; if ANS is positive, then it is adding to wealth and future economic well-being.

Figure 11. ANS components in Ghana for 1995–2019
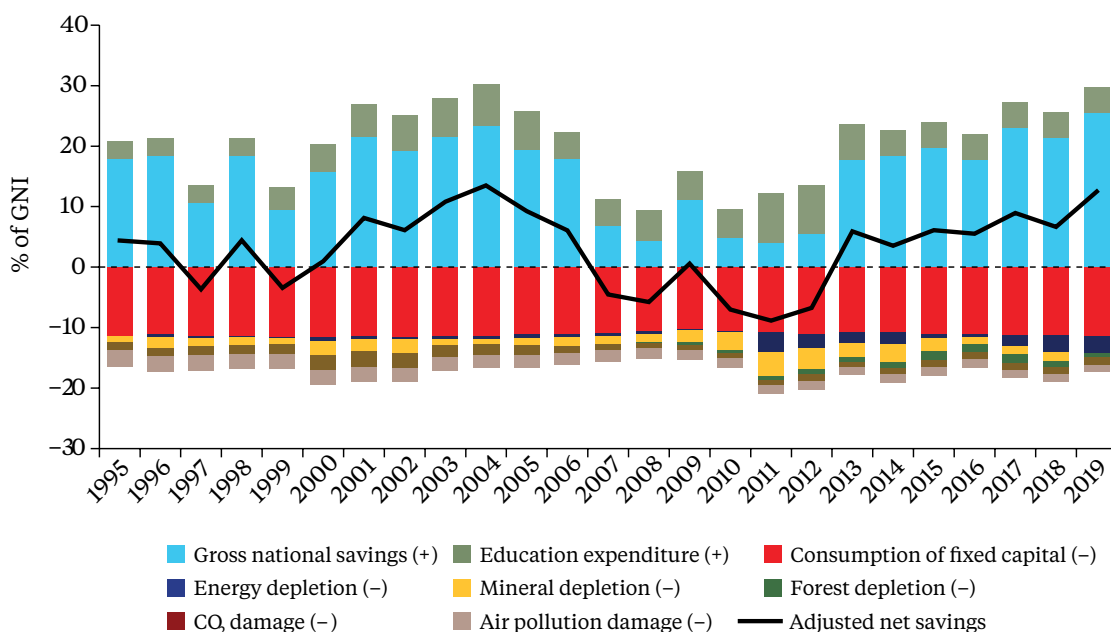
Source: World Bank 2021b.

The figure shows that during the commodity boom of the early 2000s, the depletion rates of Ghana's natural resources increased with a visible increase in forest depletion from 2011. The CWON report finds that Ghana's economic dependence on the forest sector exceeds that of its peers, as does its rate of unsustainable resource use. Ghana's net forest depletion, as a percent of GNI, tops the list of LMICs, as does its contribution from forests to GDP.

18   ANS is measured as gross national saving minus depreciation of produced capital, depletion of subsoil assets and timber resources, and air pollution damages to human health, plus a credit for expenditures on education.

This indicates that unsustainable forest resource extraction is being used as a driver for economic growth. At the same time, the CEA for Ghana (World Bank 2020b) estimates, based on the deforestation rates of the 2017 FREL,[19] that the cost of deforestation to Ghana is about US$400 million, equivalent to 0.7 percent of the 2017 GDP.

The depletion of forest resources also has a more indirect effect on the economy. Forests provide critical ecosystem services that support agricultural production and water generation—water catchment, soil fertility, NTFP provision, and so on—and there is high dependence on forest resources and agriculture across the country. For example, the Atewa Range Forest Reserve serves as a water tower for more than 1 million people in Accra, supplying industries, urban families, and rural communities and farms. The annual value of downstream water consumption from the two main river basins that have their source in the Atewa Range was more than US$28 million in 2016 (Schep et al. 2016). Deforestation has also been linked to land degradation, increasing malaria rates, and reduced air quality (World Bank 2021b). The role of providing ecosystem services is probably strongest in the cocoa growing regions. Ghana cocoa sector is valued at US$1.5 billion per year and the landscape in the cocoa growing regions consists of a cocoa forest mosaic. In this mosaic, forest plays an important role through micro-climate generation of rainfall, temperature moderation, hosting of pollinators, and enhancement of soil and air moisture, among other services.

3.3.2 Biodiversity

Biodiversity is an essential element of life and of the forests' 'natural capital'. The enormous variety and complex interactions between species help maintain the ecosystem and make the economy productive.

The HFZ is part of the Upper Guinea Forest Ecosystems which is recognized as one of the 25 global biodiversity hotspots. The other forest zones also contain important species, and it is estimated that Ghana's terrestrial ecosystems might support 221 species of amphibians and reptiles, 748 species of birds, and 225 mammalian species (MESTI 2016).

The contribution of biodiversity to the Ghanaian society comes in the form of timber and wood products; non-timber products (including bushmeat and other wildlife products, bamboo/rattan, essential oils, tannins, resins, gums, dyes, cork, honey, and medicinal plants); environmental services (such as watershed protection, biodiversity conservation, carbon sequestration and clean air, micro-climate regulation/modification, soil fertility improvement, soil conservation/soil erosion control, recreational [aesthetic] value); and ecotourism. It is estimated that these biodiversity products provide alternative income sources to over 6 million Ghanaians in the forestry and water sectors and that ecotourism earns US$ 1.6 billion in annual revenue generation (MESTI 2016).

Causes of biodiversity loss range from plant introductions, farming practices (including slash and burn), logging and extraction of other forest products, to mining (Bennett-Lartey and Adu-Dapaah 2016). The IUCN Red List analyzes the threats that affect a particular species' extinction risk. The most important threats in Ghana, in terms of number of plant and animal species affected, are 'logging and wood harvesting' and 'smallholder farming'.[20]

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[19]   As discussed in section 2.3, the estimation of the rate of deforestation in Ghana differs between sources. Out of the different sources quoted in section 2.3, the 2017 FREL has estimated the highest rate of deforestation.

[20]   Source: Ghana Country profile on the Integrated Biodiversity Assessment Tool (IBAT) website: https://www.ibat-alliance.org/country_profiles/GHA.

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Key points related to sustainability

- Deforestation and forestland conversion to cocoa and agricultural crops have led to a progressive decline in the productivity of forests in Ghana. Based on the deforestation rates of the 2017 FREL, it is estimated that the cost of deforestation to Ghana is about US$400 million per year, equivalent to 0.7 percent of 2017 GDP.

- The biodiversity of Ghana's forest makes significant contributions to the Ghanaian society and has been a major source of income and job creation. However, biodiversity is declining as a result of forest loss and forest degradation from 'logging and wood harvesting' and 'smallholder farming'.

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3.4 Efficiency

As natural resources such as forest are declining, countries such as Ghana need to use these scarce resources more efficiently. More productive use of resources is key to achieving prosperity and improving lives and livelihoods. A particular aspect related to the effective use of forest resources is energy as woodfuels which account for a significant share of the total energy used in Ghana. Finally, the quality of governance for forest management specifically, and for the broader landscapes in which forests are situated, also has a significant influence on efficiency of resource use. This section will therefore focus on the productivity of forests, the role of forests, wood for energy supply, and governance aspects.

3.4.1 Productivity of forests

On resource efficiency measures, Ghana does not perform as well as most other LMICs. For instance, despite Ghana's relatively low GHG emissions, its output per GHG is very low. Furthermore, Ghana's agricultural land productivity is below the lower-middle-income average, which reflects its relative land abundance (World Bank 2021b).

Ghana is one of the countries in West Africa that has a large number of sawmilling industries with a high volume of lumber. Because of this, the export of timber has been a key activity in the country (MLNR 2016a). The Ghanaian timber industry is made up of many wood processing units and other enterprises that focus on furniture production. As discussed in section 3.3.1, the productivity of the forestry sector in Ghana peaked in the mid-1990s and early 2000s when the volume and value of timber exports from Ghana reached record levels. Since this was mostly unsustainable and led to depletion of the forest resources, the productivity of the forest sector has been declining. This decline of Ghana's formal timber market has had an adverse effect on the timber industry. The World Bank's CEA for Ghana (World Bank 2020b) estimates that historically, the forestry sector has provided formal employment for more than 100,000 people but finds that 80 percent of the firms that once operated in the sector have collapsed since the early 2000s, with a loss of 75,000 jobs. Those that have survived are operating at 50 percent capacity; they argue that they are threatened by a lack of raw materials, overregulation, and high cost of doing business (Ghanaweb 2018). The remaining timber industry is characterized by obsolete, outmoded, and inefficient mills that were mostly installed in the late 1990s and early 2000s (Asamoah et al. 2020). The estimation is that these plants have a processing capacity of about 5.2 million m³, which is significantly higher than the AAC. In addition, many of these

are operating at a low recovery rate (20–40 percent) due to the inefficiency of the mills (Oduro et al. 2011). Asamoah et al. (2020) conclude that part of the increased rate of logging in Ghana can be attributed to the installed milling overcapacity and the low recovery rate of the timber production companies.

Ghana has already positioned itself to address the issue of its shrinking forest base, through strategies such as National REDD+ Strategy, Forest Plantation Development Strategy, and FWP. The GFPS is designed to address the decline in productivity of the forest sector. The goal of the GFPS is to achieve a sustainable supply of planted forest goods and services to deliver a range of economic, social, and environmental benefits (MLNR 2016b). In partnership with the private sector, the GFPS aims to establish 625,000 ha of forest plantations, conduct enrichment planting of over 100,000 ha of degraded forest reserves, and promote on-farm tree planting (agroforestry) across 3.5 million ha. The implementation of the strategy is only partially successful. Plantation development has featured prominently in all government sector programs and the government has been adding approximately 10,000–15,000 ha per year through internal and bilateral funds. Private sector uptake, however, has been limited due to the associated costs and off-reserve land tenure challenges, among other factors.

Under Ghana's voluntary commitments to the UNFCCC, sustainable forest management is one of the priority areas. Ghana has developed a strategy for REDD that outlines a broad plan to reduce deforestation and forest degradation (Republic of Ghana 2015). In 2021, at COP26, Ghana reconfirmed its commitment by signing the Glasgow Leaders' Declaration on Forests and Land Use,[21] which aims to "halt and reverse forest loss and land degradation by 2030 while delivering sustainable development and promoting an inclusive rural transformation."

The already-mentioned CCDR analyzed the expected costs and benefits of taking action in the forest sector. The analysis considered two pathways to a resilient forest sector for Ghana: (a) a pathway based on the voluntary commitments in the NDC[22] and (b) a pathway based on halting deforestation by 2030. The costs and benefits of these pathways were compared with a business-as-usual (BAU) scenario where the forest area would continue to decrease. The analysis found that the zero-deforestation scenario would transform a dwindling resource into a productive asset for the national economy, with more jobs created and a more favorable cost-benefit ratio compared to the BAU and NDC scenarios. The incremental annual investment needs to implement the full scale of actions and manage and maintain the forest resource effectively for production and protection use are estimated at US$400 million. However, this could vary depending on the choice of species, silvicultural practices, type of sites and harvesting schedules, and regional variances in the type and state of forests. The annual returns from the investments would start to accrue in seven years after initial investments, starting from 2022 and increasing to 2050. However, the decision to invest in forests now makes sense if Ghana intends to conserve and manage its forest resource with a longer-term perspective. The net present value (NPV) of forest due to actions on zero deforestation could reach US$66.5 billion (including returns from timber and ecosystem services) and benefit an estimated 6.1 million beneficiaries by 2050 compared to an NPV of US$23 billion under BAU. A significant part of the return is due to high-value timber with significant market value, but it also presents an opportunity

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21   https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/.

22   The NDC is a climate action plan to cut emissions and adapt to climate impacts. Each party to the Paris Agreement is required to establish an NDC and update it every five years.

to monetize ecosystem services such as carbon by making the sector a carbon sink and reaping the benefits of international markets for deforestation-free cocoa.

3.4.2 Role of forests and wood for energy supply

Biomass used to constitute the largest share of Ghana's energy supply, but oil has become the dominant fuel in the last eight years. National statistics show that biomass still accounts for approximately 34 percent of the total energy consumed in 2020 (Ghana Energy Commission 2021) and, as seen in Figure 12, the availability of oil has mostly led to an increase in energy consumption while the absolute quantity of energy derived from biomass has only slightly declined.

Most of this biomass is used for cooking. Ghana's electricity access rate is 85.33 percent (Ghana Energy Commission 2021) but it is estimated that 78 percent of the population uses biomass fuels, particularly wood and charcoal, for cooking (Karakara and Dasmani 2019). However, the way biomass is consumed has been changing with the share of firewood reducing while on the other hand wood use for charcoal production has been increasing. As of 2020, 65.67 percent of the total wood supply is used for charcoal production compared to 28 percent in 2000, with even charcoal import increasing (Ghana Energy Commission 2021). At the same time, the government is actively promoting modern fuels (such as liquefied petroleum gas [LPG]) for cooking to replace fuelwood and charcoal. However, even with an assumption that this policy is successful, Ghana's Renewable Energy Master Plan[23] (Ghana Ministry of Energy 2019) projects that demand for woodfuel will increase by 21 percent from 2015 to 2030.

Figure 12. **Trend in finale energy consumption by fuel**

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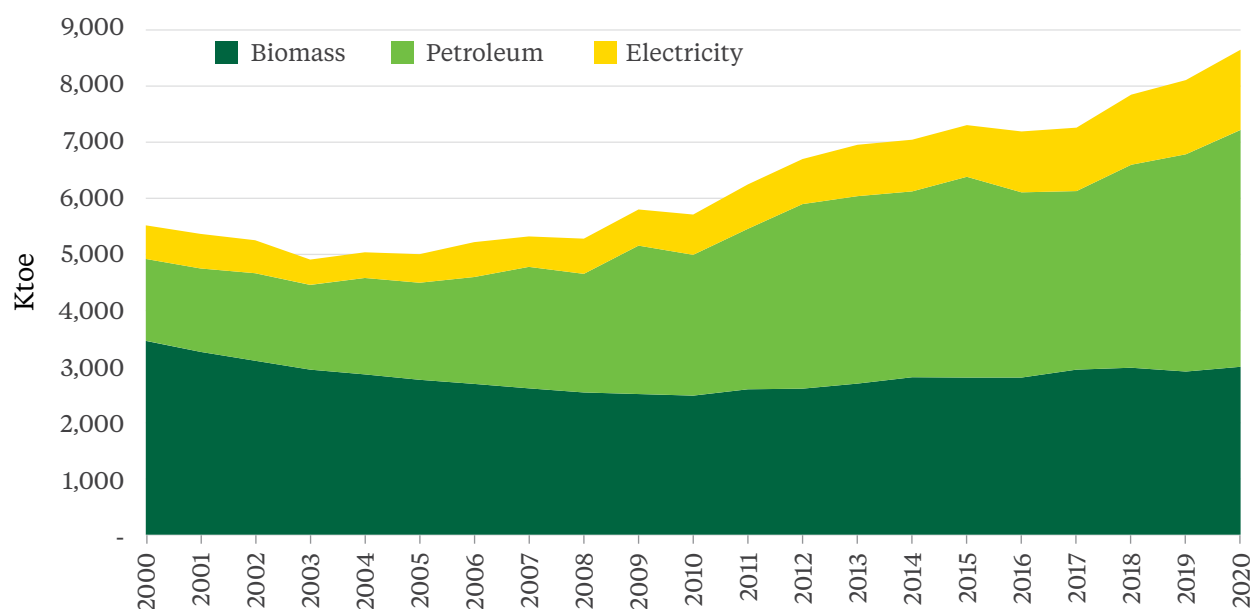
23   Ghana's Renewable Energy Act (2011) considers biomass as a source of renewable energy.

Charcoal production is moving northward and Kintampo is currently a major hotspot. Production in sampled districts of the Northern Savannah Zone (NSZ) is dominated by four species, with shea (*Vitellaria paradoxa*), dawadawa (*Parkia biglobosa*), mahogany (*Khaya spp.*), and rosewood (*Pterocarpus erinaceus*) accounting for 89 percent of species mentions. Further south, greater variety and use of farm-grown trees was recorded.

The value chain for commercial firewood has no more than three nodes from collector to customer. Value chains for charcoal are more complex but the industry is well structured and functionally efficient, with stock outages unheard of. Charcoal prices average GH¢0.5 per kg at the kiln and GH¢2.4 per kg at retail in Accra. Wood costs ~GH¢0.11 per kg for bulk purchase in the NSZ.
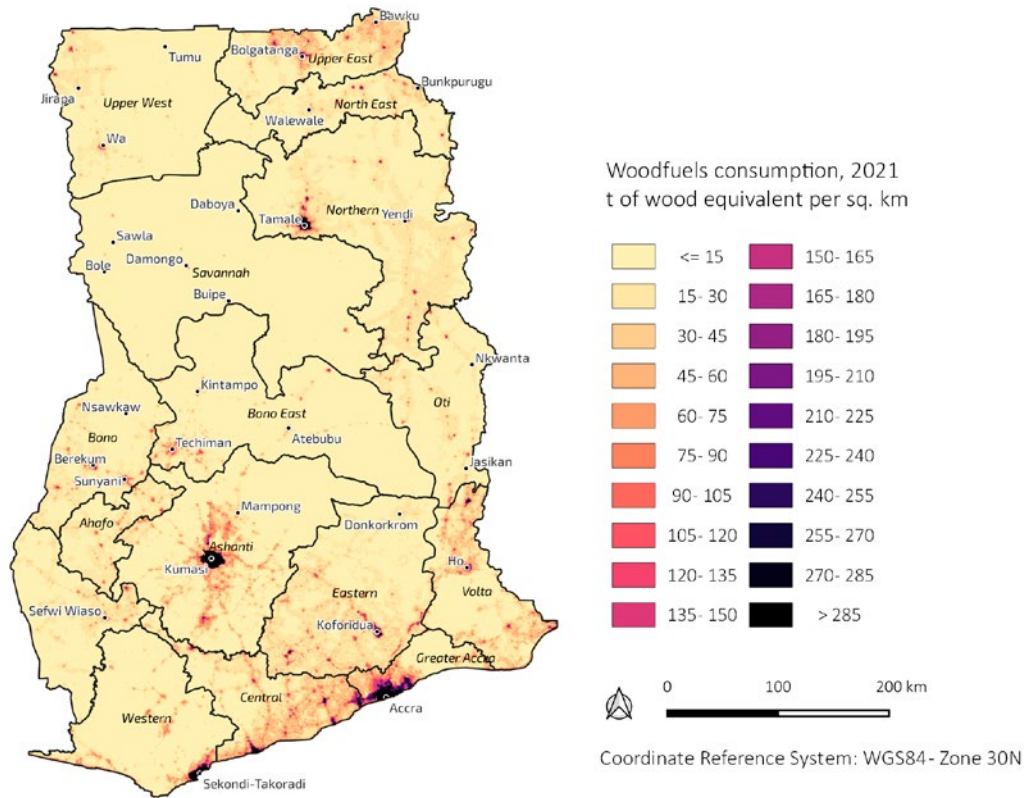
Charcoal is an important cash contributor to rural livelihoods, a gap filler in slack agricultural seasons, and a safety net in case of extraordinary needs. A survey that was done as part of a recent woodfuels assessment (World Bank 2022a) showed that charcoal was the largest source of income for only 29 percent of 552 producers surveyed. About 53 percent of producers source wood from land cleared for farming, 29 percent from land already farmed, and 20 percent from fallow land, confirming the significance of the interaction with farming. In Savannah and Upper West regions, more than 60 percent of producers source wood from trees damaged by fire, indicating the importance of fire in the north. Along the charcoal commodity chain there is clear gender segregation, with women dominating all nodes except production and transport. Women dominate the harvesting of firewood for subsistence use and commercial trade.

The same World Bank (2022a) assessment estimated that the total annual woodfuel demand for cooking comprises 6,799,414 t of firewood and 928,811 t of charcoal, giving a total of 12,372,277 t in wood equivalent. Of this, an estimated 777,000 t of firewood are used annually in institutions and 643,400 t in commercial food outlets. Firewood is also used in industries such as traditional brewing (924,000 t), fish smoking (225,000 t), shea processing (60,448 t), gari production (roasted, fermented cassava - 443,000 t), rice parboiling (442,000 t), and palm oil (380,000 t), for a total of 2,474,448 t per year. An estimated 8,400 t of charcoal per year (55,400 t in wood equivalent) is exported by sea, of which 93 percent is not captured by licensing. This gives total national demand of 14,897,125 t per year in wood equivalent, which is distributed across the country, as shown in Figure 13.

The assessment also estimated that 15 percent of the total wood demand is being harvested in excess of the MAI. Figure 14 indicates the areas where pressure from wood extraction exceeds sustainable levels. The key hotspots from the modelling match those flagged by previous studies.

The use of biomass for cooking also has a negative effect on indoor and outdoor air pollution. Incomplete combustion of biomass fuels while cooking has been associated with high levels of household air pollution and lower respiratory infections. Outdoor pollution, exacerbated by the burning of forests and municipal waste, is also trending upward in Ghana and is particularly bad in cities, killing 16,000 Ghanaians each year (8 percent of total mortality) and costing US$2.5 billion, more than 4 percent of GDP (World Bank 2020b).

Figure 13. Distribution of woodfuel consumption for cooking, industry, and exports

Woodfuels consumption, 2021
t of wood equivalent per sq. km

	<= 15		150- 165
	15- 30		165- 180
	30- 45		180- 195
	45- 60		195- 210
	60- 75		210- 225
	75- 90		225- 240
	90- 105		240- 255
	105- 120		255- 270
	120- 135		270- 285
	135- 150		> 285

0   100   200 km

Coordinate Reference System: WGS84- Zone 30N

Source: World Bank 2022a.

Figure 14. Woodfuels pressure map, indicating areas where extraction exceeds the MAI

Woodfuels pressure as proportion
of the Mean Annual Increment

	1		1.6- 1.7		2.3- 2.4
	1- 1.1		1.7- 1.8		2.4- 2.5
	1.1- 1.2		1.8- 1.9		2.5- 2.6
	1.2- 1.3		1.9- 2		2.6- 2.7
	1.3- 1.4		2- 2.1		2.7- 2.8
	1.4- 1.5		2.1- 2.2		2.8- 2.9
	1.5- 1.6		2.2- 2.3		> 2.9

Land use

	No data		Deciduous fore:
	Cropland		Savanna
	Grassland		Mangrove
	Mosaic		Urban
	Mosaic shrubland/cropland		Bare
	Evergreen forest		

0   100   200 km

Coordinate Reference System: WGS84- Zone 30N
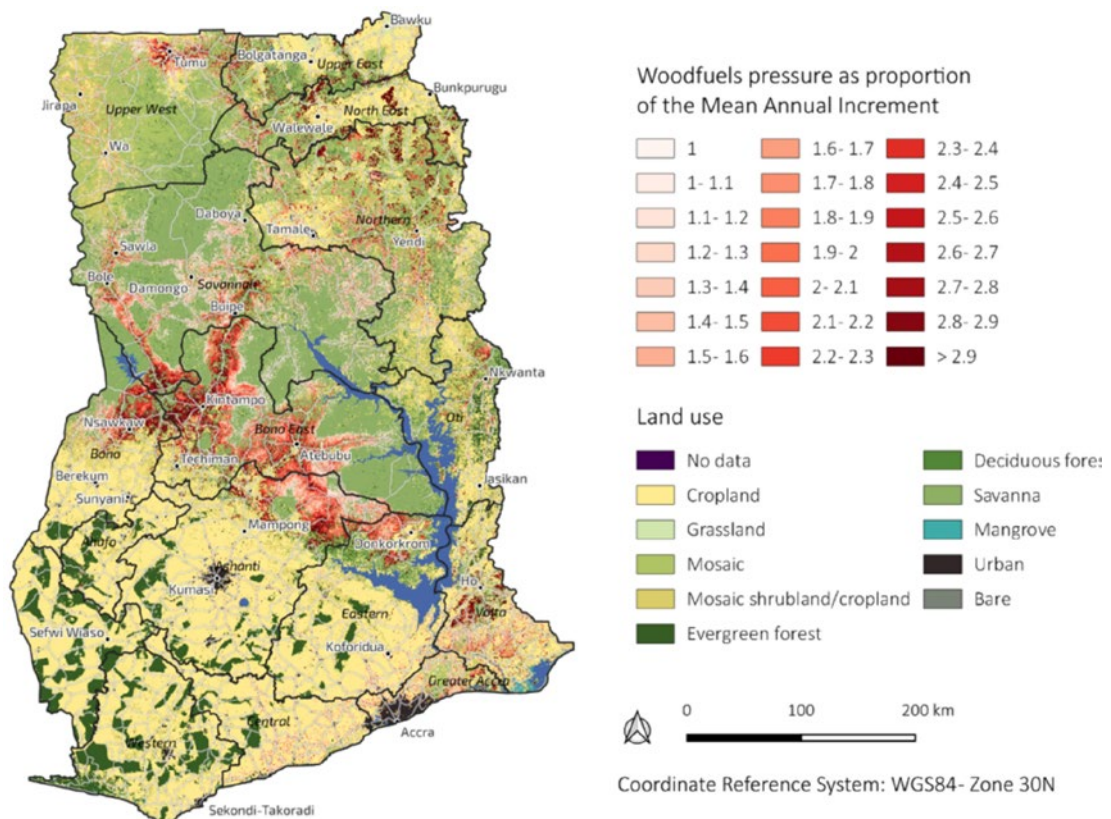
Source: World Bank 2022a.

3.4.3 Governance of forests

Efficiency of resource use is determined, among other things, by the effectiveness of the government's regulatory capacity and quality and the occurrence of corruption. In general, Ghana ranks high on regulatory quality and governance effectiveness. However, the legal frameworks for many routine business and government processes appear to lag in some regards. Additionally, Ghana is rated to have poor control of corruption. Ghana Integrity Initiatives, Transparency International's local chapter, has been raising alarms that despite being one of the least corrupt countries in Africa, the country loses roughly US$3 billion every year through corruption (World Bank 2021c). In terms of regulatory quality, the World Bank's CPIA for 2019 scores Ghana 3.6 of out 6 when it comes to public sector management and institutions although the overall trend in the last six years shows a small decline. Ghana's rule-based governance rating is above that of other resource-rich countries in Sub-Saharan Africa, although the score for its regulatory environment dropped below the scores of other country comparators (World Bank 2021c).

Chatham House rates Ghana's forest governance as fair to good, based on its assessment of the institutional and policy frameworks for the sector.[24] However, Ghana's REDD+ Strategy recognizes that deforestation and forest degradation is in part due to weak policy implementation and law enforcement, caused by weak institutional capacity and corruption (Republic of Ghana 2015). Ameyawa, Arts, and Wals (2016) suggest that there are different challenges related to forest governance in Ghana including political culture, non-compliance and poor enforcement, incentive structure, legal framework, bureaucratic red tape, and lack of resources. Underlying issues related to these challenges include elite power positions, corruption, inadequate and unrealistic laws, weak structures for detection and sanctioning, and lack of knowledge. The lack of knowledge refers to a lack of information and data (a factor that is also recognized in UNFF 2018) and a lack of skills. In addition, there is a lack of staff and logistics (cars and equipment) within the FC for monitoring compliance with rules and a lack of funds for organizing participatory meetings. The weak institutional capacity and corruption are strongly associated with the drivers of deforestation discussed in section 2.6, especially illegal logging and the expansion of illegal mining.

Boakye (2020) looked at the motivations for illegal logging. He found that among logging firms, the perceived risk of detection and the associated sanctions for illegal logging themselves are considered as low, creating a financial incentive for firms to violate the logging regulation. Similarly, the study found that perceived low sanction severity and financial gains to be derived from illegal operations were the major drivers of the violation behavior among illegal chainsaw operators. In addition, the legitimacy of the FC as a regulatory agency may have been compromised as the widely held perception among the chainsaw operators is that some FC officials take bribes to facilitate their illegal operations. Apart from that, there are influential persons at the various levels of governance who in most instances jumped to their defense to bail them out completely or have the sanctions mitigated. Boakye (2020) argues that this is based on strong social acceptance/support for the operators since their wood is meeting a high demand on the domestic market and the operators create jobs for the youth in and around the local community where they operate. This inability to enforce the ban on illegal chainsaw operation also presents a huge challenge for the FC to enforce the rule on illegal logging against licensed logging firms. The firms considered it unfair for the regulators to tighten the screw on them while chainsaw

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24   https://forestgovernance.chathamhouse.org/countries/ghana.

operators continue to operate with impunity. The end result is a declining legitimacy of the FC. Some attempts are being made to address this. For example, a recent study (Hoare et al. 2020) found that as part of the implementation of Ghana's VPA with the EU,[25] significant effort and resources have been put into strengthening Ghana's wood tracking system (WTS). A new digital WTS was completed in 2019 and the study concluded that this system has significantly improved the quality and accessibility of information on forest sector activities, which in turn has resulted in more effective decision-making and better oversight by government officials. Boakye (2020) also found different levels of regulatory compliance between licensed logging with firms who exported to the EU market complying better than their counterparts who exported to markets in Asia and Africa. At the same time, there are accusations of corruption, as shown in a recent example relating to rosewood (*Pterocarpus erinaceus*). In spite of a ban on the harvest and trade, the illegal logging and export of Ghanaian rosewood to China continues with accusations of government corruption and collusion (EIA 2019).

The expansion of illegal small-scale mining is often linked to similar governance issues. The MLNR has the overall responsibility to regulate the mining sector with the Minerals Commission as the regulatory body for mineral-related transactions. The mining sector is regulated by the Minerals and Mining Act, 2006 (Act 703) which enables Ghanaian small-scale miners to apply for a mining concession of a maximum of 25 acres. This has not prevented an influx of Chinese and other foreign nationals involved in small-scale mining in Ghana (also refer to section 2.6). Often this involves licensed Ghanaian small-scale mining operators subleasing their concessions to foreign miners against the law (Boafo, Paalo, and Dotsey 2019). This is the result of Ghanaian miners not being able to afford the cost of acquiring mining licenses, machinery, and small-scale mining operation. The process of acquiring a license for small-scale mining is often characterized by long and cumbersome bureaucratic procedures. Moreover, traditional leaders and chiefs who superintend over customary mineralized lands, particularly stool lands, must be consulted and 'appreciated' by being paid a fee before mining can begin. Crawford and Botchwey (2017) accused state officials, chiefs, and other members of customary institutions of accepting bribes from Chinese miners. Baddianaah, Baatuuwie, and Adongo (2022) argue that the local authorities collaborate and embrace illegal mining activities for economic gains while the local communities perceived illegal mining as a last resort to circumventing dispossession of their share of the mineral wealth by state institutions and foreign mining conglomerates. To find a solution, the Ghanaian government placed an indefinite ban on small-scale mining activities in 2017. This was met with heavy resistance by duly registered small-scale miners, and weak implementation and the lack of enforcement of laws remain the biggest challenge. An Inter-Ministerial Committee on Illegal Mining (IMCIM) was set up to ensure coherence in the activities of agencies involved. However, in 2019, an investigative documentary[26] showed some officers of the IMCIM allegedly receiving bribes and encouraging illegal mining. This has created a perception of a weak and selective prosecution.

It is therefore suggested that further improvements in governance, both in the forest sector and beyond, are needed to address drivers of deforestation. One potential approach for doing this is through more involvement of local communities in the management of forest

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[25] The VPA is part of the EU's FLEGT Action Plan. Under this partnership, Ghana works with the EU to reduce illegal logging by strengthening sustainable and legal forest management, improving governance, and promoting trade in legally produced timber.

[26] https://www.modernghana.com/news/918485/govt-officials-caught-taking-bribes-in-anas-latest-galamse.html.

resources. As already described in section 2.4, the GoG is trying to involve communities more in the management of forest resources through PFM arrangements and the creation of CREMAs.

The implementation of PFM in Ghana has seen mixed results. Sarfo-Adu (2020) looked at the experiences with PFM in one forestry district and found that the duties of communities in PFM were not clearly defined and that the voluntary, non-paid nature of PFM participation is a significant challenge for keeping community members interested. This also contributed to a negative community perception about the activities of the forestry officers entrusted to work together with the communities in the management of the forest. In another district, Acheampong, Agyeman, and Amponsah (2018) found that the motivation for people to participate voluntarily in PFM was mainly driven by access to the forest reserve for non-timber products and the hope of getting degraded portions of the forest to farm. Husseini, Kendie, and Agbesinyale (2016) looked at community participation in the management of forest reserves in the Northern region of Ghana. They found that although the reserves were managed collaboratively, the communities were only involved in maintenance activities of the reserve boundaries and seedling planting in plantation programs. This meant that the communities had no control over access to resources and management and could not take initiatives to manage forest resources or improve their livelihoods and sustain forest resources for the future. So in many cases the roles of the CFCs have been reduced to boundary maintenance and facilitation of social responsibility agreements with timber concessionaires. In essence, communities are providing labor rather than participating in management planning

CREMAs encourage communities to integrate natural resources management into their traditional livelihood strategies in areas outside of forest reserves and protected areas. The concept of CREMAs is generally considered as a successful model for a community-based governance system for managing Ghana's forest resources, although the establishment and continuity of the CREMAs still have challenges (IUCN 2017b). However, Agyare et al. (2015) found significant differences among CREMAs with respect to desired and perceived outcomes. The study suggested that variability in desired outcomes can be attributed to many factors, including who introduces the concept to the communities and how; the message and communication strategies used to obtain engagement by the communities; and the dynamic social, economic, cultural, and ecological contexts of the communities. Something similar was found by Bempah, Dakwa, and Monney (2019). They evaluated the performance of a CREMA 13 years since its inception. They found that communities' interests have waned through mistrust in the implementation messages, which belied their interests. Expectation management therefore seems a key factor for the success of CREMAs.

Key points related to efficiency

- The productivity of the forestry sector in Ghana peaked in the mid-1990s and early 2000s and has been declining since then, which has had an adverse effect on the timber industry.

- NTFPs contribute to rural livelihoods by providing additional household income; however, development of NTFP value chains is frequently hampered by transport problems, lack of access to market information, and financial support including credit and loans.

- Biomass is still the most important source of energy for cooking and a significant part of the country's overall energy supply.

- There are different challenges related to forest governance in Ghana including noncompliance and poor enforcement, bureaucracy, lack of resources, and weak motivation of forestry officials. More community involvement in forest management could help with this but experiences so far in Ghana have been mixed.

04

Supporting interventions to improve RISE through forest interventions

4.1 Ongoing and planned projects relevant to forestry sector

The GoG acknowledges and, through the different policies and plans, tries to find solutions for many of the issues identified in the previous chapter. The World Bank is actively supporting the government's efforts through a number of projects (more details on the World Bank projects discussed here are in Annex 2).

The continuing deforestation and forest degradation is considered as the major issue for the forest sector and Ghana's REDD+ Strategy outlines a number of possible interventions and options for addressing this while recognizing that different interventions might be required in the different forest zones.

Figure 15. Ghana's REDD+ Strategy interventions and options

1. Improving land-use and socio-economic development in the HFZ and cocoa growing areas	2. Addressing wood harvesting and agricultural practices in the savannah woodland zones	3. Policy and legislative reforms
• Address unsustainable timber harvesting • Mitigate effects of agriculture & cocoa expansion • Reduce expansion of other tree crops and agric systems by promoting climate smart agriculture • Improve regulation of mining activities • Wildfire management • Encourage the adoption of enrichment planting and use of indigenous species in forest plantation development in degraded forest lands • Watershed protection	• Address unsustainable timber harvesting • Improve sustainability of fuelwood harvest & use • Reduce expansion of other tree crops and agric systems • Improve regulation of mining activities • Wildfire management • Pastoral Control and Management • Watershed protection	• Improve quality of multi-stakeholder dialogue and decision making • Clarify rights and tenure regimes • Enforce timber compliance • Address local market supply and demand • Strengthen local decentralized management of natural resources • Improve regulation of mining activities • Prepare for natural risks

Source: Republic of Ghana 2015.

A lot of the finance for the forest sector in Ghana is climate related. The World Bank is supporting the implementation of the REDD+ Strategy through the **GFIP**. Some of the main activities under this program include the following: (a) improve forest and landscape management with communities; (b) implement institutional reforms and policy strengthening, (c) enhance trees and agroforestry practices in cocoa forests, and (d) make on-reserve investments for REDD+ and plantations and grants under the Dedicated Grant Mechanism (DGM) for Indigenous Peoples and Local Communities. Additional finance was provided to support the (a) reduction of degradation and deforestation due to illegal ASM in forest landscapes and (b) enhancement of private investment in forest plantation development, with community job creation in forest and cocoa landscapes in Ghana's HFZ. The African Development Bank also provided support through the Forest Investment Program (FIP) to engage local communities in REDD+/Enhancement of Carbon Stocks.

Under the World Bank Forest Carbon Partnership Facility, there is also an agreement with the **Ghana Cocoa Forest REDD+ Programme** (GCFRP) for up to US$50 million in performance-based payments for GHG emission reductions from REDD+. The GCFRP is being implemented in the HFZ and involves five main pillars of activities: (a) institutional coordination and monitoring, (b) landscape-level land use planning, (c) climate-smart cocoa production, (d) risk management and finance, and (e) legislative and policy reforms. The World Bank has also been working with the World Cocoa Foundation in the **Cocoa and Forests Initiative** supporting discussions on eliminating deforestation from the cocoa supply chain.

Other World Bank projects include the **Ghana Landscape Restoration and Small-Scale Mining Project** which builds on some of these activities by supporting (a) institutional strengthening for participatory landscape management, (b) enhanced governance in support of sustainable ASM, and (c) sustainable crop and forest landscape management. The World Bank team is also providing advisory and analytical support to the GoG through a **Green Growth Program for Advisory Services and Analytics** (PASA). The focus will be on analytical work that supports (a) the strengthening of integrated and sustainable management of natural resources of forests and other terrestrial ecosystems, (b) greening the agriculture supply chain to facilitate sustainable management of land use changes from agriculture, (c) greening the ASM sector, (d) natural capital accounting, and (e) climate-resilient development.

As was already mentioned, the EU is also supporting the forestry sector in Ghana through the **VPA-FLEGT** Agreement. In the past, development assistance to the forest sector in Ghana also came through the **NREG** multisector budget support mechanism. This was supported through the World Bank and the government of the Netherlands (Beeko, Oduro, and Oben 2014).

4.2 Additional challenges to be addressed

Ghana's forests are contributing in many ways to the growth and resilience of its economy and therefore need to be protected to provide benefits for the Ghanaian people sustainably. Specifically, 14 percent of Ghana's population lives in proximity to its forests and depends on them for its livelihoods and incomes, and as social safety nets in times of shocks and crises. Additionally, forests contribute in many ways to important environmental services such as soil conservation and productivity, biodiversity, and carbon sequestration.

Ghana's Forest Development Master Plan 2016–2036 (FDMP) articulates the long-term vision and goal for the sector as

> *The vision of the FDMP is to achieve a just, prosperous, and sustainable forestry sector that inclusively and continuously optimizes welfare and provides adequate means of livelihoods to all Ghanaians. In tandem with the 2012 Forest and Wildlife Policy, the goal of the Forestry Development Master Plan is to ensure the conservation and sustainable development of forest and wildlife resources to create a balance between forest products, services and marketing to satisfy domestic and international demands whilst ensuring good governance and transparent forestry enterprises development, biodiversity conservation and ecotourism development.*

Reaching this vision will require scaling up management regimes, policies, and programs which have been implemented in Ghana already. These interventions, policies, and programs have strengths and weaknesses and barriers that might be preventing them from being scaled up. Efforts to conserve and manage intact forest are threatened by illegal timber extraction, mining, and encroachment for agriculture. Although management plans exist, there is a lack of funds and staff to implement the plans. Political pressure can then lead to a situation where best practices for sustainable forest management are not adhered to, leading to overexploitation of timber stocks and a long-term decline. For off-reserve areas, tree tenure on-farm remains an unresolved issue creating a strong disincentive to maintaining trees. The establishment of plantations is hampered by difficulties to secure private sector investments and high opportunity costs, especially in areas available for off-reserve plantations. The government also has inadequate funding, and the lack of human resource capacity and poor planting material capacity lead to inconsistency in survival and growth rates. Tree planting on farms and private land is constrained by the lack of tree tenure and limited availability of planting stock. Actions required are diverse including (a) restoring degraded woodlands, (b) implementing the community-based forest resources management program; (c) providing extension services to communities and the private sector to help establish and restore forests, plantations, and nurseries; (d) improving management of forest reserves and enforcing laws governing reserves; and (e) improving wildfire management in TZs and SZs in Ghana.

The RISE approach, used in this note, has identified some critical challenges that also need to be addressed. Many of these are highlighted below and all are equally important.

- **Critical challenges related to resilience**
  - o **Conduct a national forest inventory and strengthen the forest management information system (FMIS)**. The latest forest inventory for Ghana dates back to the 2012 Forest Preservation Programme. A comprehensive forest inventory, with adequate ground-truthing, could provide a much-needed update of the extent of forest areas and their location, forest fragmentation, composition by species and age, harvestable volumes of timber, NTFPs, biodiversity, and so forth. This will provide critical inputs for evidence-based decision-making, on issues related to management of forest reserves and protected areas, allocation of concessions, development of industrial plantations, and so on.

    Developing a state-of-the-art FMIS should accompany the forest inventory. An FMIS would be needed to ensure data availability and its regular use for decision-making. The FMIS would incorporate the data from the current national forest inventory, timber concessions, information on community managed forests,

gazetted protected areas, and so forth. The FC would be responsible for the continual updating of the FMIS with any new information and to ensure that it is readily available to users.

- o **Undertake a granular analysis of the impacts of climate change on forests.** Increased threats to Ghana's forests, generated by climate change, come from forest fires, droughts, floods, shifts in growing zones, pest infestations, and so on. Based on preliminary projections from climate hazard models, this note shows that climate hazard exposures are likely to vary across the different regions of the country and so will the level of threat. Thus, there is a need to carry out a detailed mapping of Ghana's forest zones for their climate hazard exposures and create a risk map. Once the major risks have been identified at a disaggregated level, appropriate risk mitigation and adaptation measures can be identified and implemented. For example, if the threat of forest fires has increased, planning for fire breaks and ensuring availability of firefighting equipment would be appropriate responses. If drought is identified to be a major risk, then selecting drought-resistant species of trees for plantation development, reforestation, and forest enrichment would be an appropriate adaptation measure. Another appropriate measure would be the expansion of climate-smart cocoa practices (which combines agroforestry and shade trees), as this can lead to multiple benefits such as micro-climate generation of rainfall, temperature moderation, hosting of pollinators, enhancement of soil and air moisture, and carbon sequestration. It is recommended that the FC creates a small team of experts to lead the analytical work on this issue.

- **Critical challenges related to inclusion**
  - o **Tackle gender gaps.** As stated in this note, Article 17 (1) and (2) of the Constitution of the Republic of Ghana guarantees gender equality and freedom of women and men, girls and boys from discrimination on the basis of social or economic status. The GoG recognizes the persistent gender gaps in the forestry sector, related to ownership and other rights to land, employment opportunities, incomes, voice and participation in decision-making, and so on. It also realizes that the sector provides significant opportunities to redress gender gaps and the FDMP states the importance of supporting gender empowerment. A Gender Analysis and Action Plan in the context of REDD+ processes has already been formulated. It is suggested that the FC produces a broader gender action plan for the sector, learning from the early experiences of the REDD+ gender action plan. Furthermore, it is recommended that implementation should focus especially on the Northern provinces, which are characterized by the most severe gender inequalities.

- **Critical challenges related to sustainability**
  - o **Promote additional actions through the monetization of ecosystem services from land, forest, and water management practices.** The ecosystem services can be monetized through mechanisms such as payment for environmental services, with links to water resource conservation. This can be linked to other services including for carbon payments for REDD+. Legal underpinning would be needed to provide confidence to investors to invest in programs that meet climate and sustainability development goals. Together with regulatory reforms in ASM, options such as biodiversity offset programs can enhance participation of communities and mining companies for reclamation of mined out areas.

- **Critical challenges related to efficiency**
  - **Improve the efficiency of resource use.** This note points to a trend in declining productivity and poor efficiency in the forest sector. Ghana has developed a GFPS to address the decline in productivity of the forest sector. The private sector is a major player for productivity improvements to take root. However, the GFPS has been only partially successful because of limited participation by the private sector. Private sector engagement is being piloted under the FIP through crediting facility for plantation establishment. In addition, a fund was established under the Forest Plantation Development Fund Act, 2000 (Act 583) to provide financial and technical assistance to persons including forest plantation growers and forestry firms involved in forest plantations on land suitable for timber cultivation. It is recommended that the main constraints to private sector engagement (such as off-reserve land tenure challenges) be identified and resolved fully and the GFPS implemented at scale.

  - **Develop NTFP value chains.** NTFPs contribute to rural livelihoods by providing additional household income; however, development of NTFP value chains is frequently hampered by transport problems and lack of access to market information and financial support including credit and loans. Thus, it is recommended that the GoG undertakes feasibility studies for NTFPs to identify the most promising ones and the opportunities and challenges to realizing their full potential to contribute to household incomes, especially in the SZ. Developing the market potential of NTFPs often encourages women to come forth as entrepreneurs and managers and therefore has the potential to close the gender gap.

  - **Ensure that the FC is efficient and fit-for-purpose.** The FC is an apex body, tasked with the management and oversight of Ghana's forests. Thus, it needs to be well equipped to manage all challenges confronting the sector, both the long-standing ones as well as those that have arisen more recently. A capable and efficient organization would require enough staff with strong skills and competencies; good incentives and strong motivation; transparent management practices; and adequate infrastructure, physical resources, and operational budgets. Yet, as this note indicates, the FC exhibits weaknesses and shortfalls in many of these aspects. Thus, it is recommended that a comprehensive institutional capacity analysis, of the FC, be undertaken to identify the key areas requiring improvement and strengthening and suitable actions be implemented.

  - **Scale up PFM/CREMAs.** Enabling local communities to become decision-makers in forestry and forest-based activities enables a fair and equitable distribution of benefits and incomes from forests and Ghana's PFM approach attempts to do this. Implementation of PFM has thus far achieved mixed results. However, there appears to be good potential to improve the model and it is recommended that constraints and challenges that have been identified be incorporated into improving the PFM model. Analysis of the experience with CREMAs suggests that it is a largely successful model for a community-based governance system for managing Ghana's forest resources. The FDMP mentions the intention to set up a fund board to manage grants and trust funds as flexible source of funding for communities in support of establishing CREMAs, dedicated forests, and similar opportunities. It is recommended that this fund and its operating modalities be established at the earliest as a means to accelerate efforts to scale up CREMAs.

In addition, there are a number of **no regret actions for the government** that present an opportunity for achieving sustainable management of natural resources and economic development. These actions include the following:

- **Urgently advance legislation of the Wildlife Resource Management Bill** that has been submitted to the Parliament, which can add momentum to the scale-up of CREMAs and integrated landscape management.

- **Strengthen the ongoing tree tenure reform** to promote adoption of nurturing natural regeneration, planting trees, and managing trees on-farm by farmers. At present, incentives for farmers to invest in good management practices that entail higher costs and retain trees on land are limited given the lack of right to trees on land. The government has initiated some reforms to address this challenge but transformation toward integrated management at scale will require further action on tenure security and substantial buy-in from the traditional leaders, landowners, and farmers.

- **Resolve overlapping mandates on charcoal regulation.** It is estimated that 15 percent of the total wood demand is being harvested beyond what trees can grow back for extraction on a sustainable basis. Charcoal is an important cash contributor to rural livelihoods, a gap filler in slack agricultural seasons, and a safety net in case of extraordinary needs. The Energy Commission is mandated to license the production, transport, storage, and supply of woodfuels. A permit from the EPA is required before felling any tree. The FC may authorize the extraction of woodfuel from forest reserves and also has the authority to control tree felling 'off-reserve'. With regulation responsibilities spread among several agencies, the practical experience of most people involved in extracting woodfuel is that trees can be harvested without reference to government agencies (World Bank 2022a). Greater clarity and simplification is needed on the respective mandates for regulation and law enforcement to avoid duplication of efforts and to effectively manage the development and use of woodfuels.

Annexes

Annex 1. References

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Annex 2. World Bank ongoing and planned projects relevant to forestry sector

Project	Approval Date	Closing Date	Funding sources and instrument	Geographical focus	Commitment Amount (US$, millions)	Activities
GFIP	2015	2023	Grant and concessional loan from the Forest Investment Fund	HFZ of Ghana covering the Western and the Brong-Ahafo Regions	50	(a) Improve forest and landscape management with communities, (b) implement institutional reforms and policy strengthening, (c) enhance trees and agroforestry practices in cocoa forests, and (d) make on-reserve investments for REDD+ and plantations. Early remote sensing analysis has shown positive land use changes.
GFIP, additional finance	2017	2023	Grant and concessional loan from the Forest Investment Fund	HFZ	19.89	(a) Reduce degradation and deforestation due to illegal ASM in forest landscapes and (b) enhance private investment in forest plantation development, with community job creation, in forest and cocoa landscapes in Ghana's HFZ.
GCFRP	2019	2025	Performance-based payment for GHG emission reductions from the Forest Carbon Partnership Facility	HFZ	Up to 50	Performance-based payment for emission reductions from REDD+. The GCFRP is supported by private investment through the Cocoa and Forests Initiative. The GCFRP is being implemented in identified hotspot intervention areas through five main pillars of activities that require concerted actions by stakeholders: (a) institutional coordination and monitoring, (b) landscape level land use planning, (c) climate-smart cocoa production, (d) risk management and finance, and (e) legislative and policy reforms.
Ghana Landscape Restoration and Small-Scale Mining Project	2021	2027	IDA credit (US$50 million) and grants from the Global Environment Facility and the Global Partnership for Sustainable and Resilient Landscapes (PROGREEN)	The project will be implemented in two landscapes: the NSZ (including the Guinea Savannah ecological zone, the Sudan Savannah ecological zone, and the upper portions of the Transitional ecological zone) and the cocoa forest landscape (including parts of the Forest ecological zone and lower parts of the Transition ecological zone, which also includes the Pra River Basin).	77.76	(a) Institutional strengthening of governance and partnerships for participatory landscape management, (b) enhanced governance in support of sustainable ASM, and (c) sustainable crop and forest landscape management.
Green Growth PASA	2021	2025	Grants largely from the Global Partnership for Sustainable and Resilient Landscapes (PROGREEN) and the Global Program on Sustainability	Countrywide	3	The PASA is organized along five pillars: (a) green infrastructure: management of forests and other terrestrial ecosystems, (b) greening agriculture supply chain: management of land use changes from agriculture, (c) greening ASM: management of landscapes involving select sectors, (d) natural capital accounting, and (e) climate-resilient development.