



Ghana's Adaptation Communication to the United Nations Framework Convention on Climate Change

November 2021



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FOREWORD

Ghana, like many peer nations, is already taking steps to address the negative impacts of climate change. We are promoting sustainable development for sound environmental governance by raising awareness and forging collaborations and partnerships with stakeholders.

Recognizing that climate change hazards are escalating and affecting all parts of our society, we are accelerating and scaling up our efforts to build climate resilience across our country through adaptation action. These efforts to adapt will be crucial for protecting the country's development gains, and for enabling our future achievement of Sustainable Development Goals in spite of the adverse effects of climate change and variability on Ghana's economy and natural ecosystems.

The Government of Ghana has prepared this first adaptation communication (ADCOM) in line with Article 7, paragraphs 10 and 11, of the Paris Agreement and through robust engagement with stakeholders. It also draws on the results of Ghana's National Adaptation Planning (NAP) process, which aims to fully integrate adaptation into economic, environmental and social decision making.

We look forward to building on the progress and achievements on adaptation that are presented in this document and to taking action to fill the gaps identified in order to address climate change impacts in a more integrated, coordinated and sustainable manner.

HON. DR. HENRY KWABENA KOKOFU
EXECUTIVE DIRECTOR
ENVIRONMENTAL PROTECTION AGENCY (EPA), GHANA



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EXECUTIVE SUMMARY

Ghana's first Adaptation Communication (AdCom) takes stock of what has been done and what has been achieved; it also looks at existing gaps and what else needs to be accomplished to consolidate Ghana's adaptation gains going forward. While great strides continue to be made towards adaptation planning in Ghana, gains so far have been modest and only provide a basis for further commitments and more ambitious actions that ensure climate-resilient sustainable development across sectors, contexts and at multiple levels.

From policy development, collaborative partnerships, knowledge development, capacity building, institutional strengthening, program planning to implementation, these are focused areas in adaptation planning in Ghana that have seen significant progress in various sectors. The approach has been a systematic creation of the requisite institutional structures, knowledge resources and governance arrangements that enhance effective adaptation planning and program implementation at both national and sub-national levels. As these structures begin to take shape, particularly at local community levels, there has since been a growing shift towards increased local actions that are inclusive, participatory and community focused. The aim is to consolidate gains in all sectors and at all levels by transferring ownership of adaptation program planning and implementation to local people.

Doing this, as has become evident, requires more deliberate efforts, creative partnerships and collaborative efforts that bring people, groups, communities, and institutions together from diverse backgrounds and sectors to share information, develop knowledge and acquire new skills and insights to drive further actions. Such an approach has proved particularly instrumental in empowering diverse groups such as Gender, Youth, Civil Society Organizations (CSOs), Traditional Leaders and various development partners to play leadership roles in adaptation planning and program implementation at the local community level.

The launch of Ghana's National Adaptation Planning (NAP) has been a timely addition to Ghana's adaptation efforts as the NAP process begins to show potential as the principal organizing vehicle through which national adaptation planning efforts will be monitored, evaluated, and communicated to ensure study progress and the needed visibility. As Ghana continues to advance its adaptation actions, it is also becoming increasingly clear that such efforts should not be approached only as a way to address current climate impact problems, but also as an avenue to reduce future vulnerabilities, build long-term adaptive capacity with a view to transforming society.

While significant progress continues to be made, there is no doubt that a lot more needs to be done and can be done especially against the background of increasing climate change impacts. There is need for more proactive and coordinated adaptation actions and much as Ghana's NAP process is well-positioned to ensure efficient planning at scale, funding requirements to support such efforts on an on-going and long-term basis remain a challenge and one that needs to be addressed to assure the sustenance of current momentum to reduce vulnerability levels and to build adaptive capacity and resilience within and among sectors.

Ghana submits its first AdCom as a standalone document and as a response to the invitation to countries by paragraph 7 of decision 9/CMA.1 of the United Nations Convention on Climate Change (UNFCCC) to submit appropriate information that highlights national overall efforts towards adaptation to climate change. Besides highlighting Ghana's NAP process, this submission also provides added avenues for transparency, mobilization, and broader engagements of diverse stakeholders. The reporting process has

facilitated the identification of gaps in current adaptation processes and has accordingly recommended next step actions to enhance current efforts. Ghana's AdCom is organized into seven (7) interlinked parts providing a coherent account of the state of climate adaptation in Ghana. Together, the different parts provide a comprehensive and insightful narratives that project climate change adaptation efforts in Ghana, as well as highlight the support needed to catalyze enhanced adaptation action in country.

National Circumstances, Institutional Arrangements, and Legal Frameworks

1



1.1.1 Reporting Context on Adaptation Communication

Ghana became a Party to the UNFCCC in September 1995¹ and ratified the Paris Agreement in September 2016². Article 7.10 of the Paris Agreement requires of Ghana, and all other countries to “as appropriate, submit and update periodically an adaptation communication, which may include its priorities, implementation and support needs, plans and actions, without creating any additional burden for developing country Parties”³.

This submission demonstrates Ghana’s commitment to the call and in doing so fulfills the purpose of Adaptation Communication which is stated in Decision 9/CMA.1 of the Paris Agreement as “helping to increase the visibility and profile of national adaptation actions to bring adaptation in balance with mitigation actions; strengthen support for developing countries’ adaptation actions; provide input to the global stocktake and, enhance learning and understanding of adaptation needs and actions”⁴.

Article 7.11 of the Paris Agreement neither prescribes nor excludes any particular approach or vehicle for the communication of adaptation. It allows flexibility to suit each country’s context and unique circumstance. Ghana has decided to communicate its first AdCom as a standalone document with the main objective of highlighting the country’s NAP process and other adaptation efforts in-country.

1.1.2 Format of this Adaptation Communication

Ghana adopts the additional guidance provided by Annex I to decision 9/CMA.1⁵ on elements of the Adaptation Communication. By that, Parties are invited, “according to their national circumstances and capacities, to provide in their adaptation communication information on the elements referred to in paragraph (a–d) of the annex and to provide, as appropriate, additional information on the elements

¹ https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXVII-7&chapter=27&Temp=mtdsg3&clang=en

² <https://unfccc.int/node/61071>

³ https://unfccc.int/sites/default/files/english_paris_agreement.pdf

⁴ https://unfccc.int/sites/default/files/resource/cma2018_03a01E.pdf

⁵ https://unfccc.int/sites/default/files/resource/cma2018_03a01E.pdf

referred to in paragraph (e–i) of the annex.” This report is thus organized in line with the provided guidance.

1.1.3 Background to the Preparation of Ghana’s Adaptation Communication

Ghana's AdCom development process was led by the Environmental Protection Agency (EPA) of the Ministry of Environment, Science, Technology, and Innovation (MESTI). The EPA organized and facilitated a multi-stakeholder inception session which brought together diverse adaptation actors, policy leaders, experts, researchers, academia, private sector, and civil society organizations (CSOs) to share knowledge and adaptation experiences. The event introduced participants to the Adaptation Communication and discussed its merits both to the local climate adaptation agenda and also to Ghana’s international climate change action reporting requirements.

Different experiences and information shared by participants from diverse sectors at the workshop constituted a significant data source to inform the development of the AdCom. The stakeholder experience-sharing and information provision was complemented with a review of key national reports, policy, and project documents, as well as relevant international literature on climate change adaptation. This consultative inception workshop and subsequent validation workshop provided critical insights and valuable information to guide the development of this AdCom.

1.2 National Circumstances

There is already evidence of the direct manifestations of climate change impacts in Ghana. From temperature increases to rainfall variability, unpredictable extreme events such as heat waves, flooding and droughts, the impacts of climate change are being felt in local communities across Ghana. Key sectors of Ghana’s economy, many of which are largely climate-sensitive, have negatively impacted; the agricultural sector has become the most vulnerable, a function of its over-reliance on hydro-climate factors that have become highly unreliable under current conditions.

In communities across the country, there is growing evidence of how changing climatic conditions are affecting the socio-cultural life of local people. Cultural lifestyles and economic livelihoods in coastal regions are being disrupted as many settlements face the threat of frequent and more intense storm surges, erosion, and inundation, all of which have compelled the removal and resettlement of whole communities. As impacts continue to manifest forcefully, but differently in diverse communities, it has also become apparent that Ghana needs more focused and pragmatic approaches to dealing with both current and future impacts of climate change. Some of these efforts have been initiated either by government or non-state actors, and they are all aimed at building adaptive capacity to protect and preserve human life and wellbeing, infrastructure, livelihoods, and society in general.

Ghana’s NAP process has been launched at an opportune time, as the government tries to coordinate all adaptation planning activities by providing the requisite enabling environment and coordination support for the planning and implementation of adaptation actions as enshrined in the National Climate Change Policy (2013), the National Climate Change Adaptation Strategy (2012) and the Nationally Determined Contributions (NDCs,2015). These and many other such programs are expected to enhance current efforts towards Ghana’s sustainable development agenda⁶.

⁶ <https://napglobalnetwork.org/wp-content/uploads/2020/04/napgn-en-2018-ghana-nap-framework.pdf>

1.2.1 Geographic Profile

Ghana is located on the coast of the Gulf of Guinea in West Africa, with Cote d'Ivoire (Ivory Coast) to the west, Burkina Faso to the north, and Togo to the east. The country has a total land area of 238,535 square kilometres⁷ and situated close to the equator on latitude 11.50N and 4.50S and longitude 3.50W and 1.30E. Ghana resides in the tropical savannah climate zone and is divided into six agro-ecological zones (Figure 1). Agricultural land as a share of land area of Ghana increased from 51.4 % in 1969 to 65 % in 2018 growing at an average annual rate of 0.48%⁸. Another important land cover change in Ghana is the increased change in arable land from 7.5 % in 1969 to 20.7 % in 2018 growing at an average annual rate of 2.15%⁹. Forest area as a share of land area of Ghana fell gradually from 38.5 % in 2001 to 35.1 % in 2020¹⁰.

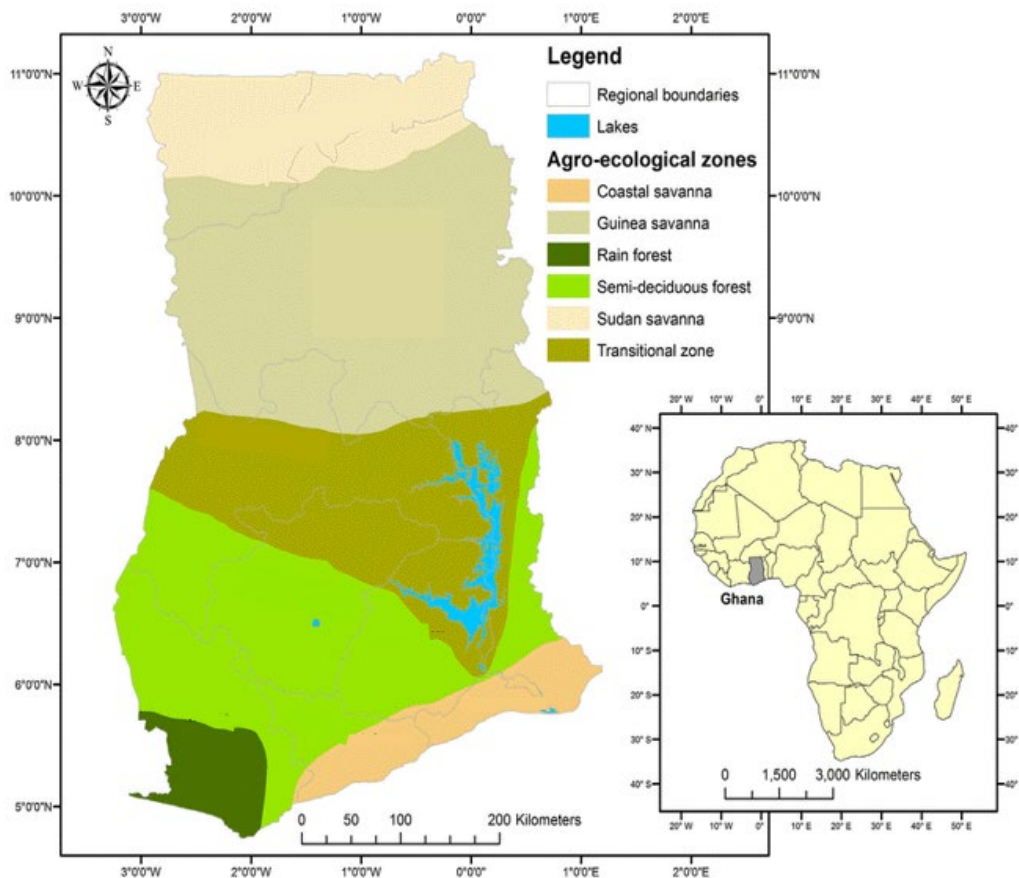


Figure 1. Map of Ghana showing the six agro-ecological zones. Source: Rhebergen et al. (2016)

⁷ <https://data.worldbank.org/country/ghana>

⁸ <https://knoema.com/atlas/Ghana/topics/Land-Use/Area/Agricultural-land-as-a-share-of-land-area>

⁹ <https://knoema.com/atlas/Ghana/topics/Land-Use/Area/Arable-land-as-a-share-of-land-area>

¹⁰ <https://knoema.com/atlas/Ghana/topics/Land-Use/Area/Forest-area-as-a-share-of-land-area>

1.2.2 Climate Profile

Ghana's agro-ecological zones, as captured in the map above (figure 1), are the Guinea savannah zone, the forest-savannah transition zone, the semi-deciduous forest zone, the Sudan savannah zone, the coastal savannah zone and the rainforest zone. Ghana's climate is tropical and strongly influenced by the West Africa monsoon winds^{11,12}. Ghana records an average mean annual temperature of 28.2 °C in the north and 27.3 °C in the south¹³. The Tropical Rainforest, the Coastal Savannah, the Moist Semi-deciduous Forest and the Transitional Zone in the southern part are characterized by bimodal precipitation, resulting in a major and a minor growing season, while the Guinea Savannah and the Sudan Savannah in the north experience unimodal precipitation distribution and only one growing season¹⁴. Mean annual precipitation ranges from 900 mm in the north to an average of 1500 mm in the wetter south. In the tropical rainforest zone in the south-west, annual precipitation can reach over 1800 mm¹⁵.

Ghana's historical climate data indicates increasing average temperatures and decreasing average yearly rainfall across all the six agro-ecological zones. On the average, annual temperature has increased by 1°C in the last 30 years¹⁶. It is projected that Ghana's temperature will experience significant rise while rainfall is expected to decrease in all agro-ecological zones.¹⁷ Data available also shows sea level has risen by about 5.3 cm over the last 21 years and accounts for only 31% of the observed annual coastal erosion rate (about 2 m/year) in Ghana¹⁸. Until 2050, very similar sea levels are projected under different GHG emissions scenarios. Under RCP6.0 and compared to year 2000 levels, the median climate model projects a sea level rise of 11 cm in 2030, 20 cm in 2050, and 39 cm in 2080.¹⁹

1.2.3 Demographic Profile

The 2021 population of Ghana is 30.8 million with an annual growth rate of 2.1%²⁰ and population density of 137 people per Km². The population is projected to reach 37 million by 2030²¹. Women make up 50.7% of the population and men 49.3%, giving a national sex ratio of 97 males for every 100 females.²² Like many West African countries, Ghana has a young age structure, with approximately 57% of the population

¹¹ Shanahan, T. M., Overpeck, J. T., Wheeler, C. W., Beck, J. W., Pigati, J. S., Talbot, M. R., ... & King, J. W. (2006). Paleoclimatic variations in West Africa from a record of late Pleistocene and Holocene Lake level stands of Lake Bosumtwi, Ghana. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 242(3-4), 287-302.

¹² Asare-Nuamah, P., & Botchway, E. (2019). Understanding climate variability and change: analysis of temperature and rainfall across agroecological zones in Ghana. *Heliyon*, 5(10), e02654.

¹³ <https://www.adaptationcommunity.net/wp-content/uploads/2019/12/Climate-risk-profile-Ghana.pdf>

¹⁴ Asare-Nuamah, P., & Botchway, E. (2019). Understanding climate variability and change: analysis of temperature and rainfall across agroecological zones in Ghana. *Heliyon*, 5(10), e02654.

¹⁵ <https://www.adaptationcommunity.net/wp-content/uploads/2019/12/Climate-risk-profile-Ghana.pdf>

¹⁶ MESTI, (2013). Ghana National Climate Change Policy. Accra, Ghana

¹⁷ https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf

¹⁸ Evadzi, P. I., Zorita, E., & Hünicke, B. (2017). Quantifying and predicting the contribution of sea-level rise to shoreline change in Ghana: Information for coastal adaptation strategies. *Journal of Coastal Research*, 33(6), 1283-1291.

¹⁹ <https://www.adaptationcommunity.net/wp-content/uploads/2019/12/Climate-risk-profile-Ghana.pdf>

²⁰ according to the 2021 Census Preliminary Report released by the Ghana Statistical Service.

www.census2021.statsghana.gov.gh

²¹ according to the 2021 Census Preliminary Report released by the Ghana Statistical Service.

www.census2021.statsghana.gov.gh

²² www.census2021.statsghana.gov.gh

under the age of 25²³. The number of households in Ghana is 8.3 million with mean household size of 3.6 compared to 4.4 in 2010²⁴. Over the last three decades, Ghana's urban population has more than tripled, rising from 4 million to nearly 14 million people, and outpacing rural population growth. 57.3% of the population lived in cities in 2020, with the urban population growing at a rate of 3.4% annually. Due to the limited economic opportunity and climate change vulnerability of the Sudan Savannah and Guinea Savannah, many people turn to migrate to southern Ghana, especially Accra to find better opportunities. The Greater Accra region is the most populous in the country and serves as home to about 51.3% of the urban population because of the economic opportunities it offers²⁵.

1.2.4 Government Profile

Ghana is a politically stable country in West Africa. It has conducted successful multi-party elections to elect successive governments who have all demonstrated commitment to universal adult suffrage and the rule of law. The country runs a constitutional presidential multiparty democracy, with power shared among the Executive, Legislature and Judiciary branches. The president is the head of state and also of government while legislative power is vested in the Parliament of Ghana. The judiciary, which is the third arm of government, is independent of both the Executive and the Legislature.

Ghana has a National House of Chiefs, which serves as the umbrella institution coordinating the activities of all traditional rulers in the country. The existence of such a body epitomizes the importance of chiefs and traditional rulers within Ghana's governance structure. The National House of Chiefs is represented at the sub-national level by Regional House of Chiefs, whose representatives converge at the National House of Chiefs to act essentially as an advisory institution, providing critical advice and guidance on matters of chieftaincy, customary laws, and land administration to the government. They are also very instrumental in issues on the environment and conflict resolution.

Governance in Ghana is decentralized through the local government system. The 16 administrative regions of Ghana are further divided into 261 Metropolitan/Municipal/District Assemblies (MMDAs), each led by a Chief Executive who represents government business at the local level. Ghana's local government structure has been well planned and widely touted as representing a clear path to the devolution of Ghana's democracy. Most national level policies and development plans are implemented through the local government system²⁶.

At the apex of Ghana's local government planning systems is the Ministry of Local Government and Rural Development; however, there is also the National Development Planning Commission (NDPC)—the planning arm of Ghana's development processes—which has the legal mandate to forecast and coordinate Ghana's short-, medium- and long-term development aspirations planning in Ghana. The work of the Commission is facilitated by the well-crafted local governance system which allows the commission to gather information and data from the local level to inform planning processes. The strategic position and role of the Commission have enhanced its ability to integrate climate change issues in national and sub-national development plans and actions

²³ https://www.indexmundi.com/ghana/demographics_profile.html

²⁴ www.census2021.statsghana.gov.gh

²⁵ <https://data.worldbank.org/country/Ghana>

²⁶ <https://lgs.gov.gh/index.php/local-governance-act-of-2016-act-936/>

1.2.5 Economic Profile

Ghana has witnessed significant economic growth in recent years, especially before the outbreak of the Covid-19 pandemic. GDP growth stood at 6.3% and 6.5% in 2018 and 2019 respectively, according to the World Bank²⁷, driven by the mining, petroleum, agriculture, and forestry sectors. In 2019, out of US\$22 billion international trade value, gold accounted for 50%, followed by crude oil (22%), cocoa (11%) and other merchantable (17%). On the other hand, the cost of environmental degradation amounts to \$6.3 billion annually, or nearly 11% of Ghana's 2017²⁸. The fastest-growing sector in Ghana in 2018 was industry, accounting for 34% of GDP; this is also the second-largest area of the economy²⁹.

Ghana's third major area of economic activity is agriculture, which accounted for 19.7% of GDP in 2018. 71% of rural people are employed in agriculture, forestry, and fishing (World Bank, 2020)³⁰. Despite the variety of agricultural activity taking place in Ghana, the country continues to be a net importer of food. Improving agricultural efficiency has therefore been a strategic priority for successive governments, starting with the publication of the Food and Agriculture Sector Development Policy (FASDEP II) in 2007 and continuing today with the Planting for Food and Jobs initiative, launched in April 2017.

1.2.5.1 Poverty

Ghana's economic performance has improved significantly over the years. The country registered a record high GDP growth rate of 14.0% in 2012 and 8.1% in 2017 (GSS 2018). The positive improvements in the performance of the economy have helped halved poverty, which had dropped to 23% by 2016. However, the dynamics of poverty in Ghana from 2005 to 2017 period indicate that poverty is still very much a rural phenomenon and although the level of extreme poverty is relatively low, it is concentrated in Rural Savannah, where more than one-third of the people deemed to be extremely poor reside.

1.2.5.2 Impact of COVID-19 on Ghana's Economy

As with many countries around the world, the impact of COVID-19 has hit Ghana's economic prospects very hard. Impacts are believed to have contracted Ghana's economy by 3.2% and 1.0% in the second and third quarters of 2020, respectively, pushing the country into a recession for the first time in 38 years³¹. Nevertheless, a modest growth of 1.1% was experienced for the full year of 2020 due to a strong 4.9% growth in the first quarter of 2020, prior to the onset of the COVID-19 crisis. The 1.1% GDP growth in 2020 is a steep fall from the pre-COVID-19 levels of 6.5%. The Government attempted to mitigate the pandemic's impact on households and businesses by enacting the Coronavirus Alleviation Plan (CAP) and the medium-term COVID-19 Alleviation and Revitalization of Enterprises Support (CARES)³² program in

²⁷ <https://www.worldbank.org/en/country/ghana/overview#1>

²⁸ <https://blogs.worldbank.org/african/ghana-balancing-economic-growth-and-depletion-resources>

²⁹ <https://oxfordbusinessgroup.com/overview/building-stability-strong-growth-rates-services-and-industry-channel-investment-government-aims>

³⁰ <https://oxfordbusinessgroup.com/overview/building-stability-strong-growth-rates-services-and-industry-channel-investment-government-aims>

³¹ <https://www.worldbank.org/en/country/ghana/overview#1>

³² <https://www.mofep.gov.gh/news-and-events/2020-11-20/government-launches-gh%BC100-billion-cares-programme>

mid-2020. These efforts notwithstanding, low growth in 2020, coupled with high population growth, has pushed real per capita incomes 1% lower than in 2019³³.

1.2.5.3 Impact of COVID-19 On Climate Change Adaptation Planning

The economic stress of COVID-19 has understandably focused the Ghanaian government's attention on the recovery; priority during and post-COVID is expected to be on the mobilization of highly impactful financial resources to mitigate economic recession. This will limit domestic funding to pursue climate change adaptation programmes and projects. Ghana requires USD 4.21 billion (34%) at the national level and USD 8.29 billion (66%) from international sources to meet the cost of implementing its adaptation actions, as stipulated in the Nationally Determine Contribution submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015. However, broader trends indicate a reduction in expectations and in official development assistance in absolute terms as donors' gross national incomes also falls. This will also cause a reduction in external finance for developing countries, including both public and private sector finance. Many countries and funding agencies have, as a result of the pandemic and the nature of associated impacts, turned inwards to manage their volatile economies.

1.2.5.4 Economic Outlook

The medium-term negative impact of the pandemic on growth will continue to be felt through low external demand, lower foreign direct investment, and decreased tourism receipts, according to the World Bank. Initial, baseline assumptions of low commodity prices, particularly of oil, led to growth projections of 1.4 % in 2021 and further to 3.6% by 2023 (average of 2.2% for 2021-2023). However, recent rapid recoveries of oil prices, complemented by the expected implementation of the Ghana CARES Program, will likely result in the realization of the upside scenario with 2021 projected growth of 4.2% and a medium term (2021-2023) average growth of 4.5%³⁴.

1.2.5.5 Fiscal Instruments that Support Climate Change in Ghana

Ghana has adopted strategies to pursue a variety of economic policy instruments that would support the mobilisation of US\$22.6 billion in investments from domestic, international, and private sources to implement the country's NDC for the ten-year period from 2020 to 2030. The government acknowledges that there is no single avenue from which the country can easily tap the funds. Moreover, grant financing is no longer a viable option because many development partners are shifting their overseas development assistance policy to favour more trade and investment than grant-making. Ghana has commenced a variety of investment portfolios like the Ghana Green Fund (GGF), a carbon pricing policy, green bonds, and Climate Innovation Centres to raise funds to support its climate action and make up for this shortfall.

1.3 Key legal and policy frameworks for climate change adaptation in Ghana

1.3.1 Legal Framework.

Ghana's economy is heavily reliant on climate-sensitive sectors such as agriculture which makes the protection and preservation of the natural environment a necessary pre-condition for the creation of a

³³ <https://www.worldbank.org/en/country/ghana/overview>

³⁴ <https://www.worldbank.org/en/country/ghana/overview>

resilient economy. From a regulatory perspective, there are a number of regulations in Ghana aimed specifically at managing human interactions with the environment. Article 257 of the 1992 Constitution provides a broad policy basis for the protection of the environment in Ghana. Subsequent to the 1992 National Constitution, the Environmental Protection Agency (EPA) Act, 1994 (Act 490) was passed. The Act established the Environmental Protection Agency (EPA) with the authority to act on environmental protection in Ghana.

The Environmental Assessment Regulations (EAR) were adopted in 1999, pursuant to the EPA Act. Primarily, the EAR (amended in 2002) requires that before the commencement of any activity which relates to the environment, such an activity or undertaking be registered by the EPA and an environment permit issued in respect of the undertaking.

The National Development Planning Commission Act, 1994 (Act 479) and the National Development Planning (System) Act, 1994 (Act 480), provide the core legal framework for the establishment of the Commission and the performance of its functions as a national coordinating body of the Decentralised Development Planning System in Ghana.

Besides these environmental management regulations, the government has been consistent in developing and implementing relevant climate adaptation laws and policies aimed at not only protecting the natural environment, but also reducing social and economic vulnerabilities to climate change impacts and building adaptive capacity to withstand both current and future climate change impacts. Some of Ghana's key climate adaptation policies across times are outlined below:

Table 1. Key policy frameworks for climate change adaptation in Ghana

Name of the policy, strategy, plan	Status (released)	Timeframe covered	Responsible institution	References to climate adaptation (yes/no)	Climate adaptation actions (yes/no)		
					identified	prioritized	costed
40-Year Socio-Economic Transformational Plan	2015	2018–2057	NDPC	Yes	No	No	No
National Decentralization Policy and National Decentralization Strategy	2020	2020-2024	IMCC	Yes	Yes	Yes	Yes
Ghana Shared Growth and Development Agenda I & II	2010	2010–2017	NDPC, MoF	Yes	Yes	Yes	No
National Planning and Budgeting Guidelines	2014	2014–2019	MoF, NDPC	Yes	No	No	No
Sector and Districts Guidelines on Mainstreaming Climate Change	2013	n/a	MESTI, DA, NGOs, RCC	Yes	Yes	Yes	No
National Climate Change Policy	2012	2012–2020	MESTI	Yes	Yes	Yes	N/A
National Climate Change Master Plan	2015	2015–2020	MESTI	Yes		Yes	Yes
Nationally Determined Contributions	2015	2020–2030	MESTI	Yes	Yes	Yes	Yes
National Climate Change Adaptation Strategy	2010	2010–2020	EPA	Yes	Yes	Yes	No
Agenda for Jobs: Creating Prosperity and Equal Opportunity for All	2018	2018–2021	NDPC	Yes	Yes	Yes	No
Local Governance Act, 2016 (Act 936)	2016	N/A	MLGRD	Yes	Not sure	No	No
National Climate Smart Agriculture Food Security Action Plan	2016	2016–2020	MOFA	Yes	Yes	Yes	No
National climate Change and Green Economy Learning Strategy	2016	N/A	MESTI	Yes	Yes	Yes	Yes
National Migration Policy	2016		Mol	Yes	Yes	Not sure	Not sure
SECTORAL DEVELOPMENT							
Ghana Forestry Development Master Plan	2016	2016–2036	FC	Yes	Yes	Yes	No

National Ghana Forest and Wildlife Policy	2012		MLNR	Yes	No	No	No
National REDD+ Strategy	2016	2016–2035	FC	Yes	Yes	Yes	No
Food and Agricultural Sector Development Policy	2012		MoFA	Yes	No	No	No
Ghana's Medium-Term Agriculture Sector Investment Plan	2009	2009–2015	MoFA	No	No	No	No
National Environment Policy	2014		MESTI	Yes	No	Yes	No
National Water Policy	2007		MWRWH	Yes	Yes	Yes	No
National Health Policy	2007	2010–2013	MoH	No	No	No	No

1.3.2 International Conventions, Treaties and Multilateral Agreements

Over the past 60 years, Ghana has signed more than 40 multilateral agreements either as a signatory or a party. Ghana has ratified the three Rio Conventions: (a) United Nations Framework Convention on Climate Change (UNFCCC), (b) United Nations Convention on Biological Diversity (UNCBD) and (c) United Nations Convention to Combat Desertification (UNCCD); it has taken active steps to meet obligations under them. The Ministry of Environment Science, Technology, and Innovation (MESTI) is responsible for coordinating the implementation of these conventions. The EPA of Ghana directly oversees the implementation of these conventions and currently hosts focal persons of the UNFCCC and UNCCD.

As part of the approaches for the implementation of the Rio conventions, Ghana prepared the following documents: National Climate Change Policy, National Action Plan to Combat Desertification and National Biodiversity Strategy and Action Plan; these serve as guiding documents and approaches for national implementation actions. As a party to the Kyoto protocol, Ghana has put in place many structures to support its implementation at the national level and has also joined the following international multilateral agreements.

- Paris Agreement
- Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer
- Minamata Convention on Mercury

2 CLIMATE IMPACTS, RISKS AND VULNERABILITIES

2.1. Recent Climate Hazards and Extreme Events

Over the past five decades, Ghana has witnessed a significant number of climate hazards, including at least three (3) major droughts and nineteen (19) flooding events.³⁵ These have been significant national events that have taken place at different parts of the country. By estimation, these extreme events are believed to have affected over sixteen million people and resulted in at least 444 deaths—excluding those undocumented. Flooding for example is ranked the second highest natural disaster after epidemics in Ghana. Economic losses caused by flooding alone between 1900 and 2014 is believed to be approximately US\$780,500,000.³⁶ Table 2 below provides a non-exhaustive list of climate disasters in Ghana.

Table 2. Flood and drought events that have occurred in Ghana

Year	Disaster description	Regions affected	Total deaths	Total people affected	Total damage (US\$)
1983	Drought	Countrywide	--	12,500,000	--
1991	Flood	Greater Accra	5	2,000,000	--
1995	Flood	Greater Accra	145	700,000	12,500,000
1999	Flood	Northern, Upper East, Upper West	52	324,602	21,000,000
2007	Flood	Northern, Upper East, Upper West	56	332,600	--
2008	Flood	Northern	--	58,000	--
2009	Flood	Greater Accra, Ashanti, Volta, Western, Central, Eastern	16	19,755	--
2009	Flood	Northern	24	139,790	--
2010	Flood	Greater Accra, Central, Volta	45	7,500	--
2010	Flood	Brong Ahafo, Eastern, Western, Upper East, Upper West, Northern	18	9,674	--
2011	Flood	Eastern	6	12,571	--
2011	Flood	Greater Accra, Eastern, Volta	14	81,473	--
2013	Flood	Northern, Volta	5	25,000	--
2015 ³⁷	Flood	Greater Accra	150	5,000	12,000,000
2016	Flood	Greater Accra	10	--	--
2018	Flood	Greater Accra, Ashanti	14	34,076	168,289

³⁵ In this report, the term hazard usually refers to climate-related physical events or trends or their physical impacts.

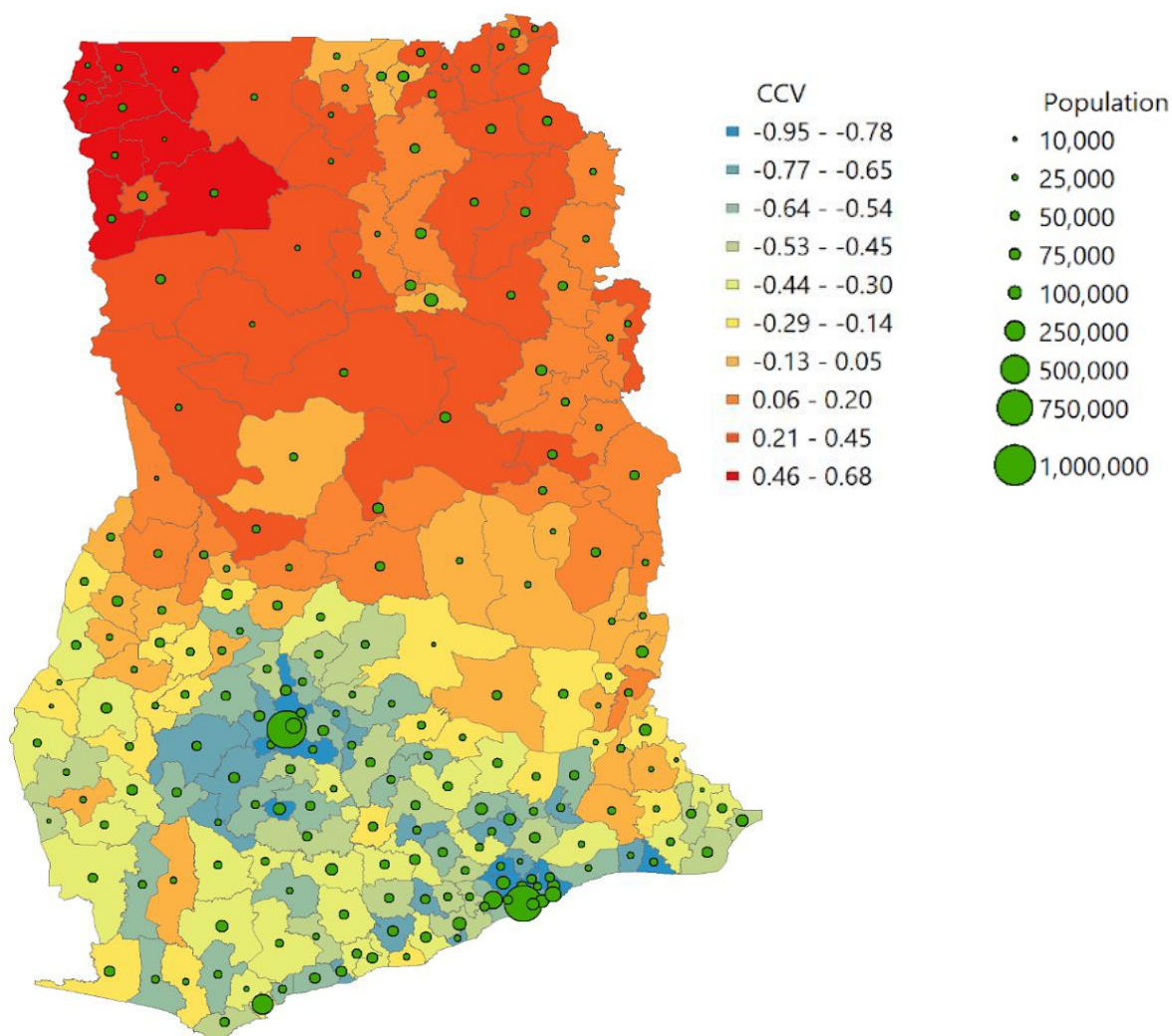
³⁶ Asumadu-Sarkodie, S., Owusu, P. A., & Jayaweera, M. (2015). Flood risk management in Ghana: A case study in Accra.

³⁷ <https://doi.org/10.1155/2020/4230627>

Source: Ghana's Fourth National Communication to the United Nations Framework Convention on Climate Change, 2020³⁸

2.2. Vulnerabilities³⁹

An assessment of climate change vulnerability across the country shows an increasing vulnerability as one move from the coast (Tropical Rainforest and Coastal Savannah zones) into the transition zone (Semi-deciduous Forest and Transitional Zone) and the northern savanna zones (Guinea Savannah and the Sudan Savannah), as shown in Figure 2. The assessment shows that the Upper West region of the Guinea Savannah zone is the most vulnerable agro-ecological zone, while the three least vulnerable regions were the Greater Accra (Coastal Savannah), Ashanti (deciduous Forest) and Central (Coastal Savannah) Regions.



³⁸ https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf

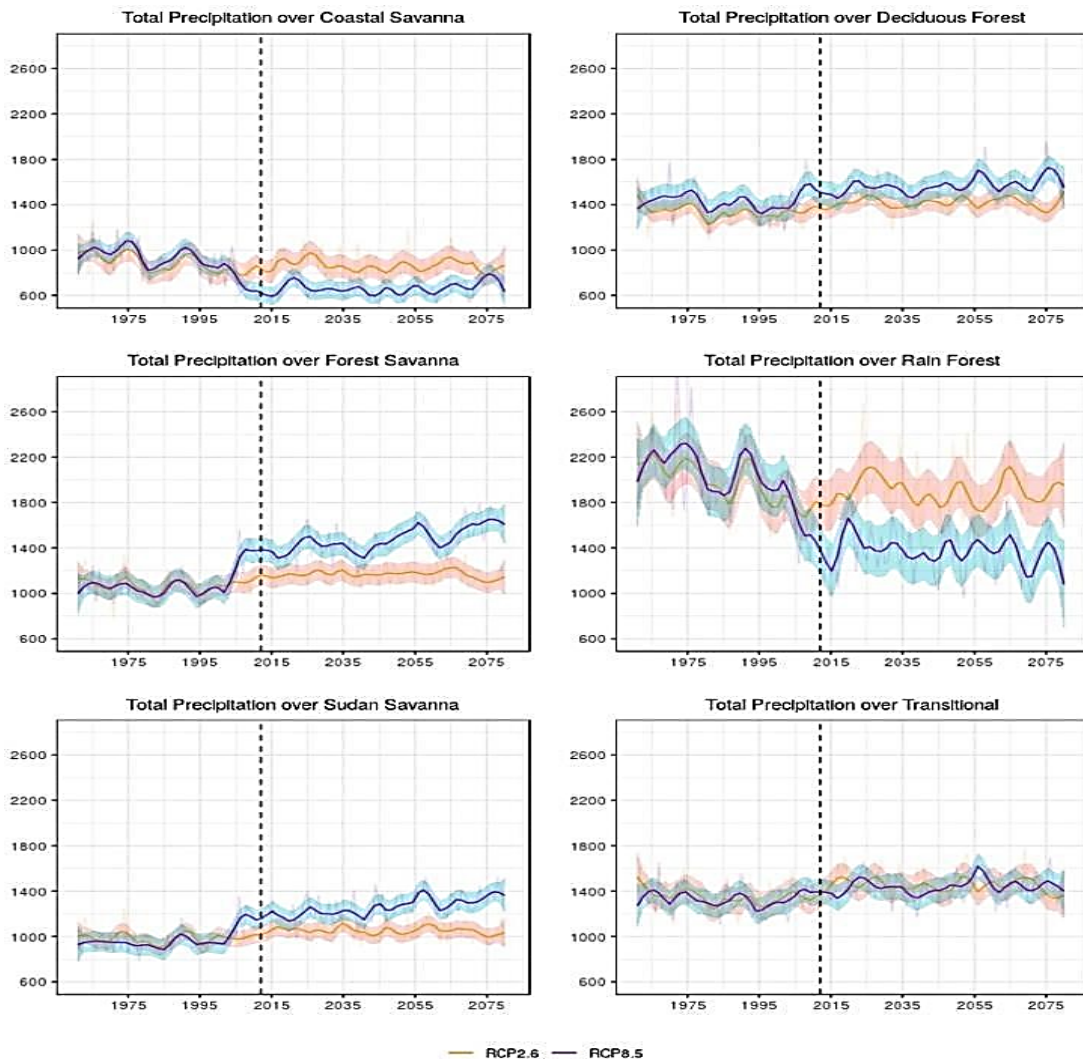
³⁹ https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf

Figure 2: Climate change vulnerability scores for Ghana’s 216 districts across 6 ecological zones. Source: Ghana’s Fourth National Communication to the UNFCCC, 2020.

2.3. Modelling, projections, and scenarios of future risks

Climate Models, projections and scenarios provide insight into the current and future climate change in Ghana. Although a range of climate scenarios are recommended, Ghana’s analysis employs the projections for the low emission scenario (RCP2.6) and the high emission scenario (RCP8.5). Also, CORDEX⁴⁰ models, instead of the AMMA model⁴¹ were used due to the former’s higher resolution and better performance. The summary below provides the projections for three time periods: 2015-2040, 20241-2060, and 2061-2080, using 1980-2014 as baseline for precipitation (Figure 3) and temperature (Figure 4) across the six agro-ecological zones.

2.3.1 Precipitation



⁴⁰ Coordinated Regional Climate Downscaling Experiment. The downscaling is performed using multiple regional climate models.

⁴¹ African Monsoon Multidisciplinary Analysis. <https://www.amma2050.org/>

Figure 3: Past and future rainfall patterns in six agro-ecological zones of Ghana. The pink and blue lines are showing the mean trend in rainfall. The enveloped around mean line shows the degree of variability of change in the past and future climate as indicated by the dotted vertical line. Source: Ghana’s Fourth National Communication to the UNFCCC, 2020.

Future projections of precipitation are substantially more uncertain than projections of temperature or sea level rise. The coastal zone projections indicate a likely reduction in rainfall at varying degrees over the analysis period (see Figure 3). The level of reduction would be smaller in the near future. The rainfall reduction is likely to be larger in the mid-future, whereas the far future would experience a marginal decline. In the deciduous forest, rainfall is projected to be high for both scenarios. In the Guinea Savannah, the overall rainfall is likely to increase but very high in the far future. Rainfall patterns in the rain forest are expected to decline significantly. Like the projected rainfall pattern in the Guinea Savannah zone, significant increase in the rainfall amount is expected with a higher amount for RCP 8.5 than RCP 2.6. In the transitional zone, only a marginal increase in rainfall is projected for both RCP 2.6 and RCP 8.5.

2.3.2 Temperature

Figure 4 below shows the present and projected average temperature across Ghana. The projections revealed a high likelihood of temperature increases to an average of 30°C across all the agro-ecological zones by the year 2080. Towards the far future, the Coastal Savanna and Sudan Savanna areas are likely to record average temperatures of above 30°C under the RCP 8.5 scenario.

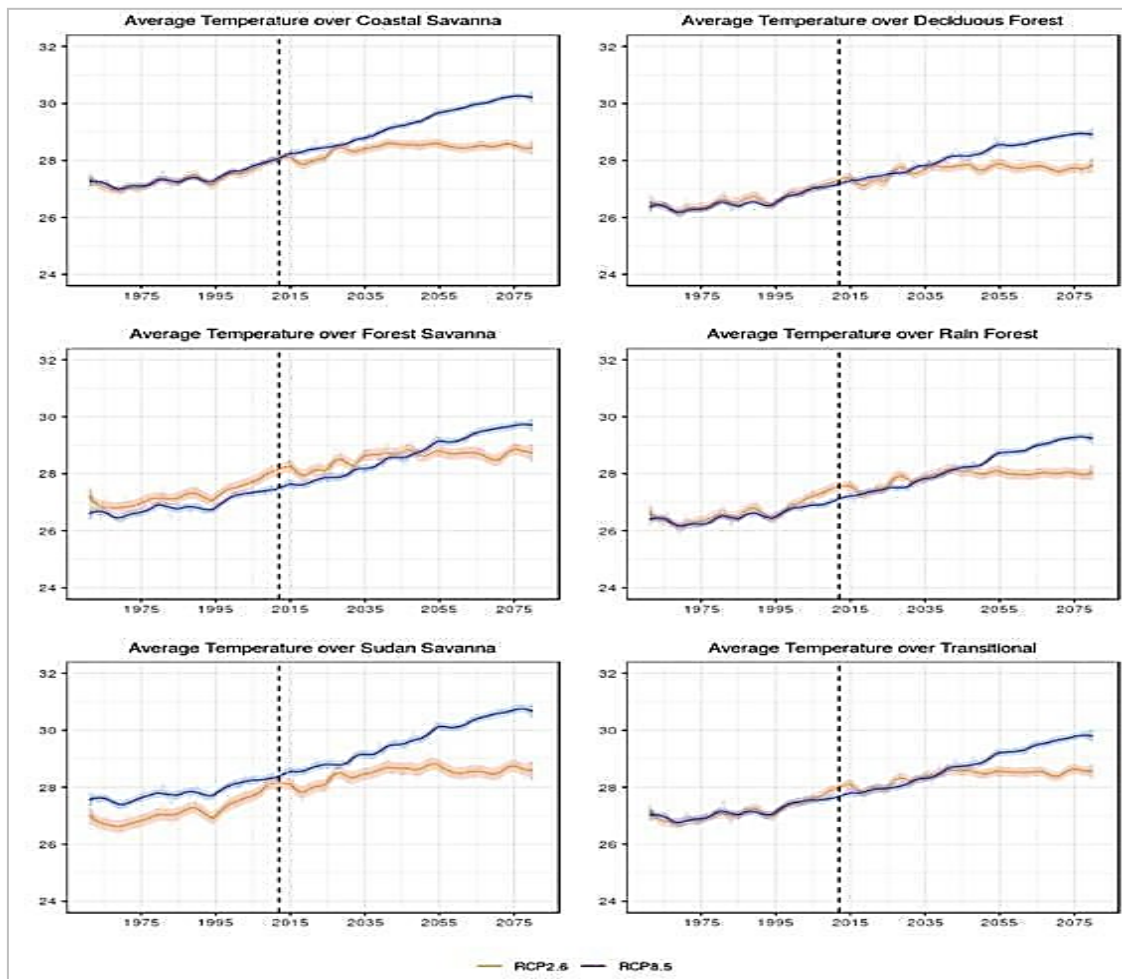
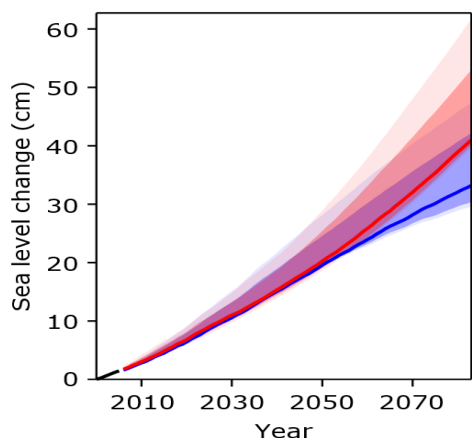


Figure 4: Past and future temperature patterns in six agro-ecological zones of Ghana. The pink and blue lines show the mean trend in

temperature. The enveloped around mean line shows the degree of variability of change in the past and future climate as indicated by the dotted vertical line. Source: Ghana’s Fourth National Communication to the United Nations Framework Convention on Climate Change, 2020.

2.3.3 Sea Level Rise⁴²



Sea level along Ghana’s coasts are expected, under RCP6.0, to rise by 39 cm by 2080 (GIZ, 2019). Under RCP6.0 and compared to year 2000 levels, the median climate model projects a sea level rise by 11 cm in 2030, 20 cm in 2050, and 39 cm in 2080. The risk profile is based on data and analysis generated as part of the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP).

Figure 5. Sea level rise projections for the coast of Ghana for different GHG emissions scenarios, relative to the year 2000. Source: Climate Risk Profile: Ghana (2019) by GIZ.

2.4 Assessments of social and environmental vulnerabilities and risks

2.4.1 Key Environmental Vulnerabilities

Climatic and non-climatic stressors pose a serious threat to Ghana's ecology and distribution of its tropical ecosystems. Human activities, mainly agriculture and illegal and unselective logging, accounts for 85% degradation of Ghana's Guinea Forest Region, a severely threatened World Biodiversity Hotspot⁴³. Ghana's protected forest reserves have suffered average annual deforestation rates of 0.7%, 0.5%, 0.4%, and 0.6% for the periods 1990–2000, 2000–2005, 2005–2010 and 2010–2015, respectively⁴⁴. Population growth puts additional stress on Ghana’s biological diversity with the majority of the population depending on ecosystem services, e.g., for income generation, as sources of food security, or as physical shelter.

Climate change threatens to reduce agro-ecological productivity, including through the loss of indigenous species and biodiversity. It is reported that some 295 indigenous crop varieties are endangered and are potentially close to extinction due to a growing shift towards more climate-resilient varieties as a form of climate change adaptation by Ghana’s farmers⁴⁵.

Model projections of species richness (including amphibians, birds, and mammals) and tree cover for Ghana showed volatility in species richness between 2030 and 2050 under RCP6.0 which suggest a high

⁴² <https://www.adaptationcommunity.net/wp-content/uploads/2019/12/Climate-risk-profile-Ghana.pdf>

⁴³ Arcilla, N., Holbech, L. H., & O’Donnell, S. (2015). Severe declines of understory birds follow illegal logging in Upper Guinea forests of Ghana, West Africa. *Biological Conservation*, 188, 41-49.

⁴⁴ Acheampong, E. O., Macgregor, C. J., Sloan, S., & Sayer, J. (2019). Deforestation is driven by agricultural expansion in Ghana's forest reserves. *Scientific African*, 5, e00146.

⁴⁵ <https://www.adaptationcommunity.net/wp-content/uploads/2019/12/Climate-risk-profile-Ghana.pdf>

sensitivity of species survival and population recovery to natural climate variability. Although overall model projections paint a positive picture for climate change impacts on ecosystems and biodiversity, it is important to note that the model projections exclude any impacts on biodiversity loss from human activities such as land use, which have been responsible for significant losses of global biodiversity in the past and are expected to remain the main driver of biodiversity loss in the future⁴⁶.

Ghana's marine ecosystem is also faced with a multi-faceted vulnerability with or without consideration of climate change. Fleet growth, gear improvement, and technological innovation and adaptation have acted in concert with a lack of research, management, and regulation to deplete the fishery. Climate change-induced sea temperature increases could exacerbate existing problems by disrupting the timing and intensity of the coastal upwelling which could in turn dramatically reduce productivity in all sectors of the Ghana's fisheries.

2.4.2 Key Social Vulnerability

The populations of the Upper East, Upper West, and Northern administrative regions have the highest overall social vulnerability to climate change; these regions, lying in the Sudan and Guinea savanna ecological zones, have a much higher incidence of poverty than other regions of Ghana, and doubled (Upper East, Upper West) or tripled (Northern) in population density between 1960 and 2000. Socio-economic factors such as high illiteracy level, heavy dependence on climate-sensitive livelihoods, less diversification of income sources and limited access to climate change information contributed to the high vulnerability level of the Sudan and Guinea Savanna ecological zones. The eastern portion of Brong Ahafo Region and both the far northern and southern-most districts of Volta Region also exhibit high social vulnerability to climate change. Typically, those living in urban districts are less vulnerable than rural districts. The Forest-Savanna Transition Zone has the next highest social vulnerability to climate change in Ghana, following the northern savanna zones⁴⁷.

2.5 Sectoral impacts assessment

2.5.1 Agriculture

Agriculture sector is usually divided into 4 subsectors, which are crops (including cocoa), livestock, forestry, and logging & fishing. Production of food crops by smallholder farmers has increased in recent years but is still characterized by low productivity due to a number of factors such as poor extension services, aging farmers and lack of finance for investment in better inputs.

Most agricultural production in Ghana rely on small, rainfed plots that are highly vulnerable to the impacts of climate change. Erratic precipitation patterns have severe consequences on production, as only 2% of the country's irrigation potential has been tapped. Rising temperatures are projected to lower yields in major staple crops (cassava, yams, plantains, maize, and rice). Cassava yields, for example, are projected to fall by 29.6% by 2080 and maize yields by 7% by 2050⁴⁸. Total crop failure is expected to occur approximately once every five years in Ghana's northern region due to delayed or diminished rains. Cocoa, a major cash crop and Ghana's second leading foreign exchange earner, is sensitive to rising temperatures

⁴⁶ IPBES (2019); <https://doi.org/10.5281/zenodo.3553579>

⁴⁷ <https://www.climatelinks.org/resources/ghana-climate-change-vulnerability-and-adaptation-assessment>

⁴⁸ https://www.adaptationcommunity.net/wp-content/uploads/2021/02/GIZ_Climate-risk-profile-Ghana_EN_Final.pdf

and drought. Areas suitable for cocoa production, which lie primarily along the coast, are contracting as temperatures rise, floods increase, and soil salinization and coastal erosion continue. Projections suggest yield losses may become more severe as interannual rainfall variability increases and the length of the growing season shortens⁴⁹.

2.5.2 Livestock

The livestock subsector contributes significantly to the agricultural GDP, 14% in 2018⁵⁰. Livestock is a key asset for poor people, fulfilling multiple economic, social and climate change adaptation functions through provision of alternative livelihood. For rural communities, losing livestock assets could trigger a collapse into chronic poverty and with significant impacts on livelihoods. The direct effects are due primarily to increased temperatures and frequency and intensity of heat waves and changing rainfall patterns, which could translate into the increased spread of existing vector-borne diseases and microparasites, accompanied by the emergence and circulation of new diseases.

2.5.3 Fisheries

Seafood is an important part of the Ghanaian diet and economy, accounting for 40–60% of the population's protein intake and contributing 4.5% to national GDP⁵¹. The sector primarily comprises marine fisheries with some inland, freshwater fisheries in Lake Volta, Lake Botsumtwi and other reservoirs. Rising sea surface temperatures are expected to alter migratory patterns and reproductive cycles of key species such as anchovies, sardines, tilapia and catfish. The decline in fisheries sector productivity from climate variability and overfishing forces Ghana to spend over \$200 million per year on seafood imports to satisfy domestic demand⁵².

2.5.4 Water Resources

Almost half of the water used in Ghana originates from three international rivers: The Volta, Bia and Tano. These rivers flow into Ghana from outside its borders, putting the country at risk of water insecurity if political tensions increase over declining water availability. A good example of such risks is

Burkina Faso's decision to withdraw water from the Volta Basin, reducing water levels required for hydropower generation in Ghana has been very impactful downstream. A recent study projected flows in the Volta Basin could fall by 24% by 2050 and 45% by 2100 due to reduced rainfall and increased evaporation. About 25% of the population does not have access to clean water, and declining rainfall levels, drought and rising temperatures are straining available water resources amidst increased demand from households, agriculture, and industry⁵³.

⁴⁹https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

⁵⁰ <https://www.mofep.gov.gh/sites/default/files/pbb-estimates/2020/2020-PBB-MoFA.pdf>

⁵¹https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

⁵²https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

⁵³https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

2.5.5 Energy

Hydropower generated from the Akosombo, Kpong and Bui dams provides approximately 38% of Ghana's national generation capacity⁵⁴. The Volta River Authority, responsible for Ghana's state-owned hydro and thermal generation, tries to balance water levels in Lake Volta in response to increased evaporation and unpredictable rainfall in this transboundary catchment. Accommodating these risks along with reduced supplies of natural gas results in erratic power production. Frequent outages, the most severe of which occurred in early 2015 when power was interrupted for up to 36 hours at a time, have real economic consequences. GDP growth fell from 8.8% in 2012 to 3.9% in 2015, in part due to insufficient power from the grid. A recent study on projected water losses in the Volta Basin due to climate change found that there will only be enough water for hydroelectric facilities to perform at 50% of current capacity by 2050⁵⁵.

2.5.6 Human Health

Projections by the WHO (2015)⁵⁶ shows that the number of days of warm spell in Ghana to dramatically increase from about 10 days in 1990 to about 280 days on average in 2100 under a high emissions scenario. Heat-related deaths among the elderly (65+ years) are projected to increase to almost 70 deaths per 100,000 by 2080 compared to the estimated baseline of under 2 deaths per 100,000 annually between 1961 and 1990. Climate change is expected to increase the risks and impacts associated with vector- and waterborne diseases, which are already prevalent in Ghana. This will be particularly true in densely populated urban areas where temporary settlements lack access to clean water and sanitation. Access to improved sanitation is low overall (20% of the urban population and 9% of the rural population), and severe flooding has led to several recent cholera outbreaks – the worst of which occurred in 2014, with nearly 15,000 cases reported across 8 of the country's 10 regions⁵⁷. Malaria, which affects 50% of children in Ghana, is likely to increase in the short term due to increasing temperatures and flooding (particularly in coastal urban areas)⁵⁸.

⁵⁴ <https://www.energymin.gov.gh/sector-overview>

⁵⁵ https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

⁵⁶ WHO (2015). Climate and Health Country Profile – Ghana ; <https://apps.who.int/iris/handle/10665/208862>

⁵⁷ https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf

⁵⁸ https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile%20-%20Ghana.pdf



3 NATIONAL ADAPTATION PRIORITIES, STRATEGIES, POLICIES, PLANS, GOALS AND ACTIONS



3.1 National long-term adaptation objectives

Recognizing the critical importance of climate change to national development planning, and also mindful of its international obligations as Party of the UNFCCC, the Government of Ghana has at various times put in place policies that aim to respond to the growing threats posed by climate change. The different policies have been complementary and are all aimed at building adaptive capacity at multiple levels, as well as using them as additional avenues to enhance Ghana's sustainable development efforts. At the multilateral level, these policies reaffirm Ghana's commitment and resolve to support global climate adaptation actions that define sustainable pathways that safeguard the collective interest of all nations, as well build adaptive capacity at different levels.

Prominent among Ghana's adaptation policy initiatives are the National Climate Change Adaptation Strategy (NCCAS, 2012), the National Climate Change Policy (NCCP, 2013), the Nationally Determined Contributions (NDC, 2015), and the National Climate Change Master Plan Action Programmes for Implementation (2015–2020). These different, but interrelated policies have built on each other at different times and are currently being consolidated in Ghana's National Adaptation Planning (NAP) program, which is providing the needed implementation pathways at multi-levels and diverse sectors for proactive and effective medium to long-term adaptation planning in Ghana.

The National Climate Change Adaptation Strategy clearly spells out Ghana's adaptation priorities and provides the requisite strategic guidelines towards their achievement. It does so by highlighting Ghana's key climate-sensitive sectors and associated vulnerabilities and the needed adaptation actions. These actions are further affirmed in the National Climate Change Policy, which provides the overarching strategic direction that synthesizes national aspirations for adaptation and mitigation. Most importantly, perhaps, the NCCP synthesizes Ghana's adaptation and mitigation ambitions in more coherent ways while advocating for mutual beneficial approaches between adaptation and mitigation to maximize associated co-benefits.

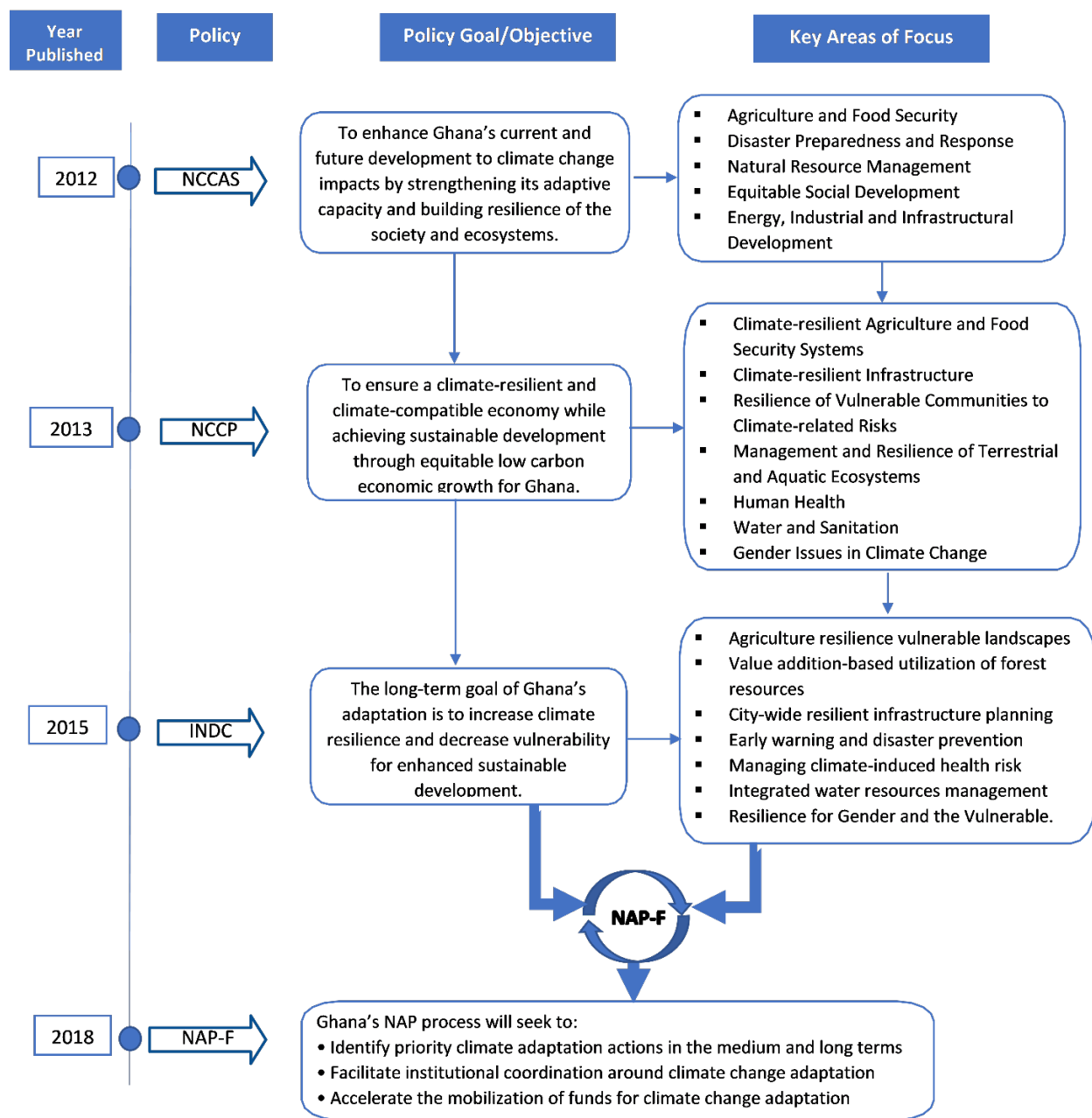


Figure 6. Ghana's key adaptation policy interventions: 2012 to 2018 (Why do we have two figure 6 above?? There is disorganization in structure)

Three key objectives guide the NCCP: (1) effective adaptation; (2) social development; and (3) mitigation. Specific to adaptation, the NCCP foregrounds four thematic areas: (1) energy and infrastructure; (2) natural resources management; (3) agriculture and food security; and (4) disaster preparedness and response. These are broad thematic areas distinct in their appearance, but complexly interconnected in

impact manifestation. They are linked with eight (8) policy areas carefully designed to ensure coordinated adaptation actions to be undertaken in a time-bound and budgeted manner. The focus areas are:

- Policy Focus Area 1: Develop Climate-resilient Agriculture and Food Security Systems
- Policy Focus Area 2: Build Climate-resilient Infrastructure
- Policy Focus Area 3: Increase Resilience of Vulnerable Communities to Climate-related Risks
- Policy Focus Area 5: Improve Management and Resilience of Terrestrial and Aquatic Ecosystems (including Marine Ecosystems)
- Policy Focus Area 6: Impact of Climate Change on Human Health
- Policy Focus Area 7: Minimize the Impact of Climate Change on Access to Water and Sanitation
- Policy Focus Area 8: Gender Issues in Climate Change.

The policy outlines sector-specific impacts and vulnerabilities while also discussing potential economic opportunities that may emerge from changing climatic conditions and from a green economy perspective. In highlighting the green economy imperative in adaptation, Ghana's NCCP also makes direct linkages between the cultural, social, environmental, and economic benefits underpinning intentional and well-planned adaptation that takes into consideration Ghana's anticipated 40-year socio-economic transformational plan and the Sustainable Development Goals (SDGs). The policy discusses how an effective and proactive national adaptation planning agenda may contribute to key national development targets. The NCCP was subsequently revised into the National Climate Change Master Plan, which ran from 2015 to 2020 and it's currently undergoing review

Complementing both the NCCS and the NCCP is Ghana's Nationally Determined Contributions (NDC) which reaffirms Ghana's commitment towards its international climate change obligations under the Paris Agreement. Ghana's NDCs, which is currently under review, highlights Ghana's long-term mitigation and adaptation goals and how they provide synergistic avenues to reduce sector-wide vulnerabilities, build resilience, and enhance overall efforts towards a green economy and a climate-resilient sustainable development. The NDC commits to 11 priority policy goals towards adaptation and spells out the needed investments for their implementation. Out of a total USD 12.79 billion required, Ghana has committed to unconditionally mobilize USD 4.21 billion (34%) at the national level while the remaining USD 8.29 billion is to be mobilized through international multi-lateral sources. Different adaptation actions are underway and are currently being consolidated by the National Adaptation Planning (NAP) program, which is providing a framework for the implementation of Ghana's policies on climate adaptation and resilience building.

3.2 The NAP Process in Ghana

Ghana's National Adaptation Planning (NAP) process is guided by a National Adaptation Plan Framework (NAP-F), developed, and published in 2018. The NAP Framework outlines the country's vision for adaptation and establishes the implementation road map and stakeholder engagement architecture needed for the achievement of Ghana's planned adaptation goals. The principal organizing objectives of Ghana's NAP-F are to:

- Clarify the national approach to its NAP process.
- Align the NAP process to existing policies, strategies, programs, and adaptation research.
- Identify specific adaptation themes that are particularly relevant to the country context.
- Serve as a basis for stakeholder engagement.

The NAP Framework adopts a sectoral approach and is coordinated by the Environmental Protection Agency (EPA) of Ghana, which is leading the development of an overarching NAP document, which will prioritize key climate-sensitive sectors such as agriculture, forestry, water, energy, gender, and health.

3.3 Towards National Adaptation Planning

The current approach to climate adaptation planning in Ghana encourages cross-sectoral and inter-agency collaborative actions that integrate adaptation imperatives into policies, programmes and plans. The government's vision is to facilitate the mainstreaming of adaptation into national policies at all levels, particularly at the sub-national governance levels where District and Municipal Assemblies, serving as local government, are being assisted to lead the process of mainstreaming adaptation planning in their medium to long-term development plans.

As part of this process, a National Climate Change Committee (NCCC), hosted by MESTI, has been created to provide the necessary strategic engagement, communication and coordination support systems across government ministries and sectors. These systems are further strengthened by the creation of Climate Change Units in key government ministries such as Energy, Forestry, Agriculture, Health, and Gender, which serve as channels for managing specific climate change issues in government ministries, departments, and agencies (MDAs). The overall technical coordination of climate change activities in Ghana falls under the direct remit of the EPA, under MESTI. The EPA leads both mitigation and adaptation policy implementation in Ghana and are currently leading NAP process.

Ghana submitted its NAP Readiness Proposal to the GCF in October 2017 to seek support to advance its climate adaptation planning efforts. The main objective was to enhance institutional coordination and to strengthen the capacity of Ghana's government at all levels to implement a NAP process, including budgets and timelines. This was done in the spirit of decision 5/CP.17 (UNFCCC, 2012) and in line with the UNFCCC NAP Technical Guidelines, developed by the Least Developed Countries Expert Group (LEG) (2012). The approved Readiness Proposal has allowed the government to launch its NAP process, which aims at producing a costed adaptation plan for the country as well as providing the tools, mechanisms, systems, and information with which to update adaptation planning at regular intervals. Central to this process is the empowerment of local governance institutions and structures and the mainstreaming of adaptation into sector and district development plans.

Ghana launched its NAP Readiness Project in 2020. The goals guiding Ghana's NAP process are to:

- Identify priority climate adaptation actions in the medium and long term
- Facilitate institutional coordination around climate change adaptation
- Accelerate the mobilization of funds for climate change adaptation

As outcomes, the NAP process is expected to create:

- Central-level systems and processes to guide the NAP
- District-level systems and processed
- Enabling environment to promote private sector investment in adaptation strengthened
- Learning about the NAP process disseminated

3.4 Institutional Arrangements for Ghana’s NAP Process

There are a number of existing national institutions and private organizations in Ghana who play leading roles in climate change issues in the country. These include government, the private sector, the research community, civil society organization and bilateral and multilateral donor partners. The NAP process is anchored on the country’s existing institutional and legal frameworks that facilitate effective coordination and program planning across sectors. Figure 7 highlights the institutional arrangement for the NAP in Ghana.

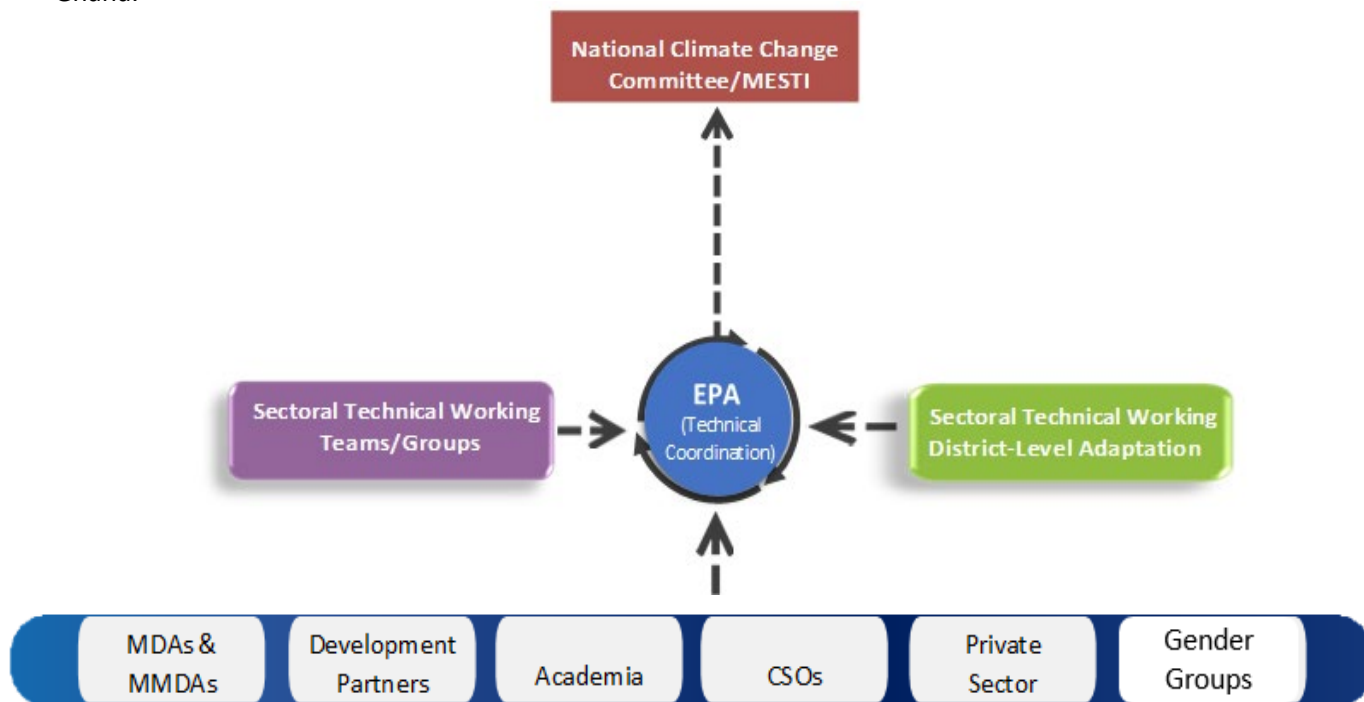


Figure 7. Institutional Arrangements for Ghana’s NAP Process

The National Climate Change Committee (NCCC)/MESTI: The NCCC was formed in 2012 as a strategic body to coordinate the planning, implementation and monitoring of climate change policies and programs at the highest level. The NCCC has its Secretariat at the Ministry of Environment, Science, Technology, and Innovation (MESTI). The NCCC plays an overall strategic supervisory role for the NAP process in Ghana. The NAP Project Steering Committee reports to and take guidance from the NCCC through the Executive Director of the EPA.

The Environmental Protection Agency (EPA): The EPA is responsible for the coordination of UNFCCC-led policies and programs on behalf of the MESTI. It is the technical arm of MESTI responsible for environmental protection and climate action in Ghana. With rich experience in international reporting and coordination, the EPA coordinates the entire NAP process to ensure that the various actors, including the MDAs, MMDAs, the private sector and CSOs perform their given roles and achieve their mandates in a timely and effective manner.

Ministries, Departments and Agencies (MDAs) and Metropolitan, Municipal and District Assemblies (MMDAs): Climate change is cross-sectoral in nature and requires a collaborative effort to address it. Many sector ministries and departments and many other sector institutions have diverse roles to play in

the coordination, planning, implementation as well as the monitoring phases of the NAP process in Ghana. These include the MESTI, the Ministry of Food and Agriculture (MoFA), Ministry of Water and Sanitation, Ministry of Lands and Natural Resources, the National Disaster Management Organization (NADMO), Ministry of Finance (MoF), Ministry of Local Government and Rural Development (MLGRD), the Forestry Commission (FC), the Energy Commission (EC), Water Resource Commission (WRC), the Ghana Meteorological Agency (GMet), and various academic and research institutions. Although the National Development Planning Commission is part of the MDAs, it has a special role in coordinating adaptation planning and mainstreaming at the district level. The local government system already has an existing well-defined and decentralized structure in place through the district assembly system, which facilitates the effective and coordinated mainstreaming of climate change adaptation. The NAP process will use this existing structure for district-level action, community engagement and feedback.

Technical Working Groups: Ghana's NAP process is currently using a cross-sectoral policy approach to ensure a robust and efficient output. This approach is also anticipated to generate the buy-in needed for effective implementation of the NAP. Five technical working groups, or cross-sectoral planning groups (CSPGs), focusing on health, infrastructure (water, energy & transport), agriculture and forestry, disaster risks and cities, and private sector with each consisting of a dozen representatives from government, private sector, civil society organizations and academia has been established.

The Private Sector: The NAP process in Ghana will harness the potential of the private sector to contribute to adaptation and climate risks reduction, recognizing the relevant role the private sector plays and will continue to play in both achieving Ghana's sustainable development agenda and realizing its nationally determined contributions (NDCs) to the Paris Agreement. This includes the important role they will play in adaptation planning, financing, implementation, and M&E.

Civil Society Organizations (CSOs): The Government of Ghana sees CSOs as strategic partners for adaptation and development. The NAP process in Ghana will actively engage the CSO community in planning, advocacy, education, and awareness raising, evidence-based research, implementation, as well as monitoring and evaluation of adaptation efforts at various levels in the country.

Gender: Ghana's NAP process gives issues of gender participation special attention. While this focus fulfills international and national policy calls for equity in participation of adaptation planning, decision making and implementation, Ghana's NAP has taken this requirement a step further by creating a Gender office at the secretariat. This office is staffed by a gender specialist who has been specifically recruited to ensure the NAP is gender-responsive.

Development Partners: International collaborations and partnerships are key to successful adaptation actions in any country. Ghana's NAP process recognizes the role of the international community, especially development partners, as critical for resource mobilization, capacity development and technology development and transfer for current and future adaptation action. Specifically, Ghana will harness support from multilateral agencies, bilateral donors and south-south cooperation for in-country adaptation action and resilience building.

Steering Committee: The implementation of the GCF NAP project in Ghana is strategically guided by a Steering Committee (SC) with membership cutting across different levels to enhance inclusiveness in the NAP process. Membership of the NAP SC include representatives from academia, CSOs, women's groups, youth groups, the private sector, and public sector ministries, departments, and agencies (MDAs).



IMPLEMENTATION OF ADAPTATION ACTIONS AND PLANS

4



4.1 Progress and Results Achieved

Since 2010, Ghana has built incremental effort to enhance adaptation and ultimately build the resilience of ecosystems and the population. The government's efforts on adaptation have in part focused on providing the enabling environment (policies, plans, strategies, etc.) for effective adaptation in-country, as well as developing and implementing concrete adaptation projects which aim at supporting lives and livelihoods. This section reports on key milestones on Ghana's adaptation planning and mainstreaming journey since 2008 – the year of its first climate vulnerability assessment.

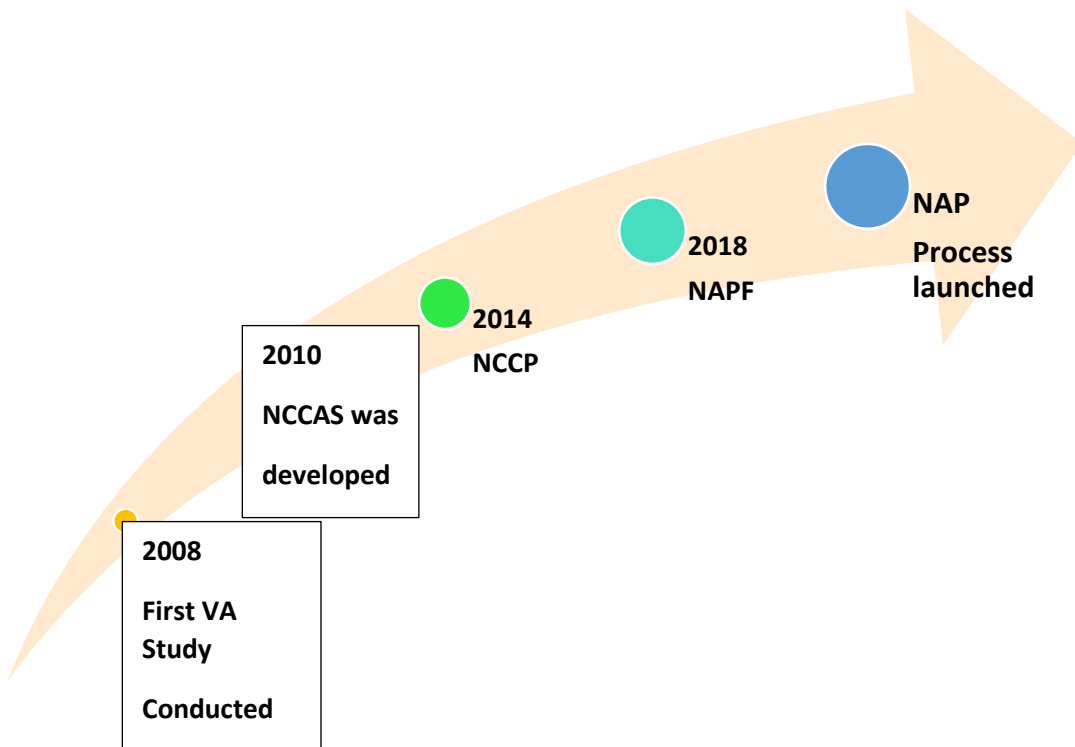


Figure 8. Key milestones in Ghana's Adaptation Planning journey

With support from the government of the Netherlands, Ghana conducted its first ever vulnerability assessment (VA) study in 2008 focusing on the following areas/sectors.

1. Climate scenarios development
2. Climate change impacts on root and tuber crop production
3. Climate change and poverty linkages
4. Climate change impact in land management
5. Climate change and human health
6. Climate change impact on fisheries production
7. Climate change impacts on women's livelihood
8. Climate change on cocoa production

The VA study became the foundation of several adaptation studies and projects including the national climate change adaptation strategy (NCCAS) and the "Ghana Goes Green" initiative, which led to the development the national climate change policy (NCCP) in 2013. To give meaning to Ghana's medium term development plan (MTDP)'s vision of enhancing climate action in the country's development discourse, the national climate change adaptation strategy was developed and published in 2012. It was also the country's first effort to transition developing and implementing medium to long term strategies to address climate change adaptation as part of the Cancun Mandate.

As an early attempt by Ghana to address climate change adaptation in a coherent and structured manner by looking at current and future adaptation gaps, the NCCAS was seen as a "blueprint" for addressing climate change adaptation in Ghana. The NCCAS made projections for the period 2010-2020 and had the goal of ***“enhancing Ghana's current and future development by strengthening its adaptive capacity with regard to climate change impacts and building the resilience of the society and ecosystems”***.

A crucial consideration of the NCCAS is to reduce vulnerabilities in the long-term and to ensure the development of a more holistic and integrated national adaptation strategy. Accordingly, the NCCAS was intended to achieve the following objectives:

- Ensure a consistent, comprehensive and targeted approach to increasing climate resilience and decreasing vulnerability of the populace.
- Deepen awareness and sensitisation for the general populace, particularly policy makers, on the critical role of adaptation in national development efforts
- Position Ghana to draw funding for meeting its national adaptation needs
- Strengthen international recognition of Ghana's vulnerabilities and priorities to facilitate action
- Facilitate the mainstreaming of climate change and disaster risk reduction into national development.

4.2. The NAP Process in Ghana

The global framework that sets the stage for the NAP process is the Cancun Adaptation Framework (2010). Domestically, the National Climate Change Policy (NCCP, 2013), the National Climate Change Adaptation Strategy (NCCAS, 2012), the National Adaptation Plan Framework (NAPF, 2018), and the Nationally

Determined Contributions (NDCs) have the primary goal of “enhancing Ghana’s current and future development to climate change impacts by strengthening its adaptive capacity and building resilience of society and ecosystems”. This provides the foundation for the the NAP process in Ghana.

The Government of Ghana has taken various actions to mainstream climate change into its national development planning process, and the NAP process aims to address climate change impacts from a more integrated, coordinated and sustainable manner.

In May 2019, the Government of Ghana successfully secured funding from the Green Climate Fund (GCF) under the NAP Readiness Support for developing countries to implement adaptation planning for a period of 36 months. This success saw the launch of Ghana’s NAP process in June 2020 and under the leadership of Prof. Kwabena Frimpong-Boateng, the then Minister of Environment, Science, Technology and Innovation (MISTI).

The NAP process has two main objectives: to reduce vulnerability to the adverse impacts of climate change by building adaptive capacity and resilience; and facilitate the integration of climate change adaptation into fiscal, regulatory, and development policies, programs, and activities. The GCF NAP Readiness funding certainly puts Ghana in a good position to get the NAP process off the ground ; however, the process is much longer and larger and will require additional on-going funding support to facilitate achievement of set objectives.

The NAP process embraces stakeholder engagement as key and has a governance structure that includes representatives from government ministries, departments, and agencies, metropolitan, municipal and district assemblies (MMDAs), and non-state actors including private sector, civil society organisations (CSOs), gender groups and youth constituencies. The process also recognizes the involvement development partners (DPs), traditional authorities and local communities.

NAP Project Governance Structure

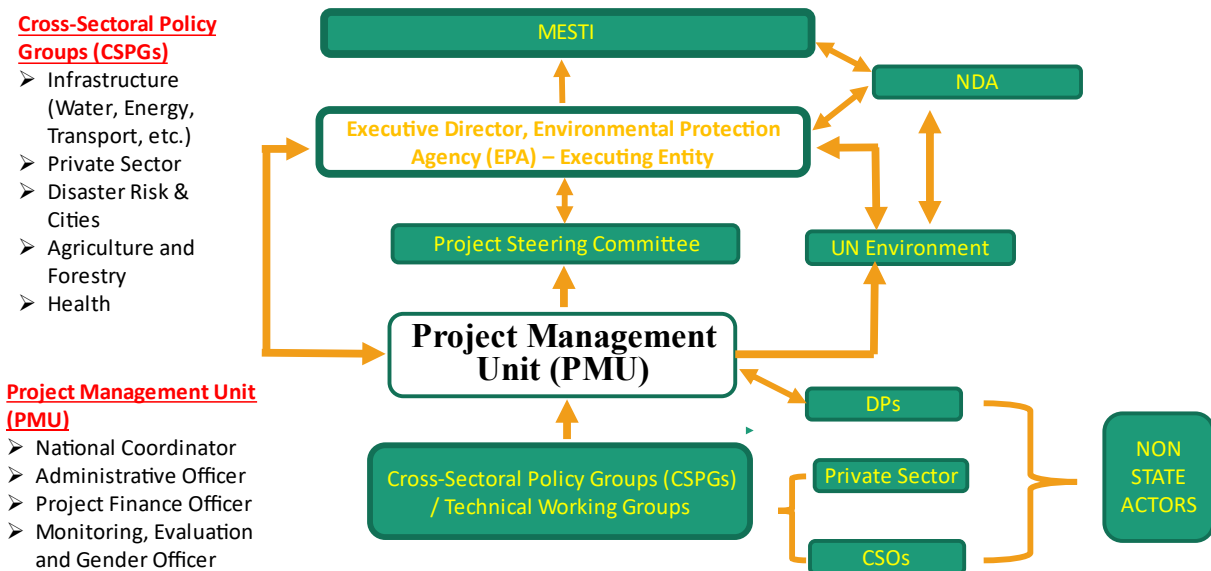


Figure 9. NAP Project Governance Structure

Ghana's vision for climate change adaptation planning is to advance sustainable development at the national and sub-national levels with continuous reference to climate resilience.

4.3. The Theory of Change of Ghana's NAP Process

The NAP process in Ghana is anchored on a Theory of Change that anticipates long-term transformation at different levels. The objective is to use established institutions, systems, and processes to build resilience in Ghana at all levels.

The rationale behind the Theory of Change is as follows:

- Improving the evidential basis of planning (scientific, economic, policy and regulatory needs) will help to build political support for the NAP.
- Establishing Cross Sectoral Policy Groups (CSPGs) will build ownership over the NAP process and the implementation of NAP priorities:
- This will be underpinned by developing better needs information for NAP action in respect of climate change projections, policy analysis gaps and successes, institutional barriers and opportunities and economic appraisal.
- Dedicated support to raising awareness among all levels of government, lawmakers and the private sector will provide the energy behind developing and implementing the NAP. Better information on risks and opportunities will be key to generating interest and political support.
- Supporting Districts to develop better evidence on vulnerability to climate change will motivate them to develop adaptation plans and to implement them via their regular planning and budgeting processes.

4.4. Main Approaches of the Ghana NAP Process

Ghana's NAP process uses a hybrid approach⁵⁹ to integrating climate adaptation considerations in policy and planning, with different planning processes happening in parallel: adaptation is simultaneously being considered at the national level, in some sector-specific planning, and to a lesser extent in selected local development plans. The current GCF NAP Readiness is intended to develop a national costed adaptation plan and ten district adaptation plans (DAPs) as a start. The national vision is to mobilize significant additional resources to increase adaptation planning efforts at the sub-national level, so that all 276 districts develop their plans. The approach adopted by Ghana in her NAP process include the following.

- i. Engaging the private sector
- ii. Gender-responsive approach
- iii. Horizontal and vertical integration
- iv. Community-based adaptation approach
- v. Prioritization of ecosystem-based adaptation approach
- vi. Anchoring adaptation planning with existing socio-economic development frameworks
- vii. Involving youth in climate change adaptation
- viii. Evidence-based climate change adaptation process

⁵⁹ The use of both horizontal and vertical integration approaches



5 GHANA'S ADAPTATION ACTIONS AND ECONOMIC DIVERSIFICATION PLANS, INCLUDING THOSE THAT RESULT IN MITIGATION CO-BENEFITS



The Ghanaian government has already made considerable strides, through policies, programmes and planning processes, to increase the resilience of the country and its population to the negative impacts of climate change. Recognizing the country's vulnerability to climate change, it is implementing several programmes and projects (at various stages of progress) across sensitive sectors to build resilience to the socioeconomic impacts of climate change. These programmes are generally driven by national circumstances and government policy priorities. The nature of the policies and associated programmes, however, open up opportunities for such programs to be used to fulfill the implementation requirements of existing policies, programs, commitments and actions, such as the NCCAS, NCCP, NDCs, SDGs, and the Sendai Framework for Disaster Risk Reduction. Of critical significance, among all these, is how the different government policy and program initiatives will contribute to meeting the climate adaptation components of Ghana's NDC, whose priority adaptation components are as follows:

- Agriculture and food security
- Sustainable forest resource management
- Integrated Water Resources Management
- Early Warning, Disaster Risk Management and Strengthening Climate Services.
- Building Resilience in Climate-Vulnerable Landscapes
- Climate change and human health
- Energy Sector Adaptation

5.1 Agriculture and Food Security

Ghana's agriculture sector comprises of crops, livestock, fisheries, and forestry. Crop and livestock are under the Ministry of Food and Agriculture (MoFA), while fisheries are under the Ministry of Fisheries and Aquaculture Development (MoFAD) and forestry under Ministry of Land and Natural Resources respectively. The broader policy instrument which embodies the Government of Ghana's vision for the agriculture sector is the Food and Agriculture Sector Development Policy (FASDEP II) (2007). There is also the more recent Investing for Food and Jobs (IFJ): An Agenda for Transforming Ghana's Agriculture (2018-2021), which was developed to operationalize the agricultural vision of the Government of Ghana, as outlined in the Medium-Term National Development Policy Framework (MTNDPF), which is entitled "Agenda for Jobs: Creating Prosperity and Equal Opportunity for All (2018-2021)".

The IFJ is the government's innovative flagship agricultural programme, and it is being implemented with several opportunities to support climate adaptation. It includes popular programmes such as the One Village One Dam (1V1D), One District One Warehouse (1D1W), One District One Factory (1D1F) and the Planting for Food and Jobs initiative. The much-touted Planting for Food and Jobs is a flagship agricultural campaign with five implementation modules which are: Food Crops (PFJ); Planting for Export and Rural Development (PERD); Greenhouse Technology Villages (3 Villages); Rearing for Food and Jobs (RFJ); and Agricultural Mechanization Services (AMSECs). These programmes specifically align with specific aspects of NCCAS, NCCP, SDGs and NDC. Examples of such policy and program convergences are as follows:

- Strengthen the capacity of local farmers to increase agricultural productivity, acquisition of alternative livelihoods skills, and cultivation of crops and rearing of animals adapted to harsh climatic conditions in the **NCCAS**.
- Develop the climate-resilient agriculture and food security systems programme area of **the NCCP**
- Achieve the Zero hunger goal of the **SDG1** and its targets: end hunger and ensure access by all people (target 2.1); double the agricultural productivity and incomes of small-scale food producers (target 2.3); ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production (target 2.4); and increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, etc. (target 2.A).
- Achieve the adaptation component of the **NDC** through policy actions around agriculture resilience building in climate-vulnerable landscapes.

These interventions are intended to address vulnerability to drought, erratic rainfall leading to crop and livestock failures, and losses which eventually affect agricultural productivity and food insecurity. They also contribute both directly and indirectly to job creation for local people and in the process enhance the adaptive capacity of women and vulnerable groups. The success of the agricultural sector is critical to the resilience of Ghana's economy as, for the most part, a lot of Ghana's industries depend on raw materials from the agricultural sector. Building resilience in agriculture is therefore necessary to address vulnerabilities in food security and also in local manufacturing industries.

5.2 Sustainable Forest Resource Management and Mitigation Co-benefits

Through partnership with the Forest Carbon Partnership Facility (FCPF), Ghana commenced REDD+ readiness activities in 2008 with the submission and acceptance of REDD+ Readiness Plan Idea Note (R-PIN) in 2010. This enabled Ghana to secure funding from the FCPF to support implementation of readiness activities commencing from 2012. The first draft of Ghana's REDD+ strategy was produced in 2014 with a focus on 13 strategic options on Policies, Actions and Measures (PAMs) to address REDD+. The strategy was further enhanced, finalized and launched in 2016 with a comprehensive analysis of the drivers of deforestation and forest degradation. The 2016 Strategy focuses on five priority REDD+ strategic options on PAMs covering a period of 20 years which will be subjected to review every five to seven years. Two of the five priority REDD+ strategic options were fully developed for funding support from FCPF Carbon Fund and Green Climate Fund (GCF). These are the Ghana Cocoa Forest REDD+ Program (GCFRP) and Ghana Shea Landscape Emission Reductions Project (GSLERP).

As Ghana makes positive strides in the REDD+ process, it has become increasingly evident that the mechanism will provide multiple benefits that will safeguard the country's forest and wildlife resources

and ensure that there is optimal and sustainable flow of benefits to all segments of Ghanaian society. Such benefits include:

- Alternative livelihoods to increase both incomes and access to natural resources to positively affect one million direct and indirect beneficiaries.
- Projected increase in current cocoa yields from 400kg per hectare to a minimum of 600kg per hectare.
- Secure cocoa beans for global supply chain to sustain a \$120 billion/year industry
- Improve environmental and social resilience
- Poverty alleviation in local communities, particularly in the vulnerable Northern Savannah Zone (NSZ).
- Empower women through cooperatives that address their disproportionate access to cocoa resources through enhanced participation in decision making in forest management and resources.

Reducing deforestation and landscape restoration under the REDD+ Programme also provides great mitigation co-benefits. These include GHG emissions reduction through carbon sequestration and carbon stocks enhancement. The \$50 million result-based payment Climate Smart Cocoa Production under the Ghana Cocoa Forest REDD+ Emission Reductions Project (GSLERP) is expected to yield 10-million-ton CO₂ equivalents reduction. Similarly, the Ghana Shea Landscape Emission Reductions Project, with funding of \$ 54.5 million, is also expected to yield 25.2-million-ton emissions reduction.

The REDD+ programme is being coordinated by the National REDD+ Secretariat, hosted by the Forestry Commission with other stakeholders (MDAs, MMDAs, CSO/NGO, local communities, traditional authorities, the private sector, etc.). The current level of policy commitment to the success of the project provides ample testimony to how much importance the government places on this initiative and in particular, its critical importance to the sound management of natural resources in local communities.

5.3 Integrated Water Resources Management

The Water Resources Commission (WRC) was established in 1996 to oversee the environmentally sound management of water resources in Ghana and to regulate, manage and co-ordinate government policies in relation to water. In 2012, the Commission launched its Integrated Water Resource Management (IWRM) Plan. The plan outlines the need for the sustainable management of all river basins and related natural resources in line with the provisions of the WRC's mandate (Act 522 of 1996), and in the context of emerging climate change and transboundary issues.

The growing recognition of the importance of irrigation to agriculture and the broader national economy have prompted the government of Ghana, through the Ghana Irrigation Development Authority, to launch the National Irrigation Policy, Strategies and Regulatory Measures in 2011. The Ghana Irrigation Policy is aimed at ensuring the achievement of sustainable growth through the enhanced performance of irrigation in the Ghanaian agricultural sector. Specifically, the policy is targeted at: i) improving national food security; ii) intensifying and diversifying production of agricultural commodities; iii) increasing livelihood options; iv) optimizing natural resource usage; v) reducing negative environmental impacts, and vi) expanding investment space for irrigated production. The implementing agencies are the Ghana Irrigation Development Authority (GIDA) under the MOFA, the District Assemblies, and the Water Resources Commission, who all work in partnerships with farmer associations, the private sector and NGOs. It is a

major priority of the policy to decentralize irrigation services across the country by encouraging community level and private sector participation. Below are some notable achievements from the implementation of Ghana's policy⁶⁰:

- Twenty-two irrigation projects constructed by GIDA covering a total of 6,505 hectares all over the country.
- An additional 22 schemes been constructed under the Small-scale Irrigation Development Project (SSIDP), and six schemes under the Small Farms Irrigation Project (SFIP). Each of these projects is less than 1,000 ha in size except the Tono and Kpong Irrigation Projects, which have about 2,500 ha.
- Thirteen irrigation schemes have been completed, increasing the irrigable area by 325 hectares, out of 44,490 hectares.
- 280 irrigation farmers trained in the management of irrigation systems.
- Phase I of the rehabilitation of the Tono Irrigation Scheme is completed. It involved rehabilitating 25,870m of left branch canal, 12,880m of the right branch and 1,800m of infill canals. Farmers are already cropping.
- Draft feasibility studies for the entire 200,000 hectares and detailed design for 5,000 hectares completed.
- A total of 897 pump sets and 266 sprinkler sets have been distributed to all 10 regions of Ghana, and installation of the same is on-going.
- Rehabilitation of 3,000ha of the Kpong Right Bank Irrigation Project and the extension of new irrigation infrastructure and services to a proposed additional 8,000ha under the New Development Irrigation Scheme (NDIS) is underway. This US\$ 90 million initiative is part of the Accra Plains Irrigation Project.
- The government's flagship programme, 1V1D, has committed to the construction of 570 community dams with the objective of making access to water available to small holder farmers all year round, particularly in the Northern, Upper-West and Upper-East Regions. The 1V1D project aims to improve food security and rural livelihoods and use that as a mechanism to reduce migration to the southern coastal areas. The planning and construction of dams under the initiative takes into consideration the projected impacts of climate change. The dams are therefore fitted with additional spillways and reinforcement in the height and length of dams.

The Government of Ghana also recognizes access to safe drinking-water as a basic human right and essential to protect public health. Although substantial progress has been made to raise the proportion of the population with access to improved water sources in the country over the decades, it might not necessarily imply access to safe water. In that regard, a rapid assessment of the status of the quality of drinking water and the way it is managed in Ghana was conducted as a basis for the formulation of a National Drinking Water Quality Management Framework through the support of UNICEF. The Framework aims at providing a guide to all water supply agencies on effective drinking-water quality management and public health protection. It covers all aspects of drinking water supply i.e. urban, peri-urban and rural settings; private and vendor water supplies. It also provides clarification on the roles and responsibilities of the stakeholders involved in drinking water quality management and the mechanisms for effective

⁶⁰ https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf

coordination and collaboration in its implementation. Projects by the Government to enhance access to clean water includes:

- Accra sea water desalination plant which involves the construction of a 60,000m³/day seawater reverse osmosis desalination plant in a 6.1-acre site situated at the beachfront, 400m west of the Nungua fish landing site, to provide fresh water to more than 300,000 people in various municipalities of the Greater Accra administrative region⁶¹

5.4 Early Warning, Disaster Risk Management and Strengthening Climate Services.

With increases in the frequency and intensity of extreme weather events, the government has become conscious of the plausibility of disasters such as floods, fire and drought and has taken proactive measures to address these risks. This includes the creation of Disaster Management and Disaster Preparedness Plans at national, regional and district levels to guide the country's disaster response efficiency. Other disaster management initiatives are:

- The National Disaster Management Plan (NDMP) (First drafted in 1997 and then reviewed in 2007)
- National Standard Operating Procedures for Emergency Response 2010 (NSOP)
- Ghana Plan of Action on Disaster Risk Reduction and Climate Change Adaptation (for 2011-2015)
- National Contingency Plan (NCP) for emergency preparedness and response

The plans provide the basis for key agencies and organizations to carry out effective and coordinated response to natural disasters. They cover preparedness for floods, droughts, earthquakes, and conflicts of different kinds.

In the context of Early Warning System, the Ghana Meteorological Agency (GMet) and the Hydrological Services Department of Ghana (HSD) are responsible for generating weather forecasts and hydrological forecasts respectively. The Hydrological Services Department of Ghana (HSD), under the Ministry of Works and Housing (MWH), is mandated to operate and manage primary storm drains and is responsible for programming and coordinating coastal protection works and for monitoring and evaluating surface water bodies with respect to floods.

The GMet issues daily weather bulletins, with information on precipitation, wind, lightning, rain, flood and other severe weather conditions floods. The bulletins are broadcasted to the population and stakeholders via e-mail, radio, Facebook and other social media. Additionally, GMet issues a weekly agro-meteorological bulletin and seasonal weather forecasts (published every March and updated in June), without any outlook on possible droughts. Seasonal forecasts are divided into weather forecasts (climate and agro-meteorological) and hydrological forecasts. The seasonal weather forecast is used actively in the northern regions and is based on a locally adjusted weather forecast from the global NOAA CFS model.

The GMet has improved data collection by recently procuring ten automatic weather stations to augment the available weather stations. This is meant to aid the Agency in receiving climate data in real-time for climate risk management decisions. Another significant initiative is the provision of location-specific climate data within every 4km radius in Ghana by merging satellite and gauge data. This was achieved through the Enhancing National Climate Services (ENACTS) initiative. Ghana is a partner to the Rainwatch Alliance. The Remote Sensing and Climate Center of the Ghana Space Science and Technology Institute is

⁶¹ <https://www.water-technology.net/projects/accra-sea-water-desalination-plant/>

a collaboration with the Ghana Meteorological Agency to build the capacity of key science actors and Agriculture Extension Agents to use climate information from the Rainwatch platform for climate risk management decisions and adaptation planning in the agricultural sector.

Beyond these, there have been many other early warning and disaster risk reduction initiatives that have been undertaken by the National Disaster Management Organization (NADMO) over the last two decades. Some of these initiatives include:

- Enacting Act 927 in 2016 to strengthen the mandate to coordinate disaster management activities
- Establishment of Climate Change Desk Offices in regional and district capitals across the country to see to the implementation of climate change and disaster risk reduction
- Community Resilience through Early Warning (CREW) project (2013 –2017) funded by Norway via UNDP to reduce economic and human losses priority disasters
- Establishment of efficient early warning and communication for priority hazards to reduce disaster risks in ten pilot sites across the country

Installation of early warning communication equipment at the NADMO head office and in 20 subnational offices. Risk transfer instruments, such as sovereign disaster risk insurance and agricultural insurance products, are also used to address residual risks associated with climate change and disasters. The Ministry of Finance created a contingency fund for disaster response, which since 2018 has been incorporated into relevant government ministries' programme budgets, such as the Ministry of Interior under which NADMO operates.

Ghana joined the African Risk Capacity (ARC) programme as a signatory in 2016 even though the formalization of Ghana's participation in ARC is still under consideration by parliament. The government has also introduced agriculture insurance products, especially for small and subsistent farmers vulnerable to drought risks. The introduction of crop insurance has been embedded in both the NCCP and the Climate Smart Agriculture Plan, and the Ghana Insurers Association - in collaboration with MoFA, the Ministry of Finance and the National Insurance Commission and their development partners - launched the Ghana Agricultural Insurance Pool (GAIP) in 2011 to offer drought index insurance, multi-peril crop insurance, poultry insurance and area yield insurance to qualified farmers

5.5 Building Resilience in Climate-Vulnerable Landscapes

5.5.1 Coastal protection⁶²

Coastal protection is a major adaptation intervention being pursued by Ghana to safeguard the integrity of its shoreline from climate-induced sea erosion. Several Sea Defence projects have been initiated and are at various stages of development. Five of them are on-going, three have been completed, and four have been planned (Table 3).

⁶² https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf

Table 3. Coastal protection Projects in Ghana

Name of Initiative	Implementing organisation	Time Frame	Status	Sponsor	Amount (Currency)	Scope of Initiative	Objectives	Major Impacts
New Takoradi SPD	HSD	2016 – 2018	ongoing	Mostly GoG*	35m (US\$)	Protection of beaches and environs against encroachment by the sea	Construction of sea defence systems for the coastal areas of the country to preserve lives.	Initial findings completed and main construction to begin
Adjua	Amandi	2016	ongoing	Mostly GoG	51 m (US\$)		country to preserve lives	Reclaimed 15 km of the coastal bed
Aboadze	Messrs Xara Developers	2016	ongoing	Mostly GoG	28.5m (US\$)		Protect coastal communities from sea surges and storms	
Ada SDP	Dredging International and international	2013 - 2016	ongoing	Mostly GoG	183.4m (€) /240228m (€)			Reclaimed 15 km of coastal bed lost along the Atlantic Ocean
Axim Coastal Protection Works - Western Region	Makam Plant Hire Ltd	2019	ongoing	Mostly GoG				
Keta Sea Defence Project			Completed		US\$52m			Protected three communities
Sakumono Sea Defence Project	Amandi Holding Limited	2015	completed	Mostly GoG	60 m	A gravity wall of length 550m and construction of two groynes of length 70 metres.	Protect the Sakumono coastal stretch belt	5,000 m stretch
Komenda Sea Defence Project- Central Region	Vuluxx Construction Company Limited	2018	Ongoing	Mostly GOG	unknown	Protection of beaches and environs against encroachment by the sea	Protecting beaches and their environs against encroachment by the sea	Reclaim of 5 km coastal stretch

5.5.2 Climate-resilient landscapes for sustainable livelihoods in Ghana

Landscapes provide critical support to ecology, rural livelihood, and the national economy. Climate change impacts have already shown their ruthlessness in altering landscape vitality. Such impacts are varied; however, they are in many areas quickly degrading ecosystem quality, depriving local people of the natural resources and ecosystems services they depend on.

The savannah and transitional ecosystem and the people living in that region are the most vulnerable to climate change. This is because the livelihoods of most people living in the savannah and transitional ecological zones are directly and intricately linked to the climate and in ways that make any significant changes in prevailing climate very disruptive to lifestyles and livelihoods. As a result, significant attention is being given to the savannah and transitional zones in the forms of climate adaptation interventions; there is a strong need in these regions to build local adaptive capacity and to address current and future vulnerabilities. Table 4 outlines some past and current interventions in the region.

Table 4. Climate adaptation interventions to build local adaptive capacity in the savannah and transitional zones.

Project name	Institution	Funding / Funding Agency	Objectives/Scope/Location	Components	Supporting adaptation area and results
Sustainable Land and Water Management Project (SLWMP)	MESTI, MoFA FC and EPA	US\$ 44,000,000 (2011–2020) GEF via World Bank	Demonstrate improved sustainable land and water management practices aimed at reducing land degradation and enhancing the maintenance of biodiversity in selected micro-watersheds. Twelve districts in Upper East, Upper West, and Northern Regions.	Tree plantation. Input supply. Extension services. Promotion of SLM technologies. Watershed management. Village saving schemes. Payment of Environmental Services.	More than 10,000 farmers benefited Strengthening the resilience of smallholder farmers
Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods	MESTI, WRC, EPA	US\$ 8,293,972 (2015-2020) Adaptation fund via UNDP	Enhance the resilience and adaptive capacity of rural livelihoods to climate change impacts, and threats to water resources in the northern regions of Ghana. Ten districts, across the Upper East, Upper West and Northern regions.	Improve water access in these regions. Increase the institutional capacity for climate-resilient management of surface and groundwater. Diversify the livelihoods of rural communities.	Strengthening the resilience of smallholder farmers
Adaptation of Agro-Ecosystems to Climate Change (AAESCC)	Ministry of Food and Agriculture	US\$ 3,900,000 (2012–2017) German Federal Ministry for Economic Cooperation via GIZ	Reduce climate-related crop losses in the savanna and transitional regions of Ghana through pilot measures. Sixteen communities in eight districts of the Brong-Ahafo and Northern regions.	Develop climate-smart farming systems. Deliver climate-smart extension services. Adopting climate-smart policies	Planted drought-resistant maize varieties in demonstration plots in the 16 pilot communities. Six hundred farmers – 300 in each region – receive weather forecasts by mobile phone, which has improved their ability to manage and plan agricultural activities. GMet being equipped with automatic weather stations in the eight project districts, which has improved weather forecasting for the region.
Climate Change Adaptation in Northern Ghana Enhanced	Regional Advisory and Information Network Systems.	US\$ 3,000,000 2013–2015	Assist smallholder farmers in improving their adaptive capacity and in building their resilience to the	CSA agricultural practices and conservation agriculture.	100% of FBO leaders reported an increased understanding of climate change. About 95% of farmers

(CHANGE)	Trade Aid Integrated. Tumu Deanery Regional Integrated Development Programme.	Government of Canada via the Department of Foreign Affairs, Trade and Development (DFATD).	impacts of climate change on agriculture, food security and livelihoods 17 communities in Savelugu-Nanton, Bolgatanga, Sissala East Districts in the Northern, Upper East, and Upper West regions	Sustainable soil and water management practices. Effective use of agriculture data. Storage and prevention of post-harvest losses	attended at least one training module. 93% – 66% female – of farmers tested one or more CSA method, far exceeding the target of 75%. 95% – 66% female – of farmers who implemented CSA strategies reported increased agricultural productivity.
Innovative Insurance Products for the Adaptation to Climate Change (IIPACC)	National Insurance Commission	€3,832,000. German Federal Ministry of Environment, Nature Conservation and Nuclear Safety via GIZ. 2009–2014	Support the development of sustainable agricultural insurance system by introducing demand-orientated crop insurance products to protect against financial risks caused by extreme weather events, and other forms of climate change.	Drought index insurance product for maize,soya and sorghum farmers. An area-yield- index product was introduced in three pilotdistricts for smallholder farmers. The multiple-peril crop insurance productwas introduced for commercial farmers	Agricultural insurance solutions for farmers in Upper East, Upper West, and Northern Regions.
Ghana Agricultural Sector Investment Programme (GASIP);	MoFA	IFAD loan of US\$ 71.6 million; Adaptation for Smallholder Agriculture Programme grant of US\$10 million; 2015–2020 – first two cycles of three years each, more are planned in the long-term, (US\$113 million).	Agribusiness, including smallholders, has enhanced its profitability and climate change resilience. Nation-wide	Value chain development Rural value chain infrastructure. Knowledge management, harmonisation and policy support.	Contribute to sustainable poverty reduction in rural Ghana
Support Transition Towards Climate-Smart Agriculture Food Systems	FAO	(2015–2016), Government of Norway	Ensure food security by improving smallholder farmers' resilience to climate change-induced hazards	Assist Ghana to create the required policy and economic environment for CSA. Provide smallholder farmers with access to resources and knowledge to implement CSA. Engage stakeholders to encourage the uptake of CSA practices.	Facilitated the scaling up of climate-smart agriculture (CSA) in Ghana
Towards Pro-poor REDD+ Project	IUCN ARocha	Phase 1: 2009–2012 with US\$4,610,960, Phase 2: 2013–2016	Communities are surrounding Mole National Park.	Pilot and assess pro-poor benefit-sharing mechanisms for performance-based REDD+. Identify and promote policy and institutional	Improved adaptation planning

	Codesult Network	with US\$4,610,960, DANIDA) Ghana, Cameroon, Uganda, Indonesia and Guatemala	Wassa Amenfi forests	arrangements required to deliver performance-based payments equitably and efficiently for REDD+ activities. Generate and promoting lessons about the design and implementation of pro-poor REDD+ benefit-sharing mechanisms.	
Promoting a value chain approach to climate change adaptation in agriculture in Ghana	MoFA by the Roots and Tubers Improvement and Marketing Programme (IFAD Project).	GEF SCCF Grant US\$2.5 million, IFAD loan. US\$8.5 million, Government of Ghana. US\$0.3 million and US\$0.2 million as beneficiary contribution	Reduce climate-induced risks to the cassava value chain; Achieve food security and generate income for rural pilot communities in Ghana. Ashanti, Brong-Ahafo, Northern and Volta regions	Awareness-raising on climate change and capacity building to address its impacts along the cassava chain. Support adaptation to climate change in cassava production. Promote innovative adaptation solutions along agricultural value chains.	Targeted individuals and groups of women, men and youth living in remote rural areas who are involved in cassava processing, production, and marketing activities.
Resilient Landscapes for Sustainable Livelihoods (RLSL)	MoFA	US\$ 3,360,000 (2013–2016) via UNDP, FAO, and WFP	Develop the capacity of national and local institutions. Strengthen the resilience of districts and communities in northern Ghana to climate change and disaster risks through the development, and implement sustainable land management approaches. Ten communities in the three northern regions of Ghana – Northern, Upper East, and Eastern.	The social component involved the development of community cooperatives. Technical component focused primarily on agricultural practices and interventions and the establishment of community-based seed production units to supply rural farmers with farming inputs; and iii) the training of rural farmers on Sustainable Land and Water Management interventions. The financial component involved the establishment of revolving funds to assist with the provision of farming inputs and diversification into additional livelihood activities.	Building the resilience of vulnerable farmers
Water, Climate and Development Project (WACDEP)	African Ministers Council on Water the Ghana Water Partnership and the Volta Basin Authority.	Austrian Development Cooperation, DANIDA; United Kingdom; and other Global Water Partnership financing partners. US\$17.8 million. 2011–2016,	Integration of water security and climate resilience in development planning processes. West Gonja district - Northern Region – and in the Bakwu and Binduri districts – Upper East Region.	Investments in regional and national development. Innovative green solutions. Knowledge and capacity development Partnership and sustainability	WACDEP promoted water as a key part of sustainable regional and national development and contributed to climate change adaptation for economic growth and human security.

5.6 Human Health⁶³

Table 5 outlines the status of implementation of climate resilient measures, plans or strategies for health adaptation of climate change.

Governance and Policy	
<ul style="list-style-type: none"> Government has identified a national focal point for climate change in the Ministry of Health 	✗
<ul style="list-style-type: none"> Government has a national health adaptation strategy approved by relevant government body 	✓
<ul style="list-style-type: none"> The National Communication submitted to UNFCCC includes health implications of climate change mitigation policies 	✓
Health Adaptation Implementation	
<ul style="list-style-type: none"> The government is currently implementing projects or programmes on health sector adaptation to climate change 	✓
<ul style="list-style-type: none"> The government has implemented actions to build institutional and technical capacities to work on climate change and health 	✓
<ul style="list-style-type: none"> The government has conducted a national assessment of climate change impacts, vulnerability and adaptation for health 	✗
<ul style="list-style-type: none"> The government has climate information included in Integrated Disease Surveillance and Response (IDSR) system, including development of early warning and response systems for climate-sensitive health risks 	✓
<ul style="list-style-type: none"> The government has implemented activities to increase climate resilience of health infrastructure 	✓
Financing and Costing Mechanisms	
<ul style="list-style-type: none"> Estimated costs to implement measures to increase resilience of health sector to climate change included in planned allocations from domestic funds in the last financial biennium 	✗
<ul style="list-style-type: none"> Estimated costs to implement health resilience measures to climate change included in planned allocations from international funds in the last financial biennium 	✗
Health Benefits from Climate Change Mitigation	
<ul style="list-style-type: none"> The national strategy for climate change mitigation includes consideration of the health implications (health risks or co-benefits) of climate change mitigation actions 	✓
<ul style="list-style-type: none"> Country has conducted valuation of co-benefits of health implications of climate mitigation policies 	✗

5.7 Energy Sector Adaptation

As climate change impacts on water intensifies, it has become clear that Ghana's hydropower sources, which contribute 38%⁶⁴ of the country's grid power, is vulnerable. Fossil fuel options pollute the air and

⁶³ https://www.who.int/globalchange/resources/country-profiles/climatechange_global_overview.pdf

⁶⁴ <https://www.energymin.gov.gh/sector-overview>

they are linked to breathing problems, neurological damage, heart attacks, and cancer. This informs Ghana decision to adapt through new investments in renewable energy sources. In 2019, the Government of Ghana (GoG) developed a Renewable Energy Master Plan⁶⁵ with the goal to provide investment-focused framework for the promotion and development of the country's rich renewable energy resources to drive sustainable economic growth. It is targeted at meeting 10% of electricity generation from renewable energy sources by 2020

The Nzema solar energy project, known to be the largest solar plant in Africa, began construction in 2016 in the Western Region and is projected to provide electricity to over 100,000 households upon completion⁶⁶. The 155-MW plant is expected to increase the nation's electricity generating capacity by 6 per cent. Also, and as an effort to further boost the utilization of alternative energy, the Energy Commission of Ghana has initiated a solar rooftop program that targets residential facilities, commercial offices, hospitality industries and small businesses.

5.7 Local Action

Locally, climate change adaptation is gaining traction across the country and is being led by diverse entities such as academia, CSOs, local governments, private sector, donor partners and many others. The different initiatives are manifested in the number of local climate adaptation actions in diverse sectors recorded across the country.

5.7.1 Academia

Several research studies have been conducted on climate change adaptation, vulnerabilities, impacts and adaptation in Ghana's universities and research centers. Also, there is evidence of new departments, institutions, centers, colleges, and schools who have foregrounded climate change as a core area of study and specialization. Apart from the different departments and centers that lead climate change adaptation teaching, learning and research in Ghana, the University of Ghana, Ghana's premier and largest public university, has also recently created dedicated Center for Climate Change and Sustainability Studies at the University of Ghana which is championing graduate level teaching and research in climate change and sustainable development.

In September 2019, all primary schools across Ghana started teaching climate change as a subject. This has been facilitated by the EPA of Ghana which continues to work in collaboration with the Ministry of Education, the Ghana Education Service, and the National Curriculum Authority to make this possible.

5.7.2 Public Access to Climate Information

There have also been complementary efforts to promote public access to climate information to support projects and other climate adaptation activities. Some of these efforts include:

- Installation of automatic weather stations in senior high schools
- Climate change information sharing platforms
- Climate change data hub by the Environmental Protection Agency
- National energy data processing and information Centre by the Energy commission

⁶⁵ https://www.gh.undp.org/content/ghana/en/home/library/environment_energy/ghana-renewable-energy-master-plan.html

⁶⁶ <https://www.bbc.com/news/science-environment-20583663>

- Climate change and resilience information Centre by the Care International

5.7.3 Efforts to Promote Public Awareness includes

- REDD Eye Campaign
- Climate Change and Population Conference on Africa
- Africa Climate Change Week
- Renewable Energy Fair
- Accra SDG Investment Fair
- Climate Change Summit - Africa
- Climate Change Dialogue with Political Parties and Parliamentarians
- National Climate Change and Green Economy Learning Strategy
- Integrated School Project on Clean Cooking Energy

5.7.4 Efforts to Promote Public Participation

CSOs, religious groups, schools, fun clubs, etc. recently participated in the tree planting exercise on June 11, 2021. The Forestry Commission (FC) distributed more than seven million assorted tree seedlings across the country during the Green Ghana tree planting exercise.

5.7.5 Youth Led Action

- Community engagement with school children, local assemblies, and young people with publications on climate change by Strategic Youth Network for Development.
- Local Conference of Youth on Climate Change (LCOY Ghana)
- The Youth Climate Council Ghana (YCC Ghana)

5.7.6 Development Partners Actions

The Local Climate Adaptive Living Facility (LoCAL) by the United Nations Capital Development Fund (UNCDF) through the Performance-based climate resilience grants (PBCRGs) system has supported enhancement of MMDA capacity through a combination of capital grants, capacity development support and incentives for improved performance in areas of local-level climate change awareness and capacities. The program integrates climate change adaptation into local government planning and budgeting in a participatory and gender-sensitive manner at the local level by providing funding and capacity building support to local governments to facilitate local climate adaptation and resilience building actions. Additionally, The UNCDF, in partnership with SNV (the Netherlands development agency), secured funding from the European Union Trust Fund for Africa to implement the Boosting Green Employment and Enterprise (GrEEen) program in Ghana as an avenue to create local jobs while also promoting climate resilience in local communities.



GENDER RESPONSIVENESS AND TRADITIONAL, INDIGENOUS AND LOCAL KNOWLEDGE

6



6.1 Gender Responsiveness

Attention to gender in development processes has increased progressively over the last decade in Ghana. The government of Ghana has shown commitment to issues of gender equity and empowerment by creating a standalone Ministry of Gender and Social Protection, whose sole responsibility is to address issues of inequity, vulnerability, and empowerment in gender relations. Gender, in the Ghanaian context as elsewhere, is socially constructed and not reduced only to descriptors of male-female unequal relationships. Notions of gender have been expanded to highlight and address issues of marginalization, inequality, and power imbalances among women and men. The focus on gender discourses has focused on empowerment as an avenue to ensuring and achieving equity. Thus, women, children and people with disabilities are included in discussions on gender.

Ghana's climate response actions have adopted gender-responsive approaches to examine gender norms in different contexts and at varying scales with a view to addresses gender roles and inequalities in adaptation planning, decision-making and actions. In adaptation planning, the principle organizing purpose for gender-responsive approaches is to go beyond mere sensitivity to the conscious and intentional efforts that seek to remove constraints of all kinds and to provide equal opportunities for the socially marginalized to participate unimpededly in adaptation actions.

Ghana has since made great strides in ensuring inclusiveness and responsiveness in its climate change policies. The NCCAS was formulated, and will be implemented, with stakeholder participation as a guiding principle. NCCAS has been unambiguous in its commitment to gender-responsiveness and has advanced such commitments into all aspects of its implementation by outlining clear engagement structures and mechanisms to ensure gender equity in the participation of adaptation planning.

Gender responsiveness in adaptation actions is also amplified in the National Climate Change Policy, which has two out of ten of its programme areas specifically dedicated to ensuring resilience of vulnerable

communities to climate related risks and addressing gender issues in climate change. Ghana's Intended Nationally Determined Contribution (2015) was not silent on matters of inclusiveness and mainstreaming and was clear about actions that ensure the "Resilience for Gender and the Vulnerable."

Ghana's National Adaptation Plan Framework (2018) affirms the gender-responsiveness both in its approach and guiding principles. The guiding principles of the NAP Framework is clear about the inclusion of youth in climate change adaptation; ensuring participatory decision-making; improving social equality; and ensuring a gender responsive NAP. Indeed, the on-going NAP process has elevated the government's commitment to gender responsiveness by recruiting a gender specialist, who works full-time at the NAP secretariat to ensure all issues around gender in national adaptation planning and across sectors and contexts are promptly and equitably addressed.

In addition, several policy and planning documents have emerged out of the NAP process and notable among them are the Communication Strategy for the National Adaptation Plan (2021); Ghana's Private Sector Engagement Strategy for the National Adaptation Plan (2020); and Integrating Gender Considerations into Ghana's National Adaptation Plan Process: A Strategy for the Green Climate Fund Adaptation Planning Readiness Project (2020). These documents demonstrate Ghana's commitment to gender responsiveness. The list below are examples of some gender-responsive adaptation programs that have recently been undertaken in Ghana.

- Southern Voices on Adaptation (SVA):
- Increase advocacy and public awareness of gender issues.
- ABANTU for Development and the Gender Action on Climate Change for Equality and Sustainability with support from Care International
- Adaptation Learning Programme –increase the capacity of vulnerable groups such as women

6.2. Traditional and indigenous knowledge

In many rural areas of Ghana, vast amounts of traditional ecological or local knowledge exists and are applied through well-established social and cultural mechanisms that are deeply rooted in local value and belief systems, such as rituals, customs, and taboos. While these socio-cultural regulatory mechanisms have remained a part of traditional knowledge and practice systems and are used in different ways to protect or regulate human interactions with the natural environment, recent evidence of climate change impacts particularly in more rural communities have revitalized such traditional and local knowledge systems as effective adaptation strategies.

This is against the background that current adaptation discourses in Ghana have predominantly favored Western adaptation approaches which sometimes perceive traditional ecological knowledge systems as detrimental to the functioning of ecosystems. There is now a welcomed shift to traditional ecological practices in certain areas, mainly in rural Ghana, where emerging resistance to Western adaptation approaches are supported with the arguments that extensive utilization of Western knowledge systems in the management of climate change impacts and particularly in ecosystems services is responsible for relegating traditional ecological systems to the background.

Indigenous knowledge practices on climate adaptation in Ghana can be categorized into four distinct types: (1) taboos and totems; (2) customs and rituals; (3) rules and regulations; and (4) traditional protected areas. Taboos and rituals as used mainly by rural people enjoin community members to partly

or completely refrain from collecting and/or using part or whole of certain plant and animal species. This implicitly is aimed at biodiversity protection to support sustainable ecosystems services provision. Community taboos are considered necessary management strategies for reducing over-harvesting of critical provisioning services as well as restoring endangered animal and plant species. Most taboos forbid the killing of different types of animals under certain circumstances, such as when they are pregnant, nursing young ones, or mating. Taboos also allow or forbid the collection or use of certain wild plants for specified purposes only. For example, the shea tree (*vitellaria paradoxa*) has many taboos relating to the use of different parts at different times and locations.

Traditional knowledge systems in the forms of customs and rituals are mostly performative proactively or reactively practices and are considered obligatory to enhance access to critical ecosystem services or promote the land's productivity. Similarly, rules and regulations facilitate common agreement on the use or non-use of a particular ecosystem service. At critical stages when a particular resource or ecosystem service is found to be threatened or vulnerable to environmental changes, communities – through their traditional authorities – may enact new rules to regulate the service's withdrawal to ensure total or partial protection. A good example is how farming and fishing are restricted on certain days. These days are in actual fact fallow periods that give both the land, forests, sea, rivers, and lakes time to restock through natural processes to ensure sustainability and continuity in function.

Traditional protected area behavior guidelines also provide basis for communities to protect and conserve specific locations of their local landscape. Such locations include sacred groves, woodlots, and riverbanks, and are protected by virtue of their unique and particular contribution to the social, economic, cultural, and environmental well-being of communities and households. For example, some local communities hold the belief that sacred groves harbor their ancestors and gods of the land who have sustained them for generations. These groves are also regarded as a place to find rare plants and animals used for medicinal and ritual purposes. There has been scientific evidence from parts of Ghana to suggest that the soil quality in some sacred groves is superior and contains high soil organic carbon content, which is an indicator of a healthy ecosystem.



PLAN FOR IMPROVEMENT AND NEXT STEPS

7



There is no doubt that Ghana has made great strides in its adaptation planning efforts. However, it is also a fact that despite progress made, a lot more needs to be done to ensure climate-resilient sustainable development across sectors, contexts and at multiple levels. While the country, led by its government and supported by other stakeholders, remain committed to the adaptation cause in Ghana, it is also important that current gains in adaptation planning are consolidated through innovative approaches that transfer ownership of implementation to people at the local community level for maximum benefits.

Doing this will require more deliberate efforts; it will also require creative partnerships that bring people, communities, and institutions together from diverse backgrounds and sectors to work together to share information, deepen knowledge and to acquire new skills and insights. Indeed, adaptation planning needs to be approached not just as a way to address climate impact problems, but also as an avenue to uncover, understand and appreciate opportunities associated with such problems and to acquire the requisite insights and skills to leverage such opportunities to the benefit of individuals, communities, institutions, and others. There is also a need for the development of new mindsets towards adaptation planning; it should also be about how people living in their communities can learn to turn problems into opportunities.

While much has been accomplished to date on climate adaptation in Ghana, through the hard work of a number of different stakeholder groups, the threat of climate change has not yet passed; much work remains to be done, and much more support is needed to enhance the resilience of Ghanaians in the face of the unprecedented climate challenge. Through the development of this AdCom, the priority areas for immediate action – in line with the NAP, NCCAS and NDC – are as follows:

1. **Establishment of climate adaptation data-sourcing architecture:** It is important that adaptation action networks are created among and between sectors in Ghana for the documentation and easy reporting of new adaptation actions. Such an approach will aim at making adaptation reporting an on-going process supported by active sources of data and new information.
2. **Climate risks assessments at different levels and in different ecological zones:** The delineation of Ghana into six major agro-ecological zones has been particularly helpful in highlighting climate

change impacts manifestations in each of these zones. However, differences in impacts are not well informed by science and are usually generalized to create wrong assumptions of impact and risk homogeneity. Such assumptions, ultimately, lead to flawed understanding of climate risks. Conscious and more targeted risk assessments processes in the different ecological zones will provide deeper insights into the nature of risks and more importantly, enhance appreciation of differences in risks, vulnerabilities, and opportunities in different the different zones and places.

3. **National legislation on climate change:** The lack of legislation on climate change as a national priority issue seems to have affected the value placed on adaptation actions. This is against the background that there plans, as part of the NAP process, to develop and pass a climate change bill that emphasizes adaptation. It is important that such an agenda is pursued to expedite the passage of this bill to help change perceptions, political will and attitudes towards adaptation and adaptation planning.
4. **Adaptation Capacity Building:** There is need for national and sub-national adaptation capacity building. This could be done through a National Adaptation Committee, focused on agenda setting, resource mobilization, research, information sharing, innovation diffusion, education, training that builds individual, community and institutional capacity to initiate and lead adaptation actions at various levels
5. **Improve Access to Place-based Climate Services:** Both climate impacts and adaptation actions are place-based, requiring sufficient knowledge, and understanding of local level climate data. Such a function is critical to support adaptation actions. However, access to climate information, particularly at the local level, remains a challenge and one which impedes proactive adaptation decision-making at the local level. There is need for such services to be improved; localized climate services can then connect researchers, practitioners, policy leaders, scientists, and the meteorological agency directly to local people and the places where climate impacts happen.
6. **Climate financing skills and competencies:** Even though climate financing remains a major discussion issue in international climate change agreements, such discussions are yet to reach the local level; few people and organisations working on adaptation planning and adaptation program implementation have the requisite knowledge and capacity to pursue financing sources. There is need for continuous awareness creation, education, and training to build capacity at all levels to facilitate access to climate financing to support local projects and programs.
7. **Use Adaptation Actions for Social Transformation:** It is important to use current and future adaptation actions as an avenue to permanently transform society. Such and effort should aim at building long-term resilience through adaptation actions that are socially, culturally, ecologically, and economically transformational.
8. **Utilize the Local Government structures and the National Decentralization Policy:** Effective adaptation planning can only happen when local governance and decentralization structures are utilized. Current efforts are not enough especially when local government capacities are low or none at all.