



REPUBLIC OF GUINEA-BISSAU

**UPDATED NATIONALLY DETERMINED
CONTRIBUTION IN THE FRAMEWORK
OF THE PARIS CLIMATE AGREEMENT**

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Preface



Since the ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, entry into force of the Paris Agreement on the New Climate Regime in 2016, Guinea-Bissau has committed to participating in global efforts to reduce its Greenhouse Gas (GHG) emissions and to strengthen its resilience and capacity to adapt to the adverse effects of climate change.

Because it is a very low GHG emitter, the country's priorities consist of limiting the carbon intensity of its development, preserving national carbon sinks, and better forecasting the impacts of climate change on ecosystems, infrastructures, as well as on the population, and their productive sectors.

The updated Nationally Determined Contribution (CDN) is part of a broader vision of low-carbon and climate-resilient development, and it is also in line with national requirements in terms of economic and social development through:

- the integration of gender aspects, as well as of the two components of the NDC (climate change mitigation and adaptation to climate change);
- alignment of the NDC with the United Nations' 2030 Agenda, including several Sustainable Development Goals - SDG 1, 3, 6, 7, 8, 9, 11, 12, 13 and 17, the African Union's Agenda 2063, the SAMOA Pathway and New Deal, and the National Program of the Development (PND) - Hora Tchiga;
- the desire to position the country within new carbon market mechanisms foreseen in Article 6 of the Paris Agreement on a new climate regime, to facilitate mitigation and adaptation investments.

This document defines the pathway for ambitious climate action and enables society, organizations, and individuals to understand the need to undertake additional efforts to be integrated into the national and global strategies needed to address climate change, the greatest challenge of our times.

Guinea-Bissau has established its target of reducing its GHG emissions by -30% by 2030, compared to the baseline scenario, and foresees an unconditional reduction in its emissions by -10% by 2030 relative to the baseline scenario—despite its low level of development and of its meager economic means.

The implementation of the updated NDC is an opportunity for ensuring the country's development on a sustainable basis, making it more resilient to climate change. However, the pursuit of the proposed objectives will require the mobilization of significant investments that go beyond the country's own resources, considering which the strengthening of international cooperation is essential.

His Excellency Mr. Viriato Luís Soares Cassamá

Minister of Environment and Biodiversity of Guinea-Bissau

A handwritten signature in blue ink, which appears to read "Viriato Luis Soares Cassama". The signature is written in a cursive style.

Abbreviations

AFOLU:	Agriculture, Forestry and Other Land Uses
AR4:	Fourth Assessment Report
NDC:	Nationally Determined Contribution
GHG:	Greenhouse gas
HDI:	Human Development Index
IPCC:	International Panel for Climate Change
MRV:	Measure, Reporting and Verification
PNIA:	Plano Nacional de Investimento Agrícola
NREAP:	National Renewable Energy Action Plan
NEEAP:	National Energy Efficiency Action Plan
NDC:	Nationally Determined Contribution
PNIA:	Plano Nacional de Investimento Agrícola
iNDC:	Initial Nationally Determined Contribution
UNDP:	United Nations Development Programme
GDP:	Gross Domestic Product
toe:	Tonne of oil equivalent
tCO _{2e} :	Tonne of CO ₂ equivalent
UEMOA:	Union Economique et Monétaire Ouest Africaine
USD:	American Dollar

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1 Introduction

Guinea-Bissau formally adopted its first Nationally Determined Contribution (NDC) following the signing of the Paris Agreement on April 22, 2016, then its ratification by the Bissau-Guinean parliament on October 22, 2018.

Although the first NDC (called “iNDC”) expresses Guinea-Bissau's commitment to the fight against climate change, it did not present a quantified GHG mitigation objective. Today, Guinea-Bissau is determined to be even more proactive in favor of the climate by adopting a quantified and ambitious target, through the present update of the iNDC, in accordance with the recommendations of the Article 4.3 of the Paris Agreement.

Compared to the iNDC, the updated 2021 NDC is marked by a significant boost in the country's ambition level, although Guinea-Bissau contributes only in an insignificantly way in global emissions:

- An commitment to a quantified GHG emission reduction target covering the main sectors: AFOLU, energy and waste.
- An ambitious target of GHG emissions reduction of approximately 30% by 2030 over the baseline scenario.
- An unconditional objective, based on the country's own resources, aimed at reducing emissions by 10% by 2030 compared to the baseline scenario. This objective is considered ambitious in view of the country's economic situation and its level of development.

The updated NDC is part of a broader vision of low carbon and climate resilient development. It is also in line with national requirements in terms of economic and social development, in particular through:

- The integration of aspects relating to gender equality and women's empowerment in the two components of the NDC: mitigation and adaptation to climate change.
- The alignment of the NDC with the United Nations Sustainable Development Goals (SDGs), in particular with respect to SDGs 1, 3, 6, 7, 8, 9, 11, 12, 13 and 17; the African Union's Agenda 2063, the SAMOA Pathway and New Deal, and the National Development Program (PND) - Hora Tchiga.
- The desire to position the country on the new carbon market mechanisms provided by Article 6 of the Paris Agreement, to facilitate mitigation investments.
- An initial articulation of the country's adaptation needs within key sectors such as agriculture, livestock, coastal and low-elevation zone management; fisheries & ocean ecosystems, energy, water resources, as well as forest conservation & management of protected areas (including dense, clear forests and mangrove areas), human health, infrastructure & urban areas, and about risk management of disasters.

Guinea-Bissau considers that the implementation of the updated NDC is an opportunity for the development of the country on a sustainable basis and more resilient to climate change. However, its implementation will require the mobilization of significant investments which exceed the country's own resources. The cost for implementing the mitigation component is estimated at around 694 million USD over the period 2021-2030, including 664 million USD to cover investments and 30 million USD for capacity building actions.

International support is crucial to achieve the objectives of the updated NDC of Guinea-Bissau. The funding required to support the achievement of the conditional mitigation contribution would amount to approximately USD 531 million over the period 2021-2030.

Guinea-Bissau formally adopted its initial Nationally Determined Contribution (the iNDC) after the country signed the Paris Agreement on 22 April 2016, followed by its ratification by the Guinea-Bissau Parliament on 22 October 2018.

This first NDC, while signaling Guinea-Bissau's commitment to the fight against climate change, did not contain any quantified GHG reduction target. Today, on the update its first NDC,

Guinea-Bissau is determined to assume an even more proactive attitude towards the climate by adopting an ambitious objective which is translated into numbers, as recommended in Article 4.3 of the Agreement on Paris.

The adaptation measures proposed in the 2021 CDN are being reviewed and re-prioritized at the national level. This is because the country's development context has been evolving and there is a great lack of in-depth analyses of vulnerability and climate risk, whether in the sectors or in different geographic regions. Even surface hydro-meteorological observations, which are necessary for climate risk management at the local level, have many shortcomings. Furthermore, various mitigation actions have the potential to also contribute to adaptation, and vice versa.

Therefore, it will be important, in the coming years, to optimize Guinea-Bissau's access to funds so that the country can increasingly deal with its climate challenges in an integrated manner.

2 National circumstances

Guinea-Bissau is a coastal and tropical country in West Africa that borders Senegal to the North, Guinea to the South and the Atlantic Ocean to the West. It is located, in the intertropical convergence climate zone of the northwest coast of Africa. The country's surface totals 32,125 sq. km, of which at least 22% is composed by water. The country is divided into a continental and an insular part, which is home to the Bijagós Archipelago, comprising 88 islands and islets, of which 21 are inhabited. Guinea-Bissau is also home to a dense network of river basins, including some international ones (such as the Geba-Kayanga river and the Corubal-Koliba river).

Much of the country's land surface is in lowlands: the highest point in the country is 298 meters above sea level, and 19% to 24% of the country's land surface has altitudes of up to 10m. Tropical and subtropical forests, savannas and shrubs dominate most of the land areas, while large expanses of mangroves are concentrated in the coastal zone, covering 22% of the country's surface.¹

Influenced by both the seasonality of the monsoon rains and the dry Harmattan winds, Guinea-Bissau's climate is warm all year round, with an average temperature of 26.3°C. The country has a relatively high level of rainfall, ranging from 1,500 to 2,000 mm per year in the coastal zone, to 1,000 to 1,500 mm in the interior. Almost all rainfall occurs between June and September/October. From December to April, the country experiences droughts.

Guinea-Bissau is a country rich in biodiversity (including coastal/marine and terrestrial biodiversity) and it has significant natural resources which have by and large not yet been explored. Currently, 26% of the national territory is located within protected areas that play an important role in maintaining these natural resources, as well as important ecosystem services, such as potential carbon sequestration.

With a population of nearly 2.0 million inhabitants, growing at a rate of 2.5% per year, Guinea-Bissau is one of the poorest and most vulnerable countries in the world. More than half of the population is urban and 42% are under 15 (2019). Life expectancy at birth has improved, going from 55 years in 2010 to 58 years in 2019. Because of these and other socioeconomic indicators, Guinea-Bissau has a very weak Human Development Index (HDI), positioning the country as a 177th out of 189 countries in the current UNDP world ranking.

The economy is based on non-mechanized agriculture, fishing, cashew nut exports, informal trade, and foreign aid, on which the government of Guinea-Bissau still depends to a large extent. According to the World Bank, GDP per capita has dropped from \$802 in 2018 to \$727 in 2020 (both in current USD and showing a 9.3% drop in 2 years). This drop is, on the one hand, due to the impact of the COVID-19 pandemic, on the other, due to the unfavorable economic environment and political instability.

Agriculture is the country's most dominant economic sector, accounting for an average of 84% of export earnings between 2016 and 2018, alongside fisheries.² Both sectors employ more than 80% of the working population. The export of cashew nuts has already placed Guinea-Bissau as the 7th largest exporter in the world in 2017. In that year, cashew nut exports yielded more than \$255M to Guinea-Bissau in gross foreign revenues, mainly due to a spike in the product's price in the international market. Despite strong international demand, production did not increase, or it increased very little. Since the price of cashew nut peaked in 2017, the contribution of this commodity to export earnings decreased significantly. Other products, such as gold and timber, became part of Guinea-Bissau's export products' portfolio. Historically, the primary sectors (agriculture, forests, and fisheries) came to represent an average of 44% of GDP between 2001

¹ The mangrove surface is according to the he RESOLVE Ecoregions dataset, updated in 2017, with the surface computed through the mapping service <https://ecoregions2017.appspot.com/> or in Google's Earth Engine. See also: E Dinerstein et al. (2017).

² In 2019, Stones, Metals and Minerals started being part of of Guinea-Bissau's export portfolio of products and services, bringing the relative contribution of the agricultural sector down to 57.6% (data from UN COMTRADE, computed through the *Atlas of Economic Complexity* (<https://atlas.cid.harvard.edu/explore>)).

and 2017. More recently, the services sector has grown and today represents around 45% of GDP, followed mainly by the agri-food industry (15%).

After three consecutive years of sustained growth (on average 6% over 2015-2017) which was able to put an end to the long period of stagnation (2000-2014), the Bissau-Guinean economy's growth slowed significantly in 2018 at a rate of 3.8%, due to the drop in both production (-25%) and the international price of cashew nuts. In 2019, economic growth accelerated, registering a rate of 4.5%. However, due to the COVID-19 pandemic, the economy contracted recording a decrease of -2.4%.

On the longer term, the IMF forecasts an average annual growth of 5%, thanks to public investment spending in major road and energy infrastructure. Nevertheless, the reversal in the price of cashew nuts and the political situation could constitute a major risk that could slow down this growth.

2.1 Socioeconomic Vulnerability Baseline

There is an important non-climate vulnerability in Guinea-Bissau's national circumstances to be considered. Less than half of the adult population can read and write (45.6% of adults over 15 years old, and 30.7% for women). More than two-thirds of the population live below the poverty line (of less than USD 1.90 a day). Many suffer chronically from food insecurity, at a population rate that varies between 11% and 51%, depending on the year and region. At a local level, cashew cultivation can compete with food production in the context of family subsistence farming³, except in regions unsuitable for cashew cultivation, where, for example, mangrove rice predominates. This, in turn, competes with imported rice and makes it difficult to maintain strategic cereal banks in the country, creating problems about food security. Shocks caused by irregular rainfall, together with price fluctuations for imported rice and cashew nuts, further aggravate the chronic food insecurity in Guinea-Bissau.

Key economic sectors such as transport, industry, infrastructure, water resources, health and energy production are still largely underdeveloped in Guinea-Bissau. Investments in the productive sectors, human capital and technology are insufficient. Climate change tends to seriously aggravate pre-existing vulnerability in Guinea-Bissau, affecting both the population and economic and ecosystem assets. Climate change also makes it difficult to consolidate the benefits of development in the country.

2.2 Energy, Forests & Biodiversity

Access to energy is a major social, economic, and environmental issue for Guinea-Bissau. The country's electrification rate is still low, not exceeding 45% in 2020, and the government plans to raise it to 80% in 2030. The country suffers from the insufficiency of its infrastructure, particularly the public grid, supplying only a small part of national needs, with a focus on the capital.

Primary energy consumption is still dominated by biomass, which accounts for over 80% of the country's primary energy demand. This is one of the most important deforestation drivers in Guinea-Bissau, alongside shifting agriculture based on slash-and-burn techniques. This is an important issue for the country in terms of its energy matrix and the costs of energy production, noting that Guinea-Bissau imports fossil fuels to meet its needs and access to modern energy, for which there is a large, suppressed demand.

Guinea-Bissau's forests, the ecosystem services that they provide, and the country's biodiversity are of critical importance to the economy and to local populations. At the same time, this biodiversity is under threat, even within protected areas, such as the Cantanhez National Park,

³ See e.g. the data of the National Statistics Institute through the portal: <https://guinebissau.opendataforafrica.org/>.

which is home to the few remnants of dense forest in Guinea-Bissau. On the one hand, protected areas act as a magnet in eyes of loggers. On the other, they fulfil their role in helping slow down deforestation. Addressing climate challenges in the forest and biodiversity sectors is critical for Guinea-Bissau in its efforts to make an effective national contribution to the implementation of the Paris Agreement.

Although the protected areas are proportionally large (having increased from 15% to 26% of the country's surface in 2010), practically all of them harbor resident population. At the same time, studies by IBAP have shown that pressure exerted on natural resources by the local population is less within protected areas than in areas where land use is not regulated. For example, in 2013, while the country was experiencing a vacuum in the inspection of the forest sector, the loss of forests peaked and has continued to accelerate since then, due to the illegal logging of hardwoods. Logging within protected areas happens at a smaller scale than outside.

Currently, investments in conservation in Guinea-Bissau are limited and vary between \$2.0M to \$3.0M per year – making biodiversity, forests and ecosystem services vulnerable 'sectors'. At the same time, these sectors are key to building resilience in the country and to controlling GHG emissions. Due to the indiscriminate logging in forest areas, which was intense in 2013, and then stabilized at a high level from 2014 on, the role of deforestation in the country's total GHG emissions contributed to changing Guinea-Bissau from being a carbon sink to becoming a net emitter of CO₂.

2.3 Climate change and climate vulnerability

The climate in West Africa already includes a significant natural variability, which presents itself on an inter-annual basis and sometimes with cycles that last for decades, such as those that characterize Sahelian droughts. This is due to a remote climatic phenomenon called 'oceanic forcing', which influences the local climate. This phenomenon affects sea surface temperatures in West Africa according to the effects of the El Niño and La Niña cycles. Climate change will further exacerbate this pre-existing natural variability.

For the short-term climate scenario (2016-2045), an increase in temperature between 1.2°C (RCP4.5) and 1.3°C (RCP8.5) is predicted for the coastal zone, and between 1.4°C (RCP4.5) and 1.5°C (RCP8.5) in the countryside. Average daily rainfall can increase slightly by 3% (RCP4.5) or stagnate (RCP8.5), with exceptions for the Southwest of the country and the Bijagós archipelago, where an increase of 5%-10% (RCP4.5) and 2%-5% (RCP8.5) may be observed. For the medium term (2046-2075), a temperature increases of 1.5°C (RCP4.5) to 2.9°C (RCP8.5) is projected, as well as an increase in average daily precipitation with 5%-10% (RCP4.5) and 2%-5% (RCP8.5) in the South of the country and a slight decrease of -2% ~ -5% (RCP4.5) or -2% ~ -10% (RCP8.5) North of Cacheu.

From the point of view of the effects and impacts of climate change in Guinea-Bissau, the country can be divided into two major regions: the coastal zone and the interior (Figure 1).

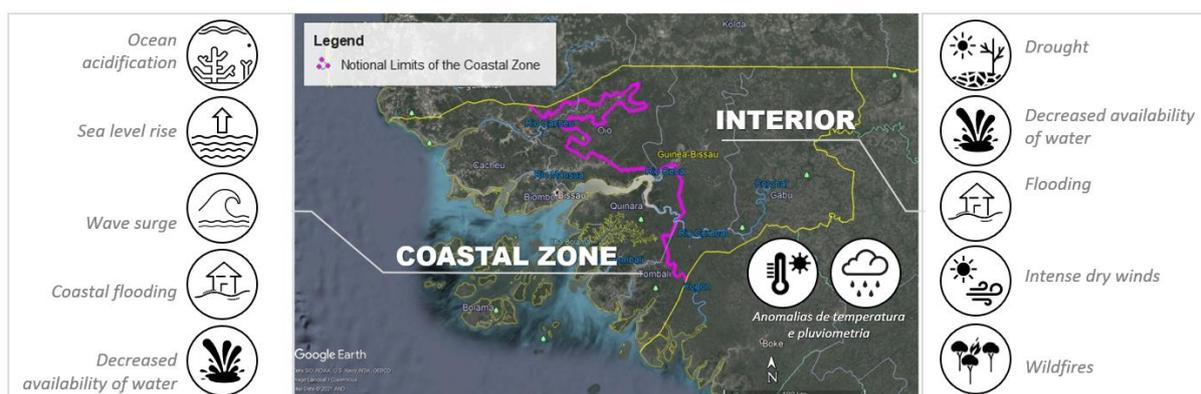


Figure 1: Representation of some side effects of Guinea-Bissau's climate change

In the interior, the climate is drier and more susceptible to temperature and precipitation anomalies resulting from the effects of climate change. These include a shortening of the rainy season and lower temperatures in the so-called "cold season", from three months (December to February) to just two months (December and January). Dust winds are also expected to become more frequent in the countryside and affect agricultural production. Although climate change scenarios point to a general trend of increasing average precipitation, phenomena such as longer droughts and higher incidence of forest fires are also expected anomalies. Floods can equally happen as an effect of climate change in the interior. Under these conditions, the availability of water for human consumption will be negatively affected.

The coastal zone, in turn, occupies two thirds of the country's territory. It has significant economic importance, and it harbors approximately 70% of the population. The only large urban center in the country is located on the coast: the capital Bissau, with 300,000 inhabitants (up to 500,000 if the peri-urban area is also considered). The maritime influence is felt in Guinea-Bissau's hydrographic basins in places as far from the sea as Farim or Bafata. The maritime influence mainly includes not only the tides, but also the saline intrusion will be exacerbated in the coastal agricultural fields. The surface of the nominal coastal zone, as plotted on the map in Figure 1, is quite extensive and it will be impacted mainly by sea level rise, tropical storms, coastal erosion, and flooding in low altitude areas. There may be scarcity of water, noting that a good part of the coast already suffers from aridity. The oceans will become more acidic as a global effect of climate change. In Guinea-Bissau, this will at some point impact marine productivity, the marine food chain, and it will consequently also affect the availability of fish. All these effects have been poorly studied.

With rising temperatures and decreased precipitation, groundwater, which is the main source of drinking water for the population, can be heavily impacted. In addition, irregular rainfall and rising temperatures would lead to a decrease in the rivers' base flow and a significant drop in the water table. An increase in groundwater salinity is also expected, amplified by the rise in sea level.

The vulnerability of the energy sector is closely linked to that of the forest sector in Guinea-Bissau. This situation of vulnerability has multiple causes. Poverty, people's low financial capacity, low capacity for energy production and the country's low level of electrification are mentioned. These elements become a stressor on forest cover, although the increase in demand for timber is currently the most important driving force behind deforestation. The indiscriminate use of timber resources in Guinea-Bissau, is a growing problem that negatively contributes to Guinea-Bissau's GHG emissions – in addition to causing forest degradation at scale, generating significant waste. The illicit nature of logging activity robs the State and the community of a sustainable revenue potential. The moratorium solution emplaced with respect to logging is an emergency measure. It cannot replace more robust and adapted measures in the medium and long term.

The pursuit of viable alternatives to current forest use practices is essential for achieving the NDC's goals. There are no easy or immediate solutions to the problem, but rather a set of well-thought-out potential measures that can together address the various causes of deforestation, while also generating adaptation benefits in different situations. Such measures or solutions will require strengthening the enforcement, monitoring and regulatory measures within the country's forest sector, establishing an evidence-based national forest policy, strengthening inspection, and creating a package of incentives for the sustainable use of the forest resource.

The main impacts of climate change in the agro-livestock sector concern irregular rainfall in terms of intensity and start / end of the season, temperature increase and submersion of agricultural land due to elevation of the average sea level. Rice crops are vulnerable to both irregular rainfall and sea level rise which affects production due to excessive saltwater invasion, especially in rice fields in mangroves due to high tides and the consequent destruction of anti-salt dikes.

The livestock sector is also strongly affected by the increase in temperature and the decrease in rainfall which inevitably translates into a general lack of water for pastures, the decrease in grazing areas, a severe reduction in the production of grazing land, milk, and meat. This encourages transhumance in search of better pastures creating conflicts between pastoralists and farmers.

Although climate change impacts are expected, they have been poorly studied in Guinea-Bissau from a sectoral and/or geographic perspective. Currently, Guinea-Bissau has few studies on vulnerability, resilience, and adaptation. Efforts in this regard need to be accelerated, including in the identification of (i) economic sectors and segments impacted by climate change, (ii) vulnerable populations and geographic zones, and (iii) important infrastructure exposed to climate risks. The country must then prioritize actions and assess the costs and potential benefits associated with priority measures. There are also signs that the national capacity to absorb climate finance has limitations. More basic efforts to strengthen institutions and expand these capacities need to be similarly designed so that climate finance for adaptation is optimally applied.

3 Mitigation component of the NDC

3.1 NDC mitigation target

3.1.1 Overall mitigation objective

Guinea-Bissau's updated NDC differs from the first submission in that it presents a quantified mitigation target of the country by 2030. This target is expressed in terms of percentage of reduction in greenhouse gas emissions compared to the business as usual (BaU) scenario, taken as the reference scenario.

Thus, Guinea-Bissau has set the objective of **reducing its GHG emissions by 30% by 2030** compared to the reference scenario. This is an increase in ambition since the first NDC did not present any quantified target.

3.1.2 Conditional and unconditional objective

Guinea-Bissau's unconditional contribution corresponds to a decrease of GHG emissions in 2030 by 10% compared to the reference scenario. This contribution, based on the country's own efforts, is ambitious given the country's economic situation and its level of development.

The conditional contribution, the implementation of which requires international support, allows an additional reduction of GHG emissions in 2030 by 20% compared to the emissions of the reference scenario, as shown in the following graph:

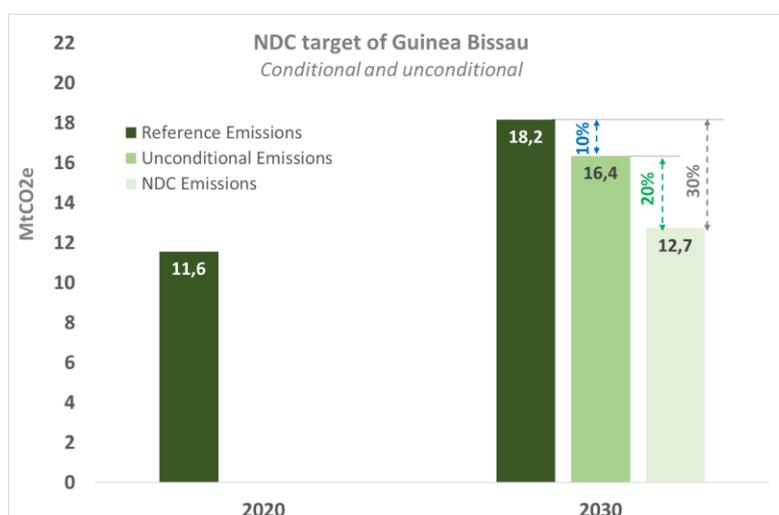


Figure 2: Guinea-Bissau NDC's GHG mitigation target

3.1.3 Coverage and scope

The emissions concerned by the updated NDC of Guinea-Bissau cover:

- The whole national territory.
- The sectors of Energy (all sources and sectors), Agriculture, Forestry and Other Land Use (AFOLU) and Waste. Industrial processes are not covered by the updated NDC. This source constitutes a very low share in Guinea-Bissau's emissions given the low level of industrialization of the country and the limited stock of household appliances, as potential source of HFC gas emissions.
- GHG: CO₂, CH₄ and N₂O.

3.1.4 Equity and Ambition

Despite being a non-Annex 1 Party to the UNFCCC, Guinea-Bissau aspires to contribute to the international mitigation effort aimed at gradually aligning with the 1.5° C trajectory as recommended by the Paris Agreement.

Guinea-Bissau's contribution is fair and ambitious for four main reasons:

- It contributes to less than 0.02% in global emissions.
- It has made efforts to present a quantified mitigation target, which is a significant step forward from the first NDC.
- The target of reducing emissions by 30% in 2030 compared to the reference scenario constitutes an ambitious objective for Guinea-Bissau, classified among the least developed countries.
- Guinea-Bissau plans an unconditional reduction of its GHG emissions by 10% in 2030 compared to the reference scenario, despite its low level of development and its very limited economic resources.

3.2 National expected emissions

3.2.1 Reference scenario emissions

The reference scenario emissions were calculated by aggregating the baseline emissions from the four main sectors, namely:

- Energy.
- Land Use, Land-Use Change and Forestry (LULUCF).
- Agriculture.
- Waste.

According to this scenario, Guinea-Bissau's GHG emissions would evolve from 11.6 MtCO_{2e} in 2020 to around 18.2 MtCO_{2e} in 2030, i.e., an average increase of 4.6% per year between 2020 and 2030.

- **Energy sector**

The baseline scenario emissions assessment was based on the primary energy demand forecast, considering two main factors:

- The trend extension of primary energy intensity, observed over the period 2010-2019.
- The forecast trends of the economic activity (GDP) and population over the next decade.

Primary energy intensity has evolved at a rate of -0.4% between 2010 and 2019, based on detailed energy balances (SIE UEMOA) and detailed socio-economic data.

For the baseline scenario, this trend was extended until 2030 from the year 2019, considered as the base year. The actual figures for the year 2020 have been incorporated as observed data in the forecast.

In the absence of official forecasts published for the period 2021-2030, the economic growth scenario was based on the IMF's long-term forecasts according to the last report (July 2021, Reference program -SMP) prepared following discussions with Government of Guinea-Bissau during the month of May 2021. On this basis, the economic scenario considered is that of accelerated development, characterized by an average annual growth rate of real GDP of 4.7% over the 2020-2030 period.

The population projection is based on forecasts made by the National Statistics Institute which forecasts an average population increase of 1.4% per year between 2020 and 2030.

Regarding access to electricity, the scenario adopted is that officially considered by the Bissau-Guinean State, expecting an increase of the electrification rate from 45% in 2020 to around 80% in 2030.

On this basis, primary energy demand would rise from 489 ktoe in 2020 to 745 ktoe by 2030, recording an average increase of 4.3% per year. The baseline emissions due to combustion were subsequently assessed, year by year, from 2021 to 2030, applying the reference approach of the 2006 IPCC guidelines. This approach covers CO₂, CH₄ and N₂O. Annual baseline emissions are expressed in tonnes of CO₂ equivalent using GWPs from the IPCC Fourth Assessment Report (AR4).

For the specific case of fugitive emissions related to charcoal production, the 2019 refinement of the IPCC 2006 guidelines was used for the calculation of these emissions.

Subsequently, the emissions were calculated year by year over the period 2021-2030 based on the mix of primary energy consumption for the year 2019. On this basis, the total GHG emissions of the reference scenario would increase from 372 ktCO₂e in 2020 to around 706 ktCO₂e in 2030, i.e., an average annual increase of 6.6% per year over the period.

- **Waste**

The quantities of waste produced are estimated based on an average per inhabitant which changes from 295 kg / ha / year in 2020 to 310 kg / ha / year in 2030.

The baseline assumes the extension of the same waste management practices currently observed. In this case, around 45% of the quantities of waste go into storage and the rest is treated by open fires. Under these conditions, the emissions, calculated using the guidelines of the IPCC 2006, would increase from 195 ktCO₂e in 2020 to around 300 ktCO₂e in 2030, i.e., an average increase of 4.4% per year over the period.

For wastewater, the quantities of BOD produced are estimated at 33 kt per year in 2030 compared to 26 kt in 2020. The extension of current management practices leads to GHG emissions of 200 ktCO₂e in 2030 against 158 ktCO₂e in 2020.

The emissions of the two sub-sectors together are thus estimated at around 500 ktCO₂e in 2030 against 353 ktCO₂e in 2020, i.e., an average annual increase of 4.4% per year.

- **Land Use, Land-Use Change and Forestry**

Historically, the land use sector in Guinea-Bissau has been a net carbon sink. However, following the 2012 political coup, the forests of the country have been under unprecedented pressure. The outside interest in African rosewood (*Pterocarpus Erinaceus*) coupled with political instability, was translated in the widespread felling and export of this species. Consequently, the sector transitioned to a net source. The issuing of a 5-year moratorium to all timber felling and export by the Government in 2015 stabilized clear cut rates and associated emissions in the subsequent

years. However, land clearing between 2013 and 2020 remained much higher than in the pre-2012 period. The average annual emissions in 2013-2020 were close to 4 Mt CO₂e which is a striking increase considering the sector was a net sink in 2006-2012 (with an average annual removal of 230 kt CO₂e). The 2021-2030 BAU projection acknowledges the end of the five-year moratorium on logging and export, the reopening of trade, and the persistent constraints hindering an effective forest management. The area of forest clear-cut in 2021-2030 is assumed to increase progressively until reaching the 2013 values in 2030. Lagged soil emissions and increasing fuelwood consumption also contribute to an increasing trend that reaches 8 Mt CO₂e in 2030, compared to 5 MtCO₂e in 2020

In developing the reference level for the land use sector, Guinea-Bissau uses the gain loss method and the 2006 IPCC guidelines. The previous GHG inventories⁴ were updated to use national data from the forest reference emission level submitted to the UNFCCC in 2019⁵, namely the forest extent in the beginning of 2007 (stratified in closed-forests, open-forests, savanna-woodlands, and mangroves⁶), and emission factors obtained from field inventories. To develop a historical baseline and activity data for the period 2007 to 2020, national data was complemented and combined with global products derived from satellite data of annual tree cover loss⁷ and monthly burned areas⁸. There is no quantitative study on the post clear cut dynamics in the 2012-2020 period. In the baseline, it was assumed that much of the post-2012 clear cut area remained degraded forest land with the potential to regrow. IPCC defaults were used to include emissions from litter and soils, to determine growth factors in forest lands and combustion factors in burnt areas.

- **Agriculture**

Guinea-Bissau's agricultural greenhouse gas emissions are mainly linked to livestock activities with CH₄ from enteric fermentation and N₂O from grazing animals. They also come from rice growing activities, the (very moderate) use of fertilizers and the burning of agricultural residues.

- Animal populations are estimated based on data available for the year 2009 and projected from this year. For all herds except cattle, animal populations are projected using the trend proposed by the FAO for the period 2009-2019. For cattle, whose population is growing rapidly (6.4% growth per year over the period 2000-2009), the historical growth rate is attenuated over the period 2010-2020, then the herd is assumed to be constant from 2021 onwards the period 2021-2030. This evolution is assumed by considering the resources necessary to feed this large animal population. Emission factors associated with animals are also considered constant.
- Crop areas and productions are taken from FAO estimates and were assumed to be stable from 2020.
- Fertilizer consumption is not well known; the quantities reported in the 2010 greenhouse gas inventory have been used and considered stable since 2010.

Based on these assumptions, emissions from agricultural sector remain stable at around 4.5 MtCO₂e per year over the entire period 2021-2030.

3.2.2 NDC scenario emissions

The emissions of the NDC scenario (mitigation scenario) were assessed at the level of the 4 sectors, and then aggregated at the global level. At the sector level, the NDC scenarios are

⁴ Biennial update report (<https://unfccc.int/documents/251917>)

⁵ Forest Reference Emission Level (<https://redd.unfccc.int/submissions.html?country=gnb>)

⁶ The CCI land cover product published by FAOSTAT (<http://www.fao.org/faostat/fr/#data>) was used to further stratify the non-forest stratum of the 2007 national map into the remaining IPCC classes and to assess transitions between non-forest classes in the reference period

⁷ Global Forest Change (GFC) from Hansen et al. (2013) (https://earthenginepartners.appspot.com/science-2013-globalforest/download_v1.3.html).

⁸ MODIS burnt areas MCD64, 500-m spatial resolution (<https://lpdaac.usgs.gov/products/mcd64a1v006/>)

simulated by deducting the avoided emissions resulting from the mitigation measures planned in each of the sectors. The implementation of these measures is divided between national effort and international support according to the technical and financial capacity of national actors, which makes it possible to distinguish the conditional and unconditional emissions trajectory, as shown in the following graph:

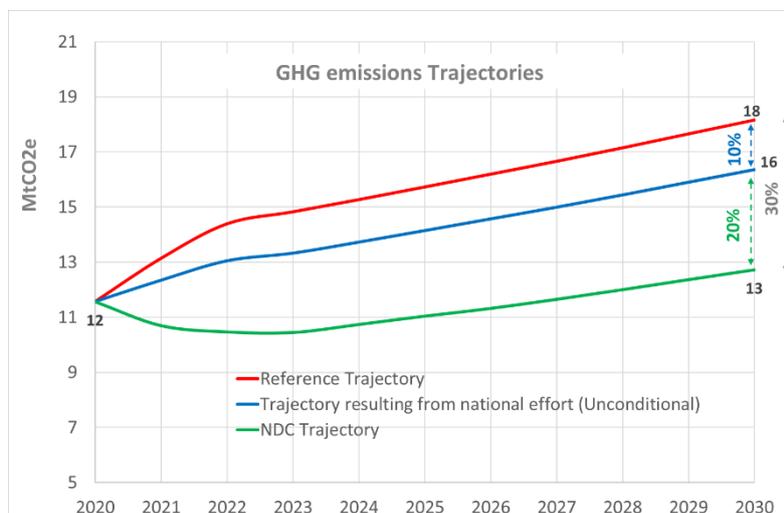


Figure 3: Trajectories of baseline and NDC scenario emissions of Guinea-Bissau

The carbon intensity of the country slows down from 10 tCO₂e/1000 USD 2010 in 2020 to 6.9 tCO₂e/1000 USD 2010 in 2030 according to the NDC scenario (9.9 tCO₂e/1000 USD for the reference scenario), i.e., an average annual decrease of -3.6%.

- **Energy sector**

The energy sector mitigation scenario (NDC scenario) reflects Guinea-Bissau's desire to be part of the energy transition dynamic with a view to reduce the energy deficit through energy efficiency and renewable energies development. It aims also at improving the standard of living of households while reducing the fuel poverty of low-income households.

The development of this scenario was based largely on official existing strategies such as the National Action Plan for Renewable Energy (NREAP), the National Action Plan for Energy Efficiency (NEEAPs) and the “National program for sustainable access to energy for all by 2030” which constitute a reference framework for the country's energy transition vision.

In concrete terms, the NDC scenario for the energy sector targets the following energy objectives:

- A reduction in primary energy demand of around 20% by 2030, compared to the baseline scenario.
- A strong increase in the share of renewable energies in the electricity mix, which will be increased from 5% currently to 58% by 2030, 40% of which would come from hydroelectricity and the rest from solar PV and wind power.

The NDC in energy sector expects in particular the implementation of the following measures:

- The set-up of an installed renewable energy capacity of around 90 MW by 2030, compared to 3 MW currently.
- A significant reduction in electricity grid losses, which would drop from 30% currently to 20% in 2030.
- The diffusion of efficient lighting in the residential and commercial sector.
- The implementation of energy efficiency actions in public and commercial buildings and in industry.

- The large-scale dissemination of improved stoves for cooking to reduce fuelwood consumption.
- The large-scale distribution of prepaid meters to encourage households to optimize their electricity consumption.
- Communication and awareness of stakeholders in favor of energy management.

Thus, according to the NDC scenario, primary energy consumption would change for only 2.1% over the period 2020-2030, going from 498 ktoe in 2020 to 605 ktoe in 2030.

The energy sector's GHG emissions would drop from around 372 ktCO_{2e} in 2020 to only 393 ktCO_{2e} for the mitigation scenario, i.e., an average annual growth of 0.6% per year against 6.6% in the case of the baseline scenario.

The NDC scenario in the energy sector allows a reduction in GHG emissions by 44% in 2030 compared to the reference scenario which is divided between the unconditional (7%) and conditional (37%) contribution. According to the NDC scenario, the carbon intensity of the energy sector would register an average annual decrease of -4% over the period 2020-2030, while it would increase by 1.8% per year in the case of the reference scenario.

• Waste

The mitigation measures foreseen by the NDC scenario in the waste sector are based on the following main assumptions:

- A reduction in the quantities put in landfills by diverting part of the waste produced for recycling: paper and cardboard (50%) and textiles (10%).
- Diversion- Diversion of 10% of food waste to composting.
- Stabilization- Stabilization of the breakdown between open and managed landfills at the same rate as in 2014, i.e., around 25% (open landfills) and 75% (controlled landfills).
- Recovery- Recovery (flaring or recovery) of 1% of CH₄ generated by 2030.

For wastewater, we consider the installation of aerobic treatment plants for the treatment of wastewater in urban areas. It is also considered that 20% of the urban population is connected to a wastewater treatment plant by 2030 (total disappearance of direct discharges and discharges into open sewers and partial transition of discharges into latrines and septic tanks by 2030).

The scenario does not expect the implementation of a wastewater treatment plant in rural areas but rather a partial transition of direct discharges to latrines and septic tanks and the disappearance of discharges into open sewers by 2030.

These assumptions lead to a reduction in GHG emissions estimated to -7% by 2030, compared to the baseline scenario (500 ktCO_{2e} in the baseline scenario and 465 ktCO_{2e} for the NDC scenario). According to these assumptions, in 2030, GHG emissions will be distributed between storage 33%, composting 5%, open fires 23% and wastewater treatment 40%.

• Land Use, Land-Use Change and Forestry

For the LULUCF sector, the mitigation contributions are based on the most recent national plans and strategies, including the *PNIA Plano Nacional de Investimento Agrícola* (2017), *Hora Tchiga, Estratégia Nacional para as Áreas Protegidas* (2015), and the *Fifth National Report to the Convention on Biological Diversity* (2014). They also take into consideration the Forest Code (Decreto-Lei n° 5/2011), the 5-year moratorium issued in April 2015, its subsequent proposed lifting, or the proposed Partial Forest Moratorium decree. These national plans and strategies were defined based on a highly participatory national process. The aim is the sustainable development of the country, while at the same time having tangible climate change mitigation benefits:

- Ensure the effective management of the protected areas (now covering 26% of the country).
- Reduce illegal and indiscriminate felling of trees.
- Develop a national forest land restoration and reforestation programme.
- Establish and schedule a new forestry policy. The vision is of a sustainable management of forest resources to enhance a socio-economic balance that meets the needs of communities and ensures their accountability (community forests).

The following additional measures, also from strategic plans, do not have a direct quantitative mitigation contribution. Nevertheless, they are essential to and will enhance the implementation of the above mitigation measures:

- Conduct a nationwide forest inventory and forest monitoring system.
- Strengthen the existing capacity to develop a REDD+ programme.
- Develop an agro-ecological zone and forest management.

The long-term vision is to return to the situation of net absorber of the Bissau-Guinean Forest by returning to situations like those before 2012. However, the implementation of this objective is difficult to achieve by 2030

The updated NDC aims, as an intermediate but ambitious step, at a reduction of approximately 40% of emissions from the LULUCF sector compared to the baseline scenario, by 2030.

The measures for the management of national forests, including protected areas, and the measures for the continued fight against illegal logging will be undertaken assuming a conjuncture of strong outside pressure over national forests and an effectiveness rate of the enforcement of the measures like that of the 5-year moratorium period (2015-2020). The progressive restoration of the area felled between 2012 and 2020 is included in both the BAU and NDC projections.

- **Agriculture**

The NDC scenario considers that development actions made it possible to optimize certain high-emitting sources:

- Improving the dairy productivity of cows by 10% would allow a reduction in the herd compared to the reference scenario and therefore a reduction in the associated CH₄ and N₂O emissions.
- Improving rice growing practices would make it possible to shorten the watering period of rice fields (from 183 days in the reference scenario to 165 days in 2030) and therefore the associated CH₄ emissions.
- Improving agricultural practices and the presence of herds in harvested areas would make it possible to stop the emissions linked to the burning of crop residues still included in the reference scenario.

All these actions will allow achieving a reduction in agricultural emissions compared to the reference scenario of - 4% by 2030.

3.3 The impacts of the NDC implementation

3.3.1 Avoided GHG emissions

Over the 2021-2030 period, the implementation of the updated NDC will reduce around 22 MtCO_{2e}, mainly coming from the forestry and land use sector (87%) followed by energy (9%) and then from agriculture (3%), as shown in the following graph:

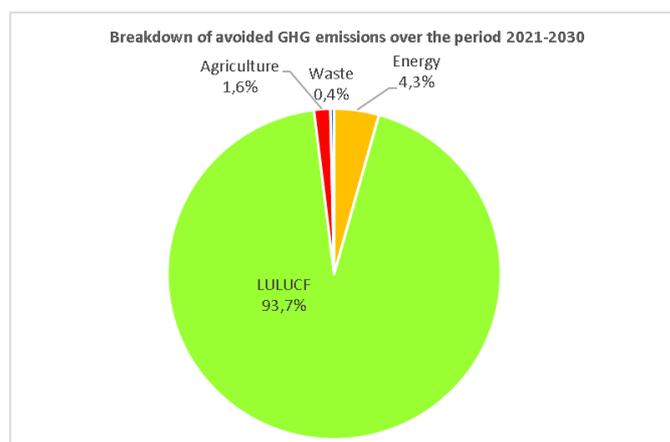


Figure 4: Structure of cumulative GHG emissions avoided by the updated NDC over the period 2021-2030

3.3.2 The impacts in terms of sustainable development

The implementation of the NDC would result in positive impacts in terms of sustainable development, including the following:

- A cumulated fossil energy saving over the period 2021-2030 of 0.9 million toe, compared to the reference scenario. Around 40% of this saving comes from final consumption and 60% from renewable energies for electricity generation.
- This saving will reduce the energy bill of Guinea-Bissau by around USD 450 million over the period 2021-2030, while reducing its energy dependence.
- A decoupling between energy consumption and economic growth resulting in an average decrease in primary energy intensity of -2.5% per year over the period, which is likely to improve the competitiveness of the economy of Guinea-Bissau.
- Better access to energy and the fight against fuel poverty for the Bissau-Guinean population.
- protecting the forest and reducing deforestation by reducing the use of wood energy and fighting forest fires.
- Improving biodiversity linked to forest protection;
- Job creation through the implementation of mitigation measures linked to energy sector decarbonisation and forest protection.

In general, the updated NDC of Guinea-Bissau remains in full alignment with the United Nations Sustainable Development Goals (SDGs), particularly goals 1, 3, 6, 7, 8, 9, 11, 12, 13 and 17.

3.4 Investment and capacity building needs

3.4.1 Investment needs

The overall amount of investment required for the implementation of the updated NDC target, roughly estimated, reaches approximately USD 664 million over the period 2021-2030. It is distributed among the different sectors as follows:

Table 1: Investment needs for the implementation of the updated NDC (mitigation component)

Sector	Amount in millions USD 2020
Energy	300
Renewable energies	180
Strengthening the electricity grid	20
Energy efficiency measures	100
Forest and Land Use	330
Agriculture	28
Waste	6
Total	664

The implementation of the conditional objective requires the mobilization of significant international support amounting to approximately USD 531 million, or 80% of the total amount of the investment needs, distributed as shown in the following table:

Table 2: Need for international financial support for the implementation of the updated NDC (mitigation component)

Sector	Amount in millions USD 2020
Energy	240
Forest and Land Use	264
Agriculture	22
Waste	5
Total	531

3.4.2 Capacity building needs

The achievement of the NDC target requires significant capacity building of stakeholders, so that they can support the NDC implementation. These support measures are mainly the following:

- Institutional capacity building to allow Guinea-Bissau to properly monitor the implementation of the NDC in the different sectors. This implies, among other things, the establishment of a transparency system allowing the regular production of GHG inventories according to IPCC rules as well as NDC monitoring indicators.
- Capacity building in the field of energy transition (energy accounting, forecasting, programming of energy management actions, development of indicators, etc.).
- Training of actors in MRV of NDC implementation.
- Capacity building of actors to better take advantage of carbon market mechanisms as provided by Article 6 of the Paris Agreement.
- Capacity building and technology transfer regarding the development of renewable energies and energy efficiency in the different sectors of the economy.
- Capacity building concerning optimized electricity system management to increase its ability to better integrate renewable energies.
- Capacity building of actors in the field of forest protection and ecosystem preservation.

Capacity building will also concern Guinea-Bissau's support in areas related to the low-carbon transition, through the implementation of the following works:

- The national and sectoral action plan for the implementation of the NDC.
- The energy sector investment plan.
- The portfolio of projects and specific financing mechanisms in the energy sector.
- Updating the NDC before 2024.
- The development of a national low carbon strategy by 2050.
- Preparation of the first biannual transparency report.
- Evaluation of the energy transition policy (integration of economic and social dimensions).

The required cost for the implementation of capacity building measures is estimated at around USD 30 million, to be financed mainly through international cooperation.

3.4.3 Use of the mechanisms foreseen by the Article 6 of the Paris Agreement

To finance its conditional contribution, Guinea-Bissau aspires to make full and voluntary use of the cooperative mechanisms provided for in Article 6 of the Paris Agreement, whether they are

market-based (paragraphs 2 and 4 of Article 6) or they are not market-based (paragraph 8 of Article 6).

In general, Guinea-Bissau wishes to engage in these cooperative approaches on all sources eligible for the mechanisms of Article 6, particularly to develop electricity generation from renewable energy sources.

For this, Guinea-Bissau intends to strengthen its capacities in the field of carbon pricing through the establishment of specific training programs for the actors concerned.

3.5 Information necessary for clarity, transparency and understanding of the NDC

1. Quantifiable information on the reference point (including, as appropriate, a base year)	
a) Reference year(s), base year(s), reference period(s) or other starting point(s)	The year 2019 has been considered as the base year for the projection of emissions.
b) Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year	The reference indicator is expressed as a percentage of decrease in GHG emissions from the baseline scenario in 2030. GHG emissions in 2019 were 409 ktCO _{2e} .
c) For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties are to provide other relevant information	NA (Not Applicable)
d) Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction	The Guinea-Bissau contribution aims to reduce GHG emissions by 30% in 2030 compared to the baseline scenario. The unconditional contribution based on the country's own resources would lead to a 10% drop in GHG emissions by 2030 compared to the reference scenario. The conditional contribution, based on international support, would allow an additional reduction in emissions of 20%.
e) Information on sources of data used in quantifying the reference point(s)	Base year emissions were calculated from existing activity data, applying the reference approach of the IPCC 2006 guidelines and using the GWPs from the IPCC Fourth Assessment Report (AR4).
f) Information on the circumstances under which the Party may update the values of the reference indicators	The complete national GHG inventories carried out in Guinea-Bissau covered the years 1994, 2006, 2010 and 2013. However, an operation is underway launched by Guinea-Bissau with the support of the UNDP to carry out complete inventories for recent years, probably including an update of the 2006, 2010 and 2013 inventories to harmonize the methodologies for emissions calculation.
2. Time frames and/or periods for implementation	
a) Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)	2021-2030
b) Whether it is a single-year or multi-year target, as applicable	One and only one target year: 2030
3. Scope and coverage	
a) General description of the target	Unconditional commitment to reduce GHG emissions by 10% (1.8 MtCO _{2e} reduction) in 2030 compared to the reference scenario with

	the international support levels in force in 2020, increased to 30% (5.5 MtCO _{2e}) with higher international support.
b) Sectors, gases, categories, and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines	The updated NDC covers: <ul style="list-style-type: none"> - The whole national territory - All sectors, except industrial processes which constitute a very low share of emissions in Guinea-Bissau - All sub-categories and sources of emissions, within each sector, in accordance with 2006 IPCC guidelines - All sources of carbon absorption covered by the AFOLU sector (soils and biomass, according to land use activities) in accordance with the 2006 IPCC guidelines - CO₂, CH₄ and N₂O as GHGs
c) How the Party has taken into consideration paragraph 31(c) and (d) of decision 1/CP.21	Guinea-Bissau's updated NDC includes all categories of anthropogenic emissions and removals covered by the IPCC 2006 guidelines, except for industrial processes. Emissions from industrial processes are negligible due to the country's low industrialization. In addition, quantified data on the use of HFCs by air conditioning and refrigeration devices are not yet available.
d) Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures, and initiatives of Parties' adaptation actions and/or economic diversification plans	Not applicable
4. Planning process	
a) Information on the planning processes that the Party undertook to prepare its nationally determined contribution and, if available, on the Party's implementation plans, including, as appropriate:	
i) Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner	<p>The updated NDC was carried out based on broad consultations with the main stakeholders concerned by the issue of climate change in Guinea-Bissau, particularly including public institutions, civil society and experts operating in the various fields and sectors concerned by GHG mitigation.</p> <p>The consultations took place, under the aegis of the climate change focal point, within the framework of an NDC group made up of representatives of the following parties:</p> <ul style="list-style-type: none"> - National Institute of Meteorology - Ministry of Agriculture and Rural Development - Ministry of Natural Resources and Energy - Ministry of Transport and Communications - Ministry of the Environment and Biodiversity - National Institute of Statistics - General Directorate of Planning - General Directorate of Budget <p>Several meetings of the group were held to consult on the following key points of the NDC:</p> <ul style="list-style-type: none"> - Choice of objective type and base year - Definition of baseline and mitigation scenarios - Definition of sectoral and global objectives - Breakdown of the objective between conditional and unconditional - Estimation of investment costs, etc. - The restitution of the main content of the NDC. <p>The development of the updated NDC was also largely based on existing sectoral and horizontal strategies, such as the Strategic and Operational Plan 2015-2020 (vision 2025), the development Plan 2020-2023, the third national communication, the first biennial report, the Action Plan. National Renewable Energies, the National Energy Efficiency Action Plan, the Urban Waste Management Plan of Guinea-Bissau, Forest Emissions Reference Line (FREL), sustainable energy investment plan Guinea-Bissau 2015- 2030, etc.</p>

ii) Contextual matters:	
<p>(ii) -a. National circumstances, such as geography, climate, economy, sustainable development, and poverty eradication;</p>	<p>Geography and climate</p> <p>Guinea-Bissau, with an area of 36,125 km² and a population of around 1.9 million, is located on the west coast of Africa. The country is divided into two zones: a continental zone and an insular zone constituted by 88 islands and islets, of which only 21 are inhabited.</p> <p>The country enjoys high rainfall ranging from 1,500 to 2,500 mm per year in the coastal zone and 1,000 to 1,500 mm per year in the continental zone. The temperature varies according to zones and seasons with extremes ranging from 16 ° C to 39 ° C, with an annual average of 26 ° C.</p> <p>The country is highly vulnerable to climate change resulting in increased temperature, reduced rainfall, and sea level rise. The most vulnerable sectors are agro-livestock, forestry, and water resources.</p> <p>National economy</p> <p>Agriculture, particularly focused on cashew nut production, is the country's main economic activity.</p> <p>After a long period of economic stagnation between 2000 and 2014, Guinea-Bissau experienced relative growth until 2019 despite the vagaries of international prices for cashew nuts, the country's main export product.</p> <p>However, due to the COVID-19 pandemic, the economy contracted in 2020 recording a decrease of -2.4%. In 2021, the country could record a growth recovery of 3%, according to IMF forecasts. In the longer term, the IMF forecasts an average annual growth of 5%.</p> <p>Sustainable development</p> <p>National Program of the Development (PND) - Hora Tchiga aims to promote the sustainable economic and social development of the country. This is based on 6 axes:</p> <ul style="list-style-type: none"> - Consolidate the democratic rule of law, reform and modernize public institutions - Reform the economy and promote growth and employment - Develop the productive sector and infrastructure the country - Enhance Human Capital and Improve the Living Conditions of Populations. - Re-energize foreign policy, promote regional integration and value the Guinean Diaspora - Preserving biodiversity, fighting climate change, and valuing natural capital <p>Fight against poverty</p> <p>With a GDP per capita of less than 800 USD, Guinea-Bissau is ranked among the least developed countries and has socio-economic indicators among the lowest in the world (177th out of 189 according to the latest ranking of the Development Index Human Rights (HDI) of the UNDP). About 70% per cent of Bissau-Guineans live below the poverty line and a third are believed to be living in extreme poverty. Still nearly a third of children under five suffer from malnutrition.</p>
<p>(ii) -b. Best practices and experience related to the preparation of the nationally determined contribution;</p>	<p>The preparation of the NDC made it possible to reactivate the consultation processes, and therefore to revitalize the commitment of all actors in favor of the fight against climate change.</p> <p>During the consultations, the emphasis was largely placed on the empowerment of stakeholders in relation to the objectives (national and sectoral),</p> <p>The development of the updated NDC is part of a more comprehensive process launched by the Bissau-Guinean government to strengthen transparency in the implementation of the NDC. This process includes the following elements:</p>

	<ul style="list-style-type: none"> - The development of the national inventory of GHG emissions for recent years based on the guidelines of the IPCC 2006, or even 2019. - The establishment of a national institutional system for inventorying GHG emissions - The development of an action plan for the establishment of a national MRV system to increase transparency - The capacity building of the stakeholders to facilitate the implementation and monitoring of the NDC
ii (c). Other contextual aspirations and priorities acknowledged when joining the Paris Agreement;	N / A
b) Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16 and 18 of the Paris Agreement;	N / A
c) How the party's preparation of its NDC has been informed by the outcomes of the global stocktaking, in accordance with Article 4, paragraph 9, of the Paris Agreement;	N / A
d) Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	
i. How the economic and social consequences of response measures have been considered in developing the nationally determined contribution;	N / A
ii. Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	N / A
5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	
a) Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	Accounting for anthropogenic greenhouse gas emissions and removals complies with 2006 IPCC guidelines. The approach used by Guinea-Bissau in accounting for emissions / removals will, by 31 December 2024 at the latest, strictly comply with the accounting guidelines for NDCs set out in Annex II of decision 4 / CMA.1.
b) Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	Emissions from the NDC scenario up to 2030 result from the implementation of mitigation measures deemed to be priorities in the energy, forest, agriculture, and waste sectors. The same assumptions

	and approaches as those of the GHG inventory are used for accounting for the reduction in emissions resulting from these measures.
c) If applicable, information on how the Party will consider existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	In its accounting of anthropogenic emissions and removals corresponding to the NDC, Guinea-Bissau relied on paragraph 14 of article 4 of the Paris Agreement, which refers to article 13 of the same agreement, which emphasizes environmental integrity, transparency, accuracy, completeness, comparability, consistency, and the avoidance of double counting.
d) IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	Methodologies: 2006 IPCC Guidelines. Metrics: GWP values used from the document "IPCC - AR4": CO ₂ = 1; CH ₄ = 25; N ₂ O = 298
e) Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	
i. Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	N / A
ii. Approach used to account for emissions and removals from harvested wood products;	Informally harvested wood products were estimated from historical data
iii. Approach used to address the effects of age-class structure in forests;	Not considered
f) Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	
i. How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	The development of the reference scenario was based on forecasting activity data by extending the trends observed over the last 10 years. The emission factors are the default values of the IPCC. The sectoral assumptions are described in section 1.2.1 of this updated NDC.
ii. For Parties with nationally determined contributions that contain non-greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable;	N / A
iii. For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers is estimated;	N / A
iv. Further technical information, as necessary;	N / A
g) The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	To finance its conditional contribution, Guinea-Bissau aspires to make full and voluntary use of the cooperative mechanisms provided for in Article 6 of the Paris Agreement, whether they are market-based (paragraphs 2 and 4 of Article 6) or not (paragraph 8 of Article 6). In general, Guinea-Bissau wishes to engage in these cooperative approaches on all sources eligible for the mechanisms of Article 6, particularly to develop energy efficiency and electricity generation from renewable energy sources. For this, Guinea-Bissau intends to strengthen its capacities in the field of carbon pricing through the establishment of specific training programs for the actors concerned.

6. How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances	
a) How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	Guinea-Bissau's contribution is fair and ambitious, because: <ul style="list-style-type: none"> - Guinea-Bissau has made efforts to present a quantified mitigation target, which is a significant step forward from the first NDC. - The 30% emission reduction target by 2030 is an ambitious goal for Guinea-Bissau, classified among the least developed countries. - Guinea-Bissau plans an unconditional reduction of its emissions by 10% in 2030, despite its low level of development and its very limited economic resources.
b) Fairness considerations, including reflecting on equity;	Guinea-Bissau contributes to less than 0.02% in global emissions.
c) How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;	The updated NDC presents for the first time a quantified mitigation target. This objective corresponds to the highest possible level of ambition for Guinea-Bissau, given its level of development, low economic resources, and the limitation of its implementation capacity over the short period 2021-2030.
d) How the Party has addressed Article 4, paragraph 4, of the Paris Agreement;	The objective of reducing emissions by 30% in 2030 compared to the baseline scenario would allow a sharp deceleration in GHG emissions evolution. The average growth rate of emissions would be only 0.6% per year on average against 6.6% per year for the baseline scenario. The carbon intensity will also decrease by average of around -3.6% per year during the period 2020-2030.
e) How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	N / A
7. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2	
a) How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2;	Despite its low level of emissions, Guinea-Bissau contributes to the global effort to achieve the objective of the UNFCCC as announced in article 2. This is confirmed by points 6a and 6b above.
(b) How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	Sections 4 and 6 detail Guinea-Bissau's mitigation ambition which will contribute to the achievement of Article 2 of the Paris Agreement.

4 NDC ADAPTATION COMPONENT

4.1 Current Adaptation Response

Under the Paris Agreement, and regarding the adaptation component, it is expected that each country can voluntarily inform the other parts of the UNFCCC which adaptation actions have been implemented in the past (focusing on results and learning), which actions are ongoing (current projects, programs, and initiatives) and what actions should be taken in the future (with a focus on strategies, action plans and needs estimates). These exercises also include the identification of external funding needs where there are gaps, capacity building and priority sectors for technology *and know-how* transfer.

It is especially important that Guinea-Bissau can be specific in articulating its adaptation needs, and within a framework of what is feasible. This entails considering not only the needs for external support in the form of programs and projects, but also considering the role of market mechanisms and the private sector in post-Covid adaptation and recovery.

This aspect of the NCD update therefore focuses on the so-called 'adaptation response' as per Article 7.1 of the Paris Agreement. Such a response should aim at different measures in the following areas: (1) strengthening adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. For the time being, the consolidation of these measures still needs to go through a process of technical scrutiny and stakeholder consultation, as well as feedback from development partners and the UNFCCC COP.

Guinea-Bissau has regularly reported to the UNFCCC. The National Action Program on Adaptation to Climate Change (NAPA) was submitted to the Convention in 2006 and prioritized actions (including programs and projects) within the scope of **Food Security, Water Resources, Coastal Zone and Forests**. These priorities resonate with diverse **economic sectors** and **government regulation**, with diverse institutions and entities involved in the evolutionary implementation. The 2015 iNDC also listed some policies, strategies, and regulatory frameworks across relevant sectors (see below), some of which are in the process of being updated. Since the iNDC submission, Guinea-Bissau submitted to the UNFCCC in 2018 its Third National Communication (TNC), and in 2019 its First *Biennial Update Report* (BUR), whose focus was to update the GHG inventory.

4.1.1 Relevant national policies updated since 2015

Regarding national policies related to adaptation, there has been little evolution in recent years. There is no specific national adaptation policy, but different sectoral policies that incorporate or not adaptation in different measures.

There is also a gap between what is defined in national plans (such as iNDC, Hora Tchiga, and Third National Communication), and Guinea-Bissau's relevant legal framework for implementing these plans and policy guidelines.

TNC (2018) includes unprioritized lists of actions in various sectors based on superficial adaptation analyses. There are six prioritized sectors: Agriculture & Livestock, Energy, Forestry, Biodiversity, Fisheries and Water Resources. As the TNC justifies and expands on the adaptation measures mentioned in the iNDC, the six listed sectors will serve as the basis for the realization of adaptation measures for and actions that can be prioritized in the updated NDC.

Lacking more specific policies in the field of adaptation, government and cooperating partners still refer to the NAPA to support measures proposed in the NDC. And although NAPA has been produced in 2006, some of the priorities listed there remain valid. Other aspects of NAPA are too generic and outdated to address the multifaceted adaptation challenges in Guinea-Bissau today.

At the same time, there has been some positive progress in implementing adaptation principles and measures across sectors. It is worth mentioning, for example, the National Agricultural

Investment Plan (PNIA2) of 2017, well aligned with Guinea-Bissau's macro development plan, called *Hora Tchiga*. The PNIA2 (2017) dedicated an entire subprogram to the incorporation of climate change in agriculture, as cited in a study carried out by the World Bank in 2019, which addresses the topic well:

"[...] providing for the strengthening of the capacities of rural populations in the face of climate change, the promotion of techniques adapted to its harmful effects and ensuring that their impacts on the country's development efforts are limited. Therefore, climate issues are widely addressed, either directly in sub-program 7 "Adaptation of agricultural sectors to climate change" or in almost all of the other six sub-programs."

The concrete measures contained in PNIA2, Subprogram 7 (and other relevant ones) provide a useful basis for reviewing the NDC goals, it is important to give preference to concrete measures, including those that can be integrated with mitigation measures, that promote food security and the resilience of the agricultural sector and gender equality. Among them are the development of climate-adapted seed varieties, agricultural insurance products that protect farmers from the weather, the exploitation of agroforestry systems adapted to local conditions, as well as others.

On June 28, 2017, six decrees related to environmental policy in Guinea-Bissau were also signed, defining attributions related to monitoring, control and punishments related to environmental practices, among other topics. One of the six decrees mentioned created the Environmental Fund, dedicated to the recovery of degraded areas and sustainable management of natural resources, among other purposes. Climate and adaptation are still incipient in the implementation of these decrees. Since 2020, when there was a new ministerial arrangement, these policies have not yet been updated, defining new roles and attributions. Furthermore, the command-control system defined through the application of fines and penalties proved to be inefficient to measure the advance of deforestation, as demonstrated by the analysis of the NDC update in containing mitigation. A more systematic integration of climate matter and its ramifications into Guinea-Bissau's new environmental policy regulatory packages would be helpful.

With the initiation in 2020 of a major adaptation project for the coastal zone of Guinea-Bissau, it is expected that the updated legislation and plans for an integrated and adapted coastal management will be developed. The multi-segment aspect of integrated coastal management makes room for the definition of actions with multiple benefits, including adaptation.

In the sectorial scope of water, forests and energy, the respective strategic planning and sectorial policy frameworks are out of date. For energy, however, processes are being updated.

4.1.2 Institutions and Main Stakeholders

Adaptation actions to climate change generally involve different sectors, acting in an integrated manner and seeking optimization in the search for results. To update the goals related to adaptation in the updated NDC, a public consultation will be carried out until March 2022, under the UNDP 003 RFP/GNB10/07/2021 project, involving the three spheres of society (government, CSO and private sector). The engagement of stakeholders is a critical factor for the success of adaptation measures and in mobilizing resources to implement them.

As main government institutions we have the following: Ministry of Environment and Biodiversity, National Institute of Meteorology; Institute of Biodiversity and Protected Areas – IBAP, Ministry of Agriculture and Rural Development; Ministry of Natural Resources and Energy; Ministry of Transport and Communications; National Institute of Statistics; General Planning Directorate; General Directorate of Budget.

As relevant agents that deserve to be mentioned and involved in the process of implementing adaptation actions and monitoring, we can also name:

- Guinea-Bissau Water and Electricity Company.

- Private sector (Eco Progresso; Eco-Social-Economy; GEAD; Petromar/Galp).
- Civil Society: National Civil Society Movement (congregates more than 170 civil society organizations); Tiniguena (NGO); Lusophone University; Guinean Association of Environmental Assessment.

In relation to international development cooperation partners in Guinea-Bissau, the following should be mainly involved in mobilizing financial resources for adaptation and, when necessary, technical assistance, transfer of technology and *know-how*: UNDP; World Bank; African Development Bank; European Union; and IUCN. Some of these agencies provide their own funds for the project, while others access funds from funding bodies such as the GEF and GCF, which have contributed to more than 73% of adaptation projects in the country (see Table 3 further down).

4.1.3 Gender and Climate Change Adaptation Baseline

Three UNDP-GEF projects on climate change adaptation strategies and measures, namely: "Strengthening the resilience of vulnerable coastal areas", "Modern energy services through mini-grids and low carbon bioenergy techniques" and "Strengthening of climate information and early warning systems", explicitly consider gender aspects in the proposed adaptation activities and have gender mainstreaming as a specific focus. These ongoing or approved projects have developed gender action plans and gender-sensitive budget activities (UNDP Gender Marker 2).

They follow the GEF Core Gender Indicators⁹ and include ensuring the integration of a gender perspective into climate change policies, programs and processes in Guinea-Bissau and promoting partnerships and cooperation among key agents on gender and climate change. As they have not yet been evaluated, there is no information available on the success/challenges of the implementation. The IUCN/GEF project "*Managing mangroves and production landscapes for climate change mitigation*" (2019-24) has a component of community engagement for adaptation, including gender-specific concerns.

GCF projects include as a standard a *Gender Assessment* and *Gender Action Plan*, without which projects cannot be approved.

In addition, different types of projects dealing with rural development in GB include gender-focused adaptation components such as RE facilities for irrigation and diversification of agricultural production by women small-scale farmers (NGO ADPP, www.adpp-gb.org), and activities for cleaner cooking or against deforestation, etc.¹⁰ The Adaptation Fund/BOAD (2020-2024) project "Scaling up smart agriculture in Eastern Guinea-Bissau" aims to strengthen practices and capacities in climate-smart agriculture. Key vulnerabilities in agriculture and water resources management are addressed, and the development and resilience need of extremely vulnerable farmers are considered, with a special focus on women, the elderly, and children.

In addition to these, other projects, in which women play a dominant role, also contribute to climate change adaptation, albeit indirectly. IFAD's PADES project (2016-2021), which focuses on rural development in the Southern Regions of Guinea-Bissau, is an example of such a project, although the incorporation of adaptation into it remains in its infancy.

The Association of Women with Economic Activities (AMAE) defends the interests of women with economic activities and provides substantial support to base organizations. Through a partnership agreement with FAO, AMAE operates a "resilience credit" initiative, including training on food safety, fruit and vegetable processing and conservation, entrepreneurship, and business opportunities in the field of food safety. Climate change adaptation strategies in general, and for the water resources management sector, must be coherent with the concepts of gender equality and women's empowerment to be able to face climate change. Incorporating

⁹GEF Gender Equality Action Plan, 2015.

¹⁰See ADPP and Tiniguena (www.tiniguenagb.org).

gender facilitates sustainable exploitation and integrated water resource management – as women are at the forefront of distributing this resource for domestic use.

Thus, despite adverse conditions of various orders, the country has, as far as possible, implemented projects/programs and other adaptation actions to face the harmful impacts of climate change in the water resources sector, having as main activities: (i) infrastructure the use of rainwater in the eastern regions of Guinea-Bissau; (ii) encouraging climate-resilient, income-generating agricultural practices; (iii) production of climate information within the scope of strengthening the national early warning system, among others.

In the agricultural sector, the reduction in precipitation observed due to the late arrival and early end of rains results in water stress and, consequently, a reduction in production. Institutions linked to agricultural research should be supported to develop scientific and technical research on the adaptation of new short-cycle varieties, resistant to drought and low rainfall. Knowledge about climate-resilient agricultural techniques and water management should be a priority in terms of capacity building for farmers.

According to the FAO study, "*Climate-Smart Agriculture (CSA) Country Profile*" from 2019, Guinea-Bissau already has some agricultural practices aimed at climate resilience. According to the document, "For this profile, practices are considered CSA if they increase food security, as well as at least one of the other CSA goals (adaptation and/or mitigation)."

Most of these practices are implemented in the area predominantly composed of savannas, areas that are very vulnerable and heavily impacted by high temperatures and rainfall variability, in the North and East of the country. As practices found, the study mentions: use of organic fertilizer; use of meteorological information; drip irrigation; anti-erosion arrangements; intercalated forage/food production; rotation of crop planted; and rainwater harvesting using the Zaï technique (which involves creating cavities (20-40 cm in diameter and 10-15 cm in depth) to accumulate water before planting with or without the application of organic resources such as fertilizer, vegetable waste and animal fertilizer); among others.

These practices affect each type of culture developed in the country in different ways and should be better mapped and disseminated to other regions. Other practices, which are viable for the Guinea-Bissau context, should be aggregated and taught in an institutionalized way through national capacity building programs. The non-use of agriculture techniques adapted to climate change can lead to a drastic fall in the agriculture and livestock sectors, which represent the largest part of the national GDP.

4.2 Implementation and Adaptation Actions

It is noted that the evolution of the adaptation project portfolio in Guinea-Bissau has helped shaping adaptation priorities and the relative importance of sectors in it. At the same time, understanding how this portfolio has influenced the adaptation agenda in the country is useful.

4.2.1 Portfolio of adaptation projects

The first adaptation project benefiting Guinea-Bissau started in 2004, was modestly funded by the GEF, and culminated in the submission of the NAPA to the UNFCCC in 2006. That same year, Guinea-Bissau began the process of developing more projects aimed at mobilizing climate funds for adaptation¹¹.

The first major projects aimed specifically at adaptation were funded by the GEF and with resources from LDCF funds¹² due to Guinea-Bissau's LDC status. Guinea-Bissau also accessed

¹¹The portfolio of natural resource management, biodiversity and mitigation projects is older.

¹²LDCF stands for: *Least Developed Countries' Fund for Adaptation*, or 'Least Developed Countries Adaptation Fund' (managed by the GEF).

other adaptation funds, such as the SPA for a sub-regional project. There is also a project supported by the Adaptation Fund (AF), which is supported by the GEF.

We carried out a historical, current, and forward-looking analysis of the portfolio of adaptation projects. Considering only the projects that have adaptation as the 'main objective' (Rio Marker “2_7”), a preliminary assessment of the investment over the years is presented in Table 3.

Table 3: Guinea-Bissau’s climate projects whose main goal is adaptation

According to donor and status of projects	Status			(USD M)
	Closed	Ongoing	Pipeline	Total
Aid Targeting the Objectives of the Framework Convention on Climate Change - Adaptation [Main Objective, Rio Marker 2_7]				
Global Environment Facility - LDCF	5.4	12.0	6.0	23.4
Green Climate Fund - GCF		0.3	18.8	19.1
European Commission - International Partnerships	6.9	8.3		15.2
Others	0.3			0.3
Total	12.6	30.6	24.8	68.0

Sources: Own compilation based on data from GEF, GCF and D-Portal.

The cumulative sum of the portfolio is USD 68M, of which USD 30.6M is invested in ongoing projects. This is at least 60% larger than that of the closed projects, which spanned an 11-year period between 2004 and 2015.

Based on the same data that generate Table 3, Figure 5 was composed to illustrate an approximation of the annual volume of adaptation projects.

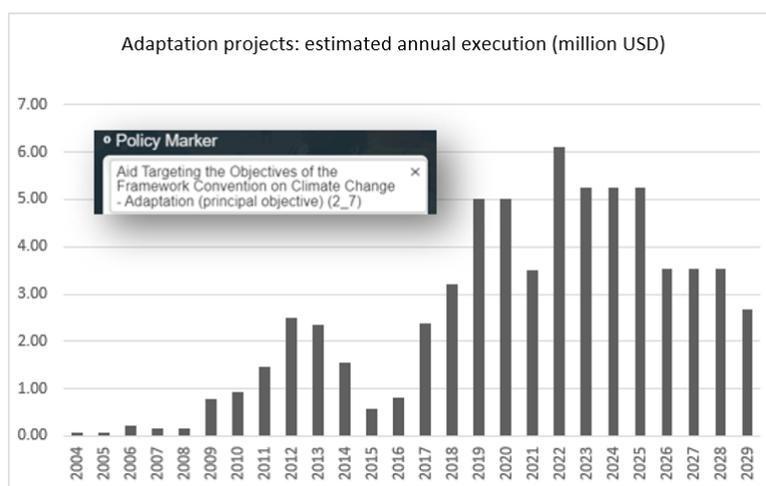


Figure 5: Guinea-Bissau climate projects that have adaptation as their main goal

The pipeline estimates and other data from Figure 5 denotes growth in the portfolio of adaptation projects, including because the *pipelining* process is rolling and dynamic, and may add more projects to the portfolio in the coming years. In the past, this growth seems to have come in waves.

It is important to point out that the programming data included in Table 3 and in Figure 5 are restricted projects that cover the topic of adaptation. Co-financing that accompanies these projects was not included either. Neither were projects and programs that have the adaptation 'Rio-marker' included, but not as their main objective, but 'secondary' (“2_7”) or 'not focused on' (“0_7”). A broader analysis could also include projects that directly or indirectly pursue resilience, whether or not related to climate. In this case, the portfolio would look much larger, but it would give a false idea about the real level of funding that focuses on adaptation. It would not be possible to distinguish between such projects and general development programs and actions.

The issue to be more deeply analyzed is whether past, current and pipeline adaptation programs are capable of meeting Guinea-Bissau's adaptation needs, and what would be the gaps.

Themes of the first adaptation projects funded by the GEF included the coastal zone, agricultural sector, and water resources. Although the geographic coverage and reach of the projects in terms of beneficiaries had several limitations, these sectors have already made some progress towards adaptation. In the GEF pipeline, there is a project to develop capacities in the hydrometric and metrology segments, including the establishment of early climate warning systems. This is urgent for Guinea-Bissau, which has important gaps in surface climate observations and hydrological monitoring. Other than that, the civil protection segment has not yet received climate funding in the context of disaster preparedness. In the GCF pipeline there is a relatively large project that focuses on 'Climate Smart Agriculture' and another that focuses on the livestock sector.

4.2.2 Funding gaps for adaptation sectors and segments

The following priority sectors, as identified in Guinea-Bissau’s official documents for the UNFCCC, are **without adequate funding** for adaptation and should be prioritized through new programs and initiatives: Fisheries & Ocean Ecosystems; Energy; Water resources; Human health; Capacity development; Disaster Risk Management.

Infrastructure, roads, bridges, houses, etc.; Local adaptation. Urban adaptation is a topic to be fully explored in Guinea-Bissau, and one with many needs – a topic that relates to infrastructure and energy and has the potential for actions integrated with mitigation.

At the same time, there are sectors whose vulnerability and importance to the economy justify that deployment and reinforcement actions be prioritized. This is the case of the agricultural sector, which has as specific segments, or consequences of the theme, food security, productivity, the cashew, and the mangrove rice segment. In the water resources sector, we have freshwater systems, more specifically, health & sanitation, as themes to be explored. In the forestry and biodiversity management sector, which are extremely important, both from an economic and a vulnerability point of view, it would also be worth focusing on wetlands and mangroves, integrating proposed actions with those of mitigation, ecosystem restoration, including through REDD+ programs. The same can be said for actions focusing on mangrove rice. It would also focus on other terrestrial ecosystems (e.g., savannas and shrubs).

All sectors mentioned above are priority sectors, as per the prioritization established in official documents, such as the NAPA, the BUR and the TNC. In other words, they have “passed the test” of priority with respect to criteria of vulnerability and socioeconomic importance. The list of priority adaptation sectors, including derived adaptation segments have been organized in a logical manner in Figure 6, in which gaps in funding and adaptation mainstreaming are represented. Gaps in adaptation sectors imply the need for strengthening the response.

MAIN ADAPTATION SECTORS WITH DERIVED ADAPTAION SEGMENTS TO BE EXPLORED						
MAIN THEMES						
	Agriculture	Livestock	Coastal and Low Lying areas	Fisheries & Ocean Ecosystems	Energy	Water Resources
DERIVED SEGMENTS	Food security and productivity					Freshwater resources
	Cashew production					Sanitation / Health
	Cashew production					Sanitation / Health

GAPS IN 'ADAPTATION SECTORS', INCLUDING DERIVED 'ADAPTATION SEGMENTS'						
OTHER THEMES	Forests, Biodiversity and Protected Areas	Human health	Capacity in general	Disaster risk management	Infrastructure, roads, bridges, houses, etc.	Local Adaptation
DERIVED SEGMENTS	Terrestrial and Wetland ecosystem Mangroves				Key economic sector and other services	
	Mangroves				Urban areas and other human habitats	
					Urban areas and other human habitats	

[*] according to prioritization in official documents (NAPA, BUR, TNC).

Legend:

- Adaptation theme has received some level of funding and attention, although insufficient
- Adaptation theme that is marginally covered / addressed
- Adaptation theme that has not been covered / addressed

Figure 6: Analysis of themed gaps (in red) in Guinea-Bissau's adaptation sectors

4.3 Challenges and Roadmap to be followed

The most significant challenges to the implementation and monitoring of NDC objectives are mainly due to the political instability recently experienced by the country. There is also a lack of monitoring data and access to external resources for the country's development. To create an environment conducive to receiving funding from partners, it is important that the government and other local agents articulate themselves in a supra-party manner, to ensure a minimum governance structure focused on climate adaptation actions, allowing for the ownership and coordination of an entire approach of the society in which government, NGOs, communities, regional and local structures (government and traditional/village structures) come together to create resilience. The absence of public policies aimed at climate adaptation is also a challenge in creating a more favorable environment for the implementation of actions.

To deal with adaptation challenges in a more efficient way, the updated NDC must define priority sectors for climate adaptation actions. By dividing the objectives by priority sectors of vulnerability and socioeconomic importance, it is possible to define more clearly the responsibilities and attributions of each agent in ensuring monitoring and achieving the defined goals and objectives. As can be seen in Figure 1 and Figure 6, there are several sectors that are directly or indirectly affected by the effect of climate change. Those in the agriculture, livestock, coastal zones, forestry, and biodiversity sectors are most described in national adaptation plans and communications, and consequently are the sectors that receive the most resources.

However, other sectors must also be prioritized and better studied to receive more attention and resources. An example is the energy sector, which depends mostly on biomass. We can also mention disaster risk management, the infrastructure sector, and the urban sectors.

It is also important to better detail some sectors, such as agriculture, in which 5 species accounts for more than 90% of the volume of exports, especially cashew. It is equally important to define adaptation strategies that include research on more resistant varieties and cheap access to seeds that are better adapted to a changing climate for the population.

In the water resources sector, improving the institutional component is the biggest challenge. The creation of alternative funding mechanisms for the water sector, including the private sector, is also worth mentioning as a challenge. It also includes the operationalization of the

National Water Fund; the completion of the review process of the sector's main strategy and policy instruments, incorporating climate change; and it would improve the state of knowledge (qualitative and quantitative) of water resources, through the rehabilitation of national hydrometric and piezometric observation networks.

Regarding the coastal areas sector, there is a delay in the implementation of planned adaptation activities: detailed vulnerability and risk assessments and sustained funding are not available. As in other sectors, the intermittent availability of funding is a problem. Furthermore, it is necessary to foster research focused on understanding the functioning of coastal ecosystems and the impacts caused by anthropogenic causes, including climate change, to set up a monitoring system. Without this, the effectiveness of adaptation measures will be limited.

Regarding gender, this should be considered a cross-cutting sector, and should contain actions in each of the relevant sectors and sub-sectors. In Guinea-Bissau, awareness of the intersection of gender and climate change is increasing only recently. The active role of women at all levels of adaptation is supported through recent projects that have more deeply incorporated the gender issue in projects. Going beyond the typical image of the vulnerable and passive group, women are seen mainly as agents who contribute to the assessment of needs and prioritization of initiatives and engage in equal participation in decision-making on adaptation and implementation measures.

Capacity to implement gender adaptation is still limited in Guinea-Bissau. The first iNDC (2015) does not consider gender vulnerabilities and adaptation needs, nor does it propose specific actions to promote gender equality in adapting to climate change, and TCN (2018) also does not address issues of equality between the genders in relation to climate adaptation goals. Thus, it is necessary to consider gender objectives in each of the defined priority sectors.

As a cross-cutting theme, it is also important to consider the challenges in the areas of technical development and education, such as weak technical capacities to operationalize actions that respond to climate adaptation issues, ensuring good planning and budget adequacy; lack of strong underlying data to serve as base for detailed, achievable and verifiable climate adaptation response targets; and weak national capacity for climate change education, research and training, particularly regarding risk identification, vulnerability and adaptation measures.

Finally, it is necessary to define integration strategies between mitigation and adaptation, including action plans, which are easy to be followed and understood at the federal and regional level, involving local leaders, civil society organizations and private companies. For this, a consultation of the main agents regarding the review of iNDC's objectives and goals, with the proposal of new objectives, constitutes the next step for the country's compliance with international agreements on climate change, and the implementation of actions at the local level.

5 FINANCIAL NEEDS

The investment required for Guinea-Bissau to meet its NDC commitments is significant. As detailed in Section 3.4.1, the amount required for climate change mitigation in the years 2021-2030 is estimated at USD 664 million. The energy sector represents 45% of the mitigation investment needs, primarily in renewable energy and energy efficiency measures; forest and land use represent another 50%, with the remaining 5% going towards agriculture and waste. The conditional portion of Guinea-Bissau's NDC mitigation target amounts to USD 531 million. Significant adaptation investments will also need to be carried out. As discussed in Section 4.2.2, significant funding gaps have been identified in fisheries and ocean ecosystems, energy, water resources, human health, capacity development, disaster risk management, infrastructure (roads, bridges, houses, etc.) and local adaptation.

Several sources of funding will be mobilized to implement the climate change mitigation and adaptation strategy:

- First, the Government will continue to pursue climate-related ODA from multilateral and bilateral donors. Over the past two decades, this has been the largest source of climate-related finance, with donors and concessional lenders that include the World Bank, European Union, African Development Bank, Global Environment Facility and Adaptation Fund. ODA comes at concessional terms, be it in the form of grants or soft loans; this suits Guinea-Bissau's precarious fiscal situation as one of the least-developed countries.

The Government will systematically screen the specific themes and sectors of interest to different donors, to identify the most appealing projects to request funding for. The Government will also expand, with the support of development agencies, its engagement with multilateral climate funds – in particular, the Green Climate Fund. Grants and concessional loans from climate funds can not only support the technical assistance activities necessary to originate and execute a pipeline of climate investments, but also de-risk investments through blended finance solutions.

- Second, some sectors addressed by the NDC are, in principle, suitable for private sector investment. Examples include renewable energy, which has an established track record of private investment in many advanced and developing economies, energy efficiency, forestry, and biodiversity-related investments (ecotourism, agroforestry), and water and transport infrastructure. Considering the low per capita income of Guinea-Bissau and underdeveloped business enabling and regulatory environment, the mobilization of private investment in most of these sectors will require concessional support from international donors.

Sources of private finance that the Government will seek to mobilize include domestic and international banks, international impact and infrastructure funds, international project developers and domestic entrepreneurs. While not private institutions themselves, the private sector arms of development banks (such as the IFC division of the World Bank Group) also provide equity or loans to private sector projects at commercial terms and often play the role of early investors in markets perceived as particularly risky. Renewable energy developers have expanded their investment horizons to low-income countries, including in the UEMOA zone, usually in conjunction with technical assistance and concessional capital provided by multilateral development banks. Impact funds are increasingly targeting the forestry, biodiversity, and sustainable agriculture sectors.

The Government will work to create the foundations to attract both domestic and international private finance through robust regulatory reforms and promoting improved governance and transparency in the corporate sector. The Government will continue to engage with international finance institutions and development agencies that offer private sector technical assistance and capacity building. For instance, local banks lack expertise and track record in climate finance, including in the renewable energy sector; the Government will seek donor

funding for awareness, technical assistance, and capacity building campaigns to help banks expand and diversify their loan portfolio outside their core sectors of commerce and agribusiness.

- Last, while budgetary contributions towards climate-related investments are currently constrained by Guinea-Bissau's macroeconomic and fiscal situation, which suffered significantly from the Covid-19 crisis, the Government will include climate change in its reform agendas with the objective of developing both short and long-term actions to allocate budget resources towards the fulfillment of the NDC.

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