IS SENEGAL ON THE RIGHT TRACK TO ACHIEVE ITS NDC COMMITMENTS

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Is Senegal on the right track to achieve its NDC commitments?

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About CoMPRA

The COVID-19 Macroeconomic Policy Response in Africa (CoMPRA) project was developed following a call for rapid response policy research into the COVID-19 pandemic by the IDRC. The project's overall goal is to inform macroeconomic policy development in response to the COVID-19 pandemic by low and middle-income countries (LMICs) and development partners that results in more inclusive, climate-resilient, effective and gender-responsive measures through evidence-based research. This will help to mitigate COVID-19's social and economic impact, promote recovery from the pandemic in the short term and position LMICs in the longer term for a more climate-resilient, sustainable and stable future. The CoMPRA project will focus broadly on African countries and specifically on six countries (Benin, Senegal, Tanzania, Uganda, Nigeria and South Africa). SAIIA and CSEA, as the lead implementing partners for this project, also work with think tank partners in these countries.

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Abstract

This paper assesses the extent to which Senegal's macroeconomic policy actions both during and after the COVID-19 pandemic have been in line with its commitments to its Nationally Determined Contribution (NDC) targets. For the past decade the country has developed various policies to address the effects of climate change. Access to finance has played an instrumental role in developing bankable projects, mainly through international funding support. However, the available funds are insufficient, given the needs of the country and the complexity of funding mechanisms. To date, the implementation of Senegal's NDC has been largely unsatisfactory.

In fact, while the government has reached major goals such as increasing the share of renewable energy in the national energy mix, some economic priorities may counter its carbon-reduction objectives. Oil and gas discoveries threaten to derail previous commitments to a low-carbon economy, as these discoveries overtake government actions to promote renewable energy options. Nevertheless, there is still hope for more climate-friendly commitments and actions through the Green Emerging Senegal Plan (Plan Sénégal Emergent Vert [PSE vert]) currently being formulated. This plan should develop a pathway towards a low-carbon and climate-resilient economy based on meeting the country's NDC and other climate targets. However, there are also major bottlenecks hindering effective implementation of the NDC commitments. In addition to a shortfall in climate-focused funds, sectoral policies do not fully incorporate the country's NDC, thus impeding the government's ability to accurately measure progress made. A comprehensive national measurement reporting and verification and supportive monitoring and evaluation system could increase transparency and strengthen efforts made in terms of climate adaptation and mitigation.

Introduction

The NDC frameworks agreed to under the Paris Agreement represent each country's commitments to reduce global greenhouse gas (GHG) emissions and adapt to climate change. In line with UN Framework Convention on Climate Change (UNFCCC) guidelines, Senegal developed and submitted its first NDC report in December 2020. The overall implementation value of these NDC projects and activities by 2030 is estimated at $13 billion, of which $8.7 billion is dedicated to mitigation and $4.3 billion to adaptation.[1]

The COVID-19 pandemic has weakened economies globally, particularly those of low-income countries, which generally have fewer coping options and resources. Senegal's gross domestic product (GDP) growth shrank from 4.6% in 2019 to 1.3% in 2020.[2] The government initiated socio-economic responses totalling $2 billion through the Socioeconomic Resilience Plan (PRES) to support affected sectors and households. Although the pandemic was an opportunity to bolster Senegal's climate action pledges, this was not a priority in its immediate stimulus package.[3] Thus, while the country has kept to its commitments summarised in the NDC, the pandemic has caused delays in implementing climate adaptation and mitigation projects.

1 Republic of Senegal, *Contribution déterminée au niveau national du Sénégal* [Senegal's Nationally Determined Contributions] (Dakar: Republic of Senegal, 2020).

2 The World Bank, Data, https://data.worldbank.org/country/senegal.

3 Joseph Upile Matola, "COVID-19 Fiscal Policy Response and Climate Change Action in Africa 2021" (Occasional Paper 9, South African Institute of International Affairs, Johannesburg, 2021).

For example, the Bus Rapid Transit (BRT) project has slowed down and has seen only 37% implementation instead of the targeted 65% by September 2021.[4]

Based on its recent NDC submission, it is still too early to undertake a full assessment of Senegal's implementation of its NDC commitments, and there is no clear overview of how actual climate projects on the ground fit in with the government's action plan. Nonetheless, the country has undertaken various responses to the climate change threat. Hence, it is key to analyse actions taken in terms of its NDC commitments. It is also essential to examine how climate policies are embedded in Senegal's macroeconomic policies to gain some insight into their level of climate-responsiveness.

This paper analyses the progress made by Senegal since the Paris Agreement, examining the different tools leveraged to achieve the country's commitments. It also assesses the government's climate priorities to understand how well they are reflected in its macroeconomic policies. Finally, it makes policy recommendations to enable Senegal's national and sectoral policies to align with its NDC commitments and more effectively produce results.

Overview of Senegal's NDC commitments

Senegal submitted its Intended NDC (INDC) in 2015. This was aligned with the Emerging Senegal Plan (Plan Sénégal Emergent [PSE]), the country's national development strategy aimed at positioning it as an emerging economy by 2035. The INDC document captured Senegal's national commitments towards reducing its GHG emissions and its intended efforts to facilitate adaptation in key identified sectors. In 2016 the government initiated a transition process that integrated the INDC into various sectoral NDC commitments, leading to the submission of its final NDC report in December 2020.

This approach was motivated by the ambition to consider other sectors in addition to the oil and gas discoveries of 2014–2017. Further, it allowed for the incorporation of sectoral adaptation action plans developed by different ministries. The NDC commitments are split into two actions: adaptation and mitigation. The country has committed to unconditionally reducing its emissions by 7% by 2030 (see Table 1).

The ambitions set out in the NDC report would see national emissions reduced conditionally by 29.5% by 2030 – if adequate access to national resources and international climate finance could be secured. With support from international partners such as the Deutsche Gesellschaft

4 International Labour Organisation, *Stratégie de mise en oeuvre de la CDN du Sénégal en tenant compte de l'impact de la COVID-19* [Senegal's NDC Implementation Strategy Taking into Account the Impact of COVID-19] (Dakar: ILO, 2022).

für Internationale Zusammenarbeit (GIZ), USAID, the World Bank, Green Climate Fund (GCF) and Global Environment Fund (GEF), the country has already implemented various adaptation-related initiatives. Adaptation goals are primarily aimed at improving the resilience of ecosystems and communities in eight focus areas: agriculture, livestock, fisheries, coastal areas, water resources, biodiversity, health and floods. Several studies have generated evidence on communities' vulnerabilities in various sectors.[5] The next NDC assessment will take place in 2025, while the National Adaptation Plan (NAP) assessment will be in 2024.

The country's climate conditions helped to frame its NDC commitments. Senegal's NDC report is based on an overarching goal to align its climate commitments with its key national development policies, set out in the PSE. The official NDC document states:[6]

> The strategy is based on the integration of the climate change dimension in the formulation and programming of development policies, taking into account other priorities such as human and animal health, the fight against poverty and malnutrition, the promotion of renewable energies and energy efficiency, and gender mainstreaming.

However, beyond this move towards policy alignment, its climate action is mainly driven by social vulnerabilities in the country. Research into those vulnerabilities informed

"The strategy is based on the integration of the climate change dimension in the formulation and programming of development policies, taking into account other priorities such as human and animal health, the fight against poverty and malnutrition, the promotion of renewable energies and energy efficiency, and gender mainstreaming"

5 Alhousseynou Ba, Ibrahima Camara and Melinda Noblet, *"Evaluation de la vulnérabilité du secteur ressources en eau à la variabilité et aux changements climatiques dans la région de Fatick"* [Evaluation of the Vulnerability of the Water Resources Sector to Climate Variability and Change in the Fatick Region] (Climate Analytics, Berlin, 2019); Mamadou Sadio et al., *Evaluation de la vulnérabilité du secteur de la zone côtière à la variabilité et aux changements climatiques dans la région de Fatick* [Assessment of the Vulnerability of the Coastal Zone Sector to Climate Variability and Change in the Fatick Region] (Climate Analytics, Berlin, 2019); Food and Agriculture Organization, *Rapport des études de vulnérabilité du secteur agricole aux changements climatiques et de l'identification des options d'adaptation dans la zone des Niayes* [Report on Studies of the Vulnerability of the Agricultural Sector to Climate Change and Identification of Adaptation Options in the Niayes Area] (Dakar: FAO, 2021); FAO, *Vulnérabilité du secteur agricole aux changements climatiques dans la région de Kolda: identification des options d'adaptation* [Vulnerability of the Agricultural Sector to Climate Change in the Kolda Region: Identification of Adaptation Options] (FAO, Dakar, 2021).

6 Republic of Senegal, *Contribution déterminée au niveau national*.

the adaptation and mitigation options considered in the NDC. In the agricultural sector, future productivity projections, under both pessimistic and optimistic scenarios, fed into the sector's climate-risk profile and the development of adaptation options.[7] In terms of mitigation, environmental assessments helped identify the sectors with the biggest emissions, in order to develop suitable mitigation responses.

Table 1 Emission reductions (Business as Usual compared to NDC ambitions) by sector over the 2030 horizon

Sectors		Unconditional (2030)		Conditional (2030)	
	BAU* emissions 2030 (Gg CO_2e**)	Emissions under the unconditional scenario (Gg CO_2e)	% reduction under the unconditional scenario	Emissions under conditional scenario (Gg CO_2e)	% reduction under the conditional scenario
Energy	23 927	21 523	10%	14 048	41.20%
Biomass	8 867	7 621	16%	6 652	24%
Agriculture	10 600	10 350	2.36%	9 329	11.98%
Waste	2 575	2 292	11%	893	65.28%
Industrial processes and product uses	3 953	3 953	0%	3 631	8,80%
Forestry (carbon sink)* **	-11 510.66	-16 894.32	46.77%	-29 328.2	154.79%
National reduction	**37 761.14**	**35 106**	**7.03%**	**26 611**	**29.53%**

* BAU is Business as Usual

** Gigagrams (thousand tonnes) of carbon dioxide equivalent

*** Forests offer a potential of absorbing emitted carbon. Negative numbers indicate carbon emissions captured by forests.

Source: Republic of Senegal, *Contribution déterminée au niveau national du Sénégal* [Nationally Determined Contribution] (Dakar: Republic of Senegal, 2020)

At the national level, there have been signs of progress in securing financing adaption funds through the GCF accreditation of La Banque Agricole (LBA).[8] However, at the international level there has been no significant improvement in financial flows. Following the Copenhagen Accord in 2009, developed countries agreed to mobilise $100 billion annually to support climate-vulnerable, low-emitting countries. Those commitments have yet to be fulfilled. The funds received by Senegal do not meet the needs expressed in its NDC report. Since 2015 the amount approved by the five main multilateral funds for Senegal has amounted to only 1% of

7 Climate Analytics, *Évaluation des références aux changements climatiques et de leur base scientifique dans les politiques et stratégies au Sénégal* [Evaluation of References to Climate Change and Their Scientific Basis in Policies and Strategies in Senegal] (Berlin: Climate Analytics, 2018).

8 Formerly called Caisse Nationale de Credit Agricole du Senegal (CNCAS), La Banque Agricole is a private commercial bank that encourages investments in the rural sector, mainly agriculture.

the $13 billion needed to implement its NDC targets (see Table 2). This has affected Senegal's achievement of its climate goals. Meanwhile, developed countries have postponed their financing commitments to 2025, as submitted during COP26. However, on a positive note, internal funding entities have agreed to collaborate more with the GEF and the GCF to scale relevant projects.

Table 2 Cumulative climate funds approved for Senegal since 2015 by main multilateral partners

	Amount ($ million)	Amount approved compared to NDC financial needs (%)
GCF	122.01	0.94%
LDC Fund	17.32	0.13%
GEF Trust Fund	2.34	0.02%
Global Climate Change Alliance	6.34	0.05%
Adaptation Fund	1.55	0.01%
Total	**149.56**	**1.15%**

Source: Climate Funds Update, "Data Dashboard", *https://climatefundsupdate.org/data-dashboard/#1541245745457-d3cda887-f010*

It is also important to consider the impact of the COVID-19 pandemic on the progress achieved in recent years. There has not been a substantial shift toward greater ambitions for NDC commitments during and post-COVID. Overall, and perhaps not surprisingly, the government did not take any major measures to bolster climate actions following the outbreak. Instead, efforts were oriented at supporting vulnerable sectors and communities and containing the virus while mitigating its immediate health impacts. The government's response package centred on strengthening the healthcare system and improving testing, treatment and prevention of COVID-19 cases. It also reinforced social protection, with food aid distributed to 1 000 000 vulnerable households, and ensured economic and financial stability by providing targeted support to the most affected sectors, as well as tax exemptions for companies.

NDC commitments vs government actions

Policy frameworks guiding the implementation of the NDC

A set of national commitments preceded the NDC and guided its formulation. Analysing the pre-existing and more recent commitments provides a more comprehensive view of the policy landscape guiding NDC implementation. However, such an assessment is challenging owing to unavailable or missing relevant data and information.

Pre-NDC policy frameworks

Senegal initiated the Stratégie Nationale de Mise en Oeuvre de la CCNUCC or SNMO (Initial National Strategy for the Implementation of the UN Framework Convention on Climate Change) in 1999. This was a national framework to integrate climate change into the country's socio-economic development policies and programmes. The SNMO first compiled a GHG emissions inventory and a vulnerability assessment of key sectors (agriculture, water resources, tourism, fisheries and coastal areas).[9] It also analysed opportunities to integrate policies to fight climate change, based on the generated evidence. However, a decade later, socio-economic development policies still failed to consider climate change fully. The Growth and Poverty Reduction Strategy (DSRP-I 2003–2005) did not make any reference to climate change, although it was the central socio-economic development policy at the time. This was partly owing to the limited involvement of the Ministry of Environment in the development of these policies.[10] In addition, the Ministry of Environment's lack of technical capacity added another layer of challenges to the SNMO's implementation.

From 2006 onwards Senegal's climate change ambitions went up a gear as crucial policies to address climate issues were developed. Funded by the GEF, which helped countries to define key adaptation priorities based on their vulnerabilities, Senegal developed and submitted its National Action Programme on Adaptation (NAPA). Following the Marrakech COP7 in 2001, the GEF handed $195 000 to Senegal to develop its NAPA. The country focused on three sectors – agriculture, water resources and coastal zones – that are considered the most at risk and assessed their vulnerability to climate change. The priority adaptation options were agroforestry promotion, rational use of water resources, coastal zone protection, awareness raising and public education. However, the reality on the ground was quite different, because only a few adaptation priorities were implemented effectively.[11] Inadequate funding mechanisms remained the principal barrier to successfully implementing the NAPA. Senegal estimated the cost of NAPA implementation at $30 million, but mobilised only $3 million.[12] Furthermore, like the SNMO, Senegal's central socio-economic policies, such as the DSRP-I, did not explicitly consider the NAPA as it was developed. This contributed to weakening the implementation of the NAPA. While there is reference to climate change impacts, no explicit measures are considered in the DRSP-I action plan.

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9 Republic of Senegal, *Stratégie nationale initiale de mise en œuvre de la convention cadre des nations unies sur les changements climatiques* [Initial National Strategy for the Implementation of the UN Framework Convention on Climate Change] (Dakar: Republic of Senegal, 1999).

10 Melinda Noblet, *L'adaptation en zone côtière au Canada et au Sénégal, une comparaison Nord/Sud* [Adaptation to Climate Change in Coastal Areas in Canada and Senegal, a North/South Comparison] (PhD dissertation, Université de Picardie Jules Verne, 2015).

11 Organisation for Economic Cooperation and Development, Environment Directorate, "Climate Change Adaptation and Financial Protection: Synthesis of Key Findings from Colombia and Senegal" (Environment Working Papers, OECD, Paris, 2017).

12 International Institute for Environment and Development, "*Changements climatiques, strategies d'adaptation et mobilités: Evidence à partir de quatre sites au Sénégal*" [Climate Change, Adaptation Strategies and Mobility: Evidence from Four Sites in Senegal] (Human Settlements Working Paper, IIED, London, 2011).

As the NAPA only integrated three sectors, other vulnerable sectors such as tourism, fisheries and transport were left behind. However, it is important to remember that the NAPA was aimed at identifying priority projects for implementation, rather than representing the country's core adaptation vision. Instead, this responsibility – to look at the bigger picture and consider sectors overlooked by the NAPA – falls to the NAP. The NAP is still under development and its completion date is unknown. It targets nine priority sectors: agriculture, livestock, fisheries, water resources, coastal zones, biodiversity/tourism, health, disaster risk management focusing on floods, and infrastructure. These sectors were selected based on the NAPA, PSE and INDC. A sectoral approach was adopted to develop each sectoral NAP based on a vulnerability assessment. Only the fisheries NAP has been completed thus far.

Policy frameworks during NDC elaboration (2015–2022)

The current Sectoral Policy Development Letter of the Environment (Lettre de Politique Secteorielle de Développement de l'Environnement) for 2019–2023, a roadmap aligned with the PSE's ambitions, emphasises the energy mix.[13] There is a willingness to move from heavy fuel oil and diesel to gas in the short term. This strategy comes on the back of recent discoveries of oil and gas in Senegal, which may slow down the country's pledges on renewable energy. Currently, there is no clear fossil fuel phase-out policy for the country. According to the National Action Plan on Renewable Energy, in line with NDC projections, renewable energy options should represent 31.8% of the country's production capacity by 2030.[14]

Energy will be the highest GHG-emitting sector in 2030, surpassing agriculture (BAU scenario). A projected exponential increase in energy demand drives this scenario, hence energy also has the largest emissions-reduction target under the NDC (14 048 Gg CO_2e[15] compared to 23 927 Gg CO_2e with the BAU). Senegal's mitigation strategies rely on sectoral approaches with adaptation measures to reduce GHG emissions. For instance, policies focus on increasing renewable energy while guaranteeing energy efficiency in the energy sector. For example, the transport sector will benefit from sustainable public transport expansion infrastructure such as an RTB system and the Regional Express Train (Train Express Régional [TER]). Meanwhile, the development of solar and wind plants in various locations (Kahone, Kael, Sendou, etc.) places the country on a green energy pathway. Nevertheless, these firm commitments have slowed down, for two reasons. Firstly, the exploitation of oil and especially gas is diluting this willingness to ensure the transition

13 Republic of Senegal, Ministry of Environment and Sustainable Development, *Lettre De Politique Du Secteur De L'environnement Et Du Développement Durable* 2016/2020 [Environment And Sustainable Development Sector Policy] (Dakar, Republic of Senegal, 2016).

14 Republic of Senegal, Ministry of Energy and Renewable Energy Development, *Plan d'actions national sur les energies renouvelables (PANER)* [National Action Plan on Renewable Energies] (Dakar: Republic of Senegal, 2015).

15 Measurement of greenhouse gas emissions for carbon dioxide equivalent.

towards more renewable energy. Secondly, grid stability has deteriorated owing to outdated infrastructure in the face of increased use of renewable energy.

Mapping NDCs with ongoing and pipeline action

The government, its partners and other stakeholders leverage various tools to help reach the ongoing NDC commitments. These include financial, fiscal and technical/infrastructure-related investments (see Table 3).

Table 3 Tools used to achieve NDC targets

Type of instrument	Actors involved	Types of projects/actions implemented	Implications in achieving NDC-related objectives
Financial	Government	Accreditation of LBA by the GCF in 2020	Funding national projects in line with NDC goals
Financial	Government	Access to international funds (GEF, GCF, etc.) through mitigation/adaptation projects submitted. These projects include various sectors (agriculture, energy, floods, etc.)	Achieving NDC adaptation and mitigation goals
Fiscal	Government	Tax exemption on renewable energy equipment	Cost reductions through tax exemptions will make renewable energy equipment more accessible. There is an expectation of GHG emission cuts. However, no quantified evidence is available to assess the level of GHG reductions
Market mechanisms	Government	Bilateral agreement to develop projects reducing GHG emissions in Senegal, using the Internationally Transferred Mitigation Outcome (ITMO) scheme (article 6.2 of the Paris Agreement)	Achieve NDC adaptation and mitigation goals
Market mechanisms	Government	World Bank Standardised Crediting Framework for facilitating the transition from the Kyoto Clean Development Mechanism (CDM) to the Paris Agreement, Article 6. Fund accessed by selling carbon credits stemming from a pilot electricity project using clean energy sources (solar mini-grids/lanterns/home systems)	Achieve NDC adaptation and mitigation goals

Advocacy	Civil society	Important initiatives by civil society to be highlighted, such as the promotion of agroecology with the support of the Dynamic for an Agro-Ecological Transition in Senegal (DYTAES)	Achieve adaptation goals in the agricultural sector with agroecology promotion
Development of climate resilient projects portfolio	Private sector	LBA has committed to fund bankable and climate-resilient projects developed by the private sector	Achieve NDC adaptation and mitigation goals

Source: Compiled by author

Financial and fiscal instruments

Senegal has leveraged three main tools to support climate projects and actions, namely tax applications/exemptions; access to funds through national accredited entities; and application of market mechanisms. A total of $13 billion is needed to implement Senegal's various adaptation and mitigation actions under its NDC commitments.[16] Domestic fund mobilisation of $4.8 billion is expected, which will cover 37% of the total costs required to meet the NDC commitments. The remaining 67% is expected to come from partners, signalling the country's reliance on external funds. However, the NDC and Environment Sector Development Policy Brief are not clear on how the national budget will finance climate action. Therefore, the tools currently used cannot achieve the NDC goals, as the funding strategies are not fully developed. Lack of expertise and low capacity at national bodies, including the National Designated Authority (Directorate of the Environment at the Ministry of Environment and Sustainable Development), are other significant hurdles.

A study undertaken in 2019 with key stakeholders explored opportunities for implementing a carbon pricing instrument in Senegal.[17] It identified a carbon tax (with compensation for affected entities) as the most relevant instrument in the Senegalese context. Such a carbon tax spurs behavioural change to reduce emissions. However, certain criteria need to be considered. Setting up a carbon tax requires a clear overview of emissions in each sector, and there needs to be clarity on how it is implemented, given the context and competitiveness concerns. In addition, to align with NDC guidelines, each sector should develop a Measuring, Reporting, and Verification[18] (MRV) framework that complies with sectoral emission targets. However, no tangible national

16 Republic of Senegal, *Contribution déterminée*.

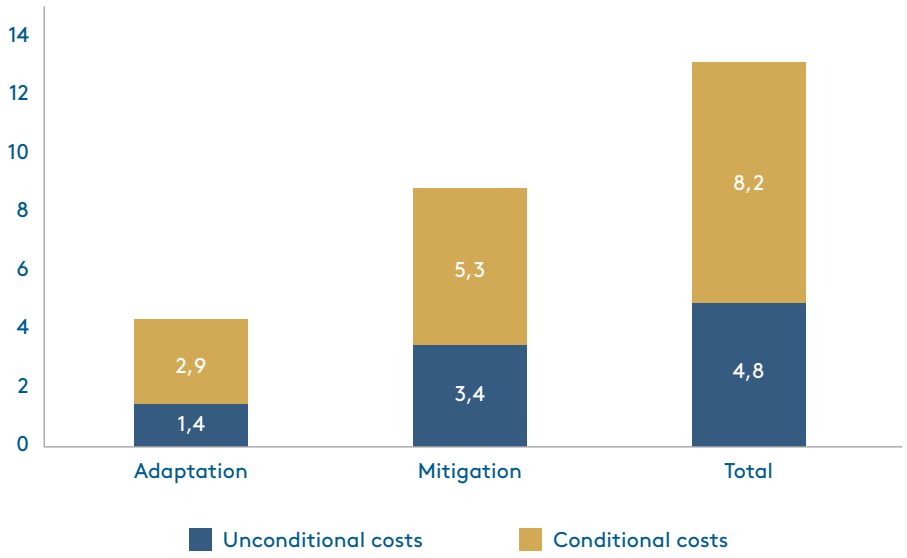
17 Axel Michaelowa et al., *Etude d'opportunité sur la mise en place d'un instrument de tarification carbone au Sénégal* [Opportunity Study on the Implementation of a Carbon Pricing Instrument in Senegal] (Fribourg: Instruments de Collaboration pour une Action Climatique Ambitieuses, 2019).

18 Measurement, reporting and verification (MRV) is a system designed to track and assess progress on the NDC emission-reduction target.

or sectoral MRV systems exist yet. While stakeholders have agreed on a roadmap to implement a carbon tax, the study does not provide a timeline with milestones to achieve this goal.

In parallel, the government also issued a decree in 2020 to provide tax exemptions of 18% on 22 renewable energy equipment categories in the energy sector.[19] This was aimed at reducing equipment costs, facilitating access to clean energy and reducing the carbon footprint, as set out in the NDC. However, there is no tangible evidence of potential emission reductions resulting from this tax exemption.

Figure 1 Senegal's NDC financing needs, 2015–2030 (in $ billions)



Source: Author's calculations from Republic of Senegal, *Contribution déterminée au niveau national du Sénégal* [Nationally Determined Contribution] (Dakar: Republic of Senegal, 2020), tables 17 & 18

Financial instruments

Senegal has achieved key milestones in facilitating direct access to climate finance by relying in part on the GCF accreditation mechanism. The first accredited entity was the Centre for Ecological Monitoring (Centre de Suivi Écologique [CSE]) in 2015, for the funding of micro-projects of less than $10 million each. The CSE is one of the country's leading fund mobilisation entities and has set up a Climate Finance Unit to manage and oversee funded projects.

19 Republic of Senegal, *Arrêté interministériel fixant la liste des matériels destines à la production d'énergies renouvelables exonérés de la taxe sur la Valeur ajoutée* [Interministerial decree defining the list of materials intended for the production of renewable energies exempted from value added tax] (Dakar: Republic of Senegal, 2020).

In August 2020, the GCF accreditation of LBA was a big step forward for direct access to climate finance using domestic mechanisms. LBA is the second GCF-accredited entity in the country and the first private commercial bank in Senegal to get the accreditation. It has launched a programme to fund five project proposals (two private and three public) from national actors and support them until implementation. It can provide grants to small projects with a value between $10 and $50 million.

The Priority Investment Guarantee Fund (FONGIP) and the Sovereign Fund for Strategic Investments (FONSIS) are also involved in the GCF accreditation process. Both are public entities financing private small and medium enterprises in various sectors and are helping to increase the country's project portfolio. The private sector will benefit from these accreditations, with substantial funds being dedicated to green projects aligned with the NDC. However, Senegal still does not have a clear and validated operational strategy for resource mobilisation. The process of defining this strategy is ongoing.

Market mechanisms

The use of market mechanisms in Senegal predates the Paris Agreement. The country benefitted from several approved carbon credit projects through the CDM in the Kyoto Protocol. Article 6 of the Paris Agreement supports the use of market mechanisms and facilitates cooperation between countries to achieve meaningful emission reductions. These market mechanisms are available options to sustain finance access. Even though there is no consensus on Article 6, progress has been made under the Article 6.2 framework on cross-country cooperation. Article 6.2 enables a direct mechanism for carbon credit exchanges between two countries through collaborative approaches. For example, the government of Switzerland entered into a bilateral agreement with the Senegalese government in July 2021, using the ITMO scheme. Under this, Switzerland buys carbon reduction credits from Senegal, which contribute to the achievement of Switzerland's NDC targets. Switzerland will in turn promote renewable energy, chemical and waste management, and mineral resource governance projects in Senegal. Both parties agreed to develop transparency mechanisms to prevent double-counting risks on undertaken mitigation interventions.[20] A project to fund 60 000 biodigesters is currently in the pipeline under this agreement.[21]

20 Double counting refers to risk cases where one mitigation action is counted twice, thereby overstating emission reductions. Such risks can occur when a) twice calculating the same GHG emission; or b) selling GHG quotas at least twice or having different entities claim them.

21 Inès Magoum, "*Sénégal: 60 000 biodigesteurs pour produire du biogaz à partir des boues fécales*" [Senegal: 60 000 Biodigesters to Produce Biogas from Faecal Sludge], Afrik21, July 15, 2021.

Climate financing strategy (including accessing international climate finance, green bonds, and other innovative financing instruments)

Senegal relies extensively on international climate funds to achieve its NDC objectives. It has entered into both multilateral partnerships (including with the GCF and GEF) and bilateral partnerships (including with the Klik Foundation and GIZ).

The GCF and GEF are among the key institutions supporting access to climate finance, and are both implementing entities of the UNFCCC financial mechanisms. Other multilateral funds include the World Bank, the UN Development Programme and the Food and Agriculture Organization. Countries generally receive a combination of grants, loans and equities. To date, Senegal has received over $95 million from the GEF to fund 32 projects on climate change at the national level,[22] while the GCF has funded 11 projects in the country for $153.9 million on adaptation, mitigation and cross-cutting issues.

Most sectors implement climate-friendly interventions – mainly infrastructure development and capacity building – that are in line with NDC goals, but they are not always fully aligned with the NDC framework. This is because the NDC submission process is still fairly recent, having been completed only in December 2020. In addition, some ministries do not take full ownership of the climate challenge and still consider it as falling within the exclusive domain of the Ministry of Environment. In addition, the consolidated national investment budget architecture does not explicitly set out budget lines that meet the NDC objectives. Given the complexity of climate finance flows, it is challenging to get a clear overview of the country's total funds received and expended. An alignment review would assist in measuring how and to what extent these interventions will contribute to achieving the NDC goals.

Senegal needs a clear strategy for mobilising financial resources to implement the NDC. Efforts are underway, with a first diagnosis that will assess all climate-related financial flows (both national and international) and evaluate to what extent the sum of these flows meets Senegal's climate ambitions. An MRV system overseeing and centralising all climate finance-related information produced by various sectors could play an instrumental role in addressing this issue. A high-level committee on sustainable finance, led by the Ministry of Economy and bringing together all sectoral ministries, has recently been set up. The overarching goal is to articulate national budget and strategic planning in alignment with NDC commitments. Meanwhile, various entities are taking steps to develop a sectoral MRV that will contribute to a national MRV. However, these efforts are not comprehensive enough to converge into a unified and coherent framework that prevents the risk of working in silos or overlaps.

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22 Global Environment Facility, "Senegal: Country-at-a-Glance", *https://www.thegef.org/projects-operations/country-profiles/senegal*.

Infrastructure/technical instruments

Mitigation measures mainly focus on the four key sectors with significant emissions, ie, energy (including transport); industrial processes; agriculture, forestry and land use; and waste.

Of these, energy benefits the most from mitigation projects. Interventions in this sector mostly target an increased use of renewable energy. Specifically, they aim to achieve universal access to electricity, primarily based on clean energy sources; a reduction in the use of wood/coal for domestic consumption through improved cookstoves and biogas promotion; and a greater share of renewables in the energy mix. Access to electricity has been the focus of special ongoing projects in remote areas. This access is based on three options: grid extension, mini-grid installation and individual solar power systems. For instance, under the Senegalese Rural Electrification Agency management, a GCF-funded project approved in 2020 will provide solar mini-grids to 1 000 villages.[23] This project will reduce CO_2 emissions by 1 127 447 tons by 2045.

The government and international partners (eg, GCF, GEF, World Bank) have made substantial efforts regarding adaptation on the ground. These efforts relate to agriculture, water resource management and coastal projects. The investments primarily focus on managing water resources to achieve climate-smart agriculture by improving water basins' infrastructure and promoting small-scale irrigation, particularly for smallholder farmers. The fight against land degradation is crucial and supports projects on sustainable land management practices, particularly in the Groundnut Basin. This region, located in the centre of the country, is affected significantly by land degradation, attributed to increased salinity and unsustainable agricultural practices. In addition, small producers find it more difficult to access insurance owing to the introduction of 50% subsidies on premiums.

Investments in the water resources sector include the development of infrastructure for better resource management, such as building a seawater desalination plant in Dakar with a 50 000 m^3/day capacity to improve water availability in urban areas. In addition, several studies are underway to assess water availability at the national level.

Beyond the government's actions, other stakeholders are pushing to strengthen climate commitments on the ground. This is particularly the case for civil society and grassroots organisations. The DYTAES, a multisectoral platform, currently advocates an agroecology transition in agricultural policies. Such action will likely contribute to achieving the NDC goals, especially in promoting climate-resilient agricultural systems.

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23 Green Climate Fund, *Funding Proposal: ASER Solar Rural Electrification Project* (Dakar: GCF, 2020).

As a GCF accredited entity, LBA in 2021 launched a programme to support the private sector in developing GCF-fundable projects in adaptation and mitigation. The process of selecting five projects is underway. Meanwhile, LBA and other commercial banks such as Société Générale and Banque Internationale pour le Commerce et l'Industrie du Senegal have also entered the renewable energy finance market. They mainly provide credits to buy solar-powered equipment for irrigation in agriculture. In addition, FONSIS and FONGIP, the two national funds, are preparing for their GCF accreditation. Once acquired, they will play an instrumental role in involving the private sector in climate-friendly projects. However, private sector interventions on climate remain timid. One of the reasons is that there are not enough state incentives to develop adaptation or mitigation projects. They also need capacity building to better understand the stakes for their industries and what climate finance is available.

The intersect between non-NDC-initiated interventions and NDC targets

The country has set a series of new priorities outside its NDC commitments. Some of these comply with the NDC targets while others do not (see Table 4).

Table 4 Cumulative climate funds approved for Senegal since 2015 by main multilateral partners

	Recent government priorities	Impacts in terms of NDC-related objectives
All sectors	The PSE vert (ongoing development) focuses on six priority sectors (energy, forestry, agriculture, water/sanitation, industry, urbanism) and on transformational economic changes to meet NDC objectives	Positive – spurring NDC commitments in reducing carbon emissions in key socioeconomic sectors
Energy	Increased oil and gas production	Negative – it requires the NDC to be updated to consider additional projected emissions stemming from oil and gas exploitation (risks missing the emission reduction goal)
Energy	Scale-up of clean energy infrastructure build (solar power plants; wind power) to achieve universal access to electricity	Positive – contributes to achieving 30% renewable energy in the energy mix by 2025
Biodiversity	Construction of Ndayane Port	Negative impacts on biodiversity, with some marine species threatened
Transport	Development of clean transport infrastructures (TER, BRT)	Positive – a reduction of 219 835 tonnes of CO_2 by 2030 for the BRT
Employment	Emergency programme focused on youth employment and socio-economic integration	Positive – 10 000 green jobs to be created by 2023 (however, no explicit linkage made with NDC objectives)

Source: Compiled by author

Of those government plans that are climate responsive, the PSE is the leading policy that seeks to secure Senegal's place as an emerging economy by 2035.[24] The PSE vert, the new PSE strand, is a solid commitment to the government's policy plans to develop a green economy. The PSE vert will focus on six key sectors (agriculture, water and sanitation, industry, energy, forestry and construction) to support its climate ambitions.

In addition, in 2021 the Senegalese government launched an emergency programme on youth employment called 'Xëyu Ndaw Gni' ('Jobs for the youth') to respond to high levels of unemployment among the youth. Around 300 000 young people enter the labour market each year in Senegal, and the unemployment gap is growing in the absence of policies that can ensure their absorption.[25] The amended 2021 finance act mobilised $745.7 million to fund this initiative from 2021–2023.[26] One of the programme's components aims to create 10 000 green jobs in activities/projects related to reforestation, the fight against plastic waste and renewable energy production. However, this is an emergency programme that runs over the short term, and concerns remain over its effectiveness in guaranteeing sustainable and decent jobs over the long run. It is also not sufficient to address the structural issue of sustainable job creation for the youth – overall, there are not enough green jobs to address the youth labour demand. Finally, the effects on the NDC goals are also unclear.

Nonetheless, Senegal is one of the leading countries in West Africa when it comes to implementing structural changes in the renewable energy landscape. Substantial efforts have been made to increase the share of renewable energy in the national energy mix, thereby supporting the goal of universal electricity access. The first solar plant started operating in 2017 with a 30MW capacity. In 2021 two new solar plants (Kael[27] and Kahone[28]) were built. They provide an additional 60MW capacity for a projected yearly emission reduction of 89 000 tonnes of CO_2. The Taïba Ndiaye wind plant, launched in 2020, is the biggest in West Africa with a capacity of 158MW. These investments underscore the government's resolve to increase renewable energy's share in the overall energy mix to 30% by 2030.

The government has also made new transport investments to enhance urban mobility. The existing transport options (old buses, taxis, private cars) cannot meet growing demand and contribute meaningfully to carbon emissions. This has led to the launch of two important projects, namely the TER, which should be operational in 2022, and the BRT system, which will be operational by 2023. The TER, which is 57km long, is a dual-mode train powered with diesel

24 Republic of Senegal, *Plan Sénégal emergent: Plan d'actions prioritaires 2019–2023* [Emerging Senegal Plan. Priority Action Plan 2019–2023] (Dakar: Republic of Senegal, 2018).

25 World Bank, *Systematic Country Diagnostic of Senegal* (Washington DC: World Bank, 2018).

26 Republic of Senegal, "*Loi de finances rectificative pour l'année 2021*" [Amended Finance Act for the Year 2021] (Republic of Senegal, Dakar, 2021).

27 Located just north of the centre of the country, in the region of Diourbel.

28 Located west of the centre of the country, in the region of Kaolack.

and electricity. The BRT project will blend with TER routes in the greater Dakar area, introducing 140 electric buses to service 300 000 passengers a day. These projects will help deliver part of the commitments towards emission reductions in the transport sector. Projections indicate a decrease of 219 825 tCO_2 by 2030 for the BRT and a yearly reduction of 8 440 tCO_2 as a result of the TER.[29]

However, there are also some state priorities that are not climate responsive. Recent fossil fuel discoveries are reshaping country commitments in the roll-out of renewable energy. Between 2014 and 2017, major oil (860 million barrels) and gas (41.3 trillion of cubic feet) discoveries were made in Senegal and Mauritania, reshaping the country's commitments to climate change action. This has affected the NDC, which was updated and submitted in December 2020. Specifically, the government revised its commitment to account for expected oil and gas exploitation with an upward emissions trend. Owing to COVID-related delays, oil and gas production is only expected to start in 2023. The country relies on a gas-to-power strategy, with two new gas plants being planned to produce electricity in the short term. Although gas is less polluting than other fossil fuels, its carbon footprint is still significant compared to that of renewable energy sources. This new strategy puts additional constraints on achieving the net-zero emission target. Emissions will mainly come from flaring, production, transport (tankers, helicopters) and electricity consumption.

Table 5 shows the estimated additional yearly emissions from oil and gas discoveries from 2020–2030, as set out in the NDC. The BAU column shows the global oil and gas emissions should Senegal not implement mitigation measures, while the NDC column presents the net emissions when avoided emissions from gas flaring are considered. Woodside and British Petroleum (BP), the leading oil and gas exploitation companies, have adhered to the Zero Routine Flaring Initiative. Overall, additional emissions remain high from 2022–2030, with a peak of 1 620 404 tonnes CO_2 eq in 2022.

29 IISD, Sustainable Asset Valuation (SAVi) of the Bus Rapid Transit Project in Senegal (Winnipeg: IISD, 2019); African Development Bank, *Dakar Regional Express Train: Summary of Strategic Environmental and Social Assessment (SESA)* (Dakar: AfDB, 2016).

Table 5 Oil and gas exploitation in the NDC: additional emissions (Woodside and BP activities)

Year	BAU (teq CO_2)	Emissions avoided (teq CO_2)	NDC (teq CO_2)
2020	125 865.00		125 865.00
2021	134 540.00		134 540.00
2022	2 634 823.90	1 014 261*	1 620 562.90
2023	2 034 502.56	1 449 981*	584 521.56
2024	806807.94		806807.94
2025	620550.78		620550.78
2026	556965.88		556965.88
2027	557379.22		557379.22
2028	556986.74		556986.74
2029	557372.83		557372.83
2030	557386.16		557386.16

* The emissions avoided in 2022 and 2023 are because the gas stemming from oil production will be stockpiled and not used during this period. From 2024 onwards, this gas will be used.

Source: Directorate of Environment and Classified Establishments, *Rapport de l'étude sur l'intégration des émissions de gaz à effet de serre liées à la future production pétrolière et gazière au Sénégal dans la CDN du Sénégal* [Report of the Study on the Integration of Greenhouse Gas Emissions Related to Future Oil and Gas Production in Senegal in the Senegalese NDC] (Dakar: DEEC, 2021)

A second large infrastructure project that falls within the 'negative impact' category is the construction of the new Ndayane Port. In light of the congestion at the Dakar Port, an agreement has been entered into with Dubai Port World to construct a new port 48km from Dakar, in Ndayane. The hope is to decongest the Dakar Port and stimulate Senegal's maritime economy. With a $840 million investment it will be one of the biggest ports in West Africa once completed. However, this project is a threat to biodiversity – the location chosen is home to various marine species that may become endangered.

On the whole, recent projects supported by the Senegalese government show that it is making a significant effort to reducing its carbon emissions, particularly in the renewable energy realm. The new PSE vert is proof of the country's commitment to climate change action. However, the gas and oil discoveries are a big red flag, diluting these efforts and placing Senegal on a pathway that will make it challenging to reach its NDC commitments. The lack of clarity on the use of oil and gas revenues threatens the fossil fuel phasing-out strategy Senegal activated. Indeed, the gas-to-power approach is taking precedence over the roll-out of further renewable energy plants. Investments in the Sangomar and GTA fields are estimated at around $10 billion, representing

more than 75% of the $13 billion needed for Senegal to meet its NDC commitments.[30] More importantly, information on these oil and gas investments is as vague as Senegal's energy policy. While foreign private companies are responsible for the largest share of investments, these massive investments outpace, in absolute value, all the recent climate-friendly investments made by the country (see Table 6). In addition, the oil and gas revenues that will be generated are not big enough to transform the economy. Projections of the country's expected hydrocarbon revenues suggest that they will represent only 1.5% of its global revenues over a 25-year period.[31]

Table 6 Estimated investment cost of Senegal's priority projects and the impact on NDC targets*

Sectors	Project	Effects on NDC	Cost of project (in $ million)
Energy	Oil and gas exploitation	Negative (+ 6 678 939 tonnes CO_2 eq)	10 000
Energy	Renewable energy (Kael and Kahone solar plants)	Positive	53
Biodiversity	Ndayane Harbour	Negative	5 000
Transport	Clean transport infrastructure (BRT)	Positive (reduction of 219 835 tonnes CO_2 by 2030)	500
Transport	Clean transport infrastructure (TER)	Positive	1 000
Employment	Emergency programme on youth employment (component on green jobs)	Positive (10 000 green jobs to be created by 2023)	746

* Note that the table does not represent an exhaustive list of NDC projects, but rather flags recent infrastructure and related priorities of the Senegalese government and how they might impact NDC targets.

Source: Compiled by author

Meanwhile, the government is not spending enough additional funds to meet the NDC targets. This is because the protracted impact of the pandemic has pushed Senegal to reorient its priorities. The government launched the PRES during the pandemic at a cost of $2 billion (representing 7% of GDP) in response to the health emergency and the economic fallout of the COVID-19 pandemic.

30 William Davis and David Mihalyi, *Opportunities and Challenges for Senegal in Oil and Gas Production: Lessons Learned from Other New Producers* (New York: Natural Resource Governance Institute, May 2021).

31 International Monetary Fund, "*Natural Resources in Senegal Before and After the Recent Oil and Gas Discoveries*" (Selected Issues Paper, IMF, Washington DC, January 28, 2019).

This plan consisted of three components:

- supporting the healthcare sector to control the pandemic and strengthen the sanitation system;
- improving social resilience through food distribution and water/electricity subsidies for households; and,
- restoring macroeconomic and financial stability through company tax exemptions associated with specific support of the most affected sectors.

PRES funds came from budgetary adjustments (37%) and grants or concessional financing from bilateral partners (63%).[32] Due to the pandemic budget reallocations, the budget deficit rose from 3.1% of GDP in 2014–2018 to 6.1% in 2021.

However, one of the biggest hurdles preventing adequate climate action is the lack of sufficient climate funds. As a result of the pandemic, external partners have been slow to provide the funds needed to achieve the conditional targets in the NDC. The complexity of accessing climate funds is another constraint. While it is crucial that national structures develop bankable climate projects, national capacity in terms of human and technical resources is often limited or missing.

In addition, there is no clear overview of the extent to which the national budget addresses climate change issues and environmental concerns. Even though the country developed its NDC through a sectoral approach, limited attempts have been made to allocate responsibility for specific climate change issues to different ministries. As a result, climate action considerations are often absent in sectoral policy planning. This hinders the alignment of governmental action and NDC commitments.

Finally, while there is a timeline to meet NDC commitments, there is no operational document that guides their implementation. This issue is meant to be addressed by the second Readiness document, funded by the GCF, with which the country will develop a comprehensive strategy for financial resource mobilisation for the NDC. There is significant interest in how it will be implemented on the ground.

32 Republic of Senegal, Ministry of Finance and Budget, *Document de programmation budgétaire et économique pluriannuelle (DPBEP) 2022–2024* [Multi-Year Budget and Economic Programming Document 2022–2024] (Dakar: MFB, 2021).

Conclusion and policy recommendations

Since the adoption of the Paris Agreement in 2015, Senegal has expressed its willingness to fight climate change through adaptation and mitigation. Its NDC, submitted in December 2020, summarises the country's intended actions, which are currently being translated into projects on the ground. In the energy sector, important climate-friendly solar and wind projects and programmes have been developed. The PSE vert, which is in development as well, is aimed at positioning Senegal as an emerging economy while considering environmental and natural resource preservation.

However, bottlenecks are impeding the effective implementation of Senegal's NDC commitments. Oil and gas discoveries have diluted the country's clean energy engagement and NDC commitments to reduce emissions. Furthermore, Senegal's sectoral development policies still do not take its NDC commitments into account.

This paper proposes the following recommendations to ensure the achievement of the NDC commitments.

Legal and institutional

- Align all sectoral policies with NDC commitments. Sectoral ministries should co-develop their policy planning to match NDC commitments. As a first step, each ministry should review, with the National Designated Authority (NDA) and other relevant stakeholders, its development policy brief and identify interventions that can contribute to NDC achievement.
- Pursue the MRV development strategy through a systemic approach to prevent inconsistencies. The NDA should host a roundtable with all the mitigation projects that have already or are in the process of developing a sectoral MRV. A diagnosis of all existing MRV systems would ensure that the national MRV embraces a harmonised, integrated approach that avoids inconsistencies.

Technical and financial

- Improve access to climate finance through capacity building and the development of solid projects. Accredited entities (CSE, LBA) should organise specific training sessions for private companies to access climate funds. This is important, as the country needs to develop a clear operational strategy on resource mobilisation to fund its NDC. The NDA should coordinate this action with the support of Le Comité National sur les Changements Climatiques (National Committee on Climate Change).

- Strengthen the national framework, including the NDA. The NDA is currently situated as a directorate in the Ministry of Environment and Sustainable Development. This setting subjects the NDA, as the Environment Directorate, to potential administrative and institutional burdens. If it had more independence and (financial/technical) power, the NDA could efficiently oversee and implement NDC commitments. The NDA should commission a study on providing a better institutional architecture for the future NDC that improves its effectiveness.

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IPAR is a space for reflection, dialogue, and proposals for concerted agricultural and rural policies in Senegal and in the West African region. The initiative was prompted by specialists in agriculture and the rural world who were already supporting farmers' organizations and who were interested in creating permanent spaces for prospective and strategic reflection. The staff of the IPAR Executive Secretariat is a multidisciplinary team made up of sociologists, economists and agronomists, supported by the experts of the Scientific Committee and the members of the Board of Directors.

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Cover image: Bandia Forest, Senegal, September 25, 2019. The need for cement in a growing Dakar means the growth of quarries to feed the factories. These quarries are moving closer to villages and threatening the Bandia Forest (John Wessels/AFP via Getty Images)

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