POLICY BRIEF

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IMPROVING THE NATIONALLY DETERMINED CONTRIBUTION (NDC) OF THE REPUBLIC OF BENIN: CHALLENGES, NEEDS FOR SUPPORT AND OPPORTUNITIES FOR FUTURE ENGAGEMENTS

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KEY RECOMMENDATIONS / SUMMARY

Historically, soil health management has primarily focused on improving agricultural productivity and food security. Soils are an essential resource for the production of food, biomass, for the filtration of water, the preservation of biodiversity and the storage of carbon. Little attention has been paid to carbon sequestration in soils with co -benefits in terms of climate change mitigation and adaptation (CC-A&M). With their potential as carbon reservoirs, soils can contribute substantially to combat the increase of greenhouse gases (GHG) concentration. Soils are thus at the heart of the United Nations Sustainable Development Goals (SDGs), in particular SDG 1 “No poverty”, SDG 2 “Zero hunger”, SDG 13 “Fight against climate change”, SDG 15 “Life on land », SDG 12 « Responsible consumption and production ».

Most policy documents, including Nationally Determined Contributions (NDCs), do not directly target the importance of oil organic carbon (SOC) and soil health for soil biodiversity conservation, water regulation and the CC-A&M. Previous CCAFS[1] work and peer-reviewed publications indicate that very few countries (about 20) included soil health (and only a few mention SOC) in their NDCs.

In this regard, there is a real need and opportunity to demonstrate the storage capacity of SOC and its potential contribution to achieving NDCs and building resilience and adaptation to climate change. This guidance document highlights opportunities for improving the integration of SOC and soil health (SOC/SH) into the future NDCs of Benin. This will create conditions for the stimulation of investment by the Government of Benin, farmers and development actors, in the soils of the country.

[1]https://ccafs.cgiar.org/fr

The analysis is based on a desk review of relevant documents and interviews with key informants who participated in the NDC development process. This helped to understand the NDC development process, highlight the level of integration of SOC/SH into the NDCs, and formulate relevant recommendations based on key areas of support.

At the end of this analysis, it should be noted that Benin's NDCs do not specifically define targets on the SOC/SH. However, the actions and measures developed in the NDCs, if effectively implemented, could contribute to improve the soils quality (in terms of SOC/SH) for climate change mitigation and climate resilience in agricultural production systems.

Based on the information collected from KII and the review of the Benin NDCs, the following recommendations can be formulated to catalyse the integration of SOC/SH in future versions of NDCs of the country:

1. Supporting technology transfer needs in the agriculture and integrated water resources sectors (under the adaptation component of the NDCs), and the agriculture, forestry and energy sectors (for the mitigation component), will improve the effective integration of the SOC/SH in the NDCs;
2. There is a need in strengthening the technical capacities at national, sub-national and local levels to enable the operationalisation of NDCs and the management of SOC/SH;
3. Strengthening the current institutional arrangements and the monitoring, reporting and verification (MRV) framework of the implementing agencies could enable transparency, sustainability and well-coordinated monitoring of NDC implementation. Good institutional capacities still need to be developed to facilitate the implementation and coordination of NDCs;
4. Financial support is needed to achieve the conditional objectives, in particular for the development of technologies, capacities and the capacity building of a network of national experts on CC A&M and NDC issues. To achieve the NDC ambitions, Benin will have to supplement national resources (public funds and private investments) with bilateral or multilateral external financial support.
5. Developing the technical, operational and human capacities of laboratories and technical services in SOC analysis and monitoring is essential for soil health management in AFOLU sector.
6. Research needs on soil health are crucial, notwithstanding the efforts of research efforts by the Universities and other research centres. The needs emerge in terms of improving the methods for assessing and monitoring the physical, chemical and biological components of soils, the techniques and practices for conserving organic matter in the soil, especially in agricultural fields.
7. There is a crucial need for applied research regarding soil conditions (health and SOC content) for the food security and resilience portfolio, but also to evaluate the impacts of NDC measures on soil conditions for CC A&M. The availability of obvious and relevant scientific information and data to support decision-making could facilitate the future integration of SOC/SH in the achievement of national commitments and the NDC.

8. The commitment of civil society organizations (NGOs and associations) of the private sector must be strengthened in the NDC process with regard to the importance of these actors in the implementation of specific actions and the achievement of objectives.
9. A solid and accessible science-policy interface would facilitate the communication and collaboration between decision-makers and research/academia producing scientific data useful for the implementation of NDCs and integration of SOC/SH for CC A&M.

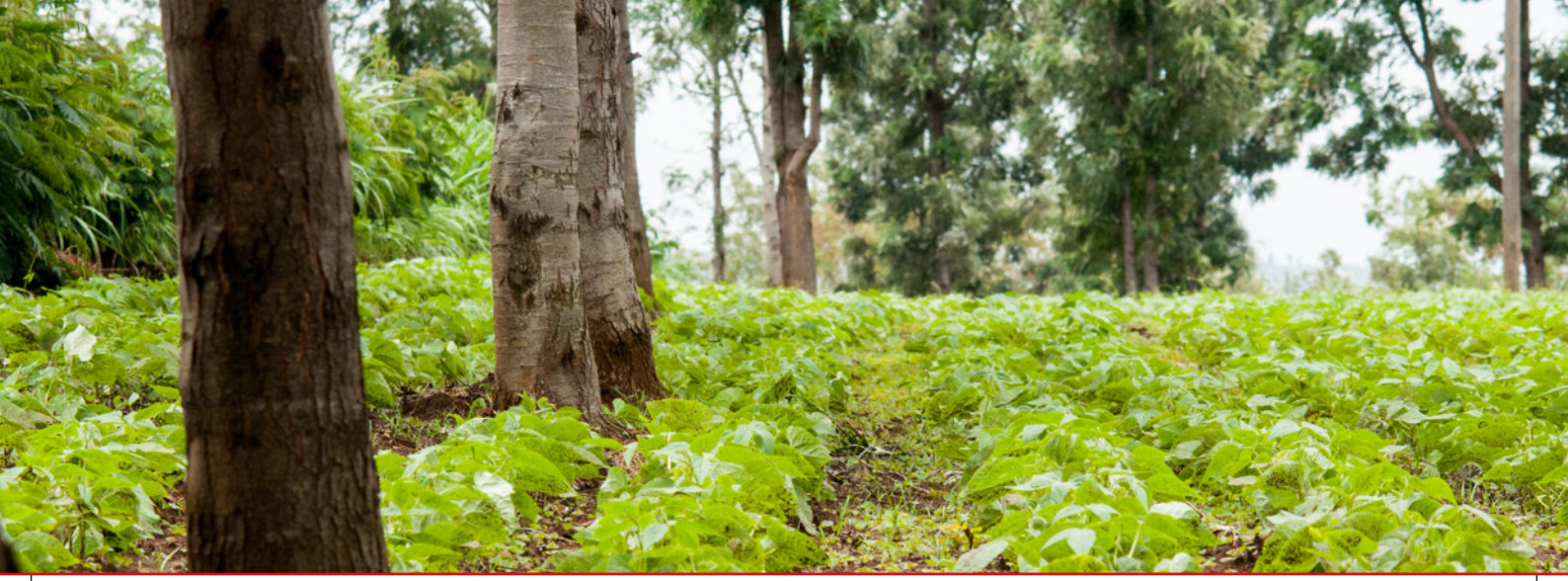
Background and policy nexus

Climate change is consistently mainstreamed into national development policies, strategies and programs, and mainstreamed into response plans and strategies at national, departmental and sectoral levels. In terms of development priorities and objectives, the Republic of Benin has made enormous efforts in terms of infrastructure development, security and governance, including climate change. The Republic of Benin is already implementing programs to combat climate change through the promotion of renewable energies, efforts to reduce deforestation and forest degradation, and the strengthening of community and ecosystem resilience. The country continues to implement transformational and sustainable economic policies to accelerate improvements in the well-being of citizens. However, the level of operationalization of the existing strategies is still low to induce a significant evolution towards the achievement of their respective visions and the National Studies of Long-Term Perspectives "Benin Alafia 2025".

In 2015, Benin adopted and ratified the Paris Agreement and subsequently submitted its INDCs in response to the Lima Call for Climate Action. Over the 2017-2019 period, the country implemented its first NDCs, which are a full conversion of its INDCs. In accordance with the Paris Agreement (art. 4 and UNFCCC 1/CP21 decisions), Benin has updated its first NDCs.

According to Benin's NDC document, the country's total GHG emissions in 2018 amounted to approximately 16.94 Megatonnes CO_2 equivalent (Mt E-CO_2), or approximately 1.5 tonnes E-CO_2 per capita, excluding the Land Use, Land Use Change and Forestry (LULUCF) sector. These emissions come from the energy (58.09%), agriculture (28.51%), waste (5.38%) and industrial processes (1.22%) and other sectors (fire vegetation and HFC emissions) for 6.80%. Taking into account the LULUCF sector, net GHG emissions amount to 9.62 Mt E-CO_2. In terms of projection, if the status quo scenario is maintained, the trend in global emissions (excluding LULUCF) reveals an increase of 71% over the period 2018-2030, changing from 16.94 Mt E-CO_2 to 29.02 Mt E-CO_2. Total cumulative global GHG emissions without any intervention over the 2021-2030 period are around 241.98 Mt E-CO_2 (excluding LULUCF sector). Faced with this picture, Benin has developed 57 adaptation actions and 30 mitigation measures in its updated NDCs. These planned measures are likely to contribute to reducing cumulative GHG emissions (excluding LULUCF) by approximately 48.75 Mt E-CO_2 compared to the reference scenario, i.e. a reduction of around 20.15% over the period 2021-2030.

Benin's commitment is ambitious given that its mitigation targets are related to key sectors for its economic development, in particular the energy and agriculture sectors, whose emissions cover 91.6% of the country's overall emissions. It is therefore essential that the country adopts sustainable practices, particularly in the soils of Agriculture, Forestry and Other Land Use (AFAT) sector.



Indeed, soils have an enormous potential for sequestration and storage of organic carbon (SOC) and a major role in mitigating climate change. However, a diagnostic of the NDCs highlighted that the SOC is not explicitly targeted with clear monitoring indicators and targets. Thus, soil health needs to be further integrated into food security and climate mitigation efforts and initiatives, as elaborated in NDCs. With a real opportunity to explore how soil health can be integrated into national policies, this document highlights the challenges, opportunities and needs for integrating SOC/SH into the NDCs of Benin towards sustainable agricultural production, food security and climate action. Rightly so, findings from a desk review and key informant interviews (KII) could better help inform a future planning process on the challenges and opportunities of integrating SOC/SH into NDCs.

NDC target setting process

Under Article 4 of the Paris Agreement, Parties are required to prepare, communicate and maintain successive NDCs. In accordance with the relevant provisions of decision 1CP/21 adopting the Paris Agreement and paragraph 22 of decision 1CP/21 adopting the agreement, Benin has prepared its first NDC and submitted to the Convention secretariat in October 2017. Following the completion of the inventory of the NDC in relation to the actions implemented over the period 2017-2019, Benin initiated the process of updating this instrument with the purpose of increasing its ambitions contribute more to the global efforts of reducing greenhouse gases (GHGs). The activities planned in the NDC covering the period 2017-2030 are structured into two main components: mitigation and adaptation.

The process of updating the NDCs involved the broad participation of stakeholders from the planning chain of the Government, decentralized State agencies, municipalities (local authorities) and Civil Society Organizations (CSOs), as well as the Technical and Financial Partners (PTF). These different stakeholders come from public and private structures, local authorities and NGOs. The process is obviously inclusive, participatory and holistic aiming at taking into account all the concerns at the climate-development interface. All the actors, under the coordination of the Ministry of the Living Environment and Sustainable Development (in French, Ministère du Cadre de Vie et du Développement Durable - MCVDD), participated in the formulation of the ambitions contained in the NDCs. Thus, the contributions of sub-regional actors (in particular the Departments, Mayors, and local CSOs) were taken into account during the development of the national NDCs.

The updated NDCs of Benin is aligned with the existing strategies, plans and programs of the country. By comparing the declarations from the KII with the content of the NDC, it is important to note that the main strategies, plans and long-term programs of the country are taken into account, in particular the National Studies of Long-Term Perspectives "Benin Alafia 2025 " , the National Development Plan 2016-2025, the National Strategy for the implementation of the UNFCCC, the National Program for the Sustainable Management of Natural Resources, the Low-Carbon and Climate-Resilient Development Strategy, the national strategy and action plan for the sustainable management of Benin's mangrove ecosystems. The key sectoral objectives in terms of mitigation and adaptation to climate change are defined for the time horizons 2020, 2025, 2030.

It should be noted that the KI believe that the targets of the INDC drawn up in 2015 were not aligned with the SDG, but those of the NDC and the updated NDC are aligned with the SDGs, especially SDGs 1, 2, 12, and 13.

Improving the NDC planning process

In terms of improving the NDC planning process, the actors would like that special attention be given to strategic documents, in particular the National Adaptation Plan (NAP) and the National Action Plan on Sustainable Land Management (PAN-GDT) 2018-2027. For its planning, the NDC will necessarily be integrated into other processes such as the National Adaptation Plan, the low-carbon and climate-resilient development strategy. Win-win opportunities could emerge in terms of economic and social benefits as well as climate.

In terms of adaptation, the needs for technology transfer concern only the agriculture and water resources sectors. Other sectors should be subjected to assessments and integrated in terms technology needs in the next editions of the NDC.

Integrating soil organic carbon (SOC) into NDCS

The republic of Benin has included both adaptation and mitigation components into its NDCs. Fifty-seven (57) adaptation actions and thirty (30) mitigation measures are considered in the updated NDCs. All KI pointed out that the SOC was not directly and explicitly integrated into the NDCs, in the absence of baseline data for clear monitoring indicators. Thus, the NDC document does not explicitly highlight the indicators of the integration of the COS in the implementation. However, many of the measures envisaged through the various programs and projects will contribute to the improvement SOC/SH. These measures target the integrated management of soil fertility (ISFM), the promotion of good practices of agricultural production. According to KI, outputs of the EXACT

tool used to build mitigation scenario, showed a total potential sequestration of C in soils of about 22,000 tons eq CO_2, if all of the proposed measures are successfully implemented. The most important measures mentioned by the KI are related to the sustainable management of agricultural lands and forests. Thus, agroforestry and CSA practices play a crucial role in maintaining soil health and storing more organic matter and carbon in soils. Based on the NDC review, mitigation and adaptation measures targeting ecosystem and landscape restoration will induce positive impacts on soil health/ SOC. Benin's NDCs target several integrated sectors, including all categories and biomass pools in AFOLU, which is recognized as having potential for carbon sequestration in agricultural lands and forestry.

In the agricultural sector, the measures envisaged in the NDCs aim to some extent to promote improved farming techniques and management of soil fertility for crop production. This measure will lead, if effective, to the adoption of good practices for improving soil fertility over a total area of 10,000,000 ha between 2021 and 2030. According to the NDCs, the avoided emissions by these measures are estimated at 29.7 Mt eCO_2.

For successful integration of SOC/SH into NDCs, key enabling conditions should contribute to mitigating risks for NDC implementation and soil health mainstreaming. This essentially involves the private sector incentive policies and the development of a legal framework conducive to the effective mobilization of financing and technology transfer. These conditions also extend to regulations and financial provisions to operationalize the key enabling conditions.

In terms of adaptation, the following projects, strategies and programs implicitly or explicitly target the SOC/SH:

- Strategic Plan for the Development of the Agricultural Sector (2017-2025)
- National strategy for the provision of effective and efficient agro-meteorological services for the benefit of actors in the agricultural sector
- Training strategy for farmers, breeders and fishermen on technologies adapted to climate change and the use of agro-meteorological information
- Communication strategy for building the capacity of actors to adapt to climate change for agricultural production and food security in Benin
- National Agricultural Investment and Food and Nutritional Security Plan (2017-2021)
- Strategic Plan for the Development of Climate-Smart Agriculture (2018-2022)
- National Program for the Sustainable Management of Natural Resources
- Capacity building strategy on wildland fire management for better adaptation to climate change
- Strategic plan for the development of mangrove ecosystems

The strategies and programs that have enabled the preparation and should be the subject of the implementation of the NDCs and targeting actions directly or not on SOC and soil health are:

- Smallholder Agricultural Productivity Improvement Program (PAPAPE) whose objective is to increase the productivity of rainfed and irrigated smallholder agricultural production systems (popularization of integrated soil fertility management technologies , restoration of soil health and fertility).
- Project for the Development of Irrigated Perimeters in Rural Areas (PDPIM). Its objective is the realization of hydro-agricultural developments: development of 1000 ha of lowlands and 300 ha of small irrigated perimeters, rehabilitation of 200 ha of degraded agricultural land, construction of four (04) water reservoirs.
- Project "Supporting the transition towards climate-smart agriculture and food systems" (CSA), with the objectives of sustainable intensification of agricultural productivity and increase in income; and the reduction and/or elimination of GHG emissions;
- Soil protection and rehabilitation project to improve food security (ProSOL), with specific actions being the large-scale promotion of sustainable soil protection and rehabilitation approaches in Benin, the rehabilitation and protection of 30,000 to 50,000 ha of soil;

- Program of intensive reforestation of the national territory by incentive measures: it is about the realization, maintenance and silvicultural follow-up: in total 20,000 ha of plantations and/or enrichment in the classified forests and expected reforestation perimeters; implementation, maintenance and silvicultural monitoring: a total of 800 ha of private and communal plantations expected; construction, maintenance and silvicultural monitoring: a total of 700,000 linear meters of alignment plantations in urban and peri-urban areas expected; creating green spaces in cities: a total of 300 green spaces expected; the implementation of a monitoring and forest protection system against bush fires and transhumance.
- PAGEFCOM 2: Communal Forest Management Support Project, phase 2 aimed at improving forest cover: a total of 600 ha of forest plantations, 20 ha of plantations in schools and 20 ha of cashew plantations expected. The promotion of non-timber forest products; the development of the blue economy in forests; support for economic alternatives to the forest;
- Program for the Management of Forests and Riparian Lands,
- Low-carbon and climate-resilient development strategy (2016-2025): strengthening carbon sinks and reducing emissions from deforestation and forest degradation.

These projects and programs globally target the adoption of best practices in land use, sustainable forest management (sustainable forest and land management through the restoration of land and forest plantations, improvement of agricultural techniques over more across the adoption of best land use practices, enhancement of carbon sinks and reduction of emissions from deforestation and forest degradation).

Furthermore, one of the factors controlling the dynamics of the availability of organic matter and SOC (sanitary state of the soil) remains vegetation fires. To this end, the NDCs plan to implement a national strategy for the management of vegetation fires in Benin. This action will improve the availability of organic matter and biomass in the different lands (crops, forests, plantations, etc.) and consequently the quantity of SOC and the health of the soil.

Integration of climate, land and biodiversity commitments

Land, climate and biodiversity, including biodiversity benefits and ecosystem services, are critical to Benin's economy. In this regard, Benin is a party to the three Rio conventions (UNFCCC, UNCCD, CBD). These commitments have enabled relevant strategies for the sustainable management of the country's biodiversity. The main tools, strategies or programs are the Low-Carbon and Climate-Resilient Development Strategy 2016-2025, the National Climate Change Management Program 2021-2030, the National Adaptation Plan, the Action Plan National Sustainable Land Management (PAN-GDT) 2018-2027, the National Development Plan 2018-2025. It should be noted that some mitigation and adaptation projects have co-benefits with adaptation and vice versa.

According to KI, the integration of the country's climate, land and biodiversity commitments refer to the National Long-Term Perspective Studies "Benin Alafia 2025" developed since the year 2000.

Seventeen challenges have been identified and are linked to:

1. the social determinants of well-being,
2. the external environment,
3. the material bases of sustainable development, and
4. the socio-institutional foundations.

These challenges are, among others the limited technical expertise, the insufficient quality of data and information, the effective and timely mobilization of national and external resources which is not always easy, the weak capacity of the public sector concerned to effectively manage large scales, ineffective application of regulatory texts, ineffective technology transfer as well as the completion of research and development work at the national level, the strong dependence of households on natural resources for livelihood and energy needs, low diversification energy sources and under-exploitation of renewable energy sources, high population growth in the face of weak economic growth.

Current efforts in integrating climate, land and biodiversity commitments are geared towards capacity building, especially for rural development actors and grassroots populations. It is important to note that the main strategies, plans and long-term programs of the country taken into account, in the formulation of the updated NDCs integrate the national commitments in terms of climate, land and biodiversity, including the three Rio conventions, the Aichi Targets, the Lima Targets, the Paris Agreement, and other regional and international initiatives (AFR100, Bonn Challenges, etc.).

Status of SOC in the country and key evidence from monitoring

For decades, the soils of Benin have been in the grip of significant degradation following their overexploitation. This degradation affects the entire national territory. The problem of declining soil fertility remains a concern for producers, decision-makers and researchers alike in their daily efforts to maintain soil fertility and restore degraded ecosystems and landscapes. Through the scientific work on the state of soil fertility and the organic carbon content of the soil in the country, it is evident that an effort is being made in terms of monitoring the soil resources of the country. This work has shown that the soils of Benin are in increasing degradation due to enormous pressures, in particular agriculture and livestock (Ahaloukpe et al, 2020). By way of illustration, in the North-West of the country, the carbon rate drops over time, going from 2.44% in the superficial horizon to 1.90% or even 0.3% on the plateaus (Kombiénou et al, 2014). Since the lower part of the Magou River basin is under the protection of the Pendjari Biosphere Reserve, the upper basin is under intense agricultural pressure, inducing an accelerated loss of organic carbon content. Similarly, according to the work of Atchada et al (2018), SOC is higher in natural formations (29.51 t/ha) than in fields (16.76 t/ha), proving the impact of agriculture on soil health. All the same, the stock of organic carbon in plantations, in particular those of Acacia auriculiformis, has been the subject of study on their contribution to climate change mitigation (Kooke et al, 2019).

Factors affecting the stability of SOC, are particularly related to the agro-ecological zones, the toposequence, the soil depth, the land uses and management practices (e.g. vegetation fires), the nature or type of soils, etc. The stabilization of soil organic carbon is essential for the sustainability of agropastoral production and the contribution of the AFOLU sector to GHG mitigation.

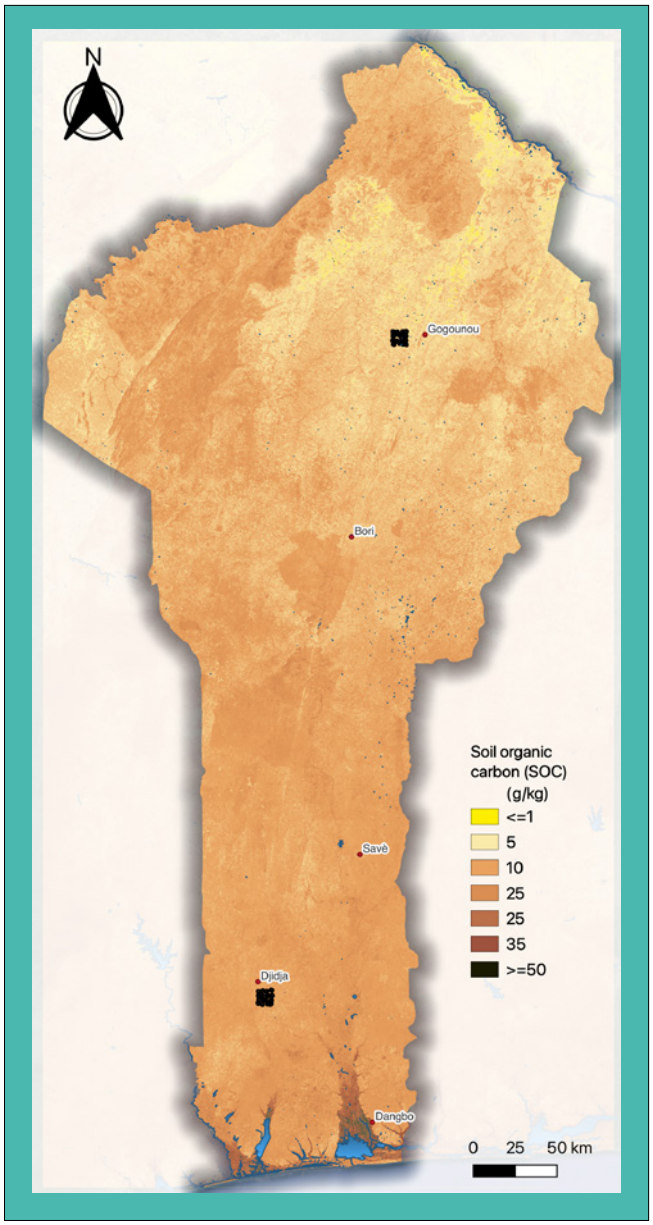


Figure 1: Map from LDSF data / monitoring http://landscapeportal.org/blog/2015/03/25/the-land-degradation-surveillance-framework-ldsf/

The assessment of organic carbon potential in Benin soils is carried out within the framework of the LDSF. Figure 1 provides these nationwide spatial patterns of the SOC content.

Monitoring NDC progress

The implementation of sectoral mitigation activities (agriculture, energy, forestry and waste) under the NDC will build on existing strategies, programs and projects and future programs and projects. Regarding the implementation of adaptation activities, it will be done at the level of eight (8) sectors: agriculture, water resources, forestry, coast, tourism, energy, health, urban planning and infrastructure.

The MCVDD will also be responsible for the MRV system (Measurement, Reporting and Verification) of the implementation of the NDC, institutional capacity building in collaboration with the relevant stakeholders.

In addition, through the institutional framework put in place, the monitoring of the implementation of Benin's updated NDC will be carried out under the aegis of the Ministry of the Living Environment and Sustainable Development (MCVDD) acting as focal point of the United Nations Framework Convention on Climate Change. The main actors involved include the relevant sector ministries and institutions; the local collectives; the private sector; civil society. The organs for implementing this instrument are the steering committee, the national coordination unit of the NDC, the sectoral coordination, the communal coordination. This institutional framework indicates that the monitoring of the implementation of the NDCs will be done at different levels of the chain of execution and implementation of the registered projects and programs. This thus engages the responsibility of the ministries, institutions or sectoral entities concerned by the sectoral projects and programs.

According to KI, monitoring and reporting on soil health/SOC in relation to the NDCs must be done under the coordination of the Ministry of Living Environment and Sustainable Development (MCVDD), Focal point of the UNFCCC, which provides the guidance and facilities needed to support sectoral agencies as needed. The technical work must be carried out by the competent services of the Ministry of Agriculture, Livestock and Fisheries (for agricultural land) and by the structures in charge of the forestry sector (for forest land) which are under the supervision of the MCVDD.

Current procedures for the collection, analysis, processing and documentation of soil health/ SOC related data are subject to standard protocols and procedures in accordance with dedicated technical guidelines in Vanek S. and Fonte S. (2020); FAO (2017); and Fairhurst T. (ed), (2015).

Issues and challenges related to MRV

The MRV system in Benin includes MRV of GHG inventories, MRV of GHG mitigation and MRV of support received. According to the investigations, only the MRV of inventories is legally implemented in the current context of NDCs. The major challenges relate to the establishment of institutional arrangements for better transparency, the strengthening of GHG inventories, including the improvement of methodological guidelines and the design of a national MRV system, and the establishment and the operationalisation of a tool for monitoring the advancement and progress of the NDC. Furthermore, it should be noted that the limited technical expertise, the low quality of data and information, and the low effective and timely mobilization of national and external resources.

In terms of challenges related to the implementation of NDCs, it is necessary to note the capacity for effective and timely mobilization of national and external resources, the capacity of the public structures concerned to effectively manage large-scale programs, the effectiveness of the application of regulatory texts, the effective transfer of technologies as well as the completion of research and development work at the national level, the lack of measuring instruments for monitoring, and the insufficiency of techniques and capacities to really measure the contributions ambitions expressed in the NDCs. Also, it is necessary to add the Quality Assurance/Quality Control (QA/QC) of the MRV, in particular the level of uncertainties on the data and indicators on all aspects.

The main risks to a successful NDC implementation can be credit risks, political or policy-related risks, and technology risks. Risk mitigation instruments can be insurance against policy risks, government or donor guarantees, capacity building of the financial sector against risks related to low-carbon or climate-resilient technologies climatic. The inability of NDC governance (monitoring of QA/QC procedures, analyses of the impacts of the NDC, lack of financial and technical means, sustainability of processes, projects or ambitions not realized due to lack of resources) should find an effective response to ensure successful implementation of NDCs.

Key areas of support

From the analysis of the NDC and the consultation of key actors, it is highlighted that the full implementation of the NDCs includes conditionality both in adaptation and mitigation, and especially in relation to health. soils and soil organic carbon. This implies a need for assistance for effective and efficient implementation of NDC measures. The following areas need support:

Needs of Technology Transfer

The needs expressed in terms of technology transfer cover the agriculture and water resources sectors for the adaptation component on the one hand, and the agriculture, forestry and energy sectors for the mitigation component. For the adaptation component, and in connection with soil health and SOC, this involves, among other things, the development and popularization of technical itineraries adapted to new climatic constraints, the popularization of good practices in agriculture (mulching, integrated management agriculture and livestock), development of small watersheds, integrated management of rice-growing lowlands. With regard to the mitigation component, the sectors covered by the NDC are: agriculture, forestry and energy. These needs directly related to soil health essentially concern integrated management of soil fertility, technology for the production and use of manure on farms, reforestation of forest land, promotion of small butane gas cooking equipment.

Institutional level needs

Capacity building will consist of skills development. Capacity building will also concern the improvement of institutional capacities. In relation to SOC and soil health, the needs are the strengthening of current

structures operating in the field of protection of the atmosphere, land and oceans, the creation or strengthening of structures dealing with issues relating to adaptation and mitigation, and the definition of national climate plans and strengthening of the consideration of climate change in development programs/ strategies. This will increase the monitoring and evaluation capacities of agricultural and forestry development projects and the consideration of SOC and soil health aspects. This will have to go through the reinforcement of the management team, follow-up and popularization of the actions/activities of the NDC, and the improvement of the capacity of follow-up and evaluation of the adaptation activities in the various sectors.

As an example of institutional strengthening, Benin is currently implementing, with GEF funding (2020-2023), through the FAO, the CBIT Project (Capacity Building Initiative for Transparency) aimed at "building capacities in the Energy, Agriculture, Forestry and Other Land Uses, for better implementation and monitoring of Benin's NDC. It will be a question of multiplying such initiatives towards the different actors and sectors in a coordinated and integrative way for better success in the implementation of the NDCs.

In addition, key insights from the interviews highlighted the following support needs for the direct integration of soil health/SOC into revised versions of NDCs:

1. Development of the technical, operational and human capacities of laboratories and technical services in soil organic carbon analysis and agricultural and forest soil health management
2. Developing the capacities of local communities and rural development actors in the management of organic carbon and soil health
3. The training of farmers' organizations on the composting of agricultural waste and land preparation practices without burning plant biomass, and sustainable land management in general.
4. Soil health research is needed. Although research teams are active in this field in the Universities and other research centres, there are great needs for a better mastery of methods for evaluating the physical components and soil biology, methods for conserving organic matter in the soil, and techniques for preparing agricultural land without the use of fires.

The need for financial support

The total estimated cost for the execution of the plans, programs and projects listed under Benin's updated NDC amounts globally to 10,515.88 million US dollars, including 5,661.89 million US dollars as an unconditional option and 4,853.99 million US dollars as a conditional option. To achieve the NDC ambitions, Benin will have to supplement national resources (public funds and private investments) with bilateral or multilateral external financial support. These funds should make it possible to implement the various projects and programs, and measure the progress made through an effective Measurement, Reporting and Verification (MRV) system. Financial support needs directly related to SOC and soil health are not explicitly costed in the NDCs. However, through the costs of projects and programs with a positive impact on the COS /SS, it is obvious to appreciate the needs of the country, especially under the conditional scenario.

The needs for strengthening research and innovations

Key informants highlighted the critical needs for applied research specifically targeting soil conditions (health and SOC content) for the food security and resilience portfolio, but also to argue the impacts of NDC measures on soil conditions. soil for CC adaptation and mitigation. Evidence from research (baseline or baseline conditions) could allow easy integration of SOC into future actions to consider soil health in achieving NDCs and national commitments. In addition, research could support NDC MRV systems.

Conclusion

Based on the diagnosis (analysis of the NDC and information from the interviews), the NDCs of Benin have planned conditional and unconditional objectives to respond to climate change. These measures are developed through mitigation and adaptation components, with mutual co -benefits, in several economic sectors including energy and agriculture. The mitigation co -benefits expected in adaptation actions in agriculture rely on the adoption of climate-smart agricultural practices and the promotion of sustainable land management practices. From a mitigation perspective, nature-based solutions should primarily enhance biodiversity conservation through forest conservation and restoration of degraded landscapes, in line with the United Nations Decade 2021-2030. Restoring Ecosystems, and supporting the implementation of the Post-2020 Global Biodiversity Framework. NDC measures explicitly target soil fertility (soil organic carbon) in relation to the great potential of climate-smart agricultural practices. Coherences exist between the document review and the KII that there is a need for institutional arrangements and a transparent and sustainable procedural framework for the collection, analysis, reporting and documentation of data for monitoring the soil health/SOC in Benin. As the challenges and needs identified by the actors are numerous, it is necessary to improve the planning and governance of the implementation of ambitions (projects and programs) for successful achievement that explicitly integrate soil health and food security. The zeak NDC governance (monitoring of QA/QC procedures, analysis of the impacts of the NDC, lack of financial and technical means, sustainability of processes, projects or ambitions not realised due to lack of resources) should find an effective response to ensure its successful implementation with more attention to soil health and climate mitigation.

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Acronyms

AEZ	Agro-ecological zones
AFOLU	Agriculture Forestry and Other Land Uses
CBD	United Nations Convention on Biological Diversity
CBIT	Capacity Building Initiative for Transparency
CC A&M	Climate Change Mitigation and Adaptation
CSOs	Civil Society Organizations
DGECV	Direction Générale de l'Environnement et du Cadre de Vie
GEF	Global Environment Facility
GHG	Greenhouse Gas
ICRAF	International Centre of Research in Agroforestry
KII	Key Informant Interview
LDSF	Land Degradation Surveillance Framework
LULUCF	Land use, land-use change and Forestry
MRV	Monitoring Reporting and Verification
NDC	Nationally Determined Contribution
QA/QC	Quality assurance /Quality control
SDGs	Sustainable Development Goals
SLM	Sustainable Land Management
SOC/SH	Soil Organic Carbon / Soil Health
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework to Combat Climate Change

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Objective

Approaches to promoting lasting soil protection and rehabilitation are implemented and shared in selected partner countries.

Approach

The programme works in coordination with the relevant ministries in the partner countries. It promotes sustainable land use, based in particular on the involvement of the affected smallholders. These are the primary target group and receive advice on agroecological practices. These practices help in building up organic matter (humus), as well as in enhancing fertility and the soil's capacity to absorb water. The immediate advantage is rising yields. This improves the food situation of smallholders and opens up new sources of income.

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