

# Info Note

## Ambition for soil organic carbon sequestration in the new and updated nationally determined contributions: 2020- 2022

*Analysis of agricultural sub-sectors in national climate change strategies*

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### Key messages

- The share of countries that referenced soil organic carbon (SOC) in new and updated NDCs has increased since the previous round of NDCs.
- Among the top 10 countries with the highest mitigation potential for SOC in croplands and grasslands, 6 referred to SOC in mitigation measures.
- Among the top 10 countries with the highest mitigation potential in wetlands, 5 referred to wetlands in mitigation measures.
- Only five countries included GHG targets related to SOC (Belize, Democratic Republic of the Congo, Liberia, Myanmar, and Uganda).
- SOC commitments that demonstrated high standards, which may indicate options for other countries, included quantified outcomes, information on reference levels of indicators, mitigation potentials, and policies.
- Specification of sub-sector actions in NDCs can improve eligibility for climate finance, but this level of detail can reduce countries' flexibility for meeting their NDC targets and countries often lack affordable, robust monitoring, reporting, and verification (MRV) systems.

Transparent commitments to soil organic carbon (SOC) sequestration as a measure for climate change adaptation and mitigation are critical for tracking progress toward global climate targets. Global SOC sequestration potential ranges from 2 to 5 Gt CO<sub>2</sub> per year, or 4 to 10

percent of global greenhouse gas (GHG) emissions in 2018 (Fuss et al. 2018, Ge et al. 2020). As of September 30, 2022, 106 of 164 countries submitting Nationally Determined Contributions (NDCs) included SOC or related measures in mitigation or adaptation contributions. Of these, 36 countries explicitly included SOC in agricultural land (including wetlands) in their new and updated NDCs. Ambition in SOC is especially needed among countries with the highest mitigation potential for SOC sequestration, yet not all of the top countries with the highest potentials included SOC in their latest NDCs. Kazakhstan has not submitted a new or updated NDC as of September 30, 2022.

To better understand the role of SOC sequestration in the new and updated NDCs, we evaluated SOC and related commitments in the new and updated NDCs (see Box 1 for an overview). We evaluated progress and ambition since the previous NDCs,<sup>1</sup> assessed ambition among countries with the highest mitigation potential for SOC sequestration and protection, highlighted examples of domestic policies for implementation, and summarized needs for implementation support. We report here on these results and conclude with recommendations on how to enhance ambition and improve transparency in the NDCs, while recognizing the challenges countries face. The analysis aims to enhance the information necessary for clarity, transparency and understanding (CTU) of NDCs by identifying gaps in targets, finance needs and policy.

<sup>1</sup> Previous NDCs include 184 NDCs submitted as of November 24, 2019. Results for previous NDCs are based on an analysis of soil organic carbon by Wiese et al. (2021).

## Box 1. SOC and related practices in the new and updated NDCs

One hundred seven out of 164 countries (65%) referred to SOC or SOC-related measures in the new and updated NDCs.

Thirty-six countries (22%) referred to SOC explicitly:

- 14% of countries referred to SOC in mitigation measures in new and updated NDCs (23 of 164 countries) compared to 7% of previous NDCs (12 of 184 countries).
- 10% of countries referred to SOC in adaptation measures in new and updated NDCs (16 of 164 countries) compared to only 2% in the previous round of NDCs (4 of 184 countries).

Seventy-one countries (43%) referred to SOC-related measures without mentioning SOC.

Priorities for SOC-related mitigation or adaptation measures included **wetland management** (43% of 164 countries), **agroforestry** (38%), and **grassland management** (21%).

### Progress and ambition for soil organic carbon

As of September 30, 2022, 164 countries (137 Parties including the EU) submitted new or updated NDCs to the UNFCCC.<sup>2</sup> Of these, 36 countries referred to SOC (23 in mitigation contributions, 16 in adaptation contributions). This represents 22 more countries compared to the previous round of NDCs based on an analysis by Wiese et al. (2021). Twenty-nine countries included SOC commitments for the first time since the previous round of NDCs.<sup>3, 4</sup>

One hundred seven (107) countries also referred in their NDCs to practices associated with increasing SOC sequestration (see Table 1 for a list of practices), with or without specifying SOC. When considering these related practices, 81 countries included SOC or related mitigation measures (49%) and 91 included SOC or related adaptation measures in the new and updated NDCs (55%) (see Figure 1). Agroforestry, wetlands and grassland management were prioritized in both mitigation and adaptation contributions (see Table 1).

Similar to the previous NDCs, SOC commitments ranged from broad, qualitative measures (including policies) to GHG targets, defined as commitments to reduce emissions or increase carbon sinks by a specified amount and timeline. Only five countries included GHG targets related to SOC (Belize, Democratic Republic of the Congo, Liberia, Myanmar, and Uganda). Specifying SOC-related policies and non-GHG actions in NDCs may provide flexibility for countries that cannot track changes in SOC sequestration but can track policies and actions. Fourteen countries explicitly referred to SOC with quantified indicators (with or without clear timelines) in new and updated NDCs, seven of which included quantified indicators for the first time.<sup>5</sup> Forty-eight countries included quantified indicators for measures for SOC or related practices that may enhance SOC. The majority of countries with quantified indicators for SOC or related measures expressed goals in non-GHG units, typically hectares under a specific practice. Table 3 summarizes GHG targets related to SOC, and Table 4 presents examples of measures with quantified indicators in non-GHG units.

**Table 1. Summary of reference to SOC or related practices in new and updated NDCs**

Measures related to soil organic carbon	Mitigation measures (No. of countries)	Adaptation measures (No. of countries)	Mitigation or adaptation measures (No. of countries)
Agroforestry	45	41	62
Conservation agriculture	9	10	16
Cover crops	5	3	7
Crop rotation	4	8	12
Erosion control	8	23	28
Fallow	0	1	1
Grassland management	21	24	35
Integrated soil fertility management (ISFM)	1	12	12

<sup>2</sup> Parties with time frames up to 2025 in their intended nationally determined contribution (INDC) were requested to communicate a *new* NDC. Parties with time frames up to 2030 in their INDC were requested to communicate an *updated* NDC (UNFCCC 2021).

<sup>3</sup> Albania, Antigua and Barbuda, Argentina, Australia, Benin, Bhutan, Brazil, Cabo Verde, Cambodia, Costa Rica, Dominica, Dominican Republic, Eswatini, Ethiopia, Guinea, Liberia, Mauritania, Moldova (Republic of), Montenegro, Nauru, Paraguay, Rwanda, Seychelles,

Sierra Leone, South Sudan, Tajikistan, United Arab Emirates, United States, and Zimbabwe

<sup>4</sup> While Japan's updated NDC did not explicitly refer to soil carbon, it did not exclude sources, sinks and activities related to soil carbon in the previous NDC. As our analysis is concerned with transparency and clarity, and the current NDC is ambiguous in regard to SOC, we treated Japan as not referencing SOC in the current NDC.

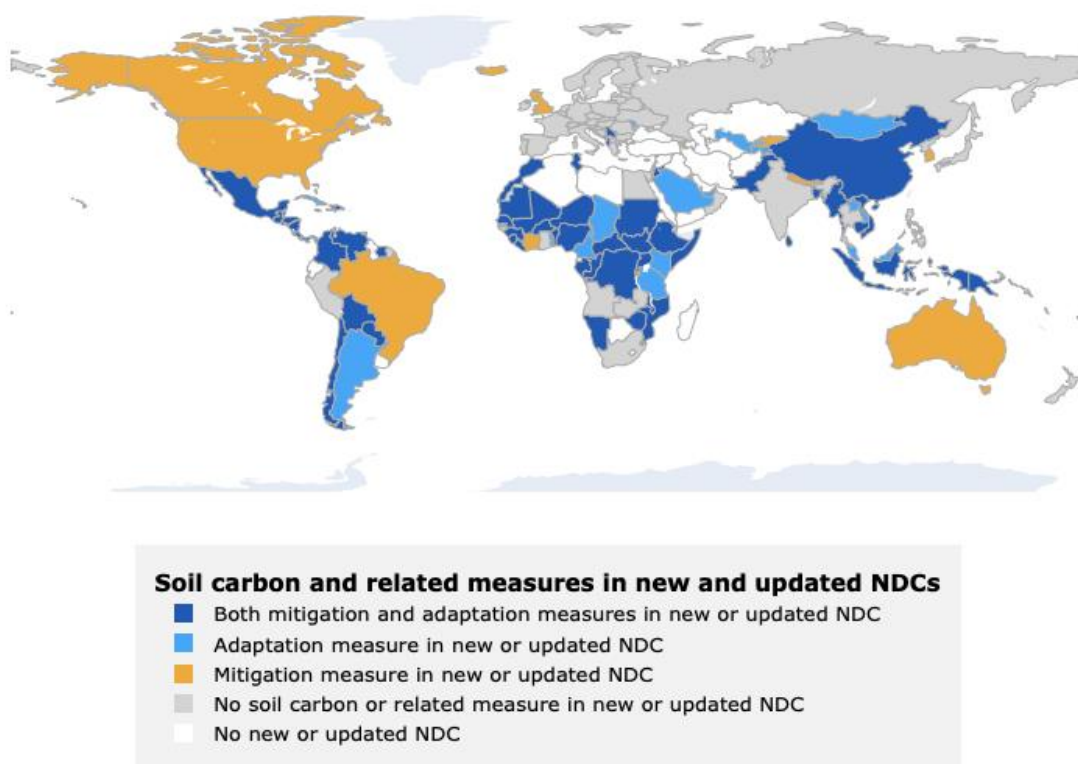
<sup>5</sup> Albania, Australia, Dominica, Liberia, Mauritania, Paraguay, and Rwanda

Measures related to soil organic carbon	Mitigation measures (No. of countries)	Adaptation measures (No. of countries)	Mitigation or adaptation measures (No. of countries)
Organic amendments (manure, compost, biochar)	19	16	28
Reduced or avoided burning of agricultural residues	15	3	16
Reduced or zero tillage	14	8	21
Regenerative agriculture	1	3	3
Soil organic carbon (explicit references)	23	16	36
Wetlands, peatlands (conservation, rewetting)	39	59	71

**Table 2.** Comparison of information on SOC-related actions, commitments, mitigation potentials and MRV mechanisms as provided in Rwanda's updated NDC and Strategic Plan for Agriculture Transformation (2018-2024) (PSTA4)

Policy	Year	Timeline	SOC-related actions in agriculture sector			MRV mechanism
			Actions	Commitments	Mitigation potentials	
NDC	2020	2020-2030	<ul style="list-style-type: none"> <li>■ Crop rotation</li> <li>■ Terracing</li> <li>■ Multicropping</li> <li>■ Conservation tillage</li> </ul>	Commitment for area (ha) increase per measure	Percentage contribution per measure to total agricultural mitigation potential provided	MRV Framework provided
PSTA4	2018	2018-2024	<ul style="list-style-type: none"> <li>■ Terracing</li> </ul>	Commitment for area (ha) increase per measure	Not provided	Monitoring and evaluation plan included

Note: EU countries are included in counts individually (i.e., as 27 countries)



**Figure 1.** Map of countries that referred to SOC or related practices in new and updated NDCs

## Alignment between mitigation ambition and mitigation potential

Greater specificity and ambition for SOC among countries with the highest mitigation potentials can support climate goals in agriculture. Ten countries contribute about 55 percent of the cost-effective global SOC sequestration potential in croplands and grasslands (Roe et al. 2021).<sup>6</sup> Only 6 of the 10 top countries with the highest mitigation

potential for SOC in croplands and grasslands specified SOC in mitigation contributions of their NDCs (see Table 5). Kazakhstan has not yet submitted a new or updated NDC as of September 30, 2022.

Ten countries contribute approximately 88 percent of the cost-effective global mitigation potential from wetlands

<sup>6</sup> Roe et al. (2020) estimated cost-effective mitigation potentials (at or up to \$100/tonne CO<sub>2</sub>e) for SOC sequestration in croplands and grasslands based on Soils Revealed (2020). Enhanced SOC sequestration in

croplands assumes no-till and cover crops. Enhanced SOC sequestration in grasslands assumes more sustainable land management and light to moderate grazing pressure.

## Box 2. Alignment of NDC and policies to implement SOC commitments in Rwanda

Rwanda's updated NDC provides detailed information for CTU for SOC commitments, including non-GHG actions, mitigation potentials, and indicators. Rwanda's supporting policy, the Strategic Plan for Agriculture Transformation (PSTA4), was released in 2018 and is not yet aligned with the updated NDC. Table 2 compares the actions, commitments, and mitigation potentials related to SOC in Rwanda's NDC and the PSTA4.

(peatland and mangroves) (Roe et al. 2021).<sup>7</sup> Only 5 of the top 10 countries with the highest mitigation potential referred to wetlands, peatlands, or mangroves within mitigation contributions in new or updated NDCs (see Table 6). Although Malaysia and Mexico lacked mitigation measures for wetlands in their NDCs, both countries described wetland conservation actions in their adaptation contributions. Among the top countries, only Australia and Indonesia referred to SOC or wetlands with quantified indicators.

### Policies for NDC implementation

NDCs do not necessarily reflect a country's domestic policies or measures related to SOC (Wiese et al. 2021) and should not be used as an indicator in this way. NDCs may provide an overview of countries' climate

commitments whereas supporting policies or technical documents may contain details on targets, costs, or other information. For example, the United States and Australia have domestic programs that contribute to SOC sequestration although such programs are not covered in depth in their latest NDCs. Countries that have domestic policies related to SOC could improve transparency of their actions by aligning NDCs with these targets and referencing these policies' contribution to SOC sequestration and protection in their NDCs.

Box 2 summarizes alignment between agricultural policy in Rwanda and SOC commitments in their NDCs. This example illustrates the varying levels of information for CTU (clarity, transparency and understanding) between NDCs and policies that support SOC-related commitments (Wiese-Rozanova et al. 2021).

**Table 3. GHG targets for SOC and related measures in new and updated NDCs**

Country	Mitigation or adaptation	Measure related to soil organic carbon	Conditionality	Commitment	Changes between previous and new or updated NDC
Belize	Mitigation	Wetland protection	Conditional	"Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 kt CO <sub>2</sub> e between 2021 and 2030 through mangrove restoration."	<ul style="list-style-type: none"> <li>■ Maintained mitigation action to protect and restore mangroves</li> <li>■ Slightly increased cumulative emission reduction potential</li> <li>■ Increased transparency by providing more detail on reference levels of indicators</li> </ul>
Democratic Republic of the Congo	Mitigation	Reduced burning of agricultural residues	Not specified	"Subsistence agriculture: mainly shifting and slash-and-burn: potential for reduction of emissions of 15 to 17 Mt CO <sub>2</sub> e in 2030, based on a program to improve the productivity affecting 50% of subsistence farms."	<ul style="list-style-type: none"> <li>■ Added GHG target and other agricultural mitigation measures (with and without quantified indicators)</li> </ul>
Liberia	Mitigation	Reduced burning of agricultural residues	Not specified	"Reduce agricultural GHG emissions by 40% below BAU levels by 2030 (reduction of 13 GgCO <sub>2</sub> e) through promoting low-emissions rice cultivation and reducing the burning of field residues."	<ul style="list-style-type: none"> <li>■ Added GHG target and other agricultural mitigation measures (with and without quantified indicators)</li> </ul>
Myanmar	Mitigation	Agroforestry	Conditional	"Myanmar's Department of Agriculture, with international assistance, will promote tree planting and agroforestry techniques to increase tree canopy cover across 275,000 ha on those agricultural lands with current tree cover <10% per hectare (Table 8). This target will yield a cumulative GHG sequestration of more than 10.4 million tCO <sub>2</sub> e over the period 2021-2030."	<ul style="list-style-type: none"> <li>■ Added agroforestry target and mitigation potential</li> </ul>
Uganda	Mitigation	Wetland management	Conditional and unconditional	"Wetland and Peatland management: The measure aims to increase wetland coverage from 8.9% in 2020, to 9.57% in 2025, and approximately 12% by 2030 through the implementation of wetland management practices such as demarcation, gazettement, and restoration of degraded wetlands. The mitigation reduction potential for this measure is expected to account for 0.4 MtCO <sub>2</sub> e by 2030."	<ul style="list-style-type: none"> <li>■ Added wetland GHG target and mitigation potential to mitigation actions</li> </ul>

<sup>7</sup> Roe et al. (2020) estimated cost-effective mitigation potentials (up to \$100/tonne CO<sub>2</sub>e) for carbon sequestration from mangrove restoration and reduced mangrove loss based on Griscom et al. (2020) as well as

avoided CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from peatland restoration and reduced peatland loss based on Humpenöder et al. (2020).

**Table 4. Examples of commitments related to SOC with indicators in non-GHG units in new and updated NDCs**

Country	Mitigation or adaptation	Measure related to soil organic carbon	Conditionality	Commitment	Changes between previous and new or updated NDC
Costa Rica	Mitigation and adaptation	Grassland management	Unconditional	"By 2030, a reduction in the total pasture area will be maintained at an annual rate of 1% and an increase in the area of well-managed pastures at a rate of 1 to 2% per year over the baseline trend." (translated)	■ Added quantified grassland measure
Malawi	Mitigation	Agroforestry	99% unconditional 1% conditional	"Targeted planting of an additional 25 trees/ha on 155,000 Ha of crop fields, equivalent to 20% of total arable land, 31,784 Ha of village forest areas; and expansion of new fruit area on 27,000 Ha to achieve at least a 10% tree cover. Scaled-up potential for all agroforestry types estimated at 700,000 Ha."	■ Added quantified measures ■ Changed action from conditional to mostly unconditional
Nepal	Mitigation	Soil organic carbon	Conditional	"By 2030, soil organic matter content of agriculture land will reach to 3.95%" (relative to a baseline of 2%)	■ Added quantified measure for soil organic matter

**Table 5. SOC in mitigation measures among countries with high SOC sequestration potential in croplands and grasslands (top ten listed in order from highest to lowest)**

Country	Sector Coverage	Cost-effective SOC sequestration potential, croplands and grasslands (Mt CO <sub>2</sub> per year) (Roe et al. 2021)	SOC specified in mitigation measures in new or updated NDC	Changes between previous and new or updated NDC
China	Not specified	230.9	Yes	<b>Elaborated on implementation plans:</b> ■ Maintained the same mitigation actions related to SOC ■ Added additional non-quantified information on implementation plans
United States	Economy-wide	210.8	Yes*	<b>Improved SOC and related commitments:</b> ■ Added reference to carbon in agricultural soils ■ Added practices: cover crops, rotational grazing
India	Economy-wide	131.5	No	None
Brazil	Economy-wide	124.6	Yes*	<b>Improved financial transparency of SOC and related commitments but removed quantified indicators:</b> ■ Added reference to SOC ■ Added no tillage practice ■ Specified investment for the Low Carbon Agriculture Plan ■ Removed quantified indicators for agroforestry (but continued to include them in domestic policy)
Russia	Economy-wide	106.5	No	None
Kazakhstan	Economy-wide	41.6	NA	NDC not updated as of September 30, 2022
Australia	Economy-wide	39.1	Yes*	<b>Improved SOC and related commitments:</b> ■ Added reference to carbon in agricultural soils ■ Established policy (Low Emissions Technology Statement) ■ Added plans to reduce the cost of soil carbon measurement to under \$3 per ha per year ■ Included details on reference indicators
South Africa	Economy-wide	37.4	No	None
Ethiopia	Economy-wide	34.6	Yes*	<b>Improved SOC and related commitments:</b> ■ Added reference to carbon in grassland
Canada	Economy-wide	32.5	Yes	<b>Improved financial transparency of SOC and related commitments:</b> ■ Added practices: cover crops, rotational grazing, improved land management ■ Specified investment in projects that can contribute to SOC sequestration or protection

\* Indicates SOC was specified in mitigation measures for the first time in new or updated NDCs

NA – New or updated NDC not yet submitted as of September 30, 2022

**Table 6. Wetlands in mitigation measures among countries with high mitigation potential in wetlands (peatlands and mangroves) (top ten listed in order from highest to lowest)**

Country	Sector Coverage	Cost-effective mitigation potential, peatlands, mangroves (Mt CO <sub>2</sub> e per year) (Roe et al. 2021) <sup>a</sup>	Wetlands, peatlands, or mangroves specified in mitigation measures in new or updated NDC	Changes between previous and new or updated NDC
Indonesia	Economy-wide	398.7	Yes	<b>No sub-sector level change:</b> <ul style="list-style-type: none"> <li>Maintained the same quantified mitigation outcome for peatland restoration (2 million ha by 2030) from the previous NDC</li> </ul>
Canada	Economy-wide	158.2	Yes	<b>Improved financial transparency of wetland commitments:</b> <ul style="list-style-type: none"> <li>Specified investment in projects that can contribute to SOC sequestration or protection on wetlands</li> <li>Added subnational action for wetlands</li> </ul>
Russian Federation	Economy-wide	103.3	No	None
Malaysia	Economy-wide	29.6	No	<b>Provided information to clarify accounting but did not include mitigation measures for wetlands:</b> <ul style="list-style-type: none"> <li>Clarified that SOC from drained peatlands is estimated</li> <li>Similar to previous NDC, grassland and wetland emissions and removals will be accounted for “subject to activities undertaken”</li> </ul>
China	Not specified	16.7	Yes	<b>Elaborated on implementation plans:</b> <ul style="list-style-type: none"> <li>Maintained the same mitigation actions related to wetlands</li> <li>Added additional non-quantified information on implementation plans</li> </ul>
Congo, Rep.	Economy-wide	14.1	Yes*	<b>Increased sub-sector coverage:</b> <ul style="list-style-type: none"> <li>Added reference to sustainable management of peatlands</li> </ul>
Finland (EU)	Economy-wide	13.0	No	None
Mexico	Economy-wide	10.3	No	None
Germany (EU)	Economy-wide	10.3	No	None
Myanmar	Economy-wide	8.7	Yes	<b>Provided information to clarify gaps in accounting:</b> <ul style="list-style-type: none"> <li>Maintained mitigation measures for mangroves from previous NDC</li> <li>Clarified SOC is not currently included but noted that future efforts may be made to quantify SOC in mangroves and peatlands</li> </ul>

\* Indicates wetlands, peatlands or mangroves were specified in mitigation measures for the first time in new or updated NDCs

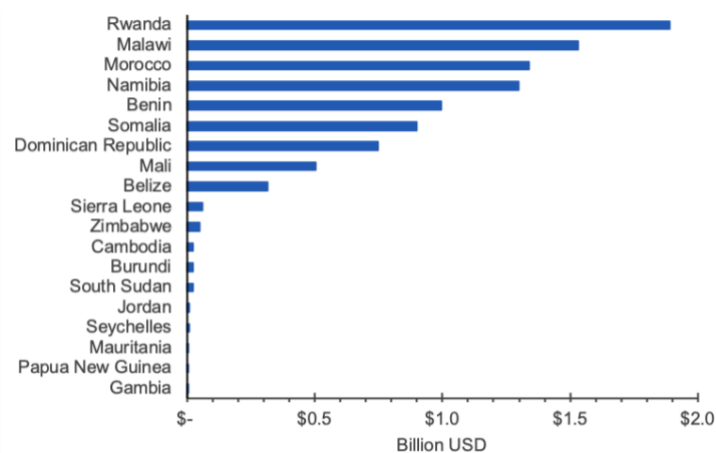
<sup>a</sup> Mitigation potentials shown here include non-CO<sub>2</sub> greenhouse gases in addition to carbon sequestration.

## Means of implementation

**Finance:** Nineteen countries reported finance needs for SOC and related measures in their new and updated NDCs, ranging from 0.6 million USD to over 1.8 billion USD from domestic or international sources (see Figure 2). The majority of countries specified finance for mitigation measures and measures conditional on international support. While more finance estimates were provided at the sub-sector level in new and updated NDCs relative to previous NDCs, many estimates were still only reported in aggregate for the agriculture sector. Figure 2 presents the finance needed for SOC and related measures, where reported. It does not include needs that may be aggregated across the agriculture sector or multiple sub-sectors. As such, the data presented in Figure 2 are not representative of all measures related to SOC in NDCs.

**Capacity Building:** Most capacity building needs were presented as crosscutting needs that are not specific to agricultural sub-sectors. Countries mentioned several

capacity building needs that are also relevant to MRV for soil carbon, such as data collection, support for establishing MRV systems, and inventory methodological improvements.



**Figure 2. Finance needed for SOC, and agricultural measures related to SOC sequestration in the new and updated NDCs**

**Technology Transfer:** Technology transfer needs were often discussed at the sector level; however, a few countries mentioned specific needs for SOC or related practices. For example, Sierra Leone identified the need for technology transfer to combat soil erosion. The Gambia included conservation agriculture as a priority for technology transfer.

## Social considerations

Countries often referenced crosscutting policies or priorities related to social inclusion in their new and updated NDCs. Some countries explicitly referred to gender, youth, local or indigenous communities as part of soil carbon measures. In the context of SOC and related measures, at least 22 countries referred to the role of women, youth, indigenous or local communities. For example, Cambodia plans to encourage women to participate in conservation agriculture. Papua New Guinea noted the importance of working with youth and women to implement agroforestry. Cabo Verde plans to provide incentives for women and youth to participate in a finance and credit scheme for regenerative agriculture. Social inclusion is more often described as part of adaptation measures, despite the relevance of inclusion for mitigation measures as well.

## Transparency challenges

Ambitious sub-sector action can attract finance and guide implementation. However, countries may prefer to maintain flexibility in how they plan to achieve their sector-level or economy-wide targets rather than commit to sub-sector actions. Sub-sector action may also be challenging to track, particularly for countries without affordable, robust MRV systems.

Quantified SOC sequestration targets may not be feasible for countries without the data, technology, or finance necessary to estimate changes in SOC stocks. Open source, cost-effective accounting systems can help countries demonstrate greater ambition and track progress towards long-term goals. In the short-term, countries have adapted by including ambition for SOC in the form of SOC-related measures and non-GHG outcomes from these practices, or existing policies that contribute to SOC sequestration.

## Conclusion and recommendations

The number of countries including SOC in their new and updated NDCs has doubled, but the overall numbers are still low. SOC was prioritized by only 50-60% of the countries with the highest mitigation potentials. Some countries with the highest ambition for SOC have improved their inclusion of SOC by providing more specific information on outcomes, reference indicators, and investment. Changes in ambition for SOC can be ambiguous if units are not consistent across NDCs.

Improvements in data availability for SOC and MRV will help clarify the level of ambition appropriate for SOC. The following items can also help raise ambition for SOC in the NDCs:

- Descriptions of enhanced policies that contribute to SOC sequestration in NDCs
- Concrete short-term and long-term plans to establish MRV systems
- Finance and technology transfer to support MRV systems for SOC sequestration

These priorities can help countries raise ambition of SOC commitments and more transparently track progress towards the goals of the Paris Agreement.

## Other NDC research

- Briefs, maps & data: [Agriculture's prominence in the INDCs: data and maps](#) (2016)
- Wiese L, et al. 2021. [Countries' commitments to soil organic carbon in Nationally Determined Contributions](#). *Climate Policy*.
- Wiese et al. 2019. [Enhancing Nationally Determined Contribution \(NDC\) ambition for soil organic carbon protection and sequestration](#). CCAFS Info Note.

## Further reading

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- Ge M, Friedrich J, Vigna L. 2021. [4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors](#).
- Roe S, Streck C, Beach R, Busch J, Chapman M, Daioglou V, et al. 2021. [Land-based measures to mitigate climate change: Potential and feasibility by country](#). *Global Change Biology*, 1– 34.
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- Wiese L, Wollenberg E, Alcántara-Shivapatham V, et al. 2021. [Countries' commitments to soil organic carbon in Nationally Determined Contributions](#). *Climate Policy*, 21:8.
- Wiese-Rozanova L, Rose S, Wollenberg E. 2021. [Assessment of agricultural policies to implement soil organic carbon \(SOC\) commitments in NDCs: Examples from Brazil and Rwanda](#). CCAFS Info Note. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

*This brief summarizes findings on soil organic carbon from an analysis of the nationally determined contributions to the Paris Agreement submitted between 2020–September 2022. This brief is one of a series on this analysis. The other Info Notes focus on the NDC's inclusion of livestock, rice, and policies related to soil organic carbon commitments in NDCs for Brazil and Rwanda. This work was conducted as part of the CCAFS Low-Emissions Development Flagship.*

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