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Options for financing emission avoidance from drained peatlands in the Nile Basin: Discussion paper

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Document Sheet

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The purpose of the technical report series is to support informed stakeholder dialogue and decision making in order to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the shared Nile Basin water resources.

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Executive summary

This report presents an outlook for policy and carbon finance options to avoiding CO_2 emissions from drained peatlands in the Nile Basin.

All Nile Basin countries are parties to the United Nations Framework Convention on Climate Change (UNFCCC). To achieve the objective of the Convention, all Parties are obliged to communicate reliable, transparent and comprehensive information on GHG emissions, climate actions and support.

Under the UNFCCC all Nile Basin countries are Non-Annex I countries. Non-Annex I countries provide the requested information in National Communications (NCs) and Biennial Update Reports (BURs). Most Nile Basin countries have submitted two National Communications. Greenhouse Gas (GHG) inventory data are furthermore for all countries present in various reporting documents, but are very outdated.

The Nationally determined contributions (NDCs) under the Paris Agreement emerge from the Intended nationally determined contributions (INDCs) that all UNFCCC parties were asked to publish for the 2013 UNFCCC Conference. All Nile Basin countries have submitted their Intended National Determined contributions, but no NBI country has as yet included the (often substantial) emissions from drained peatlands in their NDC.

Internationally, emissions from drained peatlands are reported under the land-use, land-use change and forestry sector. Emission reducing activities on peatlands, such as rewetting, restoration and low carbon management, may contribute substantially to climate change mitigation. Developing a methodology for Monitoring, Reporting and Verification ('MRV') of GHG emissions and carbon stock changes of peatlands in the Nile Basin is necessary for the implementation of and reporting on international commitments. MRV options could involve developing a combination of direct and indirect measurements to allow cost-efficient GHGs monitoring.

Three major funding frameworks are relevant for project-based peatland rewetting for climate change mitigation: 1) bi- or multilateral international donor schemes, 2) commitment carbon markets under the framework of the UNFCCC mechanism and 3) private voluntary carbon credit schemes. Bi-or multilateral donor schemes are public-funded programmes financed through international donors. The legal basis is Article 6 of the

Paris Agreement describing International cooperation. Article 6.2. of the Agreement offers Parties the opportunity to cooperate with one another. Commitment carbon market include the Kyoto Protocol's flexible instruments, of which the Clean Development Mechanism (CDM) is the most important mechanism to credit emission overshoot demands from Annex I countries by project-based emission reductions in Non-Annex I countries. Leveraging private funds for climate action mostly happens through voluntary carbon market schemes. Across standards, most credit demand is corporate, led by socially and environmentally responsible corporate decision-making (Goldstein, 2016). Standards follow the concept of results-based finance, a robust framework of transparency. Host countries have to create a legal framework for voluntary carbon credits, which fulfil and guarantee the high standard of principles.

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1. Introduction

This document builds upon the Nile Basin Initiative's technical report on 'Assessment of Carbon (CO2) emmissions avoidance potential from the Nile Basin peatlands'. The report shows that peatlands in the Nile Basin cover about 30,000 km^2, more than 50 % of which are situated in the Sudd and about 40 % are in the Nile Equatorial Lakes region (cf. Technical Report). Both systems are part of the White Nile sub-system. The Blue Nile sub-system of the Nile Basin contains smaller peatland areas, most of which are located in Ethiopia, with Sudan and Egypt expected to contain very limited peatland. The Afroalpine peatlands of high altitudes are not large in size, but known for their deep peats and their crucial role for safeguarding the water supply of both Nile sub-systems.

Estimates of drained peatlands in the Nile Equatorial Lakes region indicate that the region is a hotspot for CO_2 emissions, with annual national CO_2 emissions from peatlands within the Nile Basin in a business-as-usual scenario amounting between 0.1 and 7.8 Mt CO_2 (Figure 1). Scenario studies in WP1 have indicated that land-use and land-use change in such scenario could lead to cumulative emissions of 800 Mt CO_2 or higher in the period 2015 - 2050. Avoiding these emissions combining with stopping new drainage in 2020 or rewetting all drained peatlands in 2025 would lead to an emission reduction of at least 370 and 680 Mt CO_2, respectively.

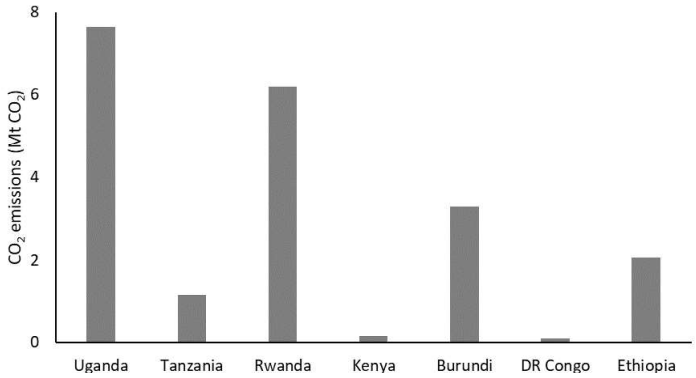


Figure 1. Average annual CO_2 emissions from drained peatlands within the various Nile Basin countries in a business-as-usual scenario for the period 2015-2050 (cf. Technical Report). Note that national emissions from drained peatlands outside the Nile Basin are not included and that information for S. Sudan, Sudan and Egypt is currently unavailable.

Emissions from peatlands are reported under the LULUCF sector (Land Use, Land Use Change and Forestry, Article 3.4 of the Kyoto Protocol). In developing countries LULUCF sector related emissions, including those from peatlands, are even more important than in developed countries both in absolute and in relative terms. For a number of years, within LULUCF almost exclusive attention has been given to REDD+ rather than to peatlands. This said, forests and peatlands often go hand in hand, and often follow a similar fate of deforestation, drainage and degradation. Important differences remain, however, in particular concerning greenhouse gas (GHG) balances and emission trends.

This paper aims at providing knowledge relevant for policy. The paper outlines the international policy commitments and activities of the Nile Basin countries with respect to peatlands, discusses emission monitoring, reporting and verification challenges, and reviews carbon financing and funding schemes and options for rewetting and avoiding CO_2 emissions from drained peatlands in the Nile Basin.

2. Peatlands and National Determined Contributions

2.1 Reporting obligations under the Climate Convention and the Paris Agreement

All Nile Basin countries are parties to the United Nations Framework Convention on Climate Change (UNFCCC). The ultimate objective of the Convention is

- to achieve stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system
- within a time-frame sufficient to allow ecosystems to adapt naturally to climate change,

- to ensure that food production is not threatened and
- to enable economic development to proceed in a sustainable manner.

To achieve the objective of the Convention, all Parties are obliged to communicate reliable, transparent and comprehensive information on GHG emissions, climate actions and support.

The reporting requirements and the timetable for the submission of national reports are different for Annex I Parties (i.e. industrialized countries and the "economies in transition" of Russia and Eastern Europe) and Parties not included in Annex I to the Convention (non-Annex I Parties). Annex I countries each year have to provide annual GHG inventories from five sectors (energy; industrial processes and product use; LULUCF; and waste) in a Common reporting format (CRF – tables) and as a National Inventory Report (NIR). Non-Annex I countries submit National Communications (NCs) and Biennial Update Reports (BURs).

[Box 1]: The Nile Basin countries are all Non-Annex I countries. Eight of the Nile Basin countries belong to the UN category Least developed countries (LDC), whereas Egypt and Kenya are Lower Middle-income countries (LM) on the current (2016) list of the OECD Development Assistance Committee (Table 1).

NCs provide information on GHG inventories, measures to mitigate and to facilitate adequate adaptation to climate change, and any other information that the Party considers relevant to the achievement of the objective of the Convention. NCs are submitted every four years. BURs provide an update of the information presented in the NCs, in particular on national GHG inventories, mitigation actions, constraints and gaps, including support needed and received. In 2012, UNFCCC COP 17 decided that the first BURs from non-Annex I Parties, consistent with their capabilities and the level of support provided for reporting, were to be submitted by December 2014. The subsequent BURs should be submitted every two years. However, flexibility was given to Least developed country Parties and Small island developing States, which may submit such reports at their discretion.

Most of the Nile Basin countries have submitted two National Communications, whereas Egypt, DR Congo and Rwanda have also submitted a third communication. A biennial update report was submitted by Uganda only. Nevertheless, GHG inventory data are present in various reporting documents for all countries, but are very outdated. The latest is from

Ethiopia (2013). The only country that submitted a GHG inventory as an official document is Egypt (2016), but the data in the document are from 2005.

All the Nile Basin countries, except South Sudan, have also ratified the Paris Agreement. The Paris Agreement (2015) is an agreement within the UNFCCC with the goal to keep the increase in global average temperature to well below 2 °C above pre-industrial levels; and to pursue efforts to limit the increase to 1.5 °C. The Nationally determined contributions (NDCs) are the heart of the Paris Agreement.

The NDCs under the Paris Agreement emerge from the Intended nationally determined contributions (INDCs) that all UNFCCC parties were asked to publish for the 2013 UNFCCC Conference. The INDC would become the first NDC when a country ratifies the Paris Agreement, unless it decides to submit a new NDC at the same time.

NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requires each Party to prepare, communicate and maintain successive NDCs. NDCs are submitted every five years and in order to enhance the ambition over time the Paris Agreement provides that successive NDCs will represent a progression compared to the previous NDC and reflect its highest possible ambition. All Parties are requested to submit the next round of NDCs (new NDCs or updated NDCs) by 2020 and every five years thereafter (e.g. by 2020, 2025, 2030). All the Nile Basin countries have submitted their Intended National Determined contributions (Table 1), but no Nile Basin country has yet included the (often substantial, cf. figure 1) emissions from drained peatlands in their NDC, except Uganda (See Box 2).

Table 1. Status of countries in relation to UNFCCC and Paris Agreement obligations. LDC= Least developed country, LM= Lower Middle-income country on the current (2016) list of the OECD Development Assistance Committee. n/a= not applicable

country	country category	Ratification of UNFCCC	National Communication (NC) 1,2,3 etc	Biennial update report (BUR 1,2,3 etc.)	GHG Inventory	INDC (submitted)	Ratification of Paris Agreement
Burundi	LDC	06/01/1997	2001 (1), 2010 (2)	0	0	17/01/2018	17/01/2018
DR Congo	LDC	09/01/1995	2000 1), 2009 (2),	0	0	13/12/2017	13/12/2017

			2015 (3)				
Egypt	LM	05/12/1994	1999 (1), 2010 (2), 2016 (3)	0	2016 (data 2005)	29/06/2017	29/06/2017
Ethiopia	LDC	05/04/1994	2001 (1), 2016 (2)	0	0	09/03/2017	09/03/2017
Kenya	LM	30/08/1994	2002 (1), 2015 (2)	0	0	23/07/2015	28/12/2016
Rwanda	LDC	18/08/1998	2005 (1), 2012 (2), 2018 (3)	0	0	01/11/2015	06/10/2016
Sudan	LDC	19/11/1993	2003 (1), 2013 (2)	0	0	28/10/2015	02/08/2017
Tanzania	LDC	17/04/1996	2003 (1), 2015 (2)	0	0	18/05/2018	18/05/2018
Uganda	LDC	08/09/1993	2002 (1), 2014 (2)	2019 (1)	0	14/10/2015	21/09/2016
S. Sudan	LDC	n/a	n/a	n/a	n/a	n/a	n/a

[Box 2]: Uganda has referred to "wetland restoration" as an activity for CO_2 emissions reduction in its second INDC in 2015. The emissions estimated for the business as usual scenario until 2030 are 77.3 Mt CO_{2eq} annually. About 22 % of these emissions are from the LULUCF sector. Wetlands restoration as a reduction activity from the business as usual scenario by 2030 amounts to about 0.8 Mt CO_{2eq} (see figure). It is unclear in the communication, whether emissions from wetlands restoration is part of the LULUCF or independent. Also, emissions from drained peatlands are not included yet.

The data in our work show that peatlands drainage, which cover less than 25 % of all the wetlands in Uganda, amount to emissions of about 8 Mt CO_2 annually from 2015 to 2035 in a business as usual scenario, which equals 10 % of the annual emissions by 2030. Emissions from drained peatlands could be significant for Uganda's future transparent reporting and emissions reduction activities, especially if wetlands restoration activities are to be included in their INDC. The same situation is likely for other Nile Basin countries with significant drained peatland areas (cf. Technical report).

It should be kept in mind that in order to achieve the zero-emission goal by 2050, emissions from drained peatlands should be avoided. These avoided and reduced emissions can be achieved easily and in a cost-effective way, while developing frames for sustainable use (e.g. paludiculture).

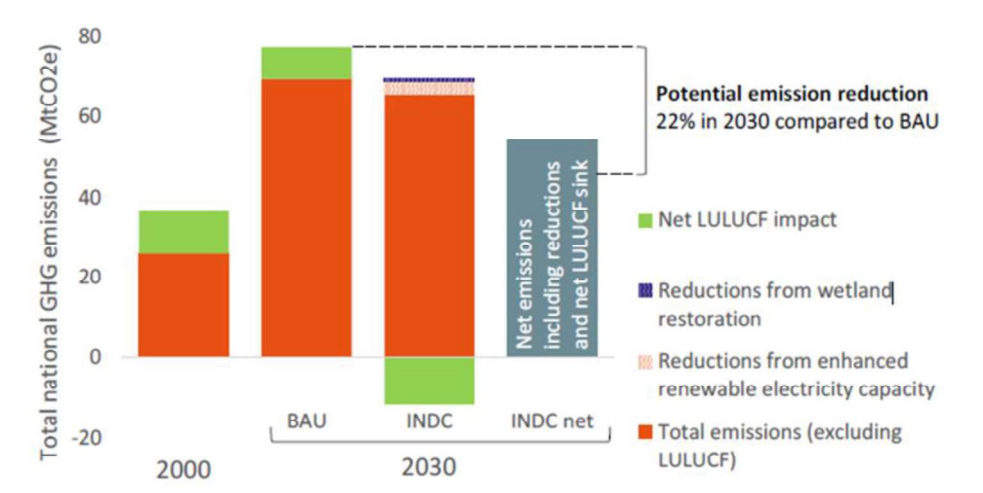


Figure. Illustration of emissions and reduction activities from Uganda INDC 2015 (source: Uganda INDC 2015).

2.2. Monitoring, reporting and verification of GHG-emissions: technical considerations

Developing a methodology for Monitoring, Reporting and Verification ('MRV') of GHG emissions and carbon stock changes of peatlands in the Nile Basin is necessary for the implementation of and reporting on international commitments, e.g. the Paris Agreement

and its NDCs. Moreover, such methodological scheme is needed to substantiate and evaluate carbon credit projects, e.g. for the voluntary carbon market.

Whereas the term 'peatlands' is widely known, the IPCC guidance uses the term 'organic soils' (cf. IPCC 2014), because no IPCC definitions for peat or peatland exist. Peatland and organic soils overlap widely, but organic soils also include some lower carbon containing soils that under most (national) approaches would not serve as peatland.

Reporting emissions and removals from peatlands under LULUCF requires

a) information on peatland/organic soil occurrences
b) "activity data", i.e. areal data with respect to land-use categories on these organic soils
c) "emissions factors", i.e. area-related values of annual emissions and removals for the respective land-use categories.

The required national peatland/organic soil base maps are for most of the Nile Basin countries available from the Greifswald Mire Centre (cf. Technical report: WP 1), but additional ground surveys are recommended to further substantiate these mainly remotely elaborated maps.

The steps below are based on international recommendations (e.g. IPCC wetlands supplement 2013). They are touching upon the general ideas around the MRV guidelines, due to the lack of on-ground capacity and knowledge. This is meant to be a framework to setup MRV, based on each country status, and should be further elaborated in future work.

The first step to assess anthropogenic emissions from peatlands is to determine whether the peatland is drained (*step 1* in Figure 2), as drained peatlands have substantially more (and different) emissions compared to undrained. The peatland water level may have been lowered directly by larger channels or smaller ditches, or indirectly by groundwater abstraction or upstream damming. If the peatland is drained, the overall default IPCC emission factor of 14 t C ha^{-1} yr^{-1} for managed tropical peatlands can be applied to roughly estimate the annual emissions (*step 2* in Figure *2*).

Land-use maps that comply with the IPCC land-use categories and that have sufficient resolution to assess land-use on peatlands are currently largely unavailable. Some good data, however, do exist, e.g. the land-use map for the Kagera region (FAO 2017). Once a land-use map is available, the appropriate Tier 1 emission factor (IPCC 2014) for each respective land-use category should be applied (Tier 1; *step 3* in figure 2).

The thus calculated peatland emissions may constitute for most NBI countries a considerable proportion of their total national emissions (cf. Technical report WP 1). Countries where peatland-use is "key category" cannot limit their reporting to using the Tier 1 default emission factors, but should develop own country specific Tier 2 emission factors (Tier 2; *step 4 in* Figure *2; See Box 3)*.

Developing own national emission factors requires measuring GHG emissions from different land-use categories over longer time to account for (largely weather induced) annual variability. For measuring two different approaches are available: 1) direct GHG measurements, and 2) indirect estimating CO_2 emissions by using 'proxy' data, e.g. peat subsidence in drained areas (IPCC, 2014).

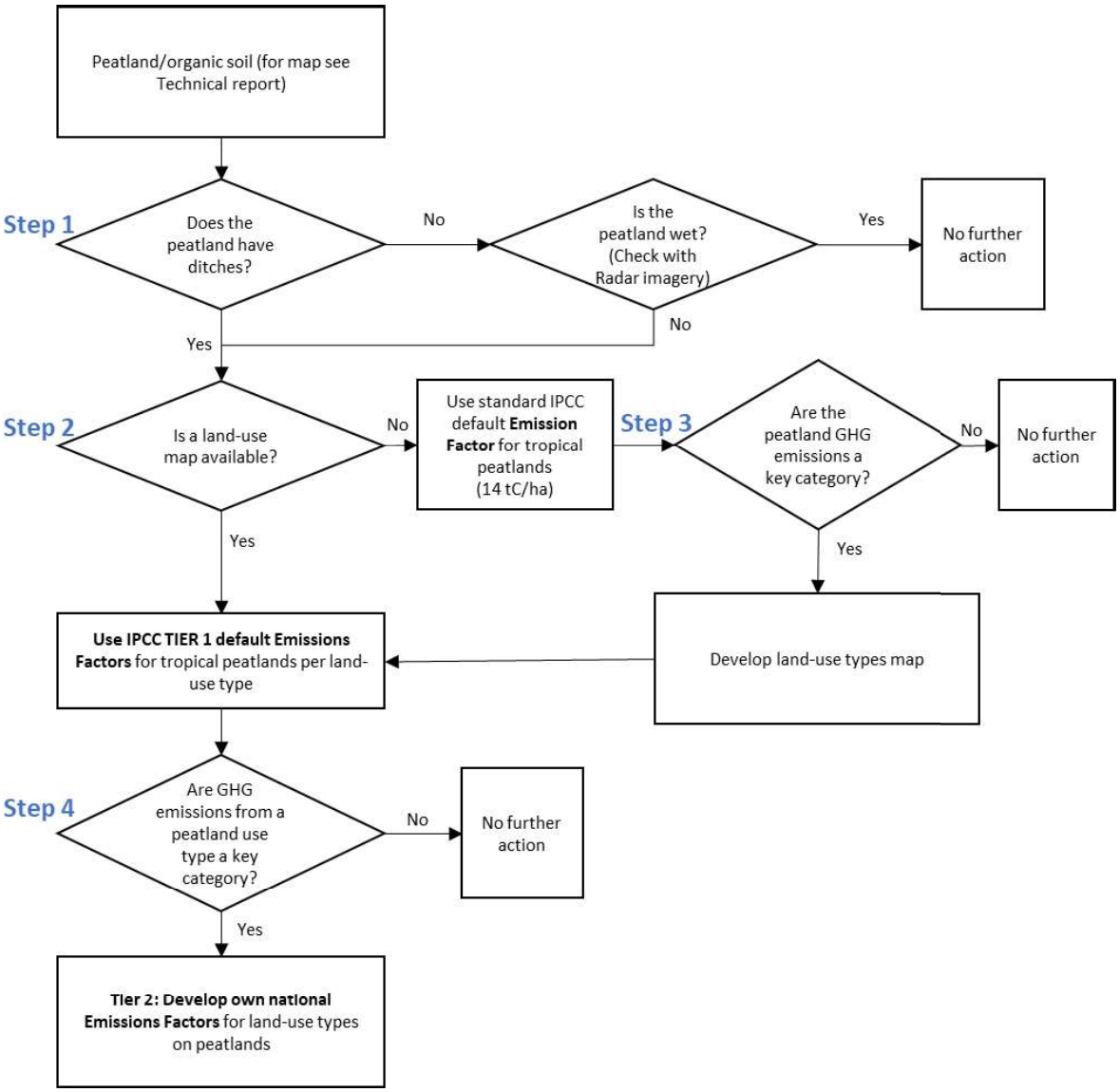


Figure 2. Monitoring, reporting and verification decision-making tree for emissions from peatlands.

[Box 3]: **Key category** analysis is a method for deciding which emissions or removals categories should be prioritized in greenhouse gas inventory. A category is key if, when categories are ordered by magnitude, it is one of the categories contributing to 95% of total national emissions or removals, or to 95% of the trend in national emissions or removals. Key category analysis including its application to the LULUCF sector, is described in section 5.4 of the GPG 2003, corresponding to Volume 1, Chapter 4 of the 2006 Guidelines.

GHG can directly be measured using Eddy co-variance or open/closed chambers methods (Lawson et al., 2015). Because of financial constraints, chamber methods are much more used than Eddy co-variance towers. Chambers methods directly measure CO_2 fluxes and

allow – after adequate interpolation of sufficient measurements over time - the elaboration of emission factors (in CO_2 ha^{-1} yr^{-1}) for specific land-use categories and drainage conditions. Chambers can also measure CH_4 and N_2O fluxes. Measurement by chambers is limited to low vegetation and the emission factors of shrub and tree vegetation cannot be determined using chambers.

The indirect subsidence approach estimates CO_2 emissions based on the decrease of peat thickness over time. Under stable land-use, carbon losses can be calculated by multiplying the loss in peat thickness (measured using subsidence poles) with the volumetric carbon content of the peat below the water level or in undrained sections of the peatland. The subsidence method can only be applied on drained peatlands, but in contrast to direct gas measurements also covers carbon losses with dissolved or particulate organic carbon (DOC and POC), which may lead to offsite CO_2 emissions (Couwenberg & Hooijer, 2013)

The choice of methods will to be informed by available financial capacities, time, knowledge, spatial and temporal variations in relief and/or vegetation, and accessibility. A combination of closed chambers methods (more expensive and complicated) and subsidence-based methods (cheaper and simpler) would allow more flexibility and cross-checking the outcomes of both approaches.

The decision-making tree is still preliminary and should be further developed to include national peculiarities and other important emission-related activities, e.g. fire-related GHG-emissions from drained peatland. Remote-sensing approaches can be used to estimate the annually burnt peatland (organic soil) area. Emission factors for fire can be used from the IPCC guidelines (IPCC, 2014). If fire-related emissions are a key category, it is good practice to develop own national factors in a similar manner as for land-use related emissions.

3. Outlook for finances of rewetting

3.1. General considerations

There are three major funding frameworks for project-based peatland rewetting for climate change mitigation:

1. Bi- or multilateral international donor schemes
2. Commitment carbon market under the framework of the UNFCCC mechanism
3. Private voluntary carbon credit schemes

New, innovative frameworks are currently under development but have not reached the magnitude of the three main frameworks yet. They will be described in more detail below.

For developing and least developed countries such as the countries in the NBI region, pure carbon finance should not be applied to avoid negative side effects and eventually risking the sustainability and long-term consistency of any such project. Additional benefits should be incorporated, especially social, economic and environmental beside climate change considerations. They should be taken into account at the first stages of project development and site selection. For site selection, peatland distribution and status have to be well known. Peatlands can be classified into three major categories with different objectives and suitability for climate action projects:

1. *Pristine, undrained peatlands*: Focus on conservation to keep carbon in the ground, conserve habitat of biodiversity and secure other ecosystem services with the involvement of local people
2. *Drained, used peatlands, not urgently needed for drainage-based subsistence food production*: Focus on rewetting, involvement and possibly alternative wet agricultural use (paludiculture) by local people
3. *Drained peatlands required for subsistence food production or for other reasons not easily rewet(able)*: Focus on climate-smart water management to slow down peat loss.

For climate action projects, site selection should prioritise on category 2, as the mitigation potential is the highest and local people can be involved in the project for mutual benefit. For detailed site selection an on-ground assessment of the following items should be performed:

- Supportive social structure: Rewetting projects only work with support or at least acceptance of local communities and their respective decision-making bodies (municipalities, village heads, self-governing structures etc.). Awareness can be raised by capacity building campaigns.
- Clear land rights and ownership: Lands within the project area must be clearly assigned to land owners and users. Traditional, unwritten customs of land-use without official titles have to be taken into account to avoid land grabbing in the name of climate action.

- Current land-use and connected income from site: In case of rewetting, opportunity costs for the ceasing of current, drainage- based land-use have to be calculated and compensated by the project to avoid impairing current land-users and their economic situation.
- Potential alternative wet land-use: To provide continuous income to sustain the livelihoods of current land-users, alternative (wet) land-use options have to be explored and support schemes (such as extension services, consultation, technology transfer, market accessibility etc.) integrated in the project design.

After site selection, a more comprehensive cost-benefit analysis (CBA) on the impact of the project on socio-economic factors, especially sustainable livelihood for local communities, is strongly advisable. This analysis should also include environmental co-benefits (ecosystem services) like water purification, local cooling effect, biodiversity etc., which is also relevant for reporting the adaptation part of the NDC. To incentivise change in local communities, a project should only be realised if the benefits in the project scenario exceed those in the business-as-usual scenario. Criteria to be incorporated in a CBA are listed in table 2.

Table 2: Selected benefits and costs of peatland rewetting projects.

Benefits	Costs
GHG reduction (avoided t CO_2/ year)	Investment Costs
New products (e.g. from paludiculture)	Opportunity costs
Traditional practices are further developed	Transaction costs
Other Ecosystem services	Negative side effects like water-borne diseases

3.2. Bi- or multilateral international donor schemes

Bi-or multilateral donor schemes are public funded programmes financed through international donors. The legal basis under Paris Agreement is its Article 6 describing International cooperation. Article 6.2. of the Agreement offers Parties the opportunity to cooperate with one another. The main objective of the cooperation mechanisms is to support parties in their NDC implementation. According to the Paris Agreement, the mechanisms should be designed in a way that they not only assist the process of achieving existing reduction targets, but also raise ambition in future efforts. How the mechanism will

work exactly is under negotiation and remains vague so far. With respect to climate change adaptation and the issue of Loss and Damage it is advised to emphasize in the NDCs LULUCF-related interventions, including for national planning purposes, that on the one hand mitigate the risk of global warming and on the other hand build up resilience in the countries and of local communities.

Section 2 of this report already indicated that no NBI country treats peatland GHG sources and sinks appropriately in their current LULUCF budgets nor includes peatland, wetland or soil carbon targets in their NDCs (if they recognise LULUCF at all…), except Uganda on a superficial level. To receive international support via Paris Agreement's Article 6 mechanisms, peatlands and their GHG balances should be incorporated in the relevant NDCs in the next updating cycle. Possible fear that inclusion might negatively affect the options for market-based climate change mitigation (New Market Mechanism, NMM) and voluntary carbon market schemes (see paragraph 4.3) should consider that including these emissions also includes a revision of the baseline, leading to more and more realistic mitigation options. Furthermore, it is foreseen that public international financial support will be much larger than private funded initiatives.

Besides in NDCs, the inclusion of wetlands and peatlands as key ecosystems for climate change adaptation in National Adaptation Programmes of Action (NAPAs) is essential for climate finance. NAPAs enable LDCs to identify priority activities that respond to their urgent and immediate needs with regard to climate change adaptation. Peatlands are important for adaptation by providing water during droughts, by mitigating floods and retaining peak water, by improving landscape hydrology by rising groundwater tables in connected watersheds and therewith combating desertification, and by providing evapotranspiration cooling. The following NBI countries mention peatlands or wetlands in their NAPAs: Burundi, DR Congo, Ethiopia, South Sudan, Tanzania and Uganda.

Peatland actions should be prioritised for funding and implementation as they provide - in most cases - a double win for climate change mitigation and adaptation. Relevant frames under which activities on wetlands/peatlands management could be funded and in which NBI countries are involved include:

1. The Green Climate Fund (GCF): Set up in 2010, GCF aims to promote low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their GHG emissions and to adapt to the impacts of

climate change. GCF is an operating entity of the Financial Mechanism of the UNFCCC and the Paris Agreement. www.greenclimate.fund. A good example of a GCF funded peatland-related plan is the project "Building the Resilience of Wetlands in the Province of Datem del Marañón, Peru", implemented by the Peruvian Trust Fund for National Parks and Protected Areas (Profonanpe) https://www.greenclimate.fund/projects/fp001

2. The Project Preparation Facility (PPF): Within the GCF, funding is available for project preparation activities and climate finance "readiness". For project preparation support, the Project Preparation Facility (PPF) supports Accredited Entities (AEs) in project and programme preparation. AEs are listed here: https://www.greenclimate.fund/how-we-work/tools/entity-directory
3. The NDC Supporting Facility: This facility is a multi-donor trust fund created and designed to facilitate the implementation of the Nationally Determined Contributions in the frame of the NDC partnership. It is operated by the World Bank (https://ndcpartnership.org/) and more information is available under https://www.worldbank.org/en/programs/ndc-support-facility
4. The NDC Partnership (https://ndcpartnership.org/) also offers a Climate Finance Explorer, which can help to identify suitable additional funding schemes: https://ndcpartnership.org/climate-finance-explorer#navi
5. The International Climate Initiative (IKI): IKI, launched in 2008 by the German Ministry for Environment (BMU), supports measures in developing and emerging countries. In addition to climate protection, it also covers measures to adapt to climate change and measures to protect biodiversity of relevance to climate change. Peatlands are well represented in the portfolio and one of the targeted nature-based solutions. IKI has country and regional specific calls, but also thematic calls. www.international-climate-initiative.com
6. The Global Environmental Facility (GEF): GEF is supporting environmental projects including climate action and biodiversity conservation with various targeted programmes (www.thegef.org). Soon GEF will operationalise the new Least Developed Countries Fund (LDCF) designed to address the special needs of the Least Developed Countries under the UNFCCC, focusing on adaptation measures. https://www.thegef.org/topics/least-developed-countries-fund-ldcf

7. The 2050 Pathways Platform with the objective to build climate resilience for communities, farmers and workers along value chains, funded by the Europe Climate Foundation, the Ikea Foundation, and the Hewlett Foundation. http://www.2050pathways.org
8. The Blue Growth Initiative, aimed to reduce CO_2 emissions by 10% in 5 years and 25% in 10 years and reduce overfishing by 20% in 5 years and 50% in 10 years in 10 developing countries (FAO)
9. The Bonn Challenge, a global effort to restore 150 million hectares of the world's deforested and degraded lands by 2020 and 350 million hectares by 2030. http://www.bonnchallenge.org/
10. The Climate Ambition Alliance (CAA). The CAA was announced at the UN Secretary-General's Climate Summit in September 2019 and brings together nations upscaling action by 2020, as well as those working towards achieving net zero CO_2 emissions by 2050. The CAA currently includes 65 countries and the EU, 10 regions, 102 cities, 93 businesses and 12 investors. https://unfccc.int/news/call-by-high-level-climate-champion-to-join-the-climate-ambition-alliance-at-cop25
11. The Great Green Wall for Sahara and the Sahel Initiative (GGWSSI) with the goal to restore 50 million hectares of land, sequester 250 million tons of carbon and support 300 million people across the Sahel by 2030. https://www.greatgreenwall.org/

The progress of the Nile Basin Countries in "Climate Action" is uneven (see Table 3). Most countries are part of the Adaptation for Smallholder Agriculture Programme (ASAP). Many countries act within the Bonn Challenge and all relevant countries are part of the GGWSSI, which has good perspectives for wetlands restoration, as declared by the project leaders at the 8th World Conference on Ecological Restoration in Cape Town, South Africa, September 2019. Ethiopia is taking part in four actions. The other countries are contributing two to three actions or not reporting. Tanzania is not involved in any action.

Table 3: Involvement of the Nile Basin Countries in various "Climate Action". (-: no activity, +: active)

country	2050 Pathway	Bonn Challenge	Great Green Wall for	Adaptation for Smallholder	Blue Growth Initiative	Climate Ambition Alliance

			Sahara and the Sahel Initiative	Agriculture Programme		
Burundi	-	+	-	+	-	-
DR Congo	-	+	-	-	-	-
Egypt	-	-	+	+	-	-
Ethiopia	+	+	+	+	-	-
Kenya	-	+	-	+	+	-
Rwanda	-	+	-	+	-	-
Sudan	-	-	+	+	-	-
Tanzania	-	-	-	-	-	-
Uganda	-	+	-	+	-	-
S. Sudan	-	-	-	-	-	+

An option for the NBI to tap into these large international funding schemes would be to set up a climate financing facility to attract and facilitate funds. This facility could consider becoming a regional executing agency to the GEF to be able to receive funds and facilitate peatland related climate projects.

Experiences from peatland projects from other parts of the world show, that on the one hand larger scale projects with a volume of several million US-dollars are preferred by funding agencies to limit administrative burdens, but that on the other peatland projects are more successful if they are grounded and implemented in local set-ups like communities or municipalities. The latter facilitates careful site selection, integration of needs of local people and therewith their awareness and ownership. To channel large scale funding down to the local level, NBI (with help of a finance facility) could set-up a small grant programme for community peatlands projects, to which communities can apply in a competition following clear guidelines. Winning projects can be supported with technical and administrative capacity building, technology transfer, MRV training etc.

3.3. Financing options under the UNFCCC

Under the Kyoto Protocol's flexible instruments, the Clean Development Mechanism (CDM) is the most important mechanism to credit emission overshoot demands from Annex I countries by project-based emission reductions in Non-Annex I countries. The CDM has been successful in leveraging project-based climate finance interventions but has important limitations in the LULUCF sector, especially with respect to the non-eligibility of peatland rewetting as a project activity. The Marrakesh Accords permit within the LULUCF sector only

afforestation and reforestation (A/R) for CDM actions, because of assumed permanence and MRV-ability constraints of other land-use related action. Indeed, land-use based carbon sequestration can easily be reversed by land-use change, fires, and other disturbances. Non-permanence, however, does not apply to emission avoidance as CDM acknowledges for avoidance projects in the energy and industry sectors. Land-use based avoidance activities, such as REDD+ and peatland rewetting, are, however, still wrongly treated like land-use based sequestration projects, not like industry-based avoidance projects (Joosten et al. 2016).

This mechanism might be phasing out in the near future, but it provides a good overview of mechanisms, and cumulative experiences, allowing international collaboration to reduce carbon emissions from peatlands. The new rules for market-based mechanisms, as mentioned in Article 6.4. of the Paris Agreement, are still under negotiation and no clear trend is visible. It is likely that some elements of the previous CDM will be adopted and modified with new elements. One way could be broadening CDM by including forest and peatland-related measures. This option finds support from a range of developing countries, and proposals have been presented to address the problem of permanence through buffer and/or insurance schemes. All future mechanism should incorporate a high level of environmental and social integrity, to be achieved by broad transparency and should guarantee that climate-related funds are spent for actions contributing to climate action.

A specific UNFCCC mechanism for the LULUCF sector with a clear focus on forest and forest management is “Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries” (REDD+). So far most REDD+ strategies focus on forest biomass and largely neglect soil carbon stocks although UNFCCC has decided that significant pools should not be omitted from forest reference emission levels or forest reference levels, and in many tropical countries emissions from drained peatland indeed cause the majority of emissions in the land-use category ‘forest land’. Therefore, REDD+ programmes should always include soil carbon stocks. In negotiations, it is discussed to expand the REDD+ mechanism with a dedicated peatlands window. This window would treat peat forest conservation and restoration as REDD+ eligible activities, include continued land-use in the calculation of reference levels, build a robust peat spatial mapping and peat drainage and restoration MRV framework, and exclude all activities from the REDD+ scope

that cause the drainage or degradation of peat soils. Countries of the Nile Basin Initiative should be aware of their peatland forest carbon stocks and value them in respective programmes.

3.4. Voluntary carbon markets

Leveraging private funds for climate action mostly happens through voluntary carbon market schemes. Across standards, most credit demand is corporate, led by socially and environmentally responsible corporate decision-making (Goldstein, 2016). Standards follow the concept of results-based finance, a robust framework of transparency – specifically the procedural guarantee of a transparent and independent review – as well as the principles of additionally, permanence and avoidance of leakage. Host countries have to create a legal framework for voluntary carbon credits, which fulfil and guarantee the high standard of principles (cf. Joosten et al., 2016; Umweltbundesamt, 2018).

The Paris Agreement intends to lead to a regulated world in which each country accounts for all its GHG emissions across sectors under the umbrella of the NDCs and sets own reduction targets (“caps”). This means that any voluntary initiative will ultimately show at the national accounting level: An emission reduction achieved through voluntary action would allow the relevant country to either claim the relevant emission reduction as a compliance effort under the national target or to monetize it (e.g. in line with the emissions trading mechanisms of the Paris Agreement, in particular Article 6.2). Here lies the inherent risk of double counting of emission reduction allowances with voluntary carbon schemes, when the allowance is first sold to a private entity to compensate for emissions and secondly used for the national reporting of the host country. As long as the host country does not account for LULUCF and the included peatland emissions - as will be the case for the foreseeable future in the NBI countries -, there will not be a problem. Voluntary carbon schemes can thus in the NBI countries top-up national ambitions (Umweltbundesamt 2018).

But ultimately, to avoid double counting, voluntary crediting will only be effective under the condition that the host country makes a “corresponding adjustment” (cf. Article 6 of the Paris Agreement), so that the voluntary mitigation benefit adds to the country’s overall target. Every five years, the revision of the country’s NDC targets should thus account for such voluntary achievements.

Another topical concept for climate finance intervention in general, and carbon project development in particular, is the principle of additionally. Additionality in the context of

project development means that the emission reduction/carbon sequestration would not have occurred in the absence of carbon market incentives, i.e. that it was not the most likely or profitable option and that there were barriers for its implementation. In most cases, this criterion will be uncomplicated, as project-based peatland rewetting interventions in the NBI context would only happen with private funding from the voluntary carbon scheme.

Permanence could be a higher practical risk in NBI countries. Peatland rewetting can easily be reversed as experiences from projects in Indonesia show. Lack of involvement of local communities, lacking alternative income sources to compensate for lost income from drained peatlands, missing awareness and capacity and, last but not least, poor maintenance of installations after project's implementation and finalization can lead to re-drainage and the stopping of emission reduction effects. Whereas reversal in avoidance projects does not jeopardize the already achieved emission reductions (see above), the prevailing opinion will require state-guarantees and substantial buffers (of unsold emission allowances) to cover possible "reversals".

The combination of voluntary carbon projects with the development of further alternative wet utilisation options, e.g. papyrus paludiculture for biomass for construction material, can minimise the presumed risk of non-permanence as local communities will be provided a long-term, sustainable source of income and will therefore be incentivised to accept and maintain the rewetting structures for water management in their own interest. Such approach has not been implemented yet but it is worthwhile pursuing such system in the Nile Basin context. More research and development (R&D) will be needed to examine various paludiculture utilisation schemes, including the processing and marketing of biomass and products.

Such approach would also reduce another high risk in the context of the Nile Basin countries: leakage. Leakage is the increase of GHG emissions or decrease of removals outside the project area because of the carbon project's interventions. In areas with high land-use pressure on peatlands like in the NBI countries, rewetting and abandonment of previously drainage-based used lands in the frame of a carbon project could easily result in drainage of new lands and therefore clear leakage. The concrete determination of this and other forms of leakage is, however, arduous and various standards have established rather different and complex leakage accounting modules. An appropriate leakage mitigation

approach could be the development of paludiculture systems to provide local communities with alternative livelihood options on rewetted peatlands.

3.5. Innovative Finance Instruments

New, innovative finance instruments have been developed in the last years to leverage sufficient funds for large-scale peatland rewetting. Frontrunner is Indonesia due to the high urgency to counteract peat fires and land degradation.

The Peatland Partnership Fund (Dana Mitra Gambut Indonesia) is a small grant fund for community-based peatland conservation, restoration and sustainable development in Indonesia, which was endorsed by the Indonesian Peatland Restoration Agency (BRG) under the facilitation of Wetlands International. It operates through calls for proposals with clear objectives, procedures and progress monitoring. Each grant will be maximum of Rp. 300 million (~$20.000) for a maximum duration of 24 months project implementation (Wetlands International 2017).

The Indonesian Government set up Indonesia's Green Bond & Sukuk Initiative in 2018 to attract funding from private investors and to align with Indonesia’s aim to achieve SDGs goals. The scheme was developed with support of the UN Development Programme in 2014. It involves a detailed assessment of the climate benefits of projects undertaken by the six-line ministries related to the climate change mitigation action plan (RAN GRK) including Ministry of Agriculture, Ministry of Environment and Forestry, Ministry of Industry, Ministry of Transportation, Ministry of Energy and Mineral Resources, and Ministry of Public Work and Housing. The bonds are sold on the official bond market with a total value of $1.25 billion and a profit rate of 3.75 % with five-year state insurance. The investors distributed around the globe (32% Islamic market, 25% Asia, 15% EU, 18% USA and 10% Indonesia). The raised funds are spent for ‘eligible green projects’ based on the Green Bond and Green Sukuk Framework which includes peatland restoration.

References

Couwenberg, J., & Hooijer, A. (2013). Towards robust subsidence-based soil carbon emission factors for peat soils in south-east Asia, with special reference to oil palm plantations. Mires & Peat, Volume 12, Art. 1, 1–13.

Goldstein, A. (2016). Buying in: Taking stock of the role of offsets in corporate carbon strategies. https://www.forest-trends.org/wp-content/uploads/imported/buyers-report-2016-final-pdf.pdf (last accessed on 25 November 2019).

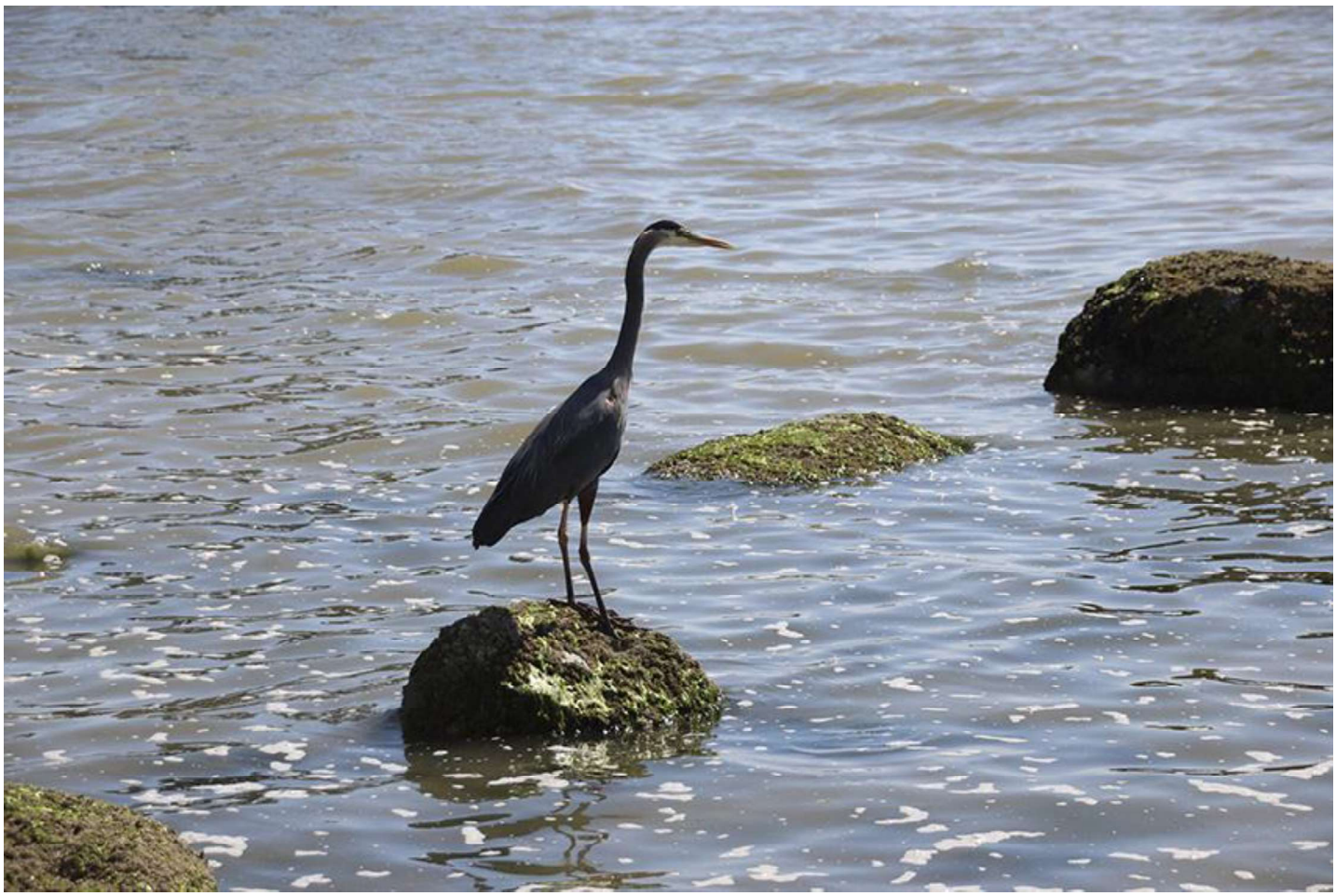
Intergovernmental Panel on Climate Change (IPCC) (2014). 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands. Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Jamsranjav, B., Fukuda, M. & T. Troxler (eds.), Switzerland: IPCC. Available at: http://www.ipcc-nggip.iges.or.jp/public/ (last accessed on 25 November 2019).

Joosten, H., Couwenberg, J., von Unger, M., Emmer, I. (2016). Peatlands, forests and the climate architecture: Setting incentives through markets and enhanced accounting. CLIMATE CHANGE 14/2016. Umweltbundesamt, Dessau. Online available: http://www.umweltbundesamt.de/publikationen/peatlands-forests-the-climate-architecture-setting (last accessed on 25 November 2019).

Lawson, I.T., Kelly, T J., Aplin, P., Boom, A., Dargie, G., Draper, F.C.H., Hassan, P.N.Z.B.P., Hoyos-Santillan, J., Kaduk, J., Large, D., Murphy, W., Page, S.E., Roucoux, K.H., Sjögersten, S., Tansey, K., Waldram, M., Wedeux, B.M.M., & Wheeler, J. (2015). Improving estimates of tropical peatland area, carbon storage, and greenhouse gas fluxes. Wetlands Ecology and Management, 23, 327–346.

Umweltbundesamt (2018). Future of the voluntary carbon markets in the light of the Paris Agreement - Perspectives for soil carbon projects. Umweltbundesamt, Dessau. Online available: https://www.dehst.de/SharedDocs/downloads/EN/project-mechanisms/moorstandards_studie.pdf;jsessionid=E3EA8B3B74FC6686292C76B53CA1BCB4.1_cid321?__blob=publicationFile&v=2 (last accessed on 25 November 2019).

United Nations Framework Convention on Climate Change (UNFCCC) (2015). The Paris Agreement. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement



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