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Overview of international soil law

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ABSTRACT

Soil protection is key for human security and survival. Not only because it is the basis of our agricultural food system but also because it is the world's second-largest carbon sink after the oceans. With the growing climate crisis, the significance of soil protection cannot be overvalued. Unfortunately, however, the legal protection of soil has mostly been left to national legislators as it is commonly linked to national territory on land. Under international law, soil protection has long been neglected in international agreements. There have been more recent developments in international law that aim to strengthen international soil law, especially but not exclusively in the context of desertification, land degradation and decarbonisation ambition.

1. Introduction

Soil on land is more than a source of food security, income and shelter. It is also subject to distributive inequalities, often related to cultural identity. It is thus often a source of political and economic competition, tribal and social tension as well as historical, feudal, imperial, missionary or colonial injustices (FAO / Food and Agriculture Organization of the United Nations, 2020).

Indeed, the most significant natural capital asset is productive land and fertile soils. For those communities that rely heavily on land as their main source of subsistence, especially the rural poor, human well-being and sustainable livelihoods are completely dependant upon and intricately linked to the health and productivity of the soil (Larbodière et al., 2020).

In this regard it is important to note that 'soil' is not synonymous with 'land'. Soils are essential ecosystems that deliver valuable services such as the provision of food and carbon sequestration, amongst others. Therefore, soil is of transnational interest as it is crucial for fighting climate change, land degradation and desertification, for protecting human health, safeguarding biodiversity and ecosystems and ensuring food security (European Commission, 2020). In light of this, this chapter provides an overview on soil protection from an international law perspective.

2. An overarching and transnational soil framework?

Even though several international conventions recognise the importance of soil conservation, no overarching and transnational framework exists. One of the reasons advanced by opponents of an overarching, global and binding framework is that soil is non-moving and has *locally unique* problems, which should be dealt with locally (Montanarella, 2015).

The European Soil Charter of 1972 is held to have been the first international document relating to soil (Alori and Nwapi, 2015). The World Soil Charter and the World Soils Policy were negotiated by the United Nations Environment Programme (UNEP) in coordination with the Food and Agriculture Organization (FAO) and were adopted in 1981. Both instruments contain non-binding guidelines and principles relating to soil conservation (Alori and Nwapi, 2015), and were intended to aid states in formulating domestic policies. However, in light of modern environmental practices, these instruments are considered to be outdated (Alori and Nwapi, 2015).

Yet, 2015 was the International Year of Soils, which has resulted in a wealth of awareness activities across the globe, in addition to putting soils back on the international policy agenda (FAO /Food and Agriculture Organization of the United Nations, 2015a). This has also led to a new international dialogue concerning the protection and rehabilitation of soils and sustainable farming practices in general (FAO /Food and Agriculture Organization of the United Nations, 2015a). The Global Soil

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Partnership (GSP) is a body established prior to the International Year of Soils and aided in the implementation and coordination of the roll-out of the year-long activities (FAO /Food and Agriculture Organization of the United Nations, 2015a). The GSP further encourages research, plans conferences and establishes local and regional partnerships (Montanarella, 2015). However, criticism has been voiced relating to the felt absence of tangible results and calls for specific actions are mounting (Montanarella, 2015).

New scientific knowledge has been gained over the past three decades, "especially with respect to new issues that emerged or were exacerbated during the last decades, like soil pollution and its consequences for the environment, climate change adaptation and mitigation and urban sprawl impacts on soil availability and functions" (FAO /Food and Agriculture Organization of the United Nations, 2015b). In this respect, the World Soil Charter has been revised and was unanimously endorsed in June 2015, during the course of the International Year of Soils, by the member states of the FAO during the 39th Session of the FAO Conference.[1]

The revised guidelines intend to ensure that "soils are managed sustainably and that degraded soils are rehabilitated or restored" (FAO /Food and Agriculture Organization of the United Nations, 2015b).[2] The actions are targeted at individuals and the organised private sector, governments and international organisations, which triggered an international dialogue concerning the protection and rehabilitation of soils and sustainable farming practices (FAO /Food and Agriculture Organization of the United Nations, 2015a). While tools such as FAOLEX and ECOLEX already compile national legislation and policies, and include some legislation on soil protection and soil degradation prevention, the newly established working group on soil legislation will in the time to come contribute to reviewing and updating the SoiLEX database containing all soil-related legal instruments adopted in each country.

While the World Charter on Nature (UN /United Nations, 1982), and Agenda 21 (UN /United Nations, 1992), have been criticised to be inappropriate to aid in soil conservation, as their wording is too broad to establish clear norms (Alori and Nwapi, 2015), other international law instruments have proved to be more relevant.

3. International law combatting desertification

The United Nations Convention to Combat Desertification (UNCCD) has declared itself as lead organisation to implement the land degradation neutrality (LDN) objective. Certain overlaps with the Convention on Biological Diversity (CBD) in terms of legal scope and mandate regarding soil biodiversity may occur, while the United Nations Framework Convention on Climate Change (UNFCCC) – addressed in more detail in Section 5 below - also creates obligations that reduce climate change thus reducing the threat of soil degradation. The Ramsar Convention on Wetlands requires contracting parties to formulate and implement plans that ensure conservation and wise use of wetlands within their boundaries. The Ramsar Convention provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Convention also recognizes the importance of peatlands for climate change mitigation and has called upon countries "to minimize the degradation, as well as promote restoration, and improve management practices of those peatlands and other wetland types that are significant carbon stores, or have the ability to sequester carbon". Peatlands are wetlands with a thick layer of organic soil. They are the most widespread of terrestrial wetland ecosystems with decayed plant material that accumulates under waterlogged conditions over long time periods. Peatlands provide important ecological, economic, social, and cultural benefits. While peatlands cover only three percent of the global land area, but they store 30 percent of the world's soil carbon. Thus they are particularly vital in combatting and mitigating the effects of climate change, storing twice as much carbon as all of the world's forests. Whereas many nature-based solutions focus on high-carbon ecosystems, such as primary forests, agroforests, wetlands, mangroves and other coastal habitats, considerably less attention has been devoted to peatlands. This is a serious omission. Positive developments have been the 2012 organic soils and peatlands climate change by the FAO and the 2016 Global Peatlands Initiative (GPI), which was established at the UNFCCC (see with further references, UNEP / United Nations Environment Programme, 2021).

The UNCCD is the main international legal document to combat desertification and mitigate the effects of drought in affected countries through effective action at all levels supported by international cooperation. This instrument is the only international treaty specifically addressing land-related issues, while the definition of desertification therein clearly relates to soil conservation.[3]

> The UNCCD laid the groundwork for developing and establishing the concept of LDN. After adoption of the SDGs, the CCD claimed leadership for implementation of target 15.3 on LDN. It decided to integrate LDN in its work and has engaged in various activities. Besides a target setting programme this includes elaborating guidance material. In particular, the CCD published a Scientific Conceptual Framework that is intended to apply to all land and guide all parties in implementing LDN. Although the legal and political constraints make the UNCCD's potential difficult to assess, it could continue to pursue a leading role in implementing the LDN target and serve as forum for discussing soil-related issues between developing and developed countries (Bodle et al., 2020).

So far, however, the tangible effect of the UNCCD remains limited, as the focus is primarily placed on capacity-building, as opposed to creating binding obligations per se (Alori and Nwapi, 2015). Moreover it has been stated in recent studies that there is an overlap and potential competition and conflict between the UNCCD and the FAO, which also claims leadership regarding international soil. Both regimes are major international actors with high participation and political legitimacy in this field. Moreover, there seems to be an overlap with the CBD in terms of legal scope and mandate regarding soil biodiversity. Here the CBD is probably the more relevant international instrument, as the diversity within species and ecosystems is closely linked and reliant upon the conservation of soils and ecosystems. It aims at conserving biological diversity, promoting the sustainable use of its components, and encouraging equitable sharing of the benefits arising out of the utilisation of genetic resources (Bodle et al., 2020).

4. Soil, the SDGs and the right to food

The Sustainable Development Goals (SDGs) were formulated as a successor to the Millennium Development Goals at the UN Conference on Sustainable Development. The SDGs were adopted in 2015 and Goal 15.3 therein pertains to achieving the "[p]rotection and promotion of sustainable use of terrestrial ecosystems, halt desertification, land degradation and biodiversity loss" and further aims to "achieve a LDN world". Although not legally binding, the SDGs, and in particular the LDN target in SDG 15.3, have at least established a political consensus for continued dialogue that guides national policies and governmental action for national land and soil policies (Bodle et al., 2020).

From the aforementioned it becomes clear, that the international soil governance framework remains highly fragmented, while the displayed

[1] The revised World Soil Charter is organised into a preamble, nine principles, and guidelines for action.

[2] See Section 3 of the Revised World Soil Charter.

[3] Land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variations and human activities.

international law instruments cover different aspects of soil protection in a relatively unconcerted manner.

The SDGs provide a universally accepted framework to foster global collaboration with a strong emphasis on the rule of law and human rights. While Agenda 2030 is aimed at fostering and renewing multilateralism and international cooperation on the global but common challenges, the SDGs include economic and social development goals that potentially involve trade-offs with environmental sustainability. One of society's most urgent challenges is to satisfy the rights of people to a 'good life', including adequate food and nutrition, while remaining within the planetary boundaries. In other words, we need to reconcile agriculture and the environment to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture" (Zero Hunger, SDG 2) and also "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (Life on Land, SDG 15) (Larbodière et al., 2020).

In terms of the right to food, the SDGs call for more sustainable production and consumption patterns and agricultural and food systems that protect natural resources (i.e., soil). Essential risks for food security are linked to food availability and consumers' access to food. In turn, stresses on food supply chains are linked to bottlenecks in farm labour, processing, transport and logistics, as supply chains respond to changing demand. While an open and predictable international trade environment ensures that food can move to where it is needed, possible supply chain approaches, can for example, intervene at the point of end consumption of such products, the production of which in distant, politically sovereign states causes sustainability risks.

Soils are essential in ensuring food security and thus also the right to food (European Commission, 2020). Strategies in support of the progressive realisation of the right to food seem to be very much in line with the recommendations of the Committee on Economic, Social and Cultural Rights in its general comment No. 12 on the right to adequate food (para. 21) (De Schutter, 2014).

According to Article 25(1) of the Universal Declaration of Human Rights (UDHR), everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, while Article 11 of International Covenant on Economic, Social and Cultural Rights (ICESCR) recognises the right of everyone to an adequate standard of living for himself and his family, including adequate food; as a fundamental right of everyone to be free from hunger.

Article 11(2) ICESCR in recognising the fundamental right of everyone to be free from hunger, compels Parties to take measures to (a) improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources; (b) taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need.

Similarly, Article 24(2)(c) of the Convention on the Rights of the Child (CRC) obliges Parties to take appropriate measures to combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the provision of adequate nutritious foods, taking into consideration the dangers and risks of environmental pollution.

While states have the obligation to respect, protect and fulfil the human right to food, this obligation is complemented by the following principal non-legally binding instruments relating to the right to adequate food, namely the 1974 Universal Declaration on the Eradication of Hunger and Malnutrition; the 1996 Rome Declaration on World Food Security; and the 2004 Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security. Despite all this, millions of people still remain deprived of their right to food, which is why the protection of soil cannot be overemphasised. Ultimately, soil protection should therefore be viewed in light of the public trust doctrine, which has its origins in the Roman law property concept of *res communis* (Preston, 2018). These are things which, by their nature, are part of the commons that all humankind has a right or at least a common interest in the protection thereof.

5. Soil and global climate governance

The 1992 the United Nations Framework Convention on Climate Change (UNFCCC) was adopted to regulate levels of greenhouse gas concentration in the atmosphere, so as to, inter alia, avoid the occurrence of climate change on a level that would compromise initiatives in food production (Ruppel, 2013). Article 2 of the UNFCCC defines the parties' ultimate objective as the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

So far, international climate policy has mostly focused on emission sources and thus on the avoidance of greenhouse gas emissions, for example from the electricity sector, the production industry, transport, and land-use changes. This will, however, be increasingly complemented by the preservation and enhancement of emission sinks to remove carbon dioxide from the atmosphere. To achieve the global climate targets adopted by the UNFCCC, alternative mitigation methods, as for example through programmes for re- or afforestation and the restoration of ecosystems, become more and more relevant. Despite the fact that the combination of bioenergy and carbon capture and storage, increased carbon sequestration in soils,[4] and the direct capture of CO_2 from ambient air need to be further researched and are not yet at the stage of market maturity, the carbon removal approach has considerable potential, while soils are the world's second largest carbon sink after the oceans (Geden and Schenuit, 2020).

> The most potentially devastating impacts of industrial modes of agricultural production stem from their contribution to increased greenhouse gas emissions. Together, field-level practices represent approximately 15 per cent of total human-made greenhouse gas emissions, inter alia from the loss of soil organic carbon in croplands (De Schutter, 2014).

The 2015 Paris Agreement, as part of the UNFCCC regime, in its Preamble includes the explicit acknowledgement "that climate change is a common concern of humankind" and that "Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights". As such the agreement binds its parties regarding activities on their respective territories and under their control.

The Paris Agreement supplements the UNFCCC and the Kyoto Protocol of 1997 by incorporating existing elements of this regime. Both the UNFCCC and Kyoto Protocol adopted rules on reporting and accounting for emissions from land use, land use change and forestry (LULUCF). These rules determine how parties have to report LULUCF in their regular emission inventories, which under the Kyoto Protocol is also relevant for accounting whether parties meet their emission reduction targets (Bodle et al., 2020).

According to Article 2, the Paris Agreement's overarching objective is to keep the increase in global temperature well below 2 °C, or even 1.5 °C. Parties are required to prepare and present individual climate plans (Nationally Determined Contributions - NDCs) every five years that set out how the party intends to contribute to the collective objectives. Under the Paris Agreement, the Principle of Common but

[4] Soil carbon sequestration is the process of capturing atmospheric CO_2 through changing land management practices to increase soil carbon content. Various land management practices promote soil carbon sequestration.

Differentiated Responsibilities (CBDR) is an obligation for all parties when formulating their NDCs. This is the result of protracted negotiations about the role and impact of historic and present, and of relative and absolute, GHG producers. Although the Paris Agreement does not specify how to take the CBDR principle into account, principles of justice and equity help to improve the understanding of the normative implications of climate law under the Paris Agreement. While equity as a normative concept has a sense of fairness, justice plays an important role in legal-political decisions in relation to climate policy in particular and through differentiation in obligations (Lawrence and Reder, 2019). GHG emissions have global, not merely national, effects, which on the basis of the need to contain the potential proliferation of trade distortions due to climate policies in terms of equity, may justify sanctioning the inaction by large GHG emitters, which can have a serious impact on local food production affected by global warming (Häberli, 2018).

Through the sustainable development mechanism in Article 6, the Paris Agreement allows the space to harness the lowest cost mitigation options worldwide. This may incentivise policymakers to enhance mitigation ambition by speeding up climate action (Tänzler et al., 2019). This implies that global climate policy development and the future of the carbon market also relate to mechanisms which support and encourage sustainable climate policies in host countries as production-based accounting does not necessarily reflect a country's contribution to global emissions because globalisation and consumption can prompt emissions beyond borders.

By signing the Paris Agreement (and in particular Article 14 therein), parties agreed on long-term goals backed by national plans that are collectively reviewed in the global stocktake, which is key to increasing ambition. While the first planned stocktake is scheduled for 2023, it has already become apparent today that the improved accuracy of carbon stock estimates would allow for more targeted interventions and better monitoring of the NDCs – which has equal significance for the protection of soil in the context of agricultural production (UNFCCC / United Nations Framework Convention on Climate Change, 2015).[5] Whereas the UNFCCC does not explicitly provide for specific trade measures, the Kyoto Protocol contains more detailed obligations related to the reduction of greenhouse gases and provides for trade-affecting techniques such as tax impositions on carbon dioxide emissions and the elimination of subsidies adversely affecting the objective of the UNFCCC (Ruppel, 2018). In addition, the parties to the Paris Agreement explicitly recognise –

> […] the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change;

while Article 2(1)(b) of the Paris Agreement provides for –

> [*in*]creasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production […].

Notwithstanding the legally neutral wording of Article 2(1) when read in isolation, achieving its purpose – (Zahar, 2020)

> […] is mandatory not for any one state or group of states, of course; it is mandatory for the state parties collectively. This straightforward logical implication of the Paris Agreement does not seem to have been noticed before, despite its potentially profound consequences.

The Paris Agreement further requires parties to engage in adaptation planning and implementation that takes into account "vulnerable people, places and ecosystems" and builds "the resilience of socio-economic and ecological systems, including through economic diversification and sustainable management of natural resources". Of course, soil as well as land use, land degradation and sustainable land management are closely linked to climate change in terms of carbon capture and storage and the emissions from deforestation and agriculture. This is underlined by Article 4 of the Paris Agreement, which explicitly includes the target "to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century", although the Paris Agreement fails to explicitly mention 'soil', 'land' or 'agriculture'. As such, the Paris Agreement only indirectly addresses soil protection in the general context of climate change. And despite the importance of land use and soil management for climate change, the UNFCCC, the Kyoto Protocol and the Paris Agreement have not established a comprehensive regime with regard to land-related climate change measures (Bodle et al., 2020). Article 5(1) of the Paris Agreement obliges parties to take action to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases as referred to in Article 4(1)(d) of the Convention. Yet, in fact, agriculture first appeared in the ongoing climate negotiations under the Koronivia joint work on agriculture programme at COP 23 in 2017 (FAO / Food and Agriculture Organization of the United Nations, 2021b):

> The decision officially acknowledges the significance of the agriculture sectors in adapting to and mitigating climate change. Countries agreed to work together to make sure that agricultural development ensures both increased food security in the face of climate change and a reduction in emissions. The joint work is expected to address six topics related to soils, nutrient use, water, livestock, methods for assessing adaptation, and the socio-economic and food security dimensions of climate change across the agricultural sectors.

To achieve the aforementioned, countries should take all appropriate measures according to their capabilities to progressively achieve the protection of the interests of all concerned. And when speaking of 'all concerned' in the context of global food security, this phrase is by no means an exaggeration. Much of the work to translate the Paris Agreement and the NDCs into concrete climate interventions in agriculture is in progress.

> Food systems are responsible for 21–37% of global greenhouse gas emissions and a major driver of deforestation and land degradation, yet there is still widespread food insecurity and malnutrition. Managing the land sector (agriculture, forestry, wetlands, bioenergy) sustainably and holistically could contribute up to 30% of the global climate mitigation effort (Palahi et al., 2020).

In 2018, the Paris Agreement adopted a transparency framework which, inter alia, included rules for reporting on and accounting for land use and land-use change, which is expected to eventually replace the existing UNFCCC framework. This may open opportunities also to shape new rules complementing the UNFCCC's Koronivia joint work on agriculture (KJWA). At COP 26 in November 2021, countries participating in the continuing discussions on agriculture and the KJWA, agreed on the need for a transition towards sustainable and climate-resilient food systems, taking into consideration the vulnerability of agriculture to the impacts of climate change. They recognised that this transition will be crucial to guarantee food security and ending hunger throughout the globe as well as to achieve climate objectives, such as emission reductions. More specifically, to achieve this transition, participants inter alia acknowledged the key role of soil and nutrient management practices, the optimal use of nutrients, including organic fertilizer and enhanced manure management, sinks on pasture and grazing lands, calling for more inclusive, sustainable and climate-resilient agricultural systems.

[5] Interestingly, in its NDCs, the Republic of South Africa, states that policy instruments under development include regulatory standards and controls for specifically identified GHG pollutants and emitters.

6. Conclusion

When it comes to the protection of soil, a wide range of policy instruments is needed to strengthen the mutually supportive role of the Paris Agreement and other international agreements. The AFOLU (agriculture, forestry, and other land use) sector plays an important role in the 1.5 °C pathways and is, inter alia, responsible for food production. Changes in the AFOLU sector are driven by demand changes, efficiency of production, and policy assumptions. While demand for agricultural products and other land-based commodities is influenced by consumption patterns, including dietary preferences and food waste (affecting demand for food), policy assumptions relate to the level of land protection, the treatment of food waste, policy choices about the timing of mitigation action, the choice and preference of land-based mitigation options, and interactions with other sectors (Rogelj et al., 2018).

In the soil-land-climate interface, effective policy responses must include carbon pricing, emissions trading schemes (including net CO_2 emissions from agriculture), carbon taxes (Ruppel et al., 2020),[6] regulations limiting GHG emissions and air pollution, forest conservation (mix of land-sharing and land-sparing) through participation, incentives for ecosystem services and secure tenure, protecting the environment, microfinance, crop and livelihood insurance, agriculture extension services, agricultural production subsidies, low export tax and import tariff rates on agricultural goods, dietary awareness campaigns, taxes on and regulations to reduce food waste, improved shelf life, sugar/fat taxes, and instruments supporting sustainable land management (including payment for ecosystem services, land-use zoning, REDD+, standards and certification for sustainable biomass production practices, legal reforms on land ownership and access, legal aid, and legal education), as well as reframing these policies as entitlements for women and small agricultural producers (Rogelj et al., 2018). Similarly, border carbon adjustments can help level the playing field and prevent emissions leakage (Peters et al., 2011), which occurs when climate action in one region merely shifts emissions elsewhere (Kasturi et al., 2019).

Ultimately, soil protection has so far too often been neglected in international agreements. Despite this oversight, the climate goals cannot be reached without soil protection and conservation. The same applies when it comes to ensuring the right to food. In fact, soil protection should be viewed in light of the public trust doctrine, which by its very nature forms part of the commons that all humankind has a right or at least a common interest in the protection thereof.

The fact, that the Norwegian Nobel Committee has decided to award the 2020 Nobel Peace Prize to the World Food Programme (WFP) for its efforts to combat hunger is a clear reflection of the growing significance of food security in our time. The Norwegian Nobel Committee explicitly emphasised that providing assistance to increase food security not only prevents hunger but can also help to improve prospects for stability and peace in the world.

While every country must have the right to develop its own agricultural model to feed its population, respect for the needs of other countries and international obligations remains key. Policies must therefore assure that trade can meet global challenges, facilitates the sustainable and efficient use of land, protects biodiversity and prevents overexploitation and degradation of land and natural resources. In this light, greater efforts are needed to combine economic and environmental performance in determining soil as a natural capital and a valuable asset that needs a price tag (despite the fact that it is actually priceless).

[6] Such was for example the Carbon Tax Act 15 of 2019, a relatively new addition to South Africa's legislative record, aiming to provide for the imposition of a tax on the carbon dioxide (CO_2) equivalent of greenhouse gas emissions; and to provide for matters connected therewith. This aim is expected to be achieved by the deployment of a range of measures to support the system of desired emissions reduction outcomes, including the appropriate pricing of carbon, the use of emissions offsets and economic incentives for rewarding the efficient use of energy to provide appropriate price signals to help nudge the economy towards a more sustainable growth path. Such tax phased in over time allows for learning, while the tax revenue can for example finance additional climate change mitigation efforts. Whether a carbon tax yields a better result, for global food security, than carbon sequestration, depends on many different factors. Taxation for climate change mitigation could be included under any broad (NDC) commitment to reduce emissions or in the promotion of green technologies.

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