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How Climate Change can Catalyze Sustainable Land-Management

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HOW CLIMATE CHANGE CAN CATALYZE SUSTAINABLE LAND-MANAGEMENT

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1. Introduction

In land-use policies, particularly forestry and agriculture, climate change mitigation, food security and poverty reduction come together. Forests and soils have a large influence on atmospheric levels of carbon dioxide (CO₂), nitrous oxide (N₂O) and methane (CH₄), three of the most important greenhouse gases (GHGs). Deforestation and agricultural practices are jointly responsible for about 30 percent of global GHG emissions.² While unsustainable land-use practices contribute to the accumulation of GHGs, environmentally responsible forest and agricultural management can offset these emissions by taking up carbon dioxide from the atmosphere. The adoption of sustainable land-use practices is a valid, and in many cases cost-effective, mitigation strategy that often comes in tandem with significant adaptation, livelihood and biodiversity benefits.

Despite the sizable climate change mitigation potential of the land-use sector, the international climate regime so far does not create many incentives to tap into this opportunity. The UN Framework Convention on Climate Change (UNFCCC) recognizes that all sinks and reservoirs of GHGs have an important impact on terrestrial and marine ecosystems.³ The Convention's objective of the "stabilization of greenhouse-gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system"⁴ should be reached, *inter alia*, by exploiting the capacity of sinks to reduce the concentration of GHGs in the atmosphere. Under the rules of the Kyoto Protocol, developed countries may use "direct human-induced," *i.e.* "net changes" in GHG emissions and removals by sinks since 1990 as part of their emission reduction targets.⁵ Developed countries have to (Article 3.3 KP) or may (Article 3.4 KP) account for the change in forest carbon stocks. In addition, these countries have to report some agricultural emissions (mainly CH₄ and NO₂ emissions from human-induced biological processes). Others are optional, such as CO₂ removal from cropland management. The Protocol's Clean Development Mechanism (CDM) offers incentives for mitigation of land-use related emissions in developing countries through manure and waste water management, as well as afforestation and reforestation.⁶ However, neither the UNFCCC nor the Kyoto Protocol are creating incentives for those activities that hold the largest potential of mitigation action in the land-use sector, namely

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² Intergovernmental Panel on Climate Change (IPCC), 2007, *Climate Change 2007: Synthesis Report*. Geneva, IPCC.

³ UNFCCC Preamble, para. 4

⁴ UNFCCC, art. 2

⁵ Those "net changes" must be "measured as verifiable changes in carbon stocks in each commitment period" (Kyoto Protocol, art. 3 para. 3).

⁶ Kyoto Protocol, art. 12.

reduced emissions from deforestation or the enhancement of carbon stocks through soil carbon sequestration in developing countries.

Nonetheless, there are signs that things may change. Over the last years, the contribution of land-use practices to global climate change has received increasing attention in international climate negotiations. The primary focus rests on the design of strategies and incentive mechanisms that reduce emissions from deforestation and forest degradation, promote the sustainable management of forest, conservation and the enhancement of forest carbon stocks, jointly referred to as REDD +. The reduction of deforestation alone has a mitigation potential of 4.3 gigatonnes of CO₂ equivalent (GtCO₂e) by 2020. Another 1.5 GtCO₂e could potentially be abated in the form of carbon captured by existing and newly planted forests as well as 1.9 GtCO₂e sequestered by more sustainable agricultural practices.⁷ At CP 11 in Montreal in 2005, developing countries tabled a motion indicating that they were prepared to reduce emissions from deforestation provided that appropriate incentives were put in place. That motion triggered intense negotiations under the UNFCCC and the establishment of various initiatives to build capacity and develop REDD demonstration projects. In recent years, political momentum to address emissions from agriculture (and recognition of the sectors relevance for adaptation) has also increased. As global food production is expected to double by 2050, GHG emissions from the sector must be stabilized to achieve emission targets advocated by the Intergovernmental Panel on Climate Change (IPCC). At the same time climate change will depress agricultural yields, making adaptation one of the main challenges of the agricultural sector. Well designed policies and measures at the national and international level can catalyze strategic investments in sustainable agricultural research, planning and practices that will be necessary to increase agricultural productivity, mitigate poverty, reduce pressure on forests and conserve water-tables, biodiversity and soil functions.

2. An Opportunity

The land-use sector is characterized by an overlapping set of interests determined by agriculture, forestry, infrastructure, settlement and industry. Climate change affects these interests by influencing soil fertility, water resources and biomass accumulation through changing and more extreme weather patterns. Many of these impacts, such as increased land degradation and soil erosion, changes in water availability, biodiversity loss, more frequent and more intense pest and disease outbreaks as well as natural disasters, need to be addressed across sectors.⁸ The IPCC Fourth Assessment Report found that agriculture (cropland, pasture and livestock production) and forestry will contribute in 2004 to respectively 13.5 and 17.4 percent of the total anthropogenic GHG emissions.⁹ While CO₂ emissions from agriculture are small, the sector accounts for about 60 percent of all nitrous oxide and about 50 percent of methane emitted, mainly from soils and enteric fermentation.

There is evidence that adaptation, mitigation, food security enhancement and rural development can go hand in hand and negative trade-offs be avoided. Unlike other sectors, adequate agriculture and forestry strategies can simultaneously increase adaptive

⁷ Project Catalyst (2009), *Towards the Inclusion of Forest-based Mitigation in a Global Climate Agreement*, February 2009.

⁸ The UN Food and Agriculture Organization (FAO), 2008, *Climate Change Adaptation and Mitigation in the Agricultural Sector*, available at: < <ftp://ftp.fao.org/docrep/fao/meeting/013/ai782e.pdf> >.

⁹ IPCC, *supra* note 2.

capacity and mitigate climate change.¹⁰ For example, increasing soil organic matter in cropping systems, agroforestry and mixed-species forestry can at the same time improve soil fertility and soil moisture holding capacity, reduce impact of droughts or floods, reduce vulnerability and sequester carbon.

Over the last year, developed countries have pledged about US\$ 5 billion in fast-track finance for REDD+. Additional fast-track funding in the order of US\$ 30 billion has been announced. The availability of funds as well as the commitment to address emissions from forestry under a REDD incentive mechanism, to promote agricultural mitigation strategies as Nationally Appropriate Mitigation Actions (NAMAs) in developing countries, and to enhance funding for the implementation National Adaptation Programmes of Activities Policy Actions (NAPAs) and other adaptation activities create an opportunity to revise existing and develop new land-use policies, mobilize finance and create new alliances for climate smart agriculture. Such policies, if well designed, support the move to a sustainable and integrated land-planning that takes into account climate change adaptation needs while promoting GHG emission reductions.

The Copenhagen Accord, drafted in the last hours of the 15th session of the Conference of the Parties to the UNFCCC (CP) in December of 2009, encourages developed country Parties of the UNFCCC to notify the Convention secretariat of economy-wide emission reduction targets. Developing country Parties are invited to notify the secretariat of NAMAs that they intend to adopt and implement. Although the Accord does not expressly refer to agriculture, several developing countries have included this sector in the NAMAs they submitted to the Secretariat. Out of the 43 developing countries which have submitted NAMA information to the Secretariat by October 2010, at least 20 state that they plan to adopt mitigation actions in the agricultural sector. Morocco and Papua New Guinea submitted quantitative sectorial agricultural mitigation targets. Both noted that these are voluntary domestic reductions considering also the use of the CDM. Brazil quantified emission reduction commitments in relation to particular activities such as restoration and conservation, improved life stock management, conservation tillage, nitrogen-fixing activities. Ethiopia specified an area where cropland-related mitigation practices will be adopted. Although they did not quantified their efforts, other countries also indicated that they will engage in a number of agricultural mitigation activities, such as restoration of grasslands, fodder crop production, introduction of combined irrigation and fertilization techniques to increase the efficiency of fertilizer application, and methane capture in livestock and chicken farms.

At the same time more than 40 tropical countries have engaged to build the capacity and institutions to participate in an international REDD+ mechanism, even before such mechanism is formally adopted. Brazil, the Democratic Republic of Congo and Indonesia, among others, have signed bilateral partnership agreements with the Government of Norway under which Norway provides performance-based resources for REDD+. The support of the World Bank's Forest Carbon Partnership Facility and UN-REDD has enabled Guyana, Panama, Indonesia and other countries to begin REDD+ capacity building at the national and sub-national level since 2009. Participating countries have started to engage in REDD+ readiness, a process that entails defining national

¹⁰ The UN Food and Agriculture Organization (FAO), 2008, Climate Change Adaptation and Mitigation in the Agricultural Sector, available at: <ftp://ftp.fao.org/docrep/fao/meeting/013/ai782e.pdf>, accessed 22 November 2010.

REDD+ strategies, public consultations and the establishment of measuring, reporting and verification (MRV) systems. The readiness process demands that countries assess drivers of deforestation and carefully evaluate options to reduce emissions and build national consensus through cabinet level and stakeholder consultations around preferred REDD+ strategies.

The analysis of drivers of deforestation in tropical countries has made it clear that in many countries the most efficient REDD+ strategies lie outside of the forestry sector. Global and local demand for agricultural products such as food, feed and fuel is a major driver of cropland and pasture expansion across much of the developing world. Whether these new agricultural lands replace forests, degraded forests or grasslands greatly influences the environmental consequences of expansion. The availability of cheap land in developing countries is a competitive advantage for agricultural producers. Forests in developing countries are being cleared at a rapid pace for many reasons, but largely for the expansion of agricultural lands. Clearing forest land for cattle pasture is the largest driver of deforestation in the Amazon, accounting for more than two-thirds of annual forest clearing in most years.¹¹ Consequently, conservation of forests has to be supported through changed agricultural, fiscal and infrastructure policies. Without any doubt, agricultural intensification is one of the most important REDD+ strategies in developing countries. Without increased crop and livestock yields per hectare, pressure on land resources will accelerate as crop and pasture areas expand under extensive production. Intensification, however, should not follow the developed country model where it is often based on the specialization of farms in a particular crop or animal and on the intensive use of agrochemicals.¹² The enhancement of less environmentally deleterious agricultural intensification is essential. Sustainable and climate-smart agriculture will, nevertheless, require diverse income sources, production choices and genetic material.¹³

The multiple goals of achieving food security, protecting water and biodiversity resources, adapting to climate change and reducing emissions can only be achieved through strategic and adaptive land management. The various preparatory and consultative processes triggered by international discussions and national strategies around climate change adaptation and mitigation, hold the potential to move countries towards the sustainable and integrated management of the various functions that land has to serve. Such integrated management makes it possible to intensify agriculture, manage water resources and improve social and economic development while protecting biodiversity and soil functions, and reducing GHG emissions. If climate interventions are aligned with traditional development plans, policies and investments in agriculture and forestry can link the various agendas to sustain multiple benefits and promote development in the changing context that climate change presents.

3. The Way Forward

Multilateral, bilateral and unilateral REDD+ readiness initiatives, the identification and formulation of agricultural NAMAs, the development of national adaptation plans and efforts to secure stable food supply can catalyze the alignment of various land-use strategies into national, integrated strategies. Emerging international incentive mechanisms for climate change mitigation, in particular performance-based financing

¹¹ The UN Food and Agriculture Organization (FAO), 2010, *Livestock Policy Brief 03, Cattle Ranching and Deforestation*, available at: < <ftp://ftp.fao.org/docrep/fao/010/a0262e/a0262e00.pdf> >.

¹² World Bank (2010), *World Development Report 2010: Development and Climate Change*, Washington DC.

¹³ *Ibid.*

linked to NAMAs and REDD+, and financial support for adaptation measures have to be coordinated and coherent with existing policies enhancing food security, ensuring that intensification of agriculture promotes climate-resilient and environmentally sound farming practices. Consultative processes triggered by new and innovative climate-related financial mechanisms and the need to adapt to a changing climate bears the opportunity to facilitate integrated land-planning in developing countries as a condition for REDD+ and sustainable food production. REDD+ readiness and the elaboration of NAMAs are essential steps towards low carbon development.

Taking into account that the land-use sector provides income for more than a third of the world's workforce, it is essential that any strategy is supported by a broad range of stakeholders, including decision-makers, land-management planners, land users, landowners and beneficiaries of land services. Consultations have to be held to identify their requirements and needs. Relevant physical, social and economic conditions and data on land units need to be made available to stakeholders to ensure that they are able to provide informed input into the development of policies. Once strategies and policies have been appraised and cost and benefits of selected measures have been assessed, governments need to establish the institutional, legislative and cadastral infrastructure needed to implement the agreed-upon land uses and long-term land management. Such infrastructure includes clarification of land titles and tenure reform; it also entails to establish institutions that integrate relevant information and manage land-planning systems.

International policy processes and bilateral cooperation can support such national process through:

- Financial support: International incentive mechanisms for mitigation (NAMAs, REDD+) and for adaptation can be bundled with financing for food security and private sector investments into the land-use sector. International safeguards may help to ensure the sustainability and social acceptability of such measures. The various international requirements for consultations may help to maximize synergies among various sources of finance, provided however that international processes and incentive mechanisms are coordinated and requirements are aligned with integrated processes in recipient countries.
- Information and learning: The performance-based nature of funding for climate change mitigation facilitates the establishment of national (and/or international) performance checks and MRV. The resulting information ensures transparency of the policies and measures towards stakeholders, and allows countries to adapt the programs based on results and lessons learned.
- Capacity building and institutional strengthening: Reflecting their capacities and national circumstances, REDD+ readiness and NAMA development have to go along with a strengthening of national institutions and processes, including law enforcement and tenure reform.
- Stakeholder involvement: Land-use planning has to be undertaken through a collaborative approach with local governments, indigenous and local groups, NGOs, and the private sector. As one of the results, land use plans provide the framework to guide decisions for every action and approved use on the relevant land unit. The REDD+ process and its requirements may be a good starting point for national consultations on low-emissions solutions for the forestry and agricultural sector. Consultations and participative processes need to result in policies and laws that are supported by wide parts of the population, remove perverse incentives and create the conditions for the move towards more robust

policy frameworks. Climate finance can support this move through incentives, subsidy and payment for ecosystem services programs.

4. Conclusions

As climate negotiators return from Tianjin, the prospect for anything more than incremental progress in forging an international consensus on a future climate agreement in Cancun in December remains bleak. While a legally binding agreement in line with the overall objective to avoid global warming beyond 2C above pre-industrial levels may take several years more to negotiate, climate change action is still happening. International mechanisms, even before being adopted (REDD+) or even being defined (NAMAs), trigger anticipatory action. Readiness processes integrated in low carbon development strategies are likely to continue and receive support through bilateral or multilateral cooperation. As long as such processes are coordinated and informed by consultations and stakeholder involvement, they have the potential to facilitate long-term change in the formulation of national strategies. The land-use sector is one of the most prominent examples where integration is essential for further success. Where countries opt for cabinet level coordination of REDD+, NAMAs and NAPAs, among others, they may use the various climate change triggered processes and incentives to adopt integrated land-planning tools. Only if the walls between adaptation and mitigation projects fall, only if food security and water management are taken into the equation, will the longer term carrying capacity and health of our land be secured.

The mission of the Centre for International Sustainable Development Law (CISDL) is to promote sustainable societies and the protection of ecosystems by advancing the understanding, development and implementation of international sustainable development law.

The CISDL is an independent legal research centre which collaborates with the McGill Law Faculty in engaging students and interested faculty members in sustainable development law research and scholarly initiatives. The CISDL also works in cooperation with a network of developing country faculties of law, and is developing closer ties with the Cambridge University Faculty of Law, the Université de Montreal, Capetown University and the University of Costa Rica. It has guidance from the three Montreal-based multilateral treaty secretariats, the World Bank Legal Vice-Presidency, the United Nations Environment Programme and the United Nations Development Programme, and a memorandum of understanding with the International Institute for Sustainable Development (IISD).

With the International Law Association (ILA) and the International Development Law Organisation (IDLO), under the auspices of the United Nations Commission on Sustainable Development (UN CSD), CISDL chairs a Partnership Initiative, International Law for Sustainable Development that was launched in Johannesburg at the 2002 World Summit for Sustainable Development, to build knowledge, analysis and capacity about international law on sustainable development.

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