

MULTILATERAL CLIMATE NEGOTIATIONS: WHY AGRICULTURE IS EXCLUDED§

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Introduction

There is a general consensus that agriculture will be greatly impacted by climate change and consequently it requires substantial adaptation efforts. At the same time there is ample evidence that agriculture is responsible for a large proportion of global greenhouse gas emissions, and has an important role in climate change mitigation. Yet, agriculture was not, until 2008, included in the multilateral climate change negotiations. In this research paper, we will attempt to find out the main reasons behind this quasi exclusion and its impact on agricultural development and food security in the developing world.

In the first section we present a brief overview of the main findings about the importance of agriculture in climate change mitigation and adaptation. The second section analyses existing international climate change agreements and negotiations underway so as to attempt to find out the ways in which agriculture is addresses in those negotiations and agreements. In the final section we will provide proposals for addressing agriculture-related issues especially for policy-makers in the developing world.

The Impact of climate change on Agriculture and the Cost of Adapting to It

There is ample scientific evidence that agriculture will be greatly impacted by climate change and will need substantial mitigation and adaptation effort. As if all the pressure on a finite land base and stretched water supply is not enough, climate change will greatly increase poverty and reduce food security of billions in the near future. We have already seen Australia, the Sahel region and California's agricultural production hurt by their long term droughts. The Stern Review considers that agricultural impacts will be greatest across Africa and Western Asia, including the Middle East and North Africa), with crop yields falling 25 to 35 percent with weak carbon fertilization and 15 to 20 percent even with high carbon fertilization once warming reaches 3 to 4 degrees C. According to the Review water stress is one of the main reasons for adverse agricultural effects. The Stern Review argues that already arid and semi-arid areas such as the Mediterranean basin would experience a 30% decline in water runoff for 2degrees C warming and 40 to 50% reduction for 4 degrees C (Stern Review 2006).

The Middle East, North Africa and Sub-Saharan Africa have already the world's most water-scarce regions. In some cases, such as Jordan, per capita availability of fresh water has already dropped to 170 cubic metres /yr. Furthermore, future projection of population growth indicates a further decrease in per capita water resources. In the MENA region, for example, current per capita renewable water resources (1100 cubic m/yr) are projected to drop to 550 cubic m/yr by 2050 which will trigger a higher water withdrawal rate with both ecological and human livelihood implications. Water scarcity and quality are potentially serious threats to food security and health in this region. Moreover, there is a direct relationship between access to water and access to food security and feed security as irrigation accounts for more than 80% of water used in the region. However, increasing competition for water among various uses will result in the reduction of the share of agriculture by 2050 to about 50% (FAO, 2002). The ADB estimates that as many as 12.2 million people in Vietnam could experience either worsening or new water stress by 2050(ADB 2009).

In terms of the most vulnerable regions to climate change, the IPCC ' Report notes that already " in the Sahelian region of Africa, warmer and drier conditions have led to a reduced length of growing season with detrimental effects on crops" (p.4). The Report also notes that by 2020, between 75 and 250 million people in Africa are projected to be expOsed to increased water scarcity from climate change. Furthermore, the Report notes that:

"Agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The areas suitable for agriculture, the length of growing seasons and yield potential, particularly along the

margins of semi-arid and arid areas are expected to decrease. This would further adversely affect food security and exacerbate malnutrition in the content. In some countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020" (p. 10).

Climate change will even steal land right out from farmers. For example, the IPCC argues that global warming will lead to sea level rise which in turn will result in flooding of thousands of hectares in many parts of the world. It warns that one meter of sea level rise will flood 100.000 hectares of cultivated and aquaculture in the Mekong River delta and a significant proportion of the Nile delta.

Despite these alarming effects of the global warming, Cline's findings confirm the view that aggregate world agricultural impacts will be moderately negative by late this century, rather than the alternative view that agriculture globally would benefit from global warming over that horizon. His findings starkly confirm in great details the asymmetry between potentially severe agricultural damages to agriculture in many poor countries and milder effects in developed countries. His findings suggest that immediate international action to curb global warming is of utmost necessity; otherwise losses in agricultural output could be severe in Africa, Latin America, and South and West Asia (Cline, 2007).

Climate change impacts combined with other water pressures in the MENA region are likely to result in substantial migration, in particular among the poor who have limited opportunities to diversify their income, with potentially significant effects on neighbouring regions and countries. In addition, changes in weather patterns, particularly droughts and floods, are expected to have negative health impacts. They may also lead to an increase in climate-related diseases and pests that could threaten crops and livestock.

Recent scientific evidence suggests that agriculture is responsible for a significant proportion of global greenhouse gas (GHG) emissions, and hence has an important role in climate change mitigation. According to the Intergovernmental Panel on Climate Change (the IPCC), combined GHG emissions from agriculture and deforestation- of which agriculture is a key driver- contribute around 35% of the human released GHG gases each year and account for more emissions than the transport sector.

The agricultural sector accounts for almost 14% of total anthropogenic GHG emissions. These include carbon dioxide released through ploughing and logging as well as fossil fuel use during production, methane from livestock production and rice paddies, and nitrous oxide from nitrogen based fertilizers. Agricultural emissions make up 47% of global anthropogenic emissions of methane and 58% of global nitrous oxide. Agricultural emissions are concentrated in developing countries, who account for almost 74% of total emissions (ICSTD, 2009). However, developed countries lead in emissions from manure management. Land –use change contributes to approximately 20% of global CO2 emissions in each year, of

which tropical deforestation is the largest contributor (Nabuurs et al.2007). The FAO (2008a) reports that agricultural emissions growth is and will continue to be driven by greater demand for food as a result of increasing human needs. Thankfully, agriculture is not only a source of GHG emissions but also an important part of the solution through both mitigation and adaptation.

Expected mitigation potential in the agriculture, land use, land-use change and forestry sectors (LULUCF) is very significant. However, the highest technical potential is from soil carbon sequestration, followed by emissions reductions of methane and nitrous oxide. The National Farmer Association (NFF, 2008) of Australia estimates that globally, nearly half of all soil carbon in farmed lands has been lost to the atmosphere during the past two centuries. This loss, however, creates an opportunity for carbon sequestration, with global additional potential in agriculture soils estimated at around 10% of atmospheric carbon. It also emphasizes that soil carbon sequestration is the most prominent option for mitigation in the agricultural sector. Carbon sequestration occurs by increasing plant materials being returned to the soil, reducing carbon loss through minimum or non-tillage conservation agriculture, and by introducing carbon from external sources, such as urban and industrial waste streams.

The FAO (2008B) estimated that mitigation efforts in developing countries through agriculture and forestry projects may cost about one-fourth to one-third of total mitigation in all sectors and regions, while generating one-half to two-thirds of all estimated emission reductions. It also noted that efforts in this sector can have a positive impact on rural population livelihoods through improved water and soil quality.

To cope with climate change, long-term measures should be taken. These include: application of new technologies, improved land management techniques, changes in land use to improve yields under new climate conditions, water-use efficiency techniques, development of resilient crop-livestock production systems, prospection for genes that adapt to drought and heat stress, and crop rotation that sequester carbon, maintain soil fertility and conserve water. According to Wheeler and Tiffin (2009:38), the estimate of McCarl (2007) is the only global estimate of the costs of adaptation for the agricultural sector. The costs of adaptation referred to by McCarl and the United Nations Framework Convention on Climate Change (UNFCCC 2007) concern only climate change proofing investments. These incremental investments are estimated at US\$14bn, 50% of which in the developing world. These costs include increase in R&D and extension funding and extra capital investment at the farm level (Wheeler &Tiffin 2009).

However, the question remains with respect to how such mitigation and adaptation measures can be financed in poor countries. This is one of the main subjects of on-going multilateral climate change negotiations. There is a consensus that current available and proposed mitigation-adaptation finance remains largely lower than the projected costs in

developing countries. Furthermore, agriculture, though crucial in combating global warming, remained a marginal issue in climate change negotiations.

Agriculture in Climate Change Negotiations

Despite considerable potential for mitigating GHG emissions, agriculture has been approached in a fragmented manner and marginally in UNFCCC discussions and negotiations. Under the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP), it is considered within the LULUCF sector, and discussions on improvements to the project-based mechanisms, including the Clean Development Mechanism (CDM), involve discussion of other sustainable land management activities. In addition, the Ad Hoc Working Group on Long Term Cooperative Action under the Convention (AWG-LCA) held a workshop on opportunities and challenges for mitigation in the agricultural sector in March 2009.

Article 2 of the Convention not only stipulates the ultimate objective, which is to achieve stabilization of GHG emissions in the atmosphere, but also specifies that this objective should be achieved in a manner that allows sustainable development to proceed. More important is the Convention emphasis on the importance of food security. It stresses that stabilization of atmospheric green house gases should be “ achieved 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 in a sustainable manner (UNFCCC: Art.2).

In addition, the UNFCCC committed all Parties to develop, update periodically and make available national inventories of anthropogenic emissions by sources and removals of sinks. However, developing country Parties should do so only if the necessary funding is provided by developed country Parties (Annex I countries): “ The extent to which developing countries will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments....related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties” (Art.4.7). It also calls for the promotion, development and diffusion of practices and technologies to limit or reduce GHG emissions from all sectors, including agriculture and forestry (Art.4.1(c)). The convention also calls upon Parties to cooperate in preparing for the adaptation to the impacts of climate change, with special reference to agriculture and water resources (Art 4.1(e)). The concept of LULUCF was included in the UNFCCC, which stressed the importance of preservation of stocks and enhancement of sinks. Land use activities, such as reforestation can remove GHGs from the

atmosphere, whereas other activities such as curbing deforestation can decrease the emissions of GHGs.

The Kyoto Protocol (KP) adopted in 1997 requested developed countries to take the leadership through Quantified Emission Limitation and Reduction Objectives (QELROs), thus imposing a binding commitment on Annex I Parties to reduce emissions by at least 5% -in aggregate- by the period 2008-12 when compared to 1990 levels. Agriculture is included in Art. 10 of the KP, which calls upon all Parties to undertake and actions to mitigate climate change and measures to enhance appropriate adaptation. Concretely, the KP allows developed country Parties to include LULUCF activities in their efforts to meet their targets by “calculating net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period” Art.3.3). Moreover, the Protocol empowered the Conference of the Parties (COP) to decide “how and which additional human induced activities related to changes in GHGs emissions in the agricultural soils, forestry and land-use change categories” should be added or subtracted from Parties’ assigned reduction amounts (Art.3.4).

Additional principles and rules for LULUCF activities were elaborated in the 2001 Marrakech Accords (UNFCCC 2001). These activities are: forest management, grazing land management, revegetation and cropland management. It is important to point out that the addition of LULUCF measures to Parties’ reduction commitments did not led to higher reduction targets and consequently resulted in limiting their potential as a means for mitigating climate change. Critics charge that “the inclusion of LULUCF should have led to more ambitious overall reduction targets, but this was not found acceptable by a number of Parties, among them the US” (ICSTD, 2009:6). So far only a few developed country Parties opted to take advantage of LULUCF.

The KP defines two ways to achieve GHG emission reductions: through internal actions taken in ANNEX I Parties and through newly established flexible mechanisms. Developed country Parties are allowed to trade emission reductions with each other under certain conditions for the purposes of achieving their commitments (Art.6), but there are caps on the number of units to be exchanged from LULUCF activities. Another market instrument set up by the PK is the CDM, which allows developed country Parties and private entities to finance projects in developing country Parties, which result in certified emission reductions and to count these in meeting their reduction commitments, while assisting the latter to achieve sustainable development (Art.12). Under the first commitment period of the KP, which ends in 2012, CDM LULUCF activities are limited to reforestation and afforestation (A/R).

Hence, many activities with the greatest value to rural communities in poorer countries are excluded from the CDM in the first commitment period with sink activities restricted to A/R. This led critics to argue that: “The CDM has essentially not captured the potentially significant mitigation potential in LULUCF in developing countries; to date there has only been one LULUCF project registered. It leaves out key LULUCF activities, and its project based approach has been too limited. Moreover, carbon credits from afforestation and reforestation under the CDM have not been sufficiently attractive to buyers due to their temporary nature” (ICSTD, 2009).

Reducing Emissions from Deforestation and Degradation (REDD) in developing countries was introduced to the UNFCCC in December 2005 and considered in the Bali Action Plan (BAP) in 2008, which states that enhanced action on mitigation of climate change should include consideration of, “policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries” (UNFCCC 2008). REDD is being discussed as a separate mechanism/ activity for the post-2012 period, and there strong arguments for expanding the CDM, and developing countries have proposed that agriculture be included under the CDM. For example, the African Bio-Carbon Initiative calls for a post-2012 agreement that encourages sustainable agriculture in Africa, including crediting and financial mechanisms that reward that reward better agriculture management practices that will help the poor adapt to climate change (Common Market for Eastern and Southern Africa, 2008).

Although agriculture and REDD are very interdependent because firstly most deforestation is due to agricultural expansion and secondly success on REDD could mean increased efficiency of food production on existing farmland. Furthermore, the incorporation of agriculture into the UNFCCC regime could encourage greater participation on the part of developing countries in reducing emissions in this sector, otherwise greenhouse emissions will dramatically increase. Indeed, “between 1990 and 2005, agricultural emissions in the developing world increased by 32% and are expected to continue to increase” (FAO 2009:1). In addition, technical mitigation potential for the sector is high and 74% of this potential is in developing countries. The IPCC and global financial indicators highlight that the magnitude of the challenge to stabilize GHG emissions will require the incorporation of agriculture into the UNFCCC regime, until new technologies are available.

Missing this opportunity to provide incentives for sustainable development of the agricultural sector means that several poor countries will, once again, be denied access to various mechanisms of carbon funding. While there is recognition of potential benefits from one common sector, there is little support from powerful

negotiating powers for linking agriculture and REDD in a post-2012 agreement. Indeed, despite intensive lobbying by the FAO, international agricultural institutions and a number of NGOs and despite their significant optimism prior to the Copenhagen Conference (see for example FAO 2009:1); the Copenhagen Accord of December 2009 did not incorporate agriculture into the UNFCCC regime (UNFCCC 2009).

One may ask why agriculture is not included in the UNFCCC regime since its inception. Are there really objective technical barriers to such inclusion? If not, what are the main obstacles? It is often argued by Parties that object to the incorporation of agriculture into the UNFCCC regime that there are major technical barriers to expanding the role of mitigation to agriculture. These can be summarized in the following:

Size: Agriculture is perceived to be a difficult sector for climate change mitigation due to the sheer size of land areas, the variation in ecosystems, and large number of farmers that would need to be involved. Yet one may argue that this breadth of opportunities, which exceeds largely that of forestry, is part of its potential, and represents strength rather than weakness of the sector.

Uncertainty and accounting: It is often argued that uncertainty associated with changes in LULUCF emissions and emission reductions can be large, especially when compared to for example fossil fuel reduction commitments. New Zealand (2008) for example states that there significant scientific uncertainty over what is really happening in some activities, such as those included in Article 3.4. The UNFCCC technical study on mitigation potentials in agriculture notes difficulties in some developing countries in establishing a baseline for agricultural mitigation activities due to lack of data, a high level of uncertainty and a lack of information for assessment. While this may be true, this barrier can be overcome by making Canada's carbon system accounting for soils and forests available to developing countries that lack capacity to establish a system of their own.

Leakage: it can occur within a country, region or at the global level. Indeed, the risk for global leakages due to, for example, REDD activities can be so high that emissions reduced in a country may be replaced by emissions in another (Robledo & Blaser 2008). This problem can be addressed through global collective participation in the climate regime and effective monitoring.

Permanence: it relates to the period of time that carbon remains in the biosphere. Lack of permanence increases uncertainty as there is a possibility that sequestered carbon can be emitted at any time, thus making emission reduction non-permanent. This issue is considered by many as a barrier to the full inclusion of agriculture into

the UNFCCC regime. Although it is difficult to meet the Kyoto permanence principle for soil sequestration projects as soil carbon fluxes occur, there are very reliable methodologies for baselines and monitoring that are already applied in Canada; and these can be adapted to developing countries' conditions for immediate experimentation. In addition, the Voluntary Carbon Standard (VCS 2008) has introduced reliable rules that allow agricultural and forestry activities to generate permanent carbon credits.

While there still methodological concerns related to these technical issues, these can be overcome- and need to be overcome-to induce developing countries to be full partners in climate change mitigation and adaptation efforts. The UNFCCC report (2008) on challenges and opportunities for mitigation in the agricultural sector stresses that uncertainties associated with the estimates of agricultural emissions and sinks, "need to be carefully considered and managed, but should not become an additional barrier for the implementation of mitigation measures in the sector because emission reductions can be estimated with the methodologies included in the IPCC guidance".

Consequently, the main obstacle is lack of political will on the part of the developed countries to honour their commitments in terms of technology and finance assistance to the developing ones. Indeed, financing and technology transfer have been since the beginning of global negotiations, major issues for negotiators. Developed countries are aware that including agriculture in the UNFCCC regime will impose on them additional financial and technology transfer commitments especially that developing countries insist on overcoming the two issues before any measurable and verifiable commitment. Although, at present, there are a variety of financial resources to fund such climate change mitigation and adaptation activities, "there is a considerable gap between identified needs and current pledges" (Jodie Keane, et al. 2009:17). As for the technology transfer, the main issue is intellectual property rights (IPR). IPR on seeds and improved varieties are a major concern for developing countries. Transfer of seeds, improved varieties and technologies are needed to increase the resilience of crops and livelihoods on those dependent on them. Developing countries call for making for climate change adaptation technologies to be patent-free or to be funded by the developed countries.

Conclusion and Recommendations

Although the agricultural sector emits 14% of total greenhouse gas emissions, it also has a unique role in absorbing carbon emitted from other sectors. Agriculture can provide alternatives to fossil fuels and oil-derived products. It can also sequester carbon in soils and biomass and enhance the resilience of the whole ecosystem. Also significant is the high potential that agriculture offers for synergies with climate change adaptation and key co-benefits of relevance to sustainable development. As emissions from agriculture are concentrated in the developing world, mitigation activities that can contribute to food security, poverty reduction, employment and resilience of agro-systems are crucial to sustainable development. Additionally, in most LDCs agriculture is the main sector of their economies and generates essential environmental services locally and globally. Yet agriculture has remained marginal within the climate change regime. Technical barriers have been repeatedly advanced as the main reason for such marginalization, yet methodologies to deal with these technical issues do exist and are being continuously improved and simplified; and one may argue that further improvements will come only once agriculture becomes eligible for generating emission reductions and financial incentives. As a consequence of this marginalization climate change financing mechanisms to support mitigation and adaptation have so far being highly inadequate in enhancing agriculture (and forestry) to contribute, in line with its important potential, to GHG reduction.

Although not part of the 2009 Copenhagen Accord or negotiations, an important step forward in Copenhagen was the announcement of the Global Research Alliance on Agriculture and Greenhouse Gas Emissions to which twenty-one nations pledged \$150 million to the effort. The main mission of the Alliance is to carry out R&D for better understanding and controlling greenhouse gas emissions from farming.

In conclusion we may argue that any strategy that seeks to mitigate global climate change without reducing emissions from agriculture is doomed to fail. Therefore, the question to be asked may not be, whether agriculture should be included in post-2012 UNFCCC regime, but whether it makes sense to keep it marginalized. This may happen in the short-run if developing countries, various interest groups and NGOs join their forces together in post- Copenhagen climate change negotiations.

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