Agriculture and climate change: Real problems, false solutions

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Executive Summary

Agriculture has entered the Copenhagen draft agreement. While few would deny that agriculture is affected by climate change and that the right practices contribute to mitigate it, expectations of the Copenhagen agreement diverge sharply, as well as notions on what are good and what are bad agricultural practices and whether any funding should come from carbon trading, or a fund or both..

Many Annex I countries want to see (virtually) all funding to come from offsets, emissions trading and projects in Non-Annex 1 Countries (largely the South). In 2008 a record 4.9 billion tonnes of carbon dioxide equivalent (CO_2e) emission reductions were traded on global carbon markets, and carbon trading increased by 83 per cent in just one year, but this trading has not led to a reduction in emissions. Since the Kyoto Protocol came into force in 2005, global CO_2 emissions have continued to increase.

Carbon trading does nothing to prevent emissions from fossil fuel burning in the North and there is strong evidence that Clean Development Mechanism (CDM) credits are being used to subsidise some of the most polluting industries in the South. Not surprisingly therefore, carbon trading has not delivered emissions reductions. Few have realized that there are several agricultural methodologies under the CDM, and many projects exist, particularly in relation to pig farms and oil palm plantations. These are contested for many reasons such as biodiversity destruction and soil and water pollution. These United Nations Framework Convention on Climate Change (UNFCCC) approved methodologies

1 First draft for the Bonn Climate Change Talks, June 2009. Both version are online available at www.econexus.info

actually help to subsidize and legitimise intensive industrial pig farms and plantations.

Offsetting is based entirely on the reduction of hypothetical emissions that would have taken place had the project not been in place. Hitherto there have been certain limits to the scope of CDM projects. Parties to the Kyoto Protocol had ruled that soil carbon sequestration and avoided deforestation are not eligible for CDM credits and furthermore, afforestation and reforestation can only account for 1% of Certified Emission Reductions. Now there is pressure to remove all these limits to offsetting. One reason given is that capacity to measure, report and verify emission reductions of certain agricultural methods has improved. However, the doubts regarding the sustainability of the methods themselves have remained.

There are proposals in the Copenhagen negotiation documents to render agricultural offsetting far easier by removing the exclusion of soil carbon sequestration from the CDM and by introducing sectoral policies and national mitigation actions which might again be financed through carbon trading. Unsurprisingly, businesses proposing hypothetical emission reductions are proliferating, such as the 25x'25 Coalition that predicts additional annual gross revenues for the US agriculture and forestry sector of over $100 billion from US domestic offsets, corresponding to 50 percent of the total value of US agricultural production.

Although the potent gases nitrous oxide (N_2O) and methane represent the largest direct emissions from agriculture, the emphasis of the agriculture debate in the context of a Copenhagen agreement is based on carbon sequestration in soils, a consequence of the dominance of the offset approach. Soils are complex systems with rich biodiversity, organic matter, water flows, complex layers and aggregates. Degradation comes fast, while the building of soils takes decades or centuries. Soils, already degraded in many regions, are very likely to suffer from the proposed methods to sequester carbon.

The inclusion of soil carbon sequestration has been proposed by the United Nations Convention to Combat Desertification (UNCCD) and several governments, with biochar explicitly mentioned.

No-till, which has repeatedly been proposed by biotech companies, is included 'by default'. Propositions in UNFCCC workshops and side events also include agricultural practices such as intensification of industrial livestock production, GM crops and bioeconomy, and the use of so-called marginal land.

In **non-tillage agriculture** (no-till or NT), soil carbon emissions are meant to be reduced by not disturbing the soil through tillage. Weeds are killed off through the application of herbicides instead, and genetically modified (GM) crops tolerant to herbicides lend themselves to this practice. But while experience from existing large scale no-till agriculture (especially with GM soya in Argentina and other crops in the US) show negative impacts on environment and climate, the capacity to sequester carbon in no-till soils is not conclusively proven. It is also largely unknown how no-till impacts on soil respiration, de-nitrification, N_2O emissions and thus overall greenhouse gas emissions, and how it compares to other management systems. In view of the inconclusive data, the fact that FAO calls for offsets from NT or "conservation agriculture" together with the biotech industry runs contrary to the independence required/expected from an UN institution.

Biochar is proposed as a new form of soil carbon sequestration in which fine-grained charcoal is applied to the soil. This carbon is identical to *black carbon* which is known for its negative impacts on climate change when airborne. The International Biochar Initiative (IBI) argues that applying charcoal to soils would create a reliable and virtually permanent carbon sink, mitigate climate change, and make soils more fertile. In support, the IBI cites past applications of charcoal such as Amazonian Dark Earths in which charcoal has been used together with varied organic residues over long periods. These, however, bear little resemblance to what is currently being proposed. Even studies by scientists who are members of the IBI indicate high levels of uncertainty and contra-indications. The burning of biomass to produce charcoal is described as close to carbon neutral because greenhouse gas (GHG) emissions during combustion are supposedly offset by CO_2 absorption in new growth, but this ignores impacts of conversion or degradation of the large areas of land needed, estimates range from half to two billion hectares.

It is also unclear what percentage of black carbon will remain in the soil, for how long, and how much will be turned into CO_2 and emitted again. Recent research shows that adding charcoal to soil sometimes even *increased* soil organic carbon losses, resulting in CO_2 emissions.

Risks also lie in the fact that small black carbon particles, if they become airborne, can significantly worsen global

warming. Significant black carbon losses during biochar application have been documented and soil erosion is another way for them to become airborne.

Nevertheless, biochar is proposed among others by the UNCCD, by a number of African countries and Belize, Costa Rica, Micronesia and, with a qualification, Australia. UNCCD is referring to IPCC, which, however, has not come to any conclusion on biochar and did not comment on it in its most recent Assessment Report. Over 150 civil society organisations have rejected biochar as an offset method.

Industrial livestock production is a major emitter of greenhouse gases, mainly nitrous oxide and methane. Grain feed production currently uses one third of global cropland and chemical fertilizers that are responsible for most of the anthropogenic nitrous oxide emissions. Yet the response is to propose intensification of industrial livestock production which is likely to deepen current problems instead of solving them. The same is true for aquaculture, which increasingly turns to the same feed resources as livestock. Grasslands represent a third of terrestrial carbon stores, mainly in their root mass, and they evolved in co-existence with livestock. Wrongly, extensive grazing is blamed for harming the climate. When grasslands are turned over to crops, often for more feed for ever more livestock, they release their carbon stores to the atmosphere.

Removing most of the animal products from Northern diets has become an imperative. The question how to achieve this has to be put on the UN agenda, the more so as, according to FAO, animal products are not required for a healthy diet, contrary to widespread belief. The intensification of livestock and aquaculture is not a sustainable option.

GM crops and further moves towards a "bioeconomy" have not yet been proposed as such for offsetting, but they are being advocated as likely solutions to a wide range of problems linked to climate change. In particular GM is presented as a means to increase yields on existing agricultural land, even though no crops have actually been engineered for yield increase and current GM crops have not led to increased yields but only some temporary reduction of losses. Hundreds of patent applications have been made for so-called "climate ready" GM crops. Promised solutions include extending the geographic and climatic range of crops and their capacity to tolerate salt, drought, heat and floods, as well as genetically engineering plants so that applications of nitrogen fertiliser can be reduced. In fact, such crops have been heralded since the 1980s, promising drought and salt tolerant crops and nitrogen-fixation as a means to combat hunger but no such GM crops have yet been launched. At the same time GM crops have led to problems such as serious herbicide resistance among weeds, requiring additional herbicide applications, with negative impacts on environment and climate. There are ambitious plans to develop a new bioeconomy based on biomass refineries to produce substitutes for fossil oil. The biotech industry clearly sees climate change as an unlimited opportunity for expansion and is lobbying for GM to be recognised as offering key solutions that must be protected by strong intellectual property rights.

Another proposal is to increase the acreage for agriculture by using so-called "**marginal" lands**. However, unused land is rare. What's seen as marginal land is often land used by marginalized people, by economically weaker sectors of communities. Much of it is communal land, collectively used by local people who might not have an individual land title, but for whom it is a vital resource for water, feed, food, medicines, fuel and other purposes. Such land is also essential for biodiversity, water supplies, soil and ecosystem regeneration.

FAO was in favour of major increases in funding for agriculture in a Copenhagen agreement arguing that "millions of farmers around the globe could also become agents of change helping to reduce greenhouse gas emissions". Their land may now become the target of businesses that intend to sequester carbon in soils.

This report does not address the existing positive options for an agriculture that mitigates climate change. They have long been advocated by, for example, the world's largest organisation of smallholder farmers, Via Campesina. These options have hardly been registered by the climate talks in the run up to Copenhagen. The challenge for a post-2012 climate agreement besides setting meaningful policies for reducing emissions, is to withstand the lobbying of companies seeking to extract carbon credits from agriculture.