

E-Paper

## **Climate-Smart Agriculture: myths and problems**

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## Introduction

The concept of “climate-smart” agriculture was invented by the UN Food and Agriculture Organization (FAO) in 2010. According to the original definition, “climate-smart” agriculture “sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals.” However, civil society organizations criticized the concept from its earliest days, calling attention to the emphasis in FAO and World Bank promotion materials for “climate-smart” financing to come principally through measuring and commodifying soil carbon that would be sold and traded in carbon markets.

The FAO, World Bank, and developed country government promoters of “climate-smart” agriculture such as the Netherlands and the United States have since developed a more sophisticated political approach to sell the concept, through a new initiative called the Global Alliance for Climate-Smart Agriculture. However the concept still remains a Trojan horse for carbon markets, as well as GMOs and synthetic fertilizers. In a new twist, the Global Alliance also provides for new ways of greenwashing “climate-smart” industrial agriculture, with the active involvement of private corporations such as Syngenta, Yara, Kellogg’s, and McDonald’s.

## Agriculture and climate change

Agriculture faces many challenges in the face of climate change. Billions of people around the world, including the poorest

and most vulnerable smallholder and landless farmers, depend on food production for their lives and livelihoods. Climate change, with increasingly variable rainfall and increasing temperatures, poses a serious threat to crop, livestock, and fisheries production. Global yields of maize and wheat have already been shown to be reduced by 3.8% and 5.5% respectively since 1980, relative to what they would have been in the absence of climate change due to changing climates.<sup>1</sup> Continuing warming of the atmosphere, reduction in rainfall in areas of rainfed crop production, increase in pests due to warming, and other climate-change-related impacts, pose real and serious threats to global, national, and local food security and sovereignty. Agricultural adaptation to climate change impacts should be one of the most pressing concerns of governments, and indeed anyone who eats.

Agriculture is also the source of greenhouse gases. Both cattle and rice production contribute vast quantities of methane, a powerful greenhouse gas. Nitrous oxide, another powerful greenhouse gas – almost 300 times more potent than carbon dioxide – is released to the atmosphere during the production of synthetic nitrogen fertilizers. It is also released from soils that are fertilized. Emissions<sup>2</sup> from the agriculture sector of both these gases together amount to between 10 and 12%<sup>2</sup> of total global greenhouse gas emissions. Much of the greenhouse gas contribution from agriculture comes from industrial agriculture production methods and rich-country consumption patterns. Industrial-scale agriculture is particularly

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<sup>1</sup> Lobell, D.B., et al. 2011. Climate trends and global crop production since 1980. *Science* 333: 616-620.

<sup>2</sup> Smith, P., et al. 2014. Agriculture, forest, and other land use (chapter 11), in *Climate Change 2014: Mitigation of climate change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.

dependent on use of synthetic fertilizers, rather than organic manures and composts. Synthetic fertilizers contribute significantly more greenhouse gases to the atmosphere than organic fertilizers, owing to emissions during their production. In fact, the production of synthetic fertilizers globally alone is responsible for about 1% of total global greenhouse gas emissions.

Industrial-scale livestock production (sometimes called factory farming) is also differentially responsible for more emissions than small-scale production; concentrated lagoons of animal manure emit substantially more methane than manure from free-ranging animals. Also contributing to the substantially greater per capita emissions from agriculture in developed countries is the much greater consumption of meat products by the wealthy of the world. Per capita consumption of meat in the developed world is many times that of the poorest developing countries. (see table below).<sup>3</sup>

### **Why “climate-smart”?**

The FAO focuses its work in developing countries, with a mandate that includes helping to eliminate hunger and food insecurity, and increasing the resilience of livelihoods to disasters. Of course the organization should be devoting considerable resources and effort in helping developing countries address the impacts of climate change on agriculture.

However the FAO took a rather misguided wrong turn in the mid-2000s when it jumped on the carbon market bandwagon. At that time there was some money to be made in buying and selling

carbon on the carbon market, particularly through the Clean Development Mechanism of the United Nations Framework Convention on Climate Change. Economists and agronomists within the FAO reasoned that the carbon in agricultural systems – in soils and in trees (perennial crops and agroforestry) – could be quantified and sold. They lamented continually declining investment in agriculture, noted the significant new resources that would be needed for adaptation, and began to promote the idea that new monies for agriculture could be generated by selling on the global carbon market carbon that was sequestered in agricultural soils. They thought all that was needed were better technologies to measure soil carbon and new rules to allow this type of carbon to be traded.

Their faith in both the market and the commodifiability of soil carbon was misplaced. The carbon market has since completely collapsed, with carbon prices now hovering at a few cents per ton, from a high of over \$30 per ton just a few years ago. Far more problematic were the scientific assumptions that commodification of soil carbon was based on – that it could be measured and that it was stable enough to sell. But, soil carbon is highly volatile – storage in soils is only temporary and so very problematic and costly to measure, account for, and convince someone to buy. Moreover, increases in global temperatures and changing moisture patterns are likely to cause significant reversals over time – carbon in soils is usually in organic forms that are degraded more quickly at higher temperatures. Finally, some of the most important practices that were being marketed as increasing soil carbon content, in particular no-till

farming, have been shown to not really increase soil carbon content at all.<sup>4</sup>

Carbon sequestration was central to the FAO concept of “climate-smart” agriculture. In their original definition, FAO calls “climate-smart” agriculture a “triple-win” – providing at the same time mitigation (carbon sequestration – not emissions reductions), adaptation, and increased productivity. Many of the practices that sequester carbon are also beneficial for adaptation, such as the use of cover crops and the addition to soils of compost and manure; healthier soils lead to increased and more stable productivity. But central to the concept of “climate-smart”, indeed, its most problematic element, is its dependence on the “mitigation potential” that exists in the soils and agroforestry systems of developing countries, which the FAO, the World Bank, and the CGIAR centers thought would generate new and substantial monies for agricultural investment.

## **The global politics of mitigation in agriculture: shifting the burden from the North to the South**

Agricultural emissions per capita are substantially higher in developed countries than in developing countries. This fact is a real problem in particular for developed country agricultural exporters, such as the United States and New Zealand. If they want to continue to grow this sector of their economy, their greenhouse gas emissions from agriculture will continue to rise. These developed country exporters need to shift the focus of attention on agriculture

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<sup>4</sup> Powlson, D.S. et al. 2014. Limited potential of no-till agriculture for climate change mitigation. *Nature Climate Change* 4: 678-683.

emissions away from themselves, towards the “mitigation potential” elsewhere.

Climate-smart project countries			Climate-smart donor countries		
	Annual per capita meat consumption (kg)	Per capita NO <sub>2</sub> emissions from agricultural soils (tons CO <sub>2</sub> eq)		Annual per capita meat consumption (kg)	Per capita NO <sub>2</sub> emissions from agricultural soils (tons CO <sub>2</sub> eq)
India	5.2	0.18	Australia	117.6	0.71
Kenya	15.4	0.27	Canada	96.3	0.97
Malawi	5.1	0.66	Ireland	100.7	2.51
Tanzania	9.5	0.21	Netherlands	77.8	0.47
Viet Nam	34.9	0.16	United Kingdom	83.9	0.43

Source: Author's own elaboration based on FAOSTAT, US EPA, UNDP reports.

It is really a boon, then, for industrial countries to be able to redirect the conversation on reduction in agricultural emissions to carbon sequestration potential in the soils of the developing world. This framing conveniently ignores completely the enormous potential in the North for reducing fertilizer production and use and reducing meat production and consumption. In an early analysis, the International Food Policy Research Institute (an economics think tank associated with the CGIAR and the World Bank) estimated the soil and tree carbon sequestration potential of the terra nullis of the African continent to be worth up to 4.8 billion dollars a year. Figures like that are used to distract attention from high-consumption societies and high-emissions agriculture. The promise of payout for

action lures many countries to the table to undertake mitigation actions in agriculture, no matter how little they contribute to the problem.

### **The Global Alliance for Climate-smart Agriculture: A Trojan horse for corporate capture of the “climate-smart” label**

To move the concept of “climate-smart” agriculture forward, a number of developed countries, led by the Dutch government and the World Bank, with the US, FAO, and CGIAR playing important supporting roles, sought to create a more formal institution. The first meeting to try to generate enthusiasm for a global alliance was held in The Hague in 2010, with subsequent meetings in Hanoi in 2012 and Johannesburg in 2013. Despite tepid reception of the idea to create a more formal alliance by most participating countries at each of these meetings, the main proponents have not been deterred in their efforts.

Indeed, these same actors are now attempting to create what they call the Global Alliance for Climate-Smart Agriculture. The original emphasis on “triple-win”, with its controversial foregrounding of agricultural mitigation, is now being qualified and nuanced. However while hidden, this essential element of “climate-smart” remains in the founding document, such as in the list of collective actions to be taken: “promote the development of rigorous metrics [i.e., methodologies] to assess ... reduced GHG emissions”. As further evidence that mitigation by smallholders is still very much part of the “climate-smart” agenda, the key technical support arm of the Alliance, the CGIAR, recently wrote that “smallholder farmers

provide up to 80 percent of the food supply in sub-Saharan Africa and Asia. Yet very little is known about either the contribution of smallholder systems to GHG emissions or the options for smallholders to mitigate their emissions. ... CCAFS is coordinating research to gather the basic data on emissions that smallholder farmers ... need.”

Many civil society organizations to this point have been cautiously watching the development of the Alliance; a growing number are now rejecting completely the Alliance and “climate-smart” agriculture. The groundswell against “climate-smart” agriculture in general, as well as its main organizational face, the Global Alliance, is growing. Civil society organizations, farmer organizations, and grassroots movements around the world are joining together to reject “climate-smart” agriculture and the Alliance, based on a series of important concerns, including:

- “Climate-smart” agriculture shifts the burden of mitigation from developed to developing countries – those least responsible for the problem are being pushed to create and carry out the solutions. The responsibility for mitigation in the agriculture sector rests squarely in the North – the countries of the North should lead with emissions reductions by drastically reducing production and use of synthetic nitrogen fertilizers, and by drastic reduction of meat production and consumption.
- The most urgent need of small farmers and rural communities is to focus on adaptation. Climate-change and impacts from climate change are already happening; the

threats to food security and food sovereignty will only continue to increase in the coming years. In some regions, communities will have no choice but to move out of agriculture altogether. Given the severity of the coming impacts, all attention should be focused on providing tools and financing for countries and communities to protect their food security and food sovereignty from the impacts of climate change.

- The Global Alliance has begun to reach out to corporations, broadening membership beyond governments to the private sector. At the last meeting of the Alliance in The Hague, Syngenta (GMOs), Yara (nitrogen fertilizer), Kellogg's (sustainable rice), and McDonald's (sustainable beef) were active participants. The Global Alliance will also now provide a new means of greenwashing for these and other agro-industrial corporations. A recent publication of the CGIAR showcases herbicide-tolerant GMO canola in Canada as an example of "climate-smart" agriculture. In its latest briefing document, the Alliance announced a series of actions it will encourage, including: "increased sourcing of food produced through climate-smart practices by the private sector." Instead of encouraging the reduction of meat consumption in the North, the Alliance will encourage consumption of "climate-smart" beef, an insidiously dangerous oxymoron.

## Real solutions

The real solutions to climate change in farmers' fields must be the climate-resilient practices of ecologically based agricultural systems, not the market/mitigation-oriented “triple-win” of “climate-smart” agriculture.

“Adaptation measures such as ... diversifying crop rotations, integrating livestock with crop production systems, improving soil quality, minimizing off-farm flow of nutrients and pesticides, and other practices typically associated with sustainable agriculture are actions that may increase the capacity of the agricultural system to minimize the effects of climate change on productivity. For example, ... production practices that enhance the ability of healthy soils to regulate water resource dynamics at the farm and watershed scales will be particularly critical for the maintenance of crop and livestock productivity under conditions of variable and extreme weather events. Enhancing the resilience of agriculture to climate change through adaptation strategies that promote the development of sustainable agriculture is a common multiple-benefit recommendation for agricultural adaptation.”<sup>5</sup>

Our governments should be taking real and positive action to increase climate resilience in agricultural systems. At the upcoming climate summit in New York, governments should stand opposed to the introduction of the Global Alliance for Climate-Smart Agriculture and instead should promote actions to:

- promote a research and knowledge-sharing agenda on ecological agriculture, adaptation, and climate resilience with

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<sup>5</sup> United States Department of Agriculture. 2013. Climate change and agriculture in the United States: effects and adaptation. CCPO Technical Bulletin 1935, p. 6.

emphasis on women farmers, and farmer, indigenous, and traditional knowledge-sharing systems;

- focus on building resilience with strong social protection programmes, such as the Food Security Climate Resilience Facility of the World Food Programme (WFP); and
- increase national and international investment in climate-resilient, ecological agriculture, including agroecological approaches, such as through the Adaptation for Smallholder Agriculture Programme of the International Fund for Agricultural Development (IFAD)

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Dr. Doreen Stabinsky is Professor of Global Environmental Politics at College of the Atlantic in Bar Harbor, Maine. Her research focuses on the impacts of climate change on agriculture and food security, adaptation and adaptation institutions under the UN Framework Convention on Climate Change (UNFCCC), and on the emerging issue of loss and damage from slow onset impacts of climate change. She is also an independent consultant and serves as advisor to a number of governments and international NGOs on issues related to agriculture, adaptation, and loss and damage under the UNFCCC. She was recently appointed as a member of the Independent Review Panel for the first overall evaluation of the UNFCCC Adaptation Fund. She has represented various NGOs and the College of the Atlantic in numerous intergovernmental forums, including the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity, the UN Food and Agriculture Organization, the UN Commission on Sustainable Development, and the World Trade Organization. Doreen studied economics at the undergraduate level and has a Ph.D. in genetics from the University of California at Davis.

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