

# Fixing the world's climate 'foodprint'

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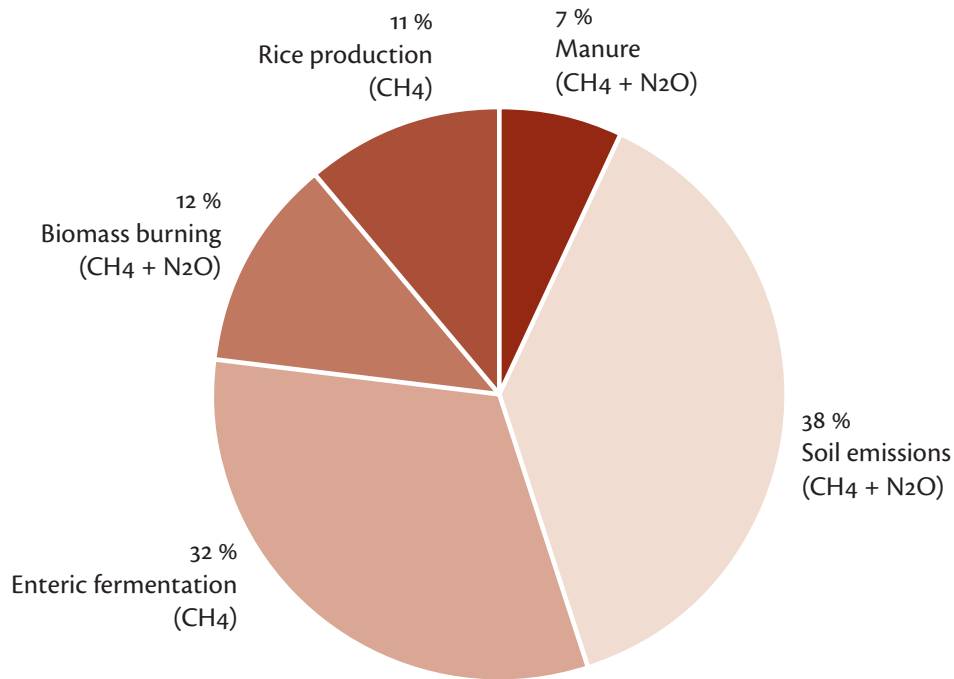
In the framework of the global climate talks, the international community is struggling to identify agriculture's potential for helping to cool the climate. The discussions are complicated by scientific uncertainties that hamper decision-making.

One thing is certain and unanimously recognised: agricultural production is vulnerable to climate change. Extreme weather events, as well as changes in average temperatures and precipitation levels, are affecting production capacities. A series of droughts in a few key grain-producing regions in 2006-07 contributed to the panic that led to the food price crisis last year. More than 1 billion people are suffering from hunger in 2009, and the impact of climate change on food security is set to become more serious in the coming decades.

Agriculture also contributes to climate change, although the extent needs to be better understood. According to the Intergovernmental Panel on Climate Change (IPCC), agriculture's contribution to global greenhouse gas (GHG) emissions is approximately 12 per cent – the emissions are mainly methane and nitrous oxide. Figure 1 shows the main sources of emissions.



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*Figure 1: Main sources of GHG emissions in the agricultural sector (ITC - FiBL 2007, based on IPCC figures)*

According to Greenpeace International, if land use, transportation, packaging and processing of agricultural products are included in the calculations, agriculture's contribution to global greenhouse gas emissions is somewhere between 16 and 30 per cent.<sup>1</sup> This proportion grows if we take a food system-wide approach (including distribution, consumption and disposal). Under the IPCC's classifications, these other emissions are accounted for by other sectors such as forestry, transport and energy.

In light of the significant contribution our food systems make to climate change and the urgent need to curb global greenhouse gas emissions, addressing our climate 'foodprint' – that is, the contribution of food production

to climate change – is critical. The convergence of multiple crises – a global economic recession, global warming, hunger and the depletion of natural resources, etc. – reinforces the need to identify integrated solutions.

### *The temptation of quick fixes*

There is a strong temptation to hope that 'miracle solutions' will reverse climate change. In the case of agriculture, technical fixes and market-based solutions attract most of the attention, particularly in the framework of the initial discussions at the United Nations Framework Convention on Climate Change (UNFCCC).

Genetic manipulations applied to plants and animals are described as promising ways to reduce emissions from agriculture. In particular, the livestock industry hopes that high-

<sup>1</sup> Bellarby et al. (2008), <http://www.greenpeace.org/international/press/reports/cool-farming-full-report> (accessed 29 May 2009)

tech breeding techniques or the use of vaccines will help curb methane emissions from cows and sheep – those represent about one-third of all agricultural emissions according to the IPCC. New Zealand is leading an ambitious international research network on this topic called LEARN.<sup>2</sup> The seed industry, Monsanto in the lead, is promoting drought- and heat-resistant crops. Climate change mitigation and adaptation are becoming new arguments in the quest for profits by transnational agribusiness companies.

A newly formed international industry alliance – the International Biochar Initiative – is actively promoting the use of ‘Biochar’ as a way to maximise the potential of soil carbon sequestration, where 89 per cent of agriculture’s mitigation potential lies, according to the IPCC. Biochar is a process consisting of the combustion of biomass, producing charcoal that is then buried in the soil. Supporters claim biochar could help turn unused land into gigantic carbon sinks.

Finally, New Zealand supports the design of an ‘optimal global production pattern for agriculture’. In other words, let those countries whose agricultural production is most efficient in climate terms feed the world. This might be tempting in theory – in reality though, the recent food price hike reminded everyone that food security is about *access* to food, not availability. New Zealand’s proposed focus on trade liberalisation to solve the climate crisis would come at the expense of food security.

At the time of writing, New Zealand is *de facto* leading the discussions on mitigation

from agriculture at the UNFCCC. Few other countries have clear positions in relation to the sector, despite its importance for food security, rural livelihoods and the economic and ecological wellbeing of many of the world’s countries. As a result, most of the options on the table seem only to take us further down the very same energy-intensive path that created the current climate and food crises. It is time for a real paradigm shift to create low input, sustainable and resilient food systems around the world.

## *Real solutions*

### *Build on agriculture’s multifunctionality*

Absent from current international climate discussions is an essential aspect of agriculture’s role in ‘cooling the earth’, multifunctionality. The International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD) – a groundbreaking international and multidisciplinary report endorsed by 58 governments in 2008<sup>3</sup> – stressed that ‘multifunctionality recognises the inescapable interconnectedness of agriculture’s different roles and functions’. Not only does agriculture provide the food we all need to live an active and healthy life, it is also a source of livelihood for about 2.6 billion people, an engine for economic development, a part of the culture of many peoples and an integral part of environmental management. Because the climate negotiations fail to take these different dimensions into account in an integrated manner, the technical or market-based solutions currently under consideration are bound to fail.

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<sup>2</sup> <http://www.livestockemissions.net/>

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<sup>3</sup> <http://www.agassessment.org/>

Despite its importance, the climate crisis cannot be considered in isolation from other global crises such as the global food security crisis. In this context, it would be misleading to adopt an approach focused on reducing greenhouse gas emissions without considering other social, economic or environmental aspects. Additionally, because agriculture is both a contributor to and a victim of climate change, we need to focus on solutions that contribute to mitigation as well as adaptation – not one or the other.

*‘The way the world grows its food will have to change radically’ – IAASTD*

There are a number of ways to cut emissions from agriculture. Out of the list of technical options outlined by the IPCC,<sup>4</sup> some provide numerous co-benefits for agriculture’s other functions. Rather than going through the technical options, we present a few principles to guide a profound reform of food systems that takes into account the need to curb our climate ‘foodprint’ and build resilient food and farm systems.

- *Adopt a rights-based approach to agriculture and climate policies*

Human rights enshrine the principles of participation, accountability and transparency. Democratic decision-making around food and climate policies is a challenge but also a fundamental precondition to achieving sustainable solutions.

A rights-based approach calls for action focused on the needs of the most vulnerable. As Germanwatch and Brot für die Welt put it, ‘it is generally likely that those already suffering from undernourishment and hun-

4 For that, see Smith et al. (2007).

ger are also among those most at risk from climate change’.<sup>5</sup> In the wake of the global food price crisis, there is increasing recognition that small-scale farmers and agroecological production methods need to play a central role in solving the global hunger and environmental crises.<sup>6</sup> IAASTD pointed to the relevance of indigenous and traditional knowledge in building a climate-friendly agriculture system. The UN Environmental Programme (UNEP) and the UN Conference on Trade and Development (UNCTAD) point to the failure of ‘the great technological progress of the past half century’ in reducing hunger in developing countries.<sup>7</sup> Finally, the UN’s Comprehensive Framework for Action on the 2008 food crisis emphasised the specific role of small-holder farmers in building resilient food systems and eradicating poverty.

For all these reasons, small farmers and indigenous groups need to be central in discussions about agricultural mitigation strategies and policies. Via Campesina, an international network comprised of small farmers’ organisations, is raising serious concerns about the direction of the current climate talks: its call to mobilisation for Copenhagen is entitled ‘Stop! The UNFCCC is going off the rails!’ Ignoring these concerns would be unwise and would compromise the likelihood of an effective outcome.

- *Prioritise soil fertility, low-input farming systems*

Nitrous oxide emissions from soils represent about 38 per cent of emissions from agri-

5 Bals et al. (2008).

6 See, for instance, the UN’s *Comprehensive Framework for Action* (2008) or UNEP-UNCTAD (2008).

7 UNEP-UNCTAD (2008).

culture. The excessive use of agrochemical products, particularly synthetic fertilisers, is a major contributor. Greenpeace stresses that 50 per cent of the nitrogen used in farming is lost to the environment<sup>8</sup> – there is a critical need to get rid of this overuse. Chemicals are also responsible for land degradation and water pollution. Reducing the quantities used, or using organic fertilisers where possible, would have multiple benefits: reducing greenhouse gas emissions, but also restoring water quality or reducing production costs for farmers. Agricultural policies – particularly in Annex I countries, China and India – need to move away from subsidising harmful fertiliser-use towards incentives for low-input farming systems.

In many developing countries, productivity will need to increase significantly in the coming decades to meet the food needs of a growing population without increasing the demand for new productive land that puts pressure on forests – conversion of forest into agricultural land is a major source of CO<sub>2</sub> emissions. Restoring or maintaining soil fertility can contribute to this effort. More attention needs to be paid to numerous studies which have shown that sustainable agriculture, including organic agriculture, has significant potential to increase yields.<sup>9</sup> Organic agriculture also allows an increase in the amount of carbon sequestered in soils, as do agroforestry systems and the use of cover crops, for instance. Methods of production which protect the carbon that is stored in soils need to be given priority, particularly since they also provide benefits for productivity by enhancing soil fertility.

8 Bellarby et al. (2008).

9 UNEP-UNCTAD (2008).

- *Move away from monoculture, towards diversified production systems*

Over the past three decades, the development of commercial agriculture around the world has favoured large, specialised farms organised around a monoculture. The development of soy cultivation is a particularly illustrative case: the crop now occupies about half the agricultural land in Argentina, Bolivia, Brazil and Paraguay. Soy is mostly used as animal feed in livestock operations.

There are numerous reasons why the viability of such a model is questioned. In terms of climate policy, these farms are of particular concern because of the energy they require (machinery, fuel, chemical fertilisers) and because of their vulnerability to climate shocks.

In contrast, diversified systems provide the opportunity to develop synergies between different types of production (for example, crop rotations, use of animal waste to fertilise crop production) and increase the farm's resilience in the face of climate shocks.

- *Address livestock's long shadow*

The FAO's groundbreaking report *Livestock's Long Shadow*, released in 2006, traced all emissions related to meat production: from deforestation to the use of fossil fuel in production and transport of processed and refrigerated animal products, to the production of feed, to land degradation in grazing areas, etc. It concludes that 'overall, livestock activities contribute an estimated 18 percent to total anthropogenic GHG emissions'. In a recent *New York Times* editorial, Nicholas D. Kristof stressed that '[a]n industrial farm with 5,000 hogs produces as much waste as a

town with 20,000 people'.<sup>10</sup> Methane emissions from liquid slurry are only one aspect of this contribution to environmental contamination.

The FAO report presents a series of options for mitigation that need to be considered urgently. It is also clear that serious reconsideration of meat-based diets that prevail in Western countries, and are growing in developing countries, is much needed. Dr Rajendra Pachauri, chair of the IPCC, himself launched this call: 'Please, eat less meat: it's a very carbon intensive commodity!'

- *Rethink the organisation of the food chain, and cut waste*

Measuring the climate impacts of the post-production stages of the food chain (transportation, refrigeration, cooking) poses challenges. The emergence of the 'food miles' concept – to identify emissions associated with the air-freight of fresh products – has triggered considerable controversy, emphasising the need for further research and discussion of the issues.

In a recent report,<sup>11</sup> the UNEP emphasises that '[c]hanging the ways in which food is produced, handled and disposed of across the globe – from farm to store and from fridge to landfill – can both feed the world's rising population and help the environmental services that are the foundation of agricultural productivity in the first place'. Over half the food produced globally today is lost, wasted or discarded as a result of inefficiency in the human-managed food chain. In the

<sup>10</sup> *New York Times* (2008), 'Obama's "secretary of food"?'', 11 December.

<sup>11</sup> UNEP, *The Environmental Food Crises: Environment's Role in Averting Future Food Crises* (2009).

US, the retail sector has loss rates of about 26 per cent. This represents an enormous amount of wasted energy and emissions as well. The multiple crises we face today call for a fundamental reorganisation of the way food chains are organised. Climate-related concerns will need to be central in this reorganisation, without underestimating other benefits for consumers and producers associated with a decrease in the number of intermediaries.

### *Conclusions: next steps*

A shift towards practices that diversify marketable products, close waste loops and reduce the need for external energy and fossil fuel inputs will help mitigate the climate problem, reduce energy use and pollution and create more adaptive food and agricultural systems. This shift is ambitious and requires the development of strong agriculture and food policies, with incentives for climate-friendly practices and sanctions against harmful practices. To pave the way for this shift, below are a few recommendations for more immediate measures.

#### *a. An agenda for agriculture research*

Too much uncertainty still exists about the interactions between agriculture and climate change – more research is certainly needed to overcome this gap. However, the focus of the research matters. Following the assessment of the IAASTD, governments need to recognise both that the multifunctionality of agriculture calls for multidisciplinary approaches to the sector, and that local, indigenous knowledge must be respected and more highly valued than it has been to date.



Research needs to focus on how to make agroecological methods more productive and on how to disseminate better what we already know these methods can achieve. In a recent report on organic agriculture and climate change, the International Trade Centre stresses, ‘as 99 percent of the world’s public and private research funds have focused on optimizing conventional and integrated food and farming systems during the last decades, major progress and solutions can be expected as a result of agro-ecological and animal welfare research activities’.<sup>12</sup> Substantial funding will be needed to support this new research agenda.

*b. Raise awareness and mobilise public opinion*

‘History shows that most struggles for great change – such as the abolition of slavery or the emancipation of women – started not as the initiative of states but as the endeavour of ordinary people.’ These words of Amnesty International Secretary General Irene Khan are particularly relevant to the climate challenge. There are many cases where ordinary people are ahead of their governments in implementing climate-friendly practices, in particular in their consumption habits. Food is a sector where more outreach and dissemination effort is needed so that consumers can make choices that will ultimately put pressure on policies. But more can and needs to be done to raise public awareness about the relationship between their food and the climate. A good mix of ambitious leadership and grassroots mobilisation will be necessary to move us in the right direction.

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<sup>12</sup> ITC-FiBL (2007).

*c. Refocus international climate negotiations*

There is no getting around the fact that climate change is a global problem. It requires global solutions and fair systems to support those who are most at risk (generally those least responsible for the problem). Multilateral negotiations are thus critical.

But existing proposals and the dynamics of the negotiations at the UNFCCC fall far short of the challenge and the emergency. The global climate talks need to be refocused. First of all, governments must ensure the meaningful participation of affected groups, such as farmers’ organisations, indigenous peoples and environmentalists. At the same time, industry’s activism in promoting quick fixes needs to be controlled. The private sector’s contribution is vital, not least their capacity to innovate and disseminate new technologies. There must be criteria in place for any public support for such initiatives, however, to ensure a desirable outcome beyond quick profits for the firms involved.

The push to include agriculture as a specific sector in the framework of the negotiations strictly so that it can benefit from carbon credits is troubling. Without even going into the reforms that would be needed to make the Clean Development Mechanism work for sustainable agriculture, it is clear that carbon prices would crash under the associated explosion of credits. The recent financial crisis should be enough of a warning against the risks of excessive speculation on carbon markets. More research, scientific evidence and pilot projects are needed before making decisions that could overhaul the global landscape of agriculture.

Finally, UNFCCC Annex I countries need to confront their historic responsibility, particularly in shaping existing food systems. They need to contribute proportionately to the identification and implementation of comprehensive solutions. This can be done through policy reforms, research and more support to developing countries to build climate-friendly food systems.

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