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## Small Scale Sustainable Farmers Are Cooling Down The Earth

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# Small Scale Sustainable Farmers Are Cooling Down The Earth

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Via Campesina Views



Jakarta, December 2009

Design : Ikez

# Small Scale Sustainable Farmers Are Cooling Down The Earth

Current global modes of production, consumption and trade have caused massive environmental destruction including global warming that is putting at risk our planet's ecosystems and pushing human communities into disasters. Global warming shows the effects of a development model based on capital concentration, high fossil energy consumption, overproduction, consumerism and trade liberalization. Global warming has been taking place for decades, but most governments have refused to deal with its roots and causes. It has been only recently, once transnational corporations have been able to set up huge money-making schemes, that we hear about possible solutions designed and controlled by big companies, and backed up by governments.

Farmers - men and women - around the world are joining hands with other social movements, organizations, people and communities to ask for and to develop radical social, economic and political transformations to reverse the current trend.

Industrialized countries and the industrialization of agriculture are the biggest sources of global warming gases, but it is farmers and rural communities - and especially small farmers and rural communities in developing countries - that are among the first to suffer from climate change. Changing weather patterns bring unknown pest along with unusual droughts, floods and storms, destroying crops, farmlands, farmstock and farmers houses. Moreover, plants, animal species and marine life are threatened or disappearing at an

unprecedented pace due to the combined effects of warming and industrial exploitation. Life at large is endangered by the decreasing availability of fresh water resources.

Destruction caused by global warming goes beyond the physical. Changing, unpredictable weather means that local knowledge, which has been the basis for good agricultural management and adjusting to climate condition, is becoming less relevant, making farmers more vulnerable and dependent on external inputs and techniques.

Farmers have to adjust to these changes by adapting their seeds and usual production systems to an unpredictable situation. Droughts and floods are leading to crop failures, increasing the number of people going hungry in the world. Studies predict a decline in global farm output of 3 to 16% by 2080. In tropical regions, global warming is likely to lead to a serious decline in agriculture (up to 50% in Senegal and 40% in India) and to the acceleration of farmland turning into desert. On the other hand, huge areas in Russia and Canada will turn into crop land for the first time in human history, yet it is still unknown how these regions will be able to grow crops.

What is expected is that millions of farmers will be displaced from the land. Such shifting is regarded by industry as a business opportunity through increasing food exports and imports, but it will only increase hunger and dependency around the world.

Corporate food production and consumption are significantly contributing to global warming and to the destruction of rural communities. Intercontinental food transport, intensive monoculture production, land and forest destruction and the use of chemical inputs in agriculture are transforming agriculture into an energy consumer and are contributing to climate change. Under neo-liberal policies imposed by the

World Trade Organisation, the regional and bilateral Free Trade Agreements, as well as the World Bank and the International Monetary Fund, food is produced with oil-based pesticides and fertilizers and transported all around the world for transformation and consumption.

Via Campesina, a movement bringing together millions of small farmers and producers around the world, asserts that it is time to radically change the industrial way to produce, transform, trade and consume food and agricultural products. We believe that sustainable small-scale farming and local food consumption will reverse the actual devastation and support millions of farming families. Agriculture can also contribute to cool down the earth by using farm practises that store CO<sup>2</sup> and reduce considerably the use of energy on farms.

## **Industrial Agriculture is a Major Contributor to Global Warming and Climate Change**

### **1/ By transporting food all around the world**

Fresh and packaged food is unnecessarily travelling around the world, while simultaneously local farmers are denied appropriate access to local and national markets. In Europe and the USA, for example, it is now common to find fruits, vegetables, meat or wine from Africa, South America or Oceania; and we find Asian rice in the Americas or in Africa. Fossil fuel used for food transport is releasing tons of CO<sup>2</sup> into the atmosphere. The Swiss peasants' organisation UNITERRE calculated that one kilo of asparagus imported from Mexico needs 5 liters of oil to travel by plane (11,800km) to Switzerland, while a kilo of asparagus produced in Switzerland only needs 0.3 liters of oil to reach the consumer.

## **2/ By imposing industrial forms of production (mechanization, intensification, use of agrochemicals, monoculture...)**

The so called “modernized” agriculture, especially industrial monoculture, is destroying the natural soil processes which lead to the storing of carbon in soil organic matter, and replaces them by chemical processes based on fertilizers and pesticides.

Due notably to the use of chemical fertilizers, intensive agriculture and animal production monocultures produce important quantities of nitrous oxide (NO<sup>2</sup>), the third most significant greenhouse gas responsible for global warming.

In Europe 40% of the energy consumed on the farm is due to the production of nitrogen fertilizers. Moreover, industrial agriculture production consumes much more energy (and releases much more CO<sup>2</sup>) to run its giant tractors to harrow and plow the land and to process the food.

## **3/ By destroying biodiversity and its capacity to capture carbon**

Carbon is naturally captured from the air by plants and it is stocked in wood and organic matter in the soils. Some ecosystems such as native forests, peat lands and meadows stock more carbon than others.

This carbon cycle has been part of the climate balance for thousands of years. Corporate agribusiness has now shattered this balance by imposing widespread chemical agriculture (with massive use of oil-based pesticides and fertilizers), by burning forests for monoculture plantations and by destroying peat lands and biodiversity.

#### **4/ By converting land and forests into non - agricultural areas**

Forests, pastures and cultivated lands are rapidly converted into industrial agricultural production areas or into shopping malls, industrial complexes, big houses, large infrastructure projects or tourist resorts. This in turn causes massive carbon releases and reduces the capacity of the environment to absorb the carbon released into the atmosphere.

#### **5/ By transforming agriculture from an energy producer into an energy consumer**

On the energy level, the first role of plants and agriculture is to transform solar energy into energy in the form of sugars and cellulose that can be directly absorbed in food or transformed by animals into animal products. This is a natural process which brings energy into the food chain. However, the industrialization process of agriculture over the last two centuries has led to an agriculture which consumes energy (fertilizers, use of tractors, oil based agrochemicals...).

#### **The False Solutions**

Agrofuels (fuels produced from plants, agriculture and forestry) are often presented as one of the solutions to the current energy crisis. Under the Kyoto protocol, 20% of the global energy consumption should come from renewable sources by 2020; this includes agrofuels. However, leaving aside the insanity of producing food to feed cars while so many people are starving, industrial agrofuel production will actually increase global warming instead of reducing it.

Agrofuel production will revive colonial plantation systems, bring back slave work and seriously increase the use of agrochemicals, as well as contribute to deforestation and biodiversity destruction. Intensive agrofuel production is not a solution to global warming; neither will it solve the global

crisis in the agricultural sector. The impacts will again be felt most seriously in developing countries, as industrialized countries will not be able to cover their agrofuel demand and will need to import huge amounts from the South.

## **Carbon Trading**

Under the Kyoto Protocol and other international schemes “carbon trading” is presented as a solution for global warming. It is a privatization of carbon after the privatization of land, air, seeds, water and other resources. It allows governments to allocate permits to big industrial polluters so they can trade “rights to pollute” amongst themselves. Some other programs encourage industrialized countries to finance cheap carbon dumps such as large-scale plantations in the South as a way to avoid reducing their own emissions. This allows companies to make a double profit while claiming falsely that they contribute to carbon sequestration. On the other hand, natural areas in Asia, Africa and Latin America are being treated as mere carbon sinks and privatized through the so called sale of environmental services, thus kicking communities out of their land and reducing their right to access their own forests, fields and rivers.

## **Genetically Modified Crops and Trees**

Genetically modified trees and crops are now being developed for agrofuel production. Genetically modified organisms will not solve any environmental crisis as they themselves pose a risk to the environment as well as to health and safety. Moreover, they increase corporate control over seeds, depriving farmers of their right to grow, develop, select, diversify and exchange their own seeds.

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These GM trees and crops are part of the “second generation” of agrofuels based on cellulose while the first generation is based on the different forms of sugar from crops.

Even when it doesn't use genetically modified varieties, this "second generation" raises similar concerns.

## **The True Solutions: Food Sovereignty as The Key to Provide Livelihoods to Millions and Protect Life on Earth**

Via Campesina believes that solutions to the current crisis have to emerge from organized social actors that are developing modes of production, trade and consumption based on justice, solidarity and healthy communities. No technological fix will solve the current global environmental and social disaster.

A set of true solutions should include: Sustainable small-scale farming, which is labor-intensive and requires little energy use, can actually contribute to stop and reverse the effects of climate change:

- by storing more CO<sub>2</sub> in soil organic matter through sustainable production
- by replacing nitrogen fertilizers by organic agriculture or/and cultivating nitrogen-fixing plants which capture nitrogen directly from the air
- by making possible the decentralized production, collection and use of energy

A true agrarian reform, that strengthens small-scale farming, promotes the production of food as the primary use of land, and regards food as a basic human right that should not be treated as a commodity. Local food production will stop the unnecessary transportation of food and ensure that what reaches our tables is safe, fresh and nutritious.

Changing consumption and production patterns which promote waste and unnecessary consumption by a minority of humankind, while hundreds of millions still suffer hunger and deprivation. Fair and just distribution of food and

necessary goods, as well as reducing unnecessary consumption should be core aspects of new development patterns. Also, industry should not be allowed to impose unnecessary consumption and waste by means of increasing disposable products or by artificially shortening their lives.

Research and implementation of diverse and decentralized energy systems, based upon local resources and technologies that do not harm the environment or take land away from food production.

We urgently demand of local, national and international decision makers: All around the world, we practice and defend small-scale sustainable family farming and we demand food sovereignty. Food sovereignty is the right of peoples to healthy and culturally-appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. Food sovereignty prioritizes local and national economies and markets, empowers peasant and family farmer-driven agriculture, artisan-style fishing, pastoralist-led grazing, and protects food production, distribution and consumption based on environmental, social and economic sustainability.

Therefore, we demand:

1. The complete dismantling of agribusiness companies: they are stealing the land of small producers, producing food and creating environmental disasters.
2. The replacement of industrialized agriculture and animal production by small-scale sustainable agriculture supported by genuine agrarian reform programs.
3. The banning of all forms of genetic use restriction technologies

4. The promotion of sane and sustainable energy policies. That includes consuming less energy and decentralized energy instead of promoting large-scale agrofuel production as is currently the case.
5. The implementation of agricultural and trade policies at local, national and international levels supporting sustainable agriculture and local food consumption. This includes the ban on the kinds of subsidies that lead to the dumping of cheap food on markets.

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For the livelihoods of billions of small producers around the world, For people's health and the planet's survival: We demand food sovereignty and we are committed to struggle to achieve it collectively.

# **The climate crisis is a food crisis Small farmers can cool the planet**

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A way out of the mayhem caused by the industrial food system

*GRAIN*  
*October 2009*

*The data presented in this document comes from a large number of references. You will find them on line in [www.grain.org/go/climatecrisisrefs](http://www.grain.org/go/climatecrisisrefs)*

# 1. The global food system tomorrow, with climate change ...

## → Probable decline in yields by 2080 as a result of climate change

World: 15.9 per cent

Latin America: 24.3 per cent

Asia: 19.3 per cent

Africa: 27.5 per cent

## → Number of people living in highly water-stressed environments

2010 - 2.4 billion

2050 - 4 billion

## → Extreme Weather

- More droughts, floods, typhoons, wild fires
- Millions of hectares of farmland will be lost by 2050
- Storms caused by climate change will make an additional three million hectares of farmland in coastal areas vulnerable to inundation

## → Expected price increase by 2050 for major cereals

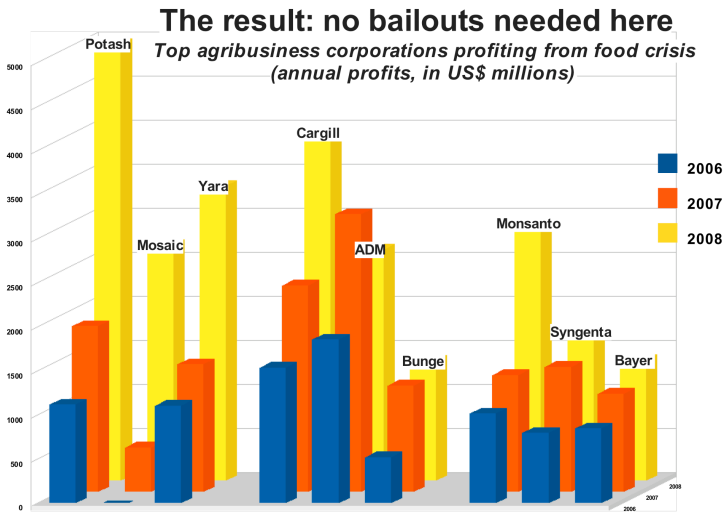
wheat: up by 170 to 194 percent

rice: up by 113 to 121 percent

maize: up by 148 to 153 percent

## → What we know from the food crisis of 2008

The corporations that control the food system used the crisis for extreme profit-taking



## → What we know from the food crisis of 2008

The food crisis triggered a surge of private sector investment in agriculture and a global farmland grab, which threatens to push farmers out in a massive way.

## → Global farmland grab

- US\$100 billion or more on the table
- 100 reported deals by Gulf investors alone
- 120 identified private sector investor vehicles for foreign farmland acquisition

## **2. Industrial agriculture and the industrial food system are major causes of the climate crisis.**

**Numbers on how these processes warm the planet are quite variable, but about global emissions we can say that:**

- Agricultural activities are responsible for **11 to 15%**
- Land clearing and deforestation cause and additional **15 to 18%**
- Food processing, packing and transportation cause **15 to 20%**
- Decomposition of organic waste: **3 to 4%**

***Total emissions of the food system: 44 to 57% of total global greenhouse emissions***

# 3. Small Farmers can cool the planet

## A. The soil solution

**Soils are one of the Earth's most amazing ecosystems.**

Millions of plants, bacteria, fungi, insects and other living organisms are in a constantly evolving process of creating, composing and decomposing organic matter.

They are also the unavoidable starting point for growing food.

**But soils are being destroyed at a rapid rate**

In the last 50 years, the massive use of chemical fertilizers and other unsustainable practices of industrial agriculture have caused an average loss of at least 30 – 60 tonnes of soil organic matter for every hectare of agricultural land.

The total loss amounts to a minimum of **150 – 205 billion tonnes of organic matter**

***What if we were able to build that back into the soil again?***

Amount of organic matter lost from the soils in the past 50 years = 150 – 205 billion tonnes

Amount of CO<sub>2</sub> that would be sequestered from the atmosphere if these losses were recuperated = 220 to 330 billion tonnes

Current excess CO<sub>2</sub> in the atmosphere = 718 billion tonnes

***Rebuilding soil fertility to pre-industrial levels would capture 30-40% of current excess of CO<sub>2</sub> in the atmosphere***

## **Can this be done?**

### **Yes!**

GRAIN calculates that, by using existing sustainable farming techniques, we can increase progressively soil organic matter by 60 tonnes/hectare over the next 50 years.

***In this way we would capture more than two thirds of the current excess of CO2 in the atmosphere!***

### **And in the process it would achieve**

- Healthier soils on which farmers produce more food
- Living soils that capture and retain huge amounts of water
- Local communities that can make a living off the land
- A substantial reduction, if not elimination, of the amount of people that go hungry every day.

### **What if farmers around the world would return organic matter to the soil again?**

- Billions of tonnes of carbon would be captured in the soil
- Soils and landfills would not release nitrous oxides and methane into the air
- Fertilizers would become progressively unnecessary, as nutrients would be recovered in organic matter
- Soil fertility would progressively improve

***Just this measure could reduce or offset greenhouse emissions by 20 to 35%***

## **B) What if the concentration of animal production was reversed and a diversity of animals were integrated with crop production again?**

- Methane and nitrous oxide from manure heaps and slurry lagoons could be eliminated
- World transportation of industrial feed would not be necessary
- Massive long-distance transportation of frozen meat would not make sense
- Natural animal feeding could be improved, thus reducing methane production by cows, sheep and goats

***Total potential reduction of current global emissions: additional 5 to 9%***

## **C) What if most food was sold through local markets and people relied on fresh food as the basis of nutrition?**

- Transportation of food back and forth around the world would be eliminated or reduced to a minimum
- Local transportation to buy food would also be reduced
- Refrigeration periods before sale would be significantly decreased or eliminated
- Food packaging would be simpler and less dependent on plastic
- Food processing would be domestic
- Packaging would be simpler or eliminated
- Less refrigeration at home would be needed

***Total potential reduction: additional 10-12% of current global emissions***

## **D) What if land clearing and deforestation were halted?**

- By halting and reversing monoculture plantations
- By supporting diversified systems that integrate forest cover
- By increasing soil fertility through the incorporation of organic matter
- By decreasing consumption of non-food products based on plant raw materials
- By cutting excessive meat consumption
- By abandoning the madness of agrofuels and implementing decentralized forms of energy production

***Another 15 - 18% of current global emissions would be avoided***

### **Today, plantations occupy over 20% of total cultivated land**

Contrary to what authorities and agribusiness often say, small farmers are not deforesting the world. Industrial plantations are currently by far the major cause of land clearing and deforestation.

The world does not need more industrial monocultures; it requires many forms of diversified agriculture that can incorporate and cohabit with trees.

## **In sum: emissions would be reduced or offset as follows**

By recuperating soil organic matter: 20 to 35%

By reversing the concentration of meat production and re-integrating animal and crop production: 5 to 9%

By putting local markets and fresh food back in the center of the food system: 10 to 12%

By halting land clearing and deforestation: 15 - 18%

***In total, these changes would provoke a reduction of ½ to ¾ of current global emissions.***

**If this is complemented by serious saving and reduction strategies in other economic sectors, the goal of zero emissions and even reducing current concentration of greenhouse gases in the atmosphere would become feasible**

### **The solutions are not just technical or biological**

The necessary forms of organizing and carrying out these forms of agriculture require decentralized tasks and millions of people, communities and organizations involved and making decisions on how to make the change possible.

They also require a sharp knowledge of local ecosystems and conditions, of seeds and biodiversity.

Only small farmers and indigenous peoples around the world can fulfill such needs.

## **So, major changes become urgent**

An end to current policies that promote the concentration of land, production processes, processing and retailing

An urgent and profound agrarian reform that re-distributes and puts an end to land concentration around the world

Active decentralization of animal production and re-integration of animal and plant production

## **Returning agriculture to its central role: food production**

Active support to agricultural techniques and practices based on diversity, local seed systems and agro-ecological processes

Food sovereignty policies through local markets and other short marketing channels, turning away from the commodity export model

Policies that support small farmers without tying them to industrial inputs, imposing unnecessary regulations or provoking loss of undermining autonomy and sovereignty

## **Cooling the planet requires small farmers and food sovereignty**

# Cooling The Planet With Small-Scale Agroecological Methods

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*By The New World Agriculture and Ecology Group  
November 20, 2009*

*The full report can be found on:  
[http://www.viacampesina.org/main\\_en/index.php?option=com\\_content&task=view&id=821&Itemid=38](http://www.viacampesina.org/main_en/index.php?option=com_content&task=view&id=821&Itemid=38)*

According to the Intergovernmental Panel on Climate Change (IPCC) agriculture is responsible for a major portion of the increase of greenhouse gases. Not all agriculture has the same impact, however--the vast majority of the effect comes from the post WWII industrial agricultural system. Transforming the world's food and fibre production to a system based on sustainable smallholder agriculture is the best way to minimize agriculture's contribution to the very significant problem of Global Warming. In short, peasant agriculture can not only feed the world, it can also cool the planet.

A team of scientists from various universities in the United States conducted a review of the literature on the role of agriculture on climate change and concluded that<sup>1</sup>:

Industrial agriculture contributes significantly to global warming through emissions representing about 22% of total greenhouse gas (GHG) - more GHG emissions than the global transportation sector. Agroecological methods on small-scale farms, is far less energy consumptive and far less responsible for the release of GHG than industrial agricultural production methods. In addition to comparatively lower emissions, agroecological methods also have the potential to sequester some of the carbon dioxide that is currently in the atmosphere. Reductions in GHG emissions through small-scale agroecological production are achievable through the rejection of underlying assumptions of the industrial agricultural system. That system has been developed along four lines, each of which is detrimental to the global climate, namely:

- **Massive energy use in transportation** - Transportation of agricultural inputs, outputs, and products contributes substantially to the overall greenhouse gas input from the transportation sector. According to the IPCC (2007), 13.1% of total GHG emissions derives from transport, some fraction of which is due to long distance transport

associated with the industrial agricultural system. While some bulk transport may be efficient, it is evident that more local distribution of food has, in principle, the possibility of reducing energy use due to transportation.

- **Changes in the normal balance of atmospheric gases, resulting from inadequate soil management** - Industrial agriculture utilizes techniques that result in significant changes in normal ecosystem properties that in times past have maintained a tenuous balance among the materials involved in release of greenhouse gases. Industrial agricultural production emits three very important human-induced GHGs at significant levels: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). CO<sub>2</sub> is the most abundant GHG and is responsible for most human-induced climate change, but N<sub>2</sub>O and CH<sub>4</sub> are also potent causes of global warming. Agricultural activities are responsible for approximately 50% of global atmospheric inputs of methane (CH<sub>4</sub>) and agricultural soils are responsible for 75% of global nitrous oxide emissions, much of which is associated with the industrial system. Especially important are 'confined animal feeding operations' (CAFOs) so characteristic of the industrial system.
- **An assumption that monocultures are efficient, with the consequent loss of ecosystem services produced by biodiversity** - Large scale monocultures continue to transform the world from landscape mosaics of small-scale high biodiversity production into massive industrial-like production, purposefully reducing biodiversity in search of "optimal" production (or profits) on any given piece of land. The ecosystem services of, for example, tight nutrient cycles and natural control of pests, are consequently disrupted, requiring industrial inputs that inevitably lead to increases in greenhouse gas emissions. In contrast, small-scale systems using agroecological methods have great potential to sequester

carbon in above-ground and soil biomass. Deforestation, mainly associated with the spread of large scale monocultures, is one of the major emitters of CO<sub>2</sub>, and programs of community tree planting and agroforestry have great potential to reverse this trend.

- **A dramatic change agriculture from energy production to energy consumption** - At its most fundamental level, agriculture was developed to be an energy producing system (and remains so in more traditional forms of agriculture). With the introduction of industrial methods it has been turned into an energy consuming system. The new industrial farmer replaces the thought-intensive technology in use for so many years with brute force energy application, made possible because we have an abundant store of cheap fossil fuel energy. Consequently, energy in agriculture was converted from something that originally was the main *product* of agriculture to something that became a main *input* into agriculture -- a change from “using sun and water to grow peanuts” to “using petroleum to manufacture peanut butter.” It has been estimated that this industrial food system *expends* 10-15 energy calories to produce 1 calorie of food, an effective reversal of what had been the reason to develop agriculture in the first place – to efficiently *harvest* energy from the sun.

The IAASTD (International Assessment of Agricultural Knowledge, Science and Technology for Development)<sup>2</sup> report, drafted by over 400 scientists and practitioners from across the globe, emphasized that 'business as usual is not an option' regarding the the role of agriculture in feeding the people of the world, and emphasized the need for more agroecological approaches. It is important to add that all attempts to reverse the now well-known problems associated with Global Warming will be in vain if 'business as usual' is allowed. Via Campesina's program of extending food

sovereignty to all corners of the globe is not only a strategy for feeding the world's population, it is also an integral element in any program to cool the planet.

#### Notes

1. Vandermeer et al. 2009. Effects of industrial agriculture on global warming and the potential of small-scale agroecological techniques to reverse those effects. Report from the New World Agriculture and Ecology Group, Ann Arbor, Michigan.
2. IAASTD (International Assessment on Agricultural Knowledge, Science and Technology for Development) (2008) Synthesis Report, Island Press, Washington, D.C.