

# Cool Farming

Climate impacts of agriculture  
and mitigation potential

**Summary of Report**

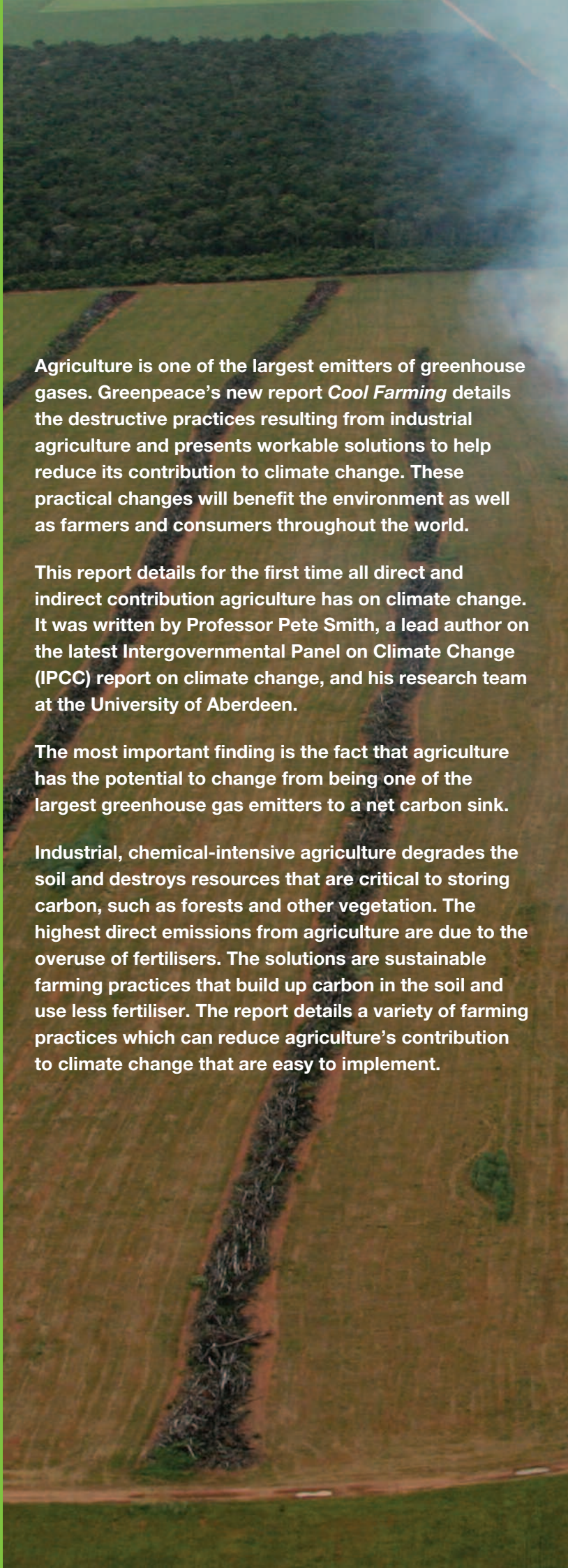
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**Agriculture is one of the largest emitters of greenhouse gases. Greenpeace's new report *Cool Farming* details the destructive practices resulting from industrial agriculture and presents workable solutions to help reduce its contribution to climate change. These practical changes will benefit the environment as well as farmers and consumers throughout the world.**

**This report details for the first time all direct and indirect contribution agriculture has on climate change. It was written by Professor Pete Smith, a lead author on the latest Intergovernmental Panel on Climate Change (IPCC) report on climate change, and his research team at the University of Aberdeen.**

**The most important finding is the fact that agriculture has the potential to change from being one of the largest greenhouse gas emitters to a net carbon sink.**

**Industrial, chemical-intensive agriculture degrades the soil and destroys resources that are critical to storing carbon, such as forests and other vegetation. The highest direct emissions from agriculture are due to the overuse of fertilisers. The solutions are sustainable farming practices that build up carbon in the soil and use less fertiliser. The report details a variety of farming practices which can reduce agriculture's contribution to climate change that are easy to implement.**

## Key causes of climate change in agriculture

The expansion of intensive farming has led to increased levels of greenhouse gas emissions primarily as a result of: Fertiliser overuse, land clearing, soil degradation, and intensive animal farming.

One of the biggest problems in industrialised agriculture is the massive overuse of fertilisers. More than 50 percent of all fertiliser applied to the soil ends up in the atmosphere or in local waterways. One of the most potent greenhouse gases is nitrous oxide (N<sub>2</sub>O), with a global warming potential of some 296 times higher than that of carbon dioxide. The overuse of fertilisers and the resulting nitrous oxide emissions have the highest share of agriculture's contribution to climate change: the equivalent of 2.1 billion tonnes of CO<sub>2</sub> every year. And, the energy-intensive production of fertiliser adds another 410 million tonnes of CO<sub>2</sub>-equivalents. Of all chemical products, fertilisers are among the greatest contributors to global greenhouse gas emissions.

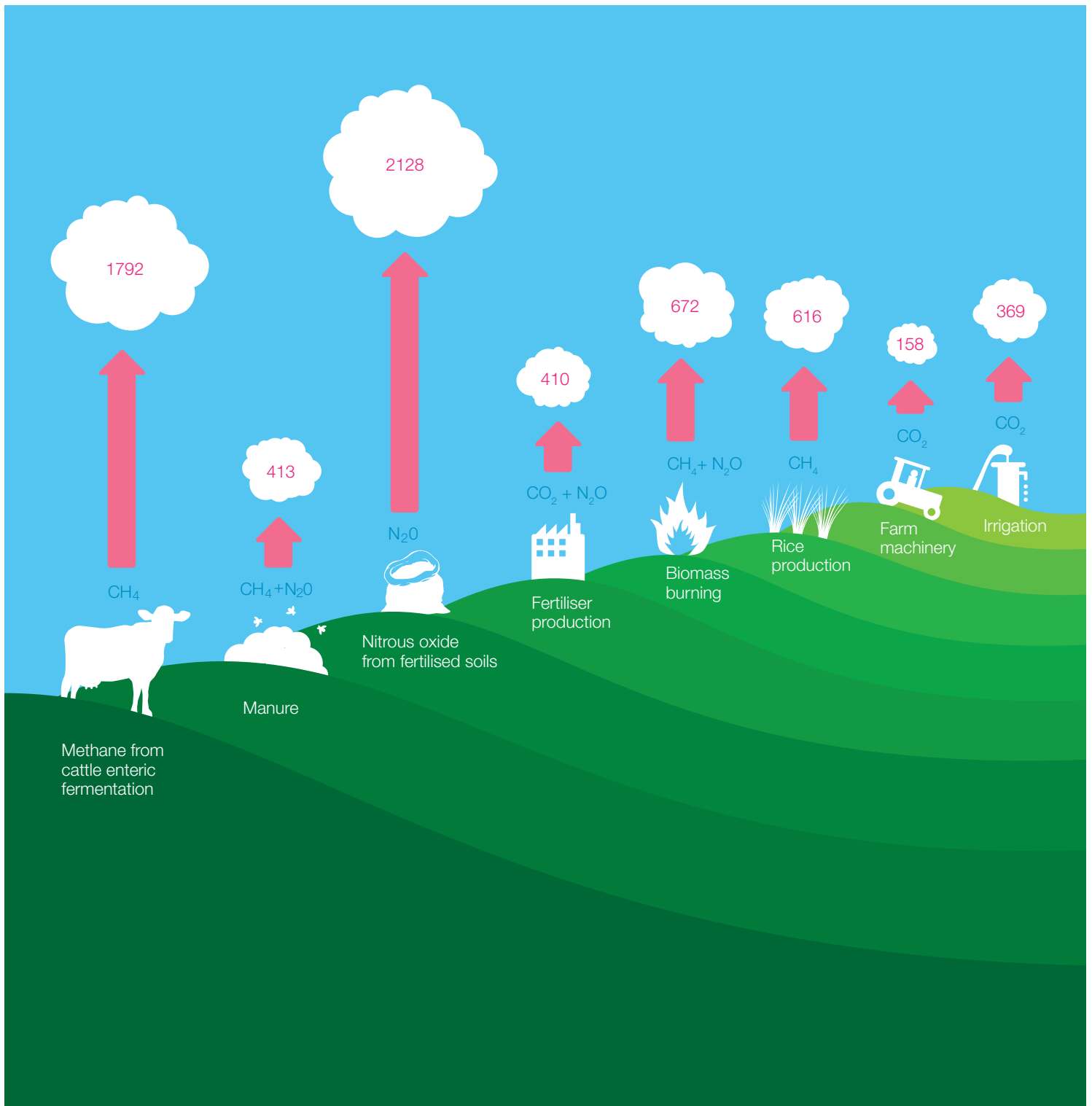
The second biggest direct emitter in agriculture is animals. When digesting fodder, animals produce – and emit at both ends – large amounts of methane; a potent greenhouse gas. With an ever increasing demand for meat, methane emissions are expected to rise continuously over the coming decades. Beef and lamb have a large impact on the climate. Each kilogramme of beef produced results in 13 kilos of carbon emission; for lamb each kilo produces 17 kilos of emission. Pork and poultry create less than half of that.

Agriculture also has a serious indirect effect on climate change. Cutting down forests and other natural cover to provide agricultural land for grazing, growing animal feed and other crops, removes key 'carbon sinks' – plants and soils that absorb carbon from the atmosphere – and increases global warming. This can be seen in particular with the destruction of tropical rainforests, where large areas are being cleared at an alarming rate to grow soya as feed for intensive animal farming, or palm oil for biofuel production.

*Cool Farming* summarises how agriculture in each region affects climate change and projects trends. North America and the Pacific, for example, are the only developed regions which show a consistent increase in their greenhouse gas emissions from agriculture and in Asia, greenhouse gas emissions in this sector are expected to rise as a result of increased animal farming.

## Sources of agricultural greenhouse gases, excluding land use change

Mt CO<sub>2</sub>-eq



## What are the solutions?

**Changes can be made in agriculture not only to make it a much smaller emitter of greenhouse gases but also to make it a carbon sink helping to reverse its destructive contribution to climate change. This can be done by:**

### Reducing use of fertilisers

By applying only the amount of fertiliser that the crop needs, precisely and at the right time, a tremendous amount of greenhouse gas releases can be prevented. At the same time, it would also reduce other environmental disasters such as dangerous algal blooms in our lakes and oceans worldwide.

### Protecting the soil

Soil is literally at the root of our current problems in agriculture, not only with implications for climate change, but also for food production. If we continue to treat our soil like dirt, one of the most precious resources of humankind is under serious threat. Industrial agriculture degrades the soil and leaches it of all its nutrients, resulting in a soil that has one of the lowest carbon contents of all land types, with the exception of deserts and semi-deserts. By increasing the carbon content through a variety of measures such as cover crops, agricultural soils can be turned into carbon sinks and can greatly reduce agriculture's contribution to climate change.

### Improving rice production

By keeping paddies dry out of season, methane emissions can be reduced. In producing rice by only using the amount of water, rather than flooding paddies, and adopting methods that increase yields without over dependence on fertilisers, the contribution to climate change of one of the world's staple foods can be slashed.

### Cutting demand for meat, especially in developed countries

Would reduce the damaging levels of methane produced by animals. It would also diminish the environmental damage caused as a result of increased demand for feed, fuel for related transport and land that is cleared to make way for cattle.

All too often, chemical-intensive farming results in a downward spiral of soil and water depletion, decreasing yields, environmental destruction, poverty and hunger. Food security will not be achieved through outdated, expensive technical fixes such as ever increasing amounts of chemical fertilisers or pesticides, or genetically engineered crops.

The future of farming lies in agriculture that works with nature and with people, not against them. Millions of farms on all continents already prove that organic and sustainable farming can provide sufficient food, increase food security, replenish natural resources and provide a better livelihood for farmers and local communities.

**This change is possible and necessary.  
The time has come to take action and  
stop agriculture from killing the climate.**

# GREENPEACE

Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

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