A tale of inaction
at the expense of converting
our agri-food systems

OUR LAND IS WORTH MORE THAN CARBON

comité catholique contre la faim et pour le développement - terre solidaire

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Though far less publicised than the need to end our dependence on fossil fuels, the link between climate change and agriculture is undoubtedly complex but fundamentally critical.

When you examine this neglected facet of the climate crisis more closely, it is clear that we have to tackle the question from different angles. First of all, small farmers are amongst those most affected by the impact of climate change. The frequency and violence of extreme weather events (heat waves, torrential rain, floods, extreme drought, storms, tropical cyclones, etc.) have a direct effect on their work, thus increased their vulnerability. Secondly, agriculture, in the sense of farming practices used across the world, is also a greenhouse gas-emitter. We cannot forget that, nowadays, agriculture is intimately linked to farming models that are themselves part of a food system that makes a sizeable contribution to climate change. Lastly, and this is one of the peculiarities of this sector at a time when we are trying to contain greenhouse gas emissions, farming land also has the potential to store carbon in the soil, thus giving it the enviable status of a "carbon sink". Only by coming back to this tripartite role can we understand the challenges weighing on people's food sovereignty both as regards opportunities and dangers. 815 million people in the world[1] today are still suffering from chronic hunger, the majority of whom live in the countryside[2]. Between now and 2080, the United Nations estimate that a further 600 million people may suffer this scourge, purely due to climate change[3]. The

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815 million people in the world1 today are still suffering from chronic hunger, the majority of whom live in the countryside.

Implicit in the fight against climate change is the question of responsibility in a world undermined by inequality.

Intergovernmental Panel on Climate Change (IPCC) confirmed this trend and predicted that every element of food security (availability, access, use and quality, and stability) would be affected[4] to varying degrees depending on the scenario.

While the question of maintaining agricultural production is at stake with an estimated drop of up to 30% in world output by 2080 according to the World Bank[5], it is mainly the question of access to food that will be crucial. In just fifteen years from now, because of climate change, up to a further 122 million people could be living in poverty while the price of agricultural produce is likely to rocket[6]. According to the High Level Panel of Experts of the Committee on World Food Security, prices have fluctuated twice as much in the decade that began in 2010 than between 1990 and 2005, and projections confirm this trend. The effects of the climate crisis only increase existing inequality and will continue to do so. Vulnerable people, mainly in the countryside, who are predominantly smallholders, are confronted daily with a variable climate that further affects their ability to adapt. Implicit in the fight against climate change is the question of responsibility in a world undermined by inequality.

To restrict the planet's temperature rise to 1.5°C above preindustrial times, two steps now seem unavoidable. The first is to reduce greenhouse gas emissions drastically and immediately. The second is to preserve and even increase places where it is possible to store carbon. This effort must necessarily look towards the responsibility of historically industrialized countries and should not be at the expense of Southern countries that are least guilty of causing climate change.

Two years ago, at the initiative of the Confédération paysanne [French confederation of peasants] and CCFD-Terre Solidaire, over 70 civil society organizations signed a declaration called "Our land is worth more than carbon". It warned of the dangers for smallholders involved in an approach based on the sequestration potential of agricultural land. The purpose of the report was to encourage reflection and see whether the strategic position of agricultural land in the fight against climate change will now guarantee or damage food sovereignty for people, given the urgent need to make profound changes to our farming models.

Words are just words

Green economy, sustainable farming, climate-smart agriculture, organic farming, agroecology, agroforestry, conservation agriculture, etc. – all these terms that pervade discussion on agriculture and the climate cover an extremely wide range of situations that often make clear political choices difficult in the absence of a binding framework.

While regulation and structure are vital in providing the desired meaning politically, by contrast, lack of a framework encourages the general idea that farming models can coexist in a worldwide effort to combat climate change and that all solutions are equally valid.

The example of agroecology (or agro-ecology) has been obvious for years. The term has been used to cover a range of farming practices and techniques, a science and a social movement. But agroecology can be all things to all men. While the origin of the term is fundamental in understanding its original meaning, on the other hand, it seems to be difficult to reduce a political vision to this one word.

Too often concepts are derailed and become umbrella terms under which everything and its opposite coexist. Given that everyone is tempted to use these terms loosely to justify false solutions, the only sure solution is to define them and that can only come from political will.

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The concept of agroecology according to La Via Campesina

[What we are putting forward] "is not a mere toolbox of techniques, but rather … an alternative to industrial farming, a way of life, an option for transforming food production into something more beneficial to humans and to Mother Earth. Our agroecology is absolutely political, it does not conform either to structures of power or to the monoculture system, but instead challenges power and places local communities at the centre of food production, in harmony with Mother Earth. [We do] not regard agroecology as a tool for industrial farming[7]."

The four pillars of peasant agroecology

ECONOMIC

Promotes fair, short, distribution webs, producers and consumers working together

Increases resilience through diversification of farm incomes and strengthens community autonomy

Aims to enhance the power of local markets and build on a social and solidarity economy vision

POLITICAL

Aims to put control of seeds, land and territories in the hands of people

Encourages new forms of decentralized, collective, participatory governance of food systems

Requires supportive public policies and investments

Encourages stronger participation of food producers/ consumers in decision making

ENVIRONMENTAL

Supports resilience and adaptation to climate change

Nourishes biodiversity and soils

Eliminates use of and dependence on agrochemicals

Enhances integration of various elements of agro-ecosystems (plants, animals, ...)

SOCIO-CULTURAL

Promotes farmers to farmer exchanges for sharing knowledge

Strengthens food producers, local communities, culture, knowledge, spirituality

Promotes healthy diets and livelihoods

Encourages diversity and solidarity among peoples, encourages women and youth empowerment

Source: CIDSE 2018.

Seen both as part of the problem and part of the solution, farming is a sector that needs to be examined to a greater degree to understand the range of factors related to it. Considering farming from the point of view its medium (farmland) or farming practices or even its systems (and all their ramifications) leads to vastly different situations in combating climate change.

AGRICULTURE AND CLIMATE CHANGE: CULPRIT OR SOLUTION?

From the field to the plate: quite a responsibility

METHANE AND NITROUS OXIDE – THE FORGOTTEN GASES

Agriculture (in the sense of farmed land[8]) contributes 10–12% of the world's greenhouse gas. These are termed direct emissions. It is estimated that farmed land produces an almost equivalent amount of carbon dioxide (CO_2) when you take account of fuel and electricity usage on farms[9] and also the deforestation that can go hand-in-hand with expanding farmland. Carbon dioxide is part of a cycle that fixes carbon through photosynthesis, thus helping balance inputs and outputs (close to neutral). So we need to look at other greenhouse gases to understand how agriculture contributes to climate change. Agriculture releases into the atmosphere not large quantities of CO_2 but methane (CH_4) and nitrous oxide (N_2O) that have warming effects 25 and 298 times greater than CO_2 over 100 years[10] (figures that are regularly revised upwards for methane). Viewed over 20 years, the data are even more alarming since, for example methane's warming potential is 72 times greater than that of carbon dioxide[11]. Farming is the sector that emits most of these two gases, producing 50% of world methane and 60% of nitrous oxide emissions in 2005[12]. Livestock raising, rice growing, fertilizing and slash-and-burn farming are the main culprits[13].

Looking at the trend[14], the use of synthetic fertilizers will shortly become the second source of methane-producing farm emissions, after enteric fermentation (flatulence and belching) from ruminants, mainly cows.

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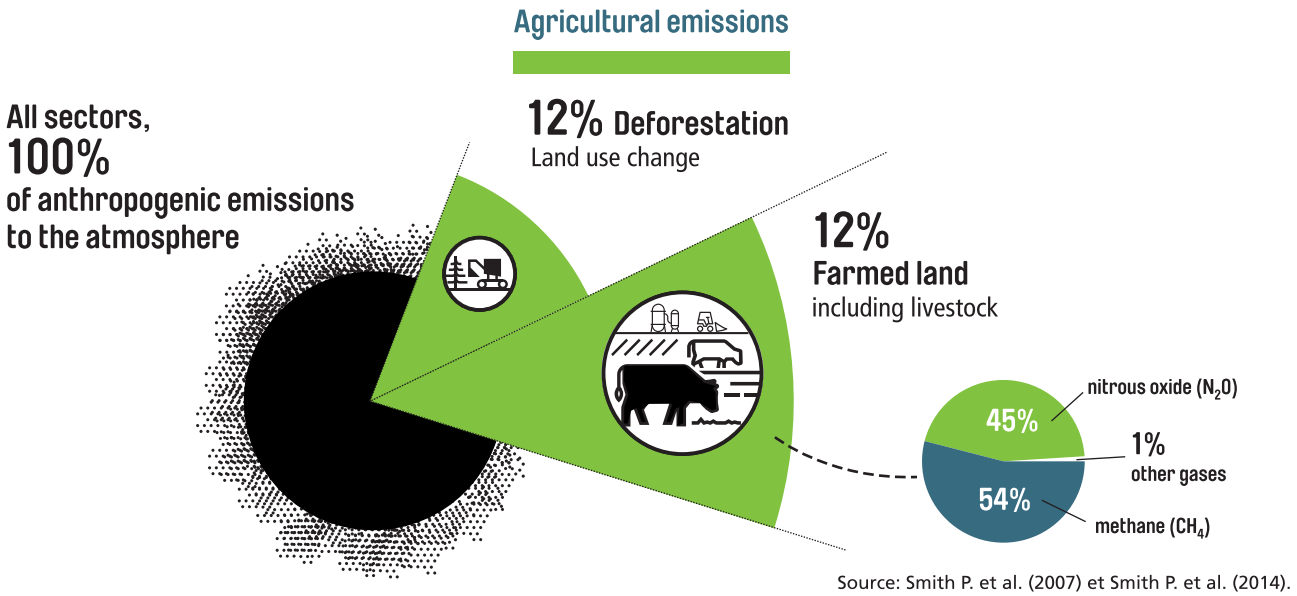
Given these facts, it would seem important in limiting emissions from managing farming land to focus on permanently reducing methane and nitrous oxide emissions produced by livestock raising and synthetic fertilizers.

We must also remember that just a small number of countries are responsible for most agricultural emissions. In 2014, ten signatories of the United Nations Framework Convention on Climate Change (UNFCCC) were responsible for 61% of farming emissions (China, India, Brazil, the European Union, the USA, Australia, Indonesia, Pakistan, Argentina and Ethiopia[15]). However the question of reducing methane and nitrous oxide emissions is systematically avoided by political decision-makers because of the problems reducing these emissions would cause their farming sectors.



Source: Smith P. et al. (2007) et Smith P. et al. (2014).

Taking account of land use changes to develop new farms (80% of new agricultural land has replaced forests and consequently emitted the CO_2 that was contained in them[16]), this adds around 12% to emissions derived from human activity due to farming. Adding direct and indirect emissions together means that almost a quarter of world emissions are connected with farming.

UPSTREAM AND DOWNSTREAM FROM PRODUCTION – WHAT WE ALL FORGET

Upstream, one of the main sources of greenhouse gas emissions is mainly from manufacturing fertilizers, including for the production of animal feed that also requires the energy used for seed, pesticides, fuel for mechanized equipment and also electricity for irrigation, heating and drying[17].

Downstream, the list of activities contributing to climate change extends prodigiously. First of all there is the processing, packing and packaging of products such as sugar, palm oil, starch and maize[18], that contributes hugely to greenhouse gas emissions. Then there are two other major emission sources – transporting and refrigerating goods that, together, may constitute the greater part of agri-food chain emissions[19]. To this must be added resale in supermarkets in particular. Finally food wastage remains a central element in that it is not only the source of indirect emissions through the elements mentioned above due to products not being consumed but also because it leads to increased methane emissions from landfill sites.

Focusing solely on emissions resulting from our cultivated land only provides a very incomplete picture of the agri-food system's role in climate change.

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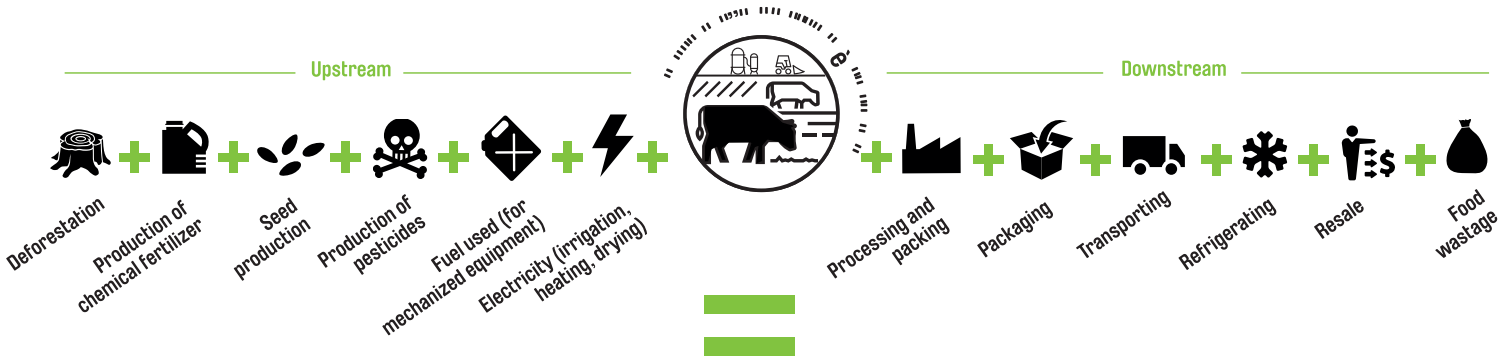
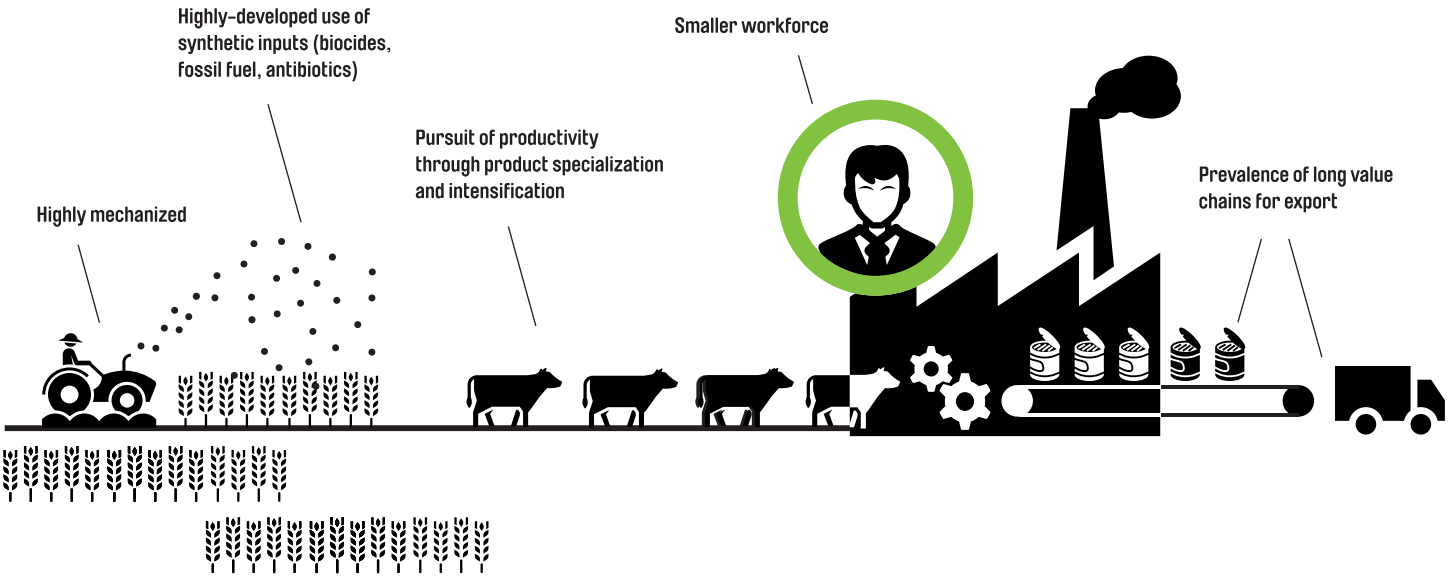
Focusing solely on emissions resulting from our cultivated land only provides a very incomplete picture of the agri-food system's role in climate change. This is one of the shortcomings of international accounting systems that separate farming (in the sense of "cultivated land") emissions from those due to the energy used in our agri-food system (which are accounted for in the energy sector). It is difficult to know precisely what the overall farming contribution is, i.e. from the farmer's land to the consumer's plate. However, most estimates attribute over a third of global emissions to the agri-food system[20]. Looking at the agri-food system beyond land use requires taking account not just of activities connected with agricultural production but also those upstream and downstream. These production stages – upstream and downstream but also those during production itself - are typical of agro-industrial models that prevail in many parts of the world. This means we must look at the agro-industrial model itself.

Contribution of agriculture to climate change: from upstream to downstream



More than one third of global emissions

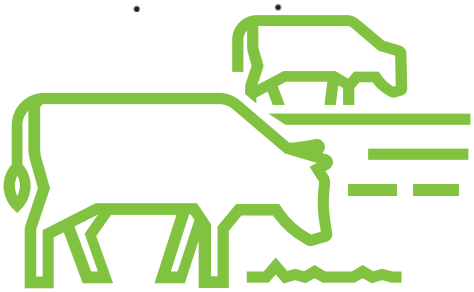
Key characteristics of industrial agri-food system



LET'S TALK ABOUT AGRI-FOOD SYSTEMS. INDUSTRIAL LIVESTOCK PRODUCTION AND ITS RELATED CONSUMPTION TYPES

In the fight against climate change, industrial livestock production is a key element insofar as "*the most important source of food system-related GHG emissions is the escalation of meat and dairy consumption— made possible by the expansion of industrial livestock and chemical-intensive feed crops. The UN Food and Agriculture Organisation (FAO) says meat production alone now generates more GHG emissions than all the world's transport combined*[21]". This analysis takes account of the entire livestock chain and should be understood as including its component parts, ie deforestation, enteric fermentation, effluent management, production of cattle feed and energy consumption. A recent study[22] calculated that the climate footprint of the twenty biggest meat and dairy producers was unprecedented. They "*emitted more greenhouse gas in 2016 than the whole of Germany, the biggest polluter in Europe. If these companies were a country, they would be the 7th biggest greenhopuse gas emitter*[23]". Even more striking "*JBS, Cargill and Tyson, three top meat companies, emitted more greenhouse gases last year than all of France and also emitted nearly as much as some of the big oil companies, like Exxon, BP, and Shell*[24]." *We must also point out that "in 2010, about one third of all cereals produced went to feed, and the FAO predicts this figure will reach 50 per cent by 2050*[25]."

Forecasts modelling what regional meat consumption will be in 2050 identified a 35% rise in which North America, Europe and Latin America predominated.



Agroindustry and industrialized food systems have developed a symbiotic relationship over time.

It would be nonsense to look at agriculture and climate change without considering consumption habits fairly. Agroindustry and industrialized food systems have developed a symbiotic relationship over time. In 2016, the US, the EU, China and Brazil together accounted for 60% of world beef consumption[26]. Forecasts modelling what regional meat consumption will be in 2050 identified a 35% rise in which North America, Europe and Latin America predominated[27]. Countries historically responsible for climate change, particularly due to their growing industrialization, need to rethink their production and consumption methods, as do emerging countries following in their wake.

Forecasts modelling what regional meat consumption will be in 2050 identified a 35% rise in which North America, Europe and Latin America predominated.

Focus on the Paraguayan agri-food export system

For many years, the economy of Paraguay has been based on producing and exporting raw materials and, more recently, processing these products (especially agri-food products)[28]. The culpability of this model in Paraguayan greenhouse gas emissions is particularly striking. Between 2015 and 2016, soya and meat[29] comprised 81% of Paraguayan exports. To export soya-based feed, paradoxically, Paraguay has to import millions of litres of synthetic products (fertilizers and pesticides) for its legume crops, which weighs heavily in its carbon footprint. As regards meat, the FAO noted that Paraguayan agricultural greenhouse gas emissions practically doubled between 1990 and 2014, a large part of which was due to enteric fermentation[30] (mainly bovine flatulence and belching). Additionally almost all bovine production is exported and subject to energy-hungry preservation requirements. In 2015, 52% of meat exports consisted of frozen and 39% refrigerated meat[31]. The Paraguayan model is, more than ever, an industrial agriculture whose output is mainly exported. It is more focused on cattle feed, exporting meat products and producing biofuel, than direct food consumption (Paraguayans eat three times less meat than their Brazilian neighbours[32]). Between 2004 and 2016, indigenous and small farmer communities lost half of their farming land while the cultivated area dedicated to exports rose from 2.3 to 5.5 million hectares in the same period[33].

Paraguayan agricultural greenhouse gas emissions practically doubled between 1990 and 2014.

Farmland – Eldorado for carbon sequestration?

The farming sector, though seriously affected by climate change while making a not inconsiderable contribution to it, offers a third feature that is increasingly coveted – carbon sequestration in soil and plants.

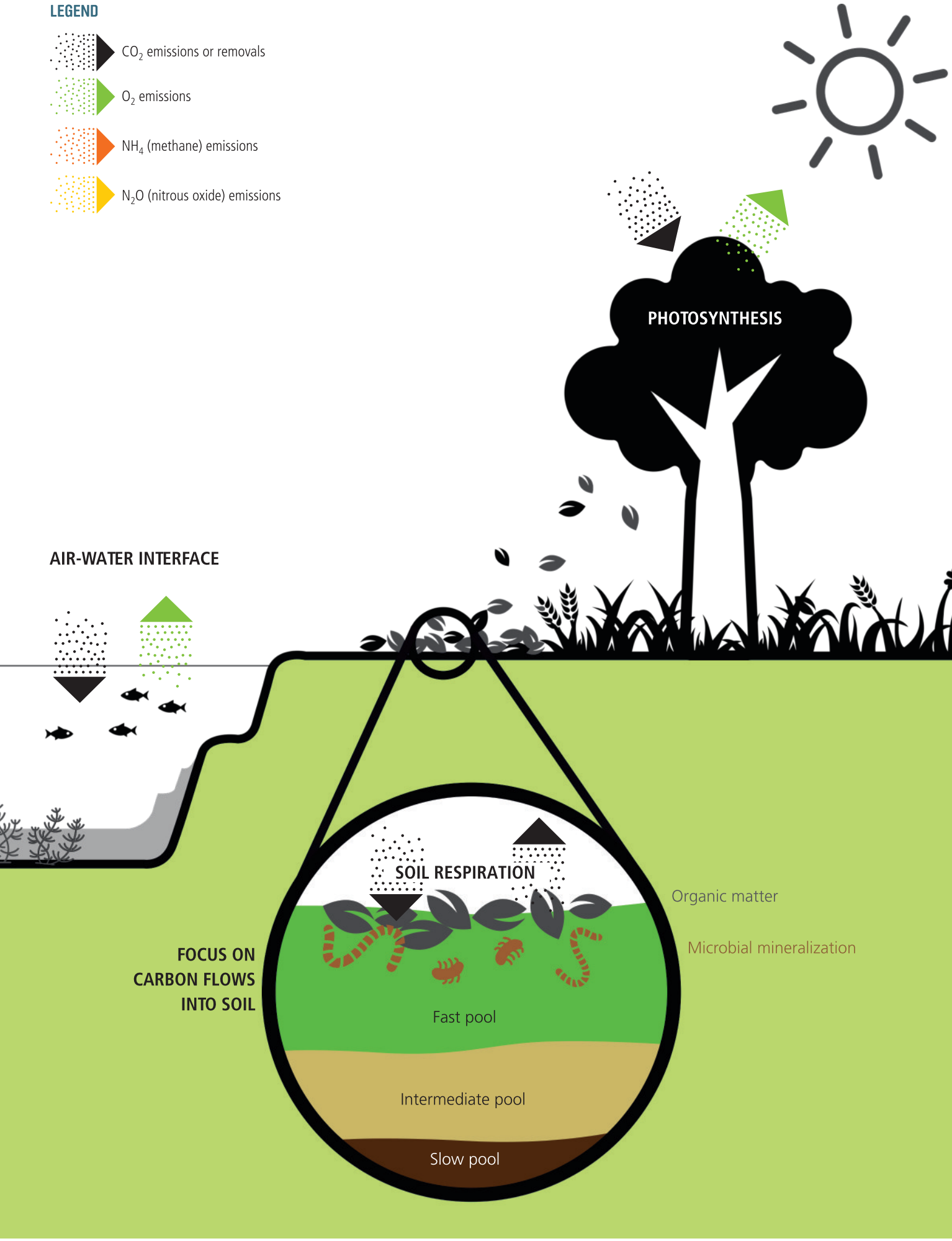
At present, no scenario proposed by the IPCC for limiting warming to 1.5°C by 2100 is possible without considerable emphasis on greenhouse gas sequestration. Forests' capacity for storing atmospheric CO_2 through photosynthesis is well known. Leaves, branches, roots and the woody tissue of trees store carbon relatively stably, if the forest remains intact. The preservation of forest ecosystems is consequently key in regulating the flow of greenhouse gases. Like forests, farmland can also be a greenhouse gas sink (often called a "carbon sink") if it retains more carbon than it emits into the atmosphere. While the atmosphere can retain 829 gigatonnes of carbon, soil can retain 2400 gigatonnes, i.e. three times more. But to think of this scientific fact as a miracle solution in combating climate change would be to ignore a situation that is far more complex.

A BIOLOGICAL PROCESS OPEN TO MULTIPLE OPTIONS

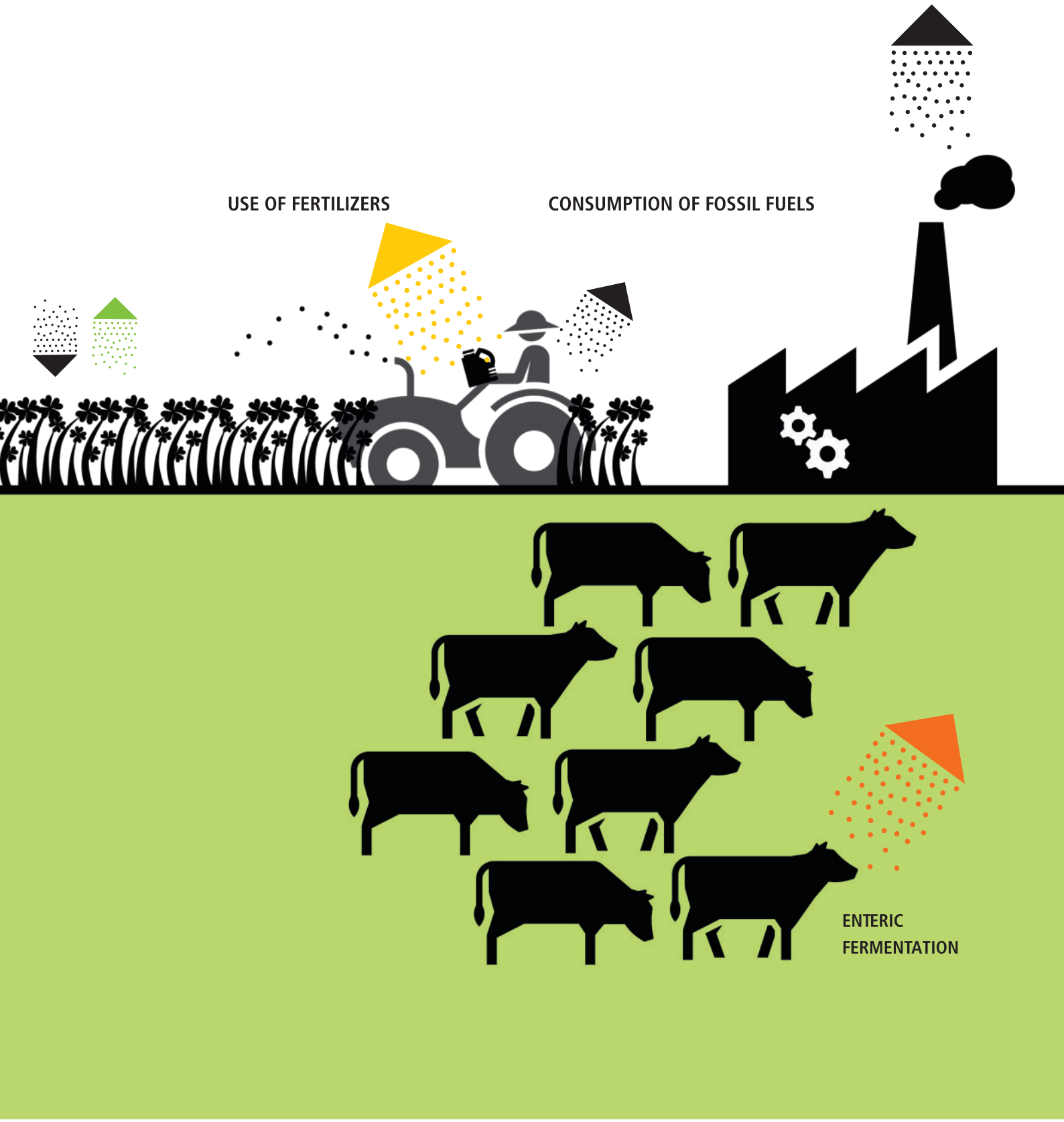
In farmland, when the vegetation absorbs carbon dioxide to give off oxygen through photosynthesis, part of the carbon is fixed in the plant producing organic matter. When the plant dies, the organic matter decomposes forming humus that contributes to soil stability. The microbial mineralization that takes place (decomposition of complex substances) then releases a number of nutrients into the soil.

The amount of organic carbon contained in a soil depends on the flow between the carbon entering the soil via organic matter and the carbon released through microbial mineralization (soil respiration). Carbon dioxide can be stored in the soil for months (fast pool), decades (intermediate pool) or even centuries (slow pool). Environmental conditions and physical and chemical properties will determine how long carbon will remain in the soil.

There are different ways of sequestering greenhouse gases in farmland. According to the situation, practices such as restoring ecosystems, agroforestry, hedges around meadows and fields, grassing orchards and vineyards, intermediate crops or even intercropping are all able to increase carbon sinks. Taking a systemic approach, these practices can form part of agroecology and represent co-benefits as regards adaptation policies and, more generally, food security for family farms and smallholders (the notion of "co-benefit" means "related benefit" in this report). Options based on sequestration can, for example, benefit the environment and make ecosystems more resilient to extreme climate events. The question over sequestration lies more in how it is carried out, taking account of economic and technical feasibility while maintaining fundamental rights and ecosystem integrity.


LEGEND
CO_2 emissions or removals
O_2 emissions
NH_4 (methane) emissions
N_2O (nitrous oxide) emissions
PHOTOSYNTHESIS
AIR-WATER INTERFACE
SOIL RESPIRATION
Organic matter
Microbial mineralization
FOCUS ON CARBON FLOWS INTO SOIL
Fast pool
Intermediate pool
Slow pool

Greenhouse gases in agriculture



SEQUESTRATION'S IN-BUILT LIMITATIONS

We need to make a distinction between natural ecosystems and those managed by humans (specifically farmland) insofar as the former are more likely to store large amounts of carbon[34]. Moving on to sequestering more carbon through sinks, we must remember that once the maximum storage capacity is reached, the ecosystem loses its sink capacity. But that does not mean that preserving this store becomes secondary. Quite the reverse, the first step must be to preserve established carbon stores rather than compensate for their loss through developing new ones[35]. The aim is, therefore, to retain carbon sustainably; knowing that such sequestration is non-permanent.

We must also take account of recent scientific thinking that appears to agree that losses of CO2 from the soil could increase as temperatures rise[36]. In addition, because of the lack of scientific data, it is difficult to predict confidently the effect on carbon stored in the soil[37] due to the range of farming practices mentioned above. Current research offers differing results, varying according to geographical areas, practices employed, etc. The ambition proposed by the international "4 per 1000" initiative was to increase the amount of carbon in soil by 0.4% per year to contain global warming. This appears to be an overestimation for many scientists given the enormous range of situations identified by research on this topic.

There is another major limitation to soil carbon sequestration. It is currently impossible to measure the carbon content of soil uniformly as there is no standardized approach[38]. The carbon content of soil is hard to determine since it is subject to wide year-to-year variations. The scientific community even disagrees about the depth at which analyses should be carried out[39]. In a 2009 World Bank experiment for example, it decided to estimate the amount of carbon sequestered in Kenyan farming land based on an IT model rather than physical samples. Given the high error rate inherent in this method, the researchers elected to reduce their findings regarding the carbon sequestration potential by 60%[40].

The aim is, therefore, to retain carbon sustainably; knowing that such sequestration is non-permanent.

The carbon content of soil is hard to determine since it is subject to wide year-to-year variations.

Furthermore, whatever the method used, greenhouse gas sequestration will never equal reducing emissions, since there is no way of guaranteeing the permanence and non-reversibility of sequestration. In other words, when gas is captured and sequestered, it does not disappear, unlike emissions that have been avoided and whose reduction is permanent. Increasing carbon storage in soil, which is easily altered, cannot compensate for depletion of carbon reserves stored in highly stable long-term reservoirs (such as fossil fuels). A 2002 report[41] on the situation in France concluded that even if major changes to French farming methods were carried out over 20 years (with state subsidies and the cooperation of farmers), the carbon sequestered would only equal 1 or 2% of total French emissions[42].

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THE GROWING POLITICAL ATTRACTION OF SOIL CARBON SEQUESTRATION

Historically, the Convention on Climate Change mainly looked at carbon dioxide in combating climate change since it was the gas most emitted by industrialized countries (countries with economies based on agriculture were far more concerned by methane). For many years "*political responses were thus focused mainly on industrial, transportation and energy sectors*"[43], ignoring agricultural problems that were often painted as being harder to resolve than other sectors. Following the 2007-2008 food crises, farming and food security returned to the fore on the international stage, including the climate negotiations. But rather than undertaking a profound rethink of food systems that were major emitters of greenhouse gas, countries preferred to look at agricultural problems through the limited prism of soil carbon sequestration. By maintaining this carbon-based approach, they tend to reduce the fight against climate change to clever mathematical calculations, transforming our ecosystems into mere carbon pocket calculators at the expense of a multi-dimensional approach to agriculture and food security.

Following the 2007-2008 food crises, farming and food security returned to the fore on the international stage, including the climate negotiations.

It's all about carbon – a simplification with adverse results

Focusing through the carbon prism in UN discussions is permissible under one of the rules in the United Nations Framework Convention on Climate Change (UNFCCC) that calculates everything in tonnes CO_2 equivalent. In their greenhouse gas tables, countries can express tonnes of methane and nitrous oxide as tonnes CO_2 equivalent. For example over 100 years, emitting a kilo of nitrous oxide (N_2O) has the same warming potential as emitting 298 kilos of CO_2. A tonne of N_2O is therefore expressed in national tables as 298 tonnes of CO_2 over 100 years. This method has the major disadvantage of giving the impression that methane and nitrous oxide emissions can be counterbalanced by an equivalent emission of CO_2, for example held in the soil in the case of farming. However in reality, these gases are not interchangeable.

Carbon sequestration compensation – back to a complicated story

The role played by forests in compensating for industrial emissions was identified long ago in international negotiations (article 3.3 of the Kyoto Protocol). However the complexity of the accounting rules did not encourage countries to favour sequestration in achieving their emission reduction targets.

In 2005 an international initiative was launched by a group of forest countries – REDD that would shortly become REDD+ (Reducing Emissions from Deforestation and forest Degradation). It would pay those who undertook to combat deforestation and forest degradation (especially in tropical forests). Originally, the aim of this initiative was to reduce atmospheric CO_2 emissions caused by forest destruction and degradation. This initiative was further complemented by including conserving forest carbon reserves, the sustainable management of forests and the growth of forest carbon storage. This extension rewarded maintenance of the carbon stored and also the increased carbon sequestered, and therefore considered the forest as a carbon sink and encouraged a compensation-based approach.

The funding for developing REDD+ projects has never been settled. Should it go through international funds like the Green Climate Fund or should these projects be opened to carbon markets (markets for trading quotas)? There are two types of carbon market – voluntary markets (markets unconnected to international regulation and for which credits generated do not count towards the goals imposed on industrialized countries under the Kyoto Protocol), or so-called "compliance markets" (internationally regulated markets in which credits generated can be counted in countries' obligations). For example, the European carbon market does not permit forest credits at the moment. Though promoters of REDD+ claim to have no desire to join the carbon compliance markets, in reality, their position is not as clear as they pretend. In international negotiations at the UNFCCC those setting up REDD+ projects have stepped up their presentations to countries with the increasingly obvious aim of incorporating carbon compliance markets so that they can use forests to compensate for permanent emissions. An Amis de la Terre and Basta! report on a case study in Madagascar pointed out that "*in 1998 the first carbon sink project set up in Brazil by Peugeot and ONF International [the international branch of the French National Forests Office] was presented as a scientific project whose only purpose was to develop methodologies for calculating carbon stocks. In the face of criticism, Peugeot and ONF International have always denied that they wished to generate carbon credits. But in 2011, ONF International and Peugeot announced that they were issuing the first carbon credits generated from the project.*[44]"

Though promoters of REDD+ claim to have no desire to join the carbon compliance markets, in reality, their position is not as clear as they pretend.

This financialization of forest management has stressed quantifying carbon in forest ecosystems at the expense of a more integrated approach in tune with people's needs. The Madagascar case study shows that the project focused on ecosystems whose storage potential was strongest "when that forest, be it moist or dry, is essential to the lives of local communities[45]." Another point was brought out in various studies[46] – blaming small farmers for deforestation, when 70-90% of forest destruction is due to expanding industrial plantations (soya, sugar cane, palm oil, etc.). Many projects, in fact, endanger the food sovereignty of small farmers who are sometimes forced to limit their farming in favour of forestry. A recent evaluation of a REDD+ project in Cameroon in 2016 cast doubt on how free, prior and informed consent was obtained from communities that were not consulted about the project that was carried out " *To sum up, […], the Baka find themselves forced to accept non-traditional activities and those they do not want for fear of losing funding set aside for them*[47]." It is quite clear that cases identified in research by civil society organizations have identified persistent failures despite effort put into safeguards.

This financialization of forest management has stressed quantifying carbon in forest ecosystems at the expense of a more integrated approach in tune with people's needs.

In Brazil, Nature is increasingly financialized in the name of the climate but at the expense of smallholders

In keeping with the Convention on Climate Change and the Kyoto Protocol that set up carbon markets internationally, for over 12 years, Brazil has continuously developed its legislation to institutionalize the financialization of Nature. This financialization is manifest in various mechanisms such as payments for environmental services to maintain or increase services provided by nature. This involves "making payments to landowners in return for managing land that maintains ecosystem services like water quality and carbon storage[48]."

Since 2009[49] the Carta de Belém [Belem Charter] group that represents many Brazilian civil society organizations has been warning about the inadvisability of reducing environmental questions to the climate alone and climate questions to carbon dioxide (CO2) alone, to permit easier recourse to market mechanisms. This vision has been promoted by the industrialized countries historically responsible for climate change to shift their obligations to the least responsible countries through carbon credit trading. This tendency has had huge consequences for the basic rights of people on the ground – such as the right to land – that have regularly been ignored. In Brazil, recent legislative changes testify to an undermining of food sovereignty and common goods to the benefit of market-led, private valuation of land turning small farmers into landholders living off annual payments. This is a legal system whose paradigm is now reversed – carbon compensation policies exploding with "tradable" rights, and backpedalling on social policies previously considered as rights for and of the Brazilian people.

In Brazil, recent legislative changes testify to an undermining of food sovereignty and common goods.

70-90% of forest destruction is due to expanding industrial plantations.

The sequestration potential of farmland is also covered in the Kyoto Protocol, but countries are free to define at a later date what activities on such land could be included in the accounting mechanism (art 4). In 2011, during the Kyoto Protocol negotiations, the Parties to the Convention on Climate Change (UNFCCC) began to look at including farming in the market mechanism known as the Clean Development Mechanism (CDM). This allows industrialized countries restricted by emission caps to fund projects to reduce or avoid greenhouse gas emissions in developing countries that, in turn, would benefit from technology transfer. These projects generate carbon credits for countries with emission caps and can be used on carbon markets to be sold to other countries. The final decision about whether or not to include farming has continually been put back in view of the intrinsic limits to carbon sequestration in soil.

An alleged competition between adaptation and mitigation justifying a policy of small steps

At the 17th COP (Conference of Parties) in Durban, also in 2011, countries decided for the first time to task the UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) to look into farming questions. In 2015 and 2016, four in-session workshops were organized to examine how to enhance the adaptation of agriculture to climate change impacts. While the industrialized countries (the European Union, New Zealand, Australia and, to a degree, the USA that have served as the linkage with the G77) wished to start discussing mitigation in agriculture, the G77 (which covers developing countries whose agriculture is becoming increasingly industrialized and countries where small family farms predominate) repeated its attachment to the adaptation of agriculture. This status quo has persisted since COP21 and speaks volumes about the general reluctance to examine agricultural models in depth. Such an examination would go well beyond a sterile comparison of adapting and mitigating.

Clearly, the industrial agri-food model needs to embrace mitigation more than the small farmer agricultural model that is most affected by the demands of adapting to climate change. Yet these two paths must meet the same goal of producing an agricultural transition that is socially fair and respects our resources. However discussions at the UN are currently far from providing any climate justice for farming.

Clearly, the industrial agri-food model needs to embrace mitigation more than the small farmer agricultural model that is most affected by the demands of adapting to climate change.

> On the one hand the G77 condemns the marked lack of financial support from the richest countries to help their farmers adapt and therefore, refuse to discuss mitigation. However the G77 contains a number of countries whose agricultural model has considerable influence in greenhouse gas emissions (especially Brazil, Argentina, Paraguay and Uruguay). This complexity blurs the dividing line between so-called "Northern" and "Southern" countries, in that it is actually agricultural models that need to be targeted, while maintaining the principle of countries' common but differentiated responsibility.

> On the other hand the historically industrialized countries focus on a restrictive concept of greenhouse gas emission mitigation in agriculture. On the grounds of supposed limited scope for reducing emissions from agriculture as compared with other sectors they are looking hopefully towards carbon sequestration in farmland. For instance, in parallel to official SBSTA negotiations, there has been a meeting to bring together different expertise in the agriculture and land sectors and demonstrate existing successes. At this session the FAO (UN Food and Agriculture Organization), the EU plus Japan[50] and Brazil put forward various projects on the potential for sequestering carbon in soil. Carbon has thus been given priority without ever speaking of the key challenges of lowering emissions through reducing consumption of meat products or exports and industrializing agriculture.

Improving food production does not mean a de facto improvement in food security. Guaranteeing food security results more from improving access to foodstuffs rather than availability. World food production could currently feed twelve billion

Whatever the position taken, most countries negotiating at the Convention on Climate Change hide behind the preamble of the Paris Agreement and studiously avoid any comparison linked to converting agricultural models. This effectively recognizes the "*fundamental priority of safeguarding food security and ending hunger*". On the basis of this disposition, countries continue to:

> Refuse to examine our greenhouse gas emitting food system in the name of preserving food production for a population that could reach nine billion by 2050;

> Prioritize carbon sequestration in soil which is often linked to greater soil fertility and productivity, thus contributing to world food production and, ultimately, food security[55].

Food production is, in fact, just one of the four pillars of food security (availability, access, utilization and quality, and stability). Improving food production does not mean a de facto improvement in food security. Guaranteeing food security results more from improving access to foodstuffs rather than availability. World food production could currently feed twelve billion, yet 40% is wasted[56] and a large element is destined for animal feed or diverted from its food use (e.g. biofuels). This absurdity is however effectively absent in the current state of discussions with countries, they prefer to brandish the concept of food security and the need to feed nine million human beings eventually. Yet solving the problem of hunger is much more of a political than a scientific problem[57].

Back to a dubious EU premise

In 2014, the European Council, in its conclusions, recorded the importance of recognizing the limited mitigation capacity of agriculture and land[51]. This repeated a European Parliament report of 2010 saying "that if agriculture is to be more actively involved in the global process of curbing climate change, care must be taken to ensure that the competitive position of the EU's agri-foodstuffs sector in the world market does not suffer[52]". In 2016 the European Commission commissioned an impact study to support its proposed new regulation on sharing efforts between EU members to achieve the region's greenhouse gas emission targets. This study repeated the limited potential from an economic point of view of reducing farming emissions in countries in which this sector constituted a large part of their emissions[53]. This is a questionable analysis in that, maintaining European agricultural production could represent a disproportionate cost for our societies if costs attributable to greenhouse gas emissions (externalities)[54] are included. It is even more concerning that a thoroughgoing transformation of our agricultural model that included reducing European livestock and overhauling our industrial livestock rearing together with modifying our food regimes was not covered at this point. Due to the supposed special nature of this sector, the result is that the EU is permitting countries that emit large amounts via their agriculture to use their land sector (and therefore carbon sequestration) to compensate for their methane and nitrous oxide emissions mainly.

In 2017, after six years of continuous obstructionism, at COP23 countries finally agreed to start a three year work on agriculture. While the process will go ahead, the content is yet to be determined and still appears far from a thoroughgoing examination of our food systems.

Though progress in international negotiations on agriculture since 2011 appears feeble given the climate imperative hanging over our planet's small farmers, private or multi-stakeholder initiatives have proliferated. Private-public partnerships, national and international donors, and the private sector have readily bombarded the UNFCCC, offering their solutions, such as the land sector meeting in May 2017 (the TEM – Technical Expert Meeting) on "attracting private sector engagement for ambitious mitigation action."

Though progress in international negotiations on agriculture since 2011 appears feeble given the climate imperative hanging over our planet's small farmers, private or multi-stakeholder initiatives have proliferated.

PROGRESS IN GREENING PRACTICES IN THE DOMINANT AGRI-FOOD SYSTEM

Since COP21 and the adoption of the Paris Agreement, the idea has gained ground that countries should not just regulate but also support non-state actors working to combat climate change (communities, towns, investors, companies, non governmental organizations). Due to governmental decision-makers' foot-dragging over agriculture in the Convention on Climate Change, parallel initiatives abound and are sometimes formalized. The production of a "Agenda of Solutions" at COP21 – also known as the "Action Agenda[58]" – with its vague outlines has supported this dilution of the state's role in a range of initiatives jointly-led by different players[59]. As a key sector in this Agenda, the farming and land sector are more than ever ripe for myriad international initiatives.

By analysing this evolution we can identify the key players in this alteration in decision-making and deconstruct solutions put forward on the vital issue of agricultural transition.

The private sector prowling around nations

Looking at COP21, many initiatives were proposed to meet the challenge of agriculture and climate change, many of which stressed the carbon sequestration potential of the soil. Let us look at three of them from the "Action Agenda" which bring together countries, financial institutions, research centres, NGOs and especially agri-food companies, particularly from the industrial seed and synthetic inputs sectors.

By way of background, since 2015, the industrial seed and synthetic inputs industry has evolved enormously. While six major groups already possess 75% of the world market in toxic agrochemicals (Dupont, Monsanto, Dow Agroscience, BASF, Bayer Cropscience and Syngenta), three new merger/acquisitions have been announced between Syngenta and ChemChina, Dupont and Dow Agroscience, and Monsanto and Bayer[60]. As they are aware of the requirements that might affect them in combating the climate crisis, the seed and synthetic inputs industry is taking the lead by joining various international initiatives, particularly to promote the carbon sequestration potential of farmland.

THE GLOBAL ALLIANCE FOR CLIMATE SMART AGRICULTURE (GACSA)

This international alliance was launched in 2014, alongside UN institutions, to promote the concept of Climate Smart Agriculture (CSA), first mentioned by the FAO in 2009. According to the FAO, CSA "*aims to enhance the capacity of the agricultural systems to support food security, incorporating the need for adaptation and the potential for mitigation into sustainable agriculture development strategies*[61]." . As regards mitigation, the FAO is proposing two main trends – improving agricultural productivity which would not be linked to a proportional increase in greenhouse gas emissions (also called "sustainable intensification of agriculture") and improved sequestration of carbon in soil[62].

Looking at COP21, many initiatives were proposed to meet the challenge of agriculture and climate change, many of which stressed the carbon sequestration potential of the soil.

Within GACSA, the CSA element is based on vague parameters[63]. Clearly this solution suits its members, especially the agri-food industry that is investing hugely in it. "*Apparently only 17 of its 148 members come from the fertilizer, biotechnology and seed or agro industries. However an examination of the partners of GACSA members shows that in fact 33 of them are linked to these sectors. 41% of private companies that are GACSA members have main partners drawn from these sectors (as members or founders) or have close links with some of them*[64]". If you take Yara, Syngenta or Danone and Kellogg, it is noticeable that the countries in which they are headquartered, (Norway, Switzerland, France and the USA respectively) are also members of GACSA. Countries, and major economic players in them, all support a vision that, in the guise of helping combat climate change, allows projects to coexist under the same heading that range from promoting Genetically Modified Organisms (GMOs) to transitioning to agroecology.

In Kenya, the World Bank cultivates financialization of carbon in farmland

Amongst so-called "climate smart" projects is a World Bank experiment in Kenya to sequester carbon in farmland – the "Kenya Agricultural Carbon Project ". This began in 2009, supported by the World Bank's BioCarbon fund and its participants – the Agence Française du Développement [the French development agency] and the Syngenta Foundation[65]. This pilot project is to be developed over twenty years to install a market mechanism based on compensation. The goal is to involve 60,000 Kenyan farmers over an area of 45,000 hectares to rehabilitate land and develop farming techniques to capture carbon in the soil[66]. It was designed to meet the triple challenge of mitigation, adaptation and food security. The project was based on paying smallholders once carbon in the soil had been measured (using a simplified methodology). By showing that carbon credits can support family farming in Southern countries, the World Band was clearly showing it wanted carbon credits from soil sequestration to be recognized in official UNFCCC negotiations[67]. In time we could imagine carbon markets – like the European market – incorporating this type of mechanism and regulating the financialization of farmland to combat the climate crisis. However, initial results from the World Bank's pilot project demonstrate that, in fact, transaction costs absorb half of the income generated by carbon credits and that profit for small holders was derisory, estimated at just over 1 dollar per smallholder per year in 2011[68]. In addition, the social and economic impact appears to have been underestimated particularly as regards massive use of herbicides, including glyphosate. Finally, research[69] also showed that smallholders' responsibility for climate change was trumpeted by project managers to justify the need to adopt new practices.

Making smallholders in the South responsible for mitigation in order to generate carbon credits when they are the first victims of, as well as being least responsible for, climate change is an unacceptable conclusion.

Leaving aside scientific uncertainty about measuring carbon sequestered in soil and the social and environmental dangers[70], this approach casts doubt on the key principle of countries' common but differentiated responsibility for climate change. Making smallholders in the South responsible for mitigation in order to generate carbon credits when they are the first victims of, as well as being least responsible for, climate change is an unacceptable conclusion. Adapting to the consequences of climate change must be a priority for small family farms and mitigation should only be a co-benefit.

THE ADAPTATION OF AFRICAN AGRICULTURE (AAA) INITIATIVE

At COP22 in 2016, Morocco (the conference organizer and host) launched a new initiative called AAA (Adaptation of African Agriculture). Soil management was one of AAA's priorities. It attracted various supporters, though far fewer that other initiatives. The agri-food and synthetic input sectors were represented by Avril, the leading French oil and vegetable protein company as well as the number one French animal feed producer, and two company foundations – Danone (Fondation Livelihoods) and the Office Chérifien des Phosphates (OCP) [the Moroccan phosphate producer].

The AAA website, rather than presenting actual projects that had started, just indicates its carbon sequestration vision. Agroecology is proclaimed but with a specific meaning: "strik[ing] the right balance between a production-oriented agriculture and an agro-ecology that would 'produce with less or zero inputs[71]'." Though certain practices are proposed, (such as conservation agriculture – *see following section*), at no point is this "right balance" really explained. Once again vagueness triumphs in this initiative, as with Climate Smart Agriculture. This absence of clear political choice was also exposed in another initiative, similar to and supported by AAA – "4 per 1000".

Launched by France in 2015 at Cop21, "4 per 1000" is a multi-stakeholder international initiative to improve carbon storage in the soil. Though, unlike the previous two initiatives, it restricts the involvement of profit-making entities in its consultative bodies, it does allow company foundations to contribute to its decision-making bodies. Amongst its supporters we therefore find the Avril and Livelihoods foundations as well as others linked to carbon markets (Country Carbon, the Fair Carbon Exchange). Unlike the first two initiatives, the policy of "4 per 1000" showed an initial inclination towards transforming farming through agroecology. Civil society organizations asked for this desire to be turned into actual specific commitments in order to clarify the vision political decision-makers[72] were working to. Drawing up a multidimensional baseline, however imperfect, has had the practical benefit of raising the question of how to integrate a wide range of levers in climate policy. The credibility of the initiative will depend on the content of the baseline and how it is used.

Given the economic (and commercial) considerations that seem to be eclipsing the urgency around the climate, the small steps policy seems to be in fashion amongst countries in official discussions on agricultural models. But, astonishingly, partnerships on this subject between governmental decision makers and private entities are proliferating in parallel at international level.

On the menu are:

- **the financialization of carbon in soil to trade the credits generated on carbon markets and thus compensate for emissions,**
- **an absence of oversight of initiatives,**
- **the promotion of dominant economic players from the agriculture industry that are those most responsible for the sector's greenhouse gas emissions.**

Conservation agriculture – a new trump card for industrial agriculture?

To contain carbon in farmland, a miracle solution seems to be going the rounds in political decision-making circles – conservation agriculture. It is based on three main principles:

> maximum soil cover
> crop rotation
> minimum soil disturbance

Contrary to what is often stated by no-till promoters, it is not so much the fact of not tilling the soil that permits sequestering more carbon as the addition of organic matter to this soil, the choice of crops and their rotation[73]. These data remain questionable in that scientific research provides particularly disparate results[74]. In sub-Saharan Africa for example, one study[75] concluded that no-till would only lead to a limited increase in carbon in soil. Adding organic matter (such as mulching with crop residue) could provide more satisfactory results but with the disadvantage of dedicating this material to the soil when it has existing uses (fodder, fuel, construction material, etc.). Another study[76] in Laos, showed that the no-till system did not store carbon despite major additions of organic matter combined with use of herbicides and fertilizers. It should be noted here that the performance claimed for conservation farming is difficult to isolate from associated factors such as the use of nitrogenous fertilizer (a source of nitrous oxide), herbicides and improved seed. It is generally acknowledged that in the first years, conservation agriculture requires greater use of herbicides than conventional farming[77].

It should be noted here that the performance claimed for conservation farming is difficult to isolate from associated factors such as the use of nitrogenous fertilizer (a source of nitrous oxide), herbicides and improved seed.

In 2008-2009 8% of the world's cultivated land[78] used this type of farming. It was developed mainly in the USA, Canada, Australia, Brazil and Argentina; countries with large-scale farming often dependent on pesticides and major consumers of GMOs[79].The three countries with the largest area of GMO crops also happen to be the three countries with the greatest no-till areas[80]. It was originally promoted by the FAO and the World Bank to achieve greater integrated soil management. This type of farming was then developed in other countries, especially in Africa (Kenya, Tanzania, Zambia, Zimbabwe, Lesotho, Swaziland, Mozambique and Malawi). Though their way of implementing conservation agriculture differs from that developed industrially on a large scale, (greater crop rotation, less GMOs, etc.), take-up by farmers is still limited[81], mainly because it is hard for smallholders to access the technology package supporting the introduction of conservation agriculture[82].

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Conservation agriculture is now the basis of the agrochemical industry's strategy to perpetuate a particular farming model in the name of the climate but also to benefit from international funding, not to mention market mechanisms. In Brazil, conservation agriculture was initially tried out in small and medium-sized farms before the multinationals of the agrochemical industry such as Monsanto got interested and developed large scale conservation agriculture, mainly soya monoculture.

Though originally expanded nationally, conservation agriculture is now part of the international discussions. For

example in the case of climate-smart agriculture, the World Business Council for Sustainable Development (WBCSD) – an organization made up of over two hundred large companies such as Monsanto, Olam, Danone and Bayer – insists on the CO2 emission reduction potential of no-till. By opting for pedigreed seed (including GMOs), this would avoid tilling and therefore the use of fossil energy that tilling requires. However we are not told what greenhouse gas emissions result from the manufacture and transport of seed and herbicides – such as glyphosate – that often go together.

Conservation agriculture is now the basis of the agrochemical industry's strategy to perpetuate a particular farming model in the name of the climate but also to benefit from international funding, not to mention market mechanisms.

Glyphosate and environmental health

Glyphosate is a systemic herbicide used in the composition of many herbicides and products used in farming and gardening, like Monsanto's famous Roundup. Glyphosate is the world's most-used herbicide molecule and constitutes "the cornerstone of plant biotechnology development strategy, since almost three quarters of GMO crops are now adapted to tolerate glyphosate[83]." In 2015, this product was classed as a mutagen, a carcinogen for animals and probably a carcinogen for humans by the World Health Organization's specialized cancer agency, the International Agency for Research on Cancer (IARC). In 2017 the "Monsanto Papers" provided further information. Declassified internal Monsanto correspondence showed that the company had been seriously concerned since 1999 about the mutagenic and genotoxic (the ability to alter DNA – a feature of carcinogenesis) potential of glyphosate. The documents also reveal the company's dealings with researchers and scientific publications in attempting to influence the opinion of the EFSA (the European Food Safety Authority). These revelations chime in with civil society reports and scientific warnings questioning the methodological choices and the handling of conflict of interest in European regulatory agencies[84]. Monsanto rejects the WHO's classification and resolutely hides behind the opinions of regulatory agencies that support it.

Despite the limitations identified regarding large-scale deployment of conservation agriculture and the absence of regulation, this type of farming is on the way to becoming central to national climate change policies.

Many countries have referred to this way of farming or no-till in their Intended Nationally Determined Contribution (INDC) to achieve the goals set by the Paris Agreement - Argentina, Paraguay, Uruguay, Malawi, Botswana, Sierra Leone, Cameroon, Lesotho, Zambia, Eritrea, Madagascar, the Comoros and Turkey. Most of these countries have little responsibility for climate change, historically. So we must wonder about the future use of the supposed carbon benefits that could result from an agricultural policy focused on carbon sequestration in farmland. In the USA and Canada – two countries with particularly high, long-standing responsibility – protocols have been established to allow carbon sequestration projects to generate credits to compensate for other greenhouse gas emissions[85]. Such projects must meet requirements regarding means (implementing low-till or no-till practices) rather than results (a genuine increase of carbon in soil). Compensating permanent emissions through reversible, temporary sequestration is already highly dubious, but even more disturbing would be internationalizing carbon credits between historically industrialized countries and those that were least responsible for climate change. Concentrating on the, at times, largely hypothetical benefits from mitigation in countries with mainly family farms could divert public policy from the real need - adapting to a fair peasant agroecological transition.

Conservation agriculture without glyphosate. Can it be done?

For many years there have been small scale experiments in trying to avoid synthetic plant health products when using no-till. The notion of bringing together conservation agriculture and organic farming seems light years away from the model promoted by the agroindustry giants. At present, it is hard to generalize about successful experiments and tilling the soil, however shallowly, is still often necessary. However progress in research shows us that a word can cover a wide variety of situations. In a vision that included, the social, environmental and economic elements of farming, we could imagine conservation agriculture as a type of agroecology in certain territories.

"We cannot solve problems
by using the same kind of thinking
we used when created them[86]."

RETHINKING AGRI-FOOD SYSTEMS TO MEET THE CLIMATE CRISIS

Adapting farming to the impact of climate change, mitigating the contribution of the agri-food system to greenhouse gas emissions and retaining, or increasing, stores of carbon in soil – these are the three challenges agriculture must take up. Rather than developing silo thinking on each component, we need to tackle this challenge holistically and offer broad-based responses that take account of the multitudinous factors on which food sovereignty depends. The climate crisis needs to be seen as an opportunity to rethink an agri-food system that no longer meets social, environmental or economic requirements.

By reducing agriculture to virtuous (or otherwise) practices for storing carbon but forgetting that it is more implicated in the other greenhouse gases, methane and nitrous oxide, means further pressure on land is likely to grow at the expense of small-scale farming. Investment schemes favouring huge areas of agricultural land seem particularly worrying because they are unsuited to the small farms that ought to be the first to benefit from investment to combat the climate crisis. For example the creation of a *Land Degradation Neutrality Fund* which has identified millions of hectares of land and is supported by France, casts doubt on the choices that will be made in financing projects[87].

An approach restricted to evaluating carbon in farmland rather than a multi-role (social, economic and environmental) vision of agriculture could, furthermore, lead to the additional danger of land-grabbing. This concept is particularly open to developing investment-based models in which land would become an item of speculation.

So do we want to make our land a new carbon Eldorado with, at the end of it all, the probable financialization of nature or do we want to convert our farming model whose carbon storage potential would not be an end but just one element in a multilayered approach?

In a report to the French National Assembly in 2003, a French research institute, the INRA, said that "*though the carbon storage potential is far from negligible, it is difficult to evaluate because of the myriad uncertainties and difficulties […] Research stresses the limited value of using this solution to combat greenhouse gas. […] Unlike the reduction of greenhouse gas emissions, in the tests carried out, storing carbon in the soil is not a sustainable solution for reducing atmospheric CO2. Stores cease to grow after a few decades and the usable farmland is finite. The conclusion of the research does not support using farmland for storing carbon. However we should note that it demonstrated the other environmental benefits deriving from practices that stored carbon in soil, such as reducing erosion, improving soil and water quality, fossil fuel savings or even greater biodiversity. The INRA study considered that it would be more advantageous to incorporate carbon storage incentives into wider agro-environmental measures*[88]."

The climate crisis needs to be seen as an opportunity to rethink an agri-food system.

Investing in the small farms, family farms and smallholdings, that together represent almost 90% of the world farming sector and 80% of total food production is the first requirement.

Investing in the small farms, family farms and smallholdings, that together represent almost 90% of the world farming sector and 80% of total food production[89] is the first requirement. But this vital investment must stay away from carbon markets to preserve smallholders' most basic rights. Rather than attempting to segment farming problems, public policy should provide support for much more systemic measures that promote agroecological transition. This transition will foster reflection on farming structures and their evolution while respecting environmental and social imperatives.

As long as we restrict the fight against climate change to purely mathematical notions, false solutions will continue to proliferate. It is vital to reverse the paradigm and put humans and ecosystem integrity back at the centre of efforts on the climate, taking a much more holistic perspective. Adopting ambitious public policies that produce a real change in our means of production and consumption must supplant diktats imposed by economic, financial and political spheres that, after having been the biggest contributors to climate change, now claim to have the solution. Sequestering carbon in our soil should only be a "co-benefit" of action by governments to profoundly change our societies, be it in agriculture or forest management. Only by combining economic, social, cultural and environmental criteria, can choices be made that respect everyone and our land.

As long as we restrict the fight against climate change to purely mathematical notions, false solutions will continue to proliferate.

"We need a conversation which includes everyone, since the environmental challenge we are undergoing, and its human roots, concern and affect us all."

(*Laudato Si'*, Pope Francis' Encyclical on care for our common home, 14)

RECOMMENDATIONS

THE ROLE OF NATION STATES AND THE PLACE OF THE PRIVATE SECTOR

1_ The Action Agenda[90] created at COP21 must be completed immediately with principles of governance, selection criteria for initiatives and a liability framework to exclude initiatives endangering people's fundamental rights (including the right to food) and which, in the fight against climate change, do not permit genuinely "transformational" action.

2_ In the absence of clear regulatory and accountability rules on the role of the private sector in international governance, countries have to retain their regulatory function to defend the common interest, including agricultural questions raised in the Convention on Climate Change (UNFCCC) negotiations whose role is eminently political. Inadequately regulated parallel initiatives should receive no state political or financial support.

3_ The multidimensional baseline developed to implement "4 per 1000" needs to be refined so that involves a genuine reorientation of dominant farming models. It should be obligatory and used systematically for projects developed as part of this initiative and communicated widely to donors.

4_ Investments countries make to reduce food insecurity and climate change must be directed at smallholder farmers and peasants. We have to recognise their vital multi-role function in transitioning to agroecology both for localizing output and responsible management of land and the countryside.

POLICY CONSISTENCY

5_ To improve policy consistency, specifically climate and agricultural policy, in their work on agriculture between 2018 and 2020 at the Convention on Climate Change, countries need to actively involve the Committee on World Food Security (CFS) and especially the HLPE and decisions reached, such as "Food Security and Climate Change" (2013), "Voluntary Guidelines on the Responsible Governance of Tenure" (2012), "Biofuels and Food Security" (2013).

DIFFERENTIATING BETWEEN AGRICULTURAL MODELS

6_ The concept of production and consumption systems must be at the centre of discussions on agriculture to be held between 2018 and 2020. These should not be restricted to combinations of farming practices that leave out a systemic approach that is crucial in the climate crisis.

7_ To respond adequately to the challenges posed by the role of farming in climate change, countries must apply a principle of differentiating agricultural models according to their impact on food security and the climate. They need to be classified so that they can be easily identified in negotiations and other national and international instruments (Nationally Determined Contributions or NDCs, public policy, etc.) so that appropriate, consistent public policies are developed.

PRIORITIZING DRASTIC EMISSION REDUCTIONS

8_ To counter an approach mainly based on compensation for farming emissions through soil carbon sequestration, permanent reduction of farming emissions such as methane and nitrous oxide needs to be a priority for countries while respecting the principle of common but differentiated responsibility. For example we must not require disproportionate effort to reduce greenhouse gas emissions from pastoral farming as part of mixed system possessing positive environmental synergies between crops and animals.

REGULATING THE USE OF SOIL CARBON SEQUESTRATION

9_ Given scientific uncertainty about measuring carbon sequestration in farmland, countries cannot account for this greenhouse gas as a source of mitigation in their national accounting. Carbon sequestration can only be a co-benefit from holistic adaptation measures.

10_ The issue of agricultural soils has to be included in public policy on transitioning to agroecology so that it incorporates the complexity of our farming rather than being a dedicated, fragmented policy that only meets short-term climate considerations. Regulation will have to justify the social and environmental imperatives involved in transitioning to agroecology. Promoting conservation agriculture through incentives, for example, must be linked to banning the use of glyphosate.

11_ To head off the danger that increased financialization of land could lead to land grabbing, policies involving transitioning to agroecology need to avoid the market and financial approaches – such as carbon markets - developed by countries in international climate negotiations.

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Acronyms

AAA: Adaptation of African Agriculture

AFD: Agence Française du Développement [French development agency]

BECCS: Bio Energy with Carbon Capture and Storage

CDM: Clean Development Mechanism

CFS: Committee on World Food Security

CO2: Carbon Dioxide

COP: Conference of Parties

CSA: Climate Smart Agriculture

DNA: Deoxyribonucleic Acid

EFSA: European Food Safety Authority

EU: European Union

FAO: UN Food and Agriculture Organization

GACSA: Global Alliance for Climate Smart Agriculture

GHG: Greenhouse Gas

GMO: Genetically Modified Organism

HLPE: High Level Panel of Experts

IARC: International Agency for Research on Cancer

INDC: Intended Nationally Determined Contribution

INRA: Institut National de la Recherche Agronomique

IPCC: Intergovernmental Panel on Climate Change

N2O: Nitrous Oxide

NDC: Nationally Determined Contribution

NGO: Non Governmental Organization

OCP: Office Chérifien des Phosphates

REDD+: Reducing Emissions from Deforestation and forest Degradation

UN: United Nations

UNFCCC: UN Framework Convention on Climate Change

SBSTA: Subsidiary Body for Scientific and Technological Advice

TEM: Technical Expert Meeting

UNDP: United Nations Development Programme

WBCSD: World Business Council for Sustainable Development

WHO: World Health Organization

Notes

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List of illustrations

List of boxes

Leading French NGO CCFD-Terre Solidaire tackles the root causes of poverty and hunger.

For more than **55 years**, CCFD-Terre Solidaire has been fighting hunger by tackling its underlying causes. It supports more than **697 projects** initiated by local actors in **66 countries**. CCFD-Terre Solidaire draws on a network of **15,000 volunteers** to raise public awareness in France on international solidarity and, through advocacy, works with decision makers to build a more just world.

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