Rikolto and climate change

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VECO

Towards a climate-sensitive approach to agricultural chain development.

The UNFCCC defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods". The increase in greenhouse gases like carbon dioxide leads to a warming of the planet and effects such as increasingly extreme weather patterns, the melting of mountain glaciers around the world and a rise in global mean sea level (up to 1 m increase by 2100 is projected).

Position of Rikolto

Rikolto supports the idea of contraction and convergence. The Contraction and Convergence strategy consists in lowering overall emissions of greenhouse gases to a safe level (contraction), as a result of every country bringing its per-capita emissions to a level that is equal for all countries (convergence). This is a concept for international agreement on greenhouse gas reduction and has been gaining ground because it outlines a way to fight climate change that is fair and equitable for everyone on the planet. Priorities for climate change should be differentiated: in developed economies, the priority should be on doing more with less and drastically cutting emissions (20% of the population is responsible for 80% of the life-cycle impact of consumption). In fast-growing economies, the priority is to leapfrog to highly productive low-carbon economies. For the least developed countries, the priority is to eradicate poverty and build a basis for sustainable and equitable growth. To limit the rise in global temperatures to 2°C, everyone on the planet should be allocated an equal carbon footprint. Currently, this would be about 2 tonnes per person, falling to about 1.5 tonnes per person by 2050 due to the projected population increase.

Rikolto firmly believes that sustainable development is possible when adaptation, mitigation and development approaches are combined. In dealing with climate change, a distinction is made between adaptation and mitigation. Mitigation refers to any action taken to eliminate or reduce the long-term risks and hazards of climate change, whereas adaptation refers to the ability of a system to adjust to climate change (including climate variability and extremes) in order to moderate potential damage, take advantage of opportunities, or cope with the consequences. The IPCC mentions in its latest report that curbing emissions to maintain global temperatures below 2°C would need urgent action at a global level. However, the benefits to the global climate, and thus to the societies and ecosystems that depend on it, will only emerge in the latter half of the century. The IPCC lists the many reasons why mitigation action must start now and the kinds of benefits it can deliver. In contrast, taking action on adaptation today delivers many immediate benefits. Adaptation is the only effective option to manage the inevitable impacts of climate change that mitigation cannot reduce. There are limits to adaptation, however. For this reason, both adaptation and mitigation are needed: they each deliver

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Photo: africagreenmedia.co.za

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benefits but over different time frames.
Rikolto thinks that it is important to incorporate both aspects into the programmes.

Rikolto accepts that carbon markets for agriculture should be introduced when the following conditions are met:

- They are excluded from Carbon Trading Mechanisms in speculative markets;
- Carbon market financing systems should only form a small part of a farm's income and should not be seen as a major income source;
- There are numerous co-benefits of ensuring better carbon management practices: increases in soil carbon to improve climate change adaptation through water-use efficiency, increased resilience and better fertility, biogas generation, energy efficiency, better composting techniques, greater adoption of compost use and higher yields for traditional smallholders;
- The concept of systems that are based on paying for multiple best-practice services, ecosystem services and social services should be preferred to systems limited to carbon only;
- Insetting Carbon Markets (i.e. markets in which a dedicated sum, already included in the final price tag for products, is returned to farmers; in other words, consumers do not just pay for an apple, but also for the ecological production methods used) would be more beneficial than the uncertainties of offsetting schemes. Insetting allows the sector to control the amount returned to farmers for their ecosystem and social justice services. In open market systems on the contrary, which occur with offsetting, the returns to farmers are subject to the whims of price fluctuations. Insetting can also be used as a very effective marketing tool to "sell" the value of the multifunctional benefits of organic systems to consumers (more details can be found in "Draft IFOAM WB Position on Carbon Trading Markets").

Implications for our work

It is Rikolto's ambition to contribute to chains that will eventually be CO2 neutral. A climate-sensitive approach should therefore be mainstreamed across the chain. At every level of the chain we should check for negative climate effects and the potential to reduce them.

Rikolto's efforts in the **Democratic Republic of Congo (DRC)** embody that ambition. In the DRC, Rikolto is conducting a participatory study on how to re-use seed husks and parchment as fuel in order to reduce the need for firewood, resulting in fewer trees being cut down.

By incorporating adaptation into planning and decision-making, many synergies with development can be created that reduce the consequences of global warming already being felt today and build resilience in critical sectors such as water, energy and agriculture. ICC reports mention a list of actions on climate change adaptation that can bolster development.

Adaptation options can be categorised as follows:

- Technological developments (e.g. new crop varieties, water management innovations);
- Government programmes and insurance (e.g. agricultural subsidies, private insurance);
- Farm production practices (e.g. crop diversification, irrigation); and
- Farm financial management (e.g. crop shares, income stabilisation programmes)

Rikolto promotes the integration of smallholders into domestic and international value chains, which means that Rikolto will focus on different aspects of the chain.

Production

Rikolto advocates the implementation of agro-ecological principles, the promotion of low-carbon agriculture (which increases soil organic matter, improves the application of fertilisers, etc.) and the adoption of measures that reduce waste, particularly post-harvest measures that target carbon sequestration.

One specific example is the EcoMakala project in **RD Congo**, in which Rikolto is involved (WWF, 2014). In order to reduce water consumption, Rikolto is implementing the System of Rice Intensification (SRI) method in South Kivu.
In **Nicaragua and Honduras**, Rikolto supports smallholder farmers who produce their cocoa in agroforestry systems and implement agro-ecological practices such as low tillage and good design of plots with good pest and disease control. Rikolto has also financially supported research on the adaptation and mitigation of climate change at three levels (Community, Municipality and Farm). Based on the findings, several strategies have been designed at all three levels for Matiguas and Waslala in Nicaragua, where our cocoa partners are based. Measures such as natural resource management and agroforestry systems are implemented to increase the resilience of cocoa plants.
In **Ecuador and Peru**, Rikolto, in collaboration with other institutions (e.g. ECOPAR in Ecuador), contributes to the development of research into climate change adaptation and mitigation measures. In Peru, we have been able to design farms to be more resilient to climate change. As a result, farms can now be built using techniques that resist the harmful effects of climate change more effectively and help affected areas recover more quickly.
In another project in Latin America, Rikolto, again in collaboration with other institutions (e.g. the National Coffee Board in Peru), contributes to the development of research into climate change adaptation and mitigation measures. In Ecuador, the research has identified the most appropriate adaptation measures for coffee plants. These include (1) the management of shade, (2) the nutritional strengthening of the plant, (3) the development of microclimates on farmland, (4) efficient water management and (5) integrated pest and disease management.

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Processing

Energy use should be monitored and, if necessary, adapted throughout the chain, especially in the processing phase, which very often has high energy consumption. We are striving to phase out the use of fossil fuels or non-renewable resources in chains and make the transition towards Energy Efficiency and Renewable Energy Use in production, processing and transport.

In **West Africa**, Rikolto encourages the adoption of energy-efficient cooking stoves for parboiling rice. Sugar cane farmers in Nueva Segovia in northern Nicaragua use sugar cane waste as a source of energy to process the sugar cane.

The processing factories we are working with are not always aware of the amount of energy they are consuming and Rikolto can assist them in reducing energy use and in optimising processes. Rikolto can also support them in implementing an energy audit and in looking for alternative sources of energy.

Transport

Air freight has a huge impact in terms of CO2 emissions and therefore has to be strongly discouraged. Rikolto can work in chains that use air freight when there is a concrete plan to work towards more sustainable means of transport.

One example is the IDH project with Special Fruit, which is currently exporting passion fruit from **Tanzania and Kenya** by air. The project's specific objective is to explore the possibility of replacing air freight with ship freight.

Stimulating short food chains that focus on local and regional markets is very important for reducing CO2 emissions and could even have priority over other chains if the potential exists to create a better livelihood for farmers.

Consumption

Consumption patterns have an enormous influence on climate change. In developing and emerging countries, food and housing dominate greenhouse gas emissions. For industrialised countries, all studies indicate that housing, mobility, food and electrical appliances typically determine over 70% of the impact of household consumption.

The consumption of meat and dairy products, in particular, accounts for a large share of environmental impact, as well as food waste at the consumption level.

Rikolto **Belgium** actively works with a sustainable consumption programme, geared towards changing consumption patterns through sustainable catering. Sustainable consumption is based on six principles: (1) local foods and seasonality, (2) sustainable fish consumption, (3) meat reduction and sustainable meat consumption, (4) consumption of foods produced by organic farming methods, (5) consumption of foods produced by fair-trade farming methods and (6) reduction of food waste.

Facts and Figures

Trends and effects

The effects of climate change on crop and food production are already evident in several regions of the world. Based on the IPCC Fifth Assessment Report, the University of Cambridge in the UK explored the specific trends that will affect the agricultural sector and discussed some key findings.

- Climate-related impacts are already reducing crop yields in some parts of the world, a trend that is projected to continue as temperatures rise further. The crops affected include staples such as wheat, maize and rice. Climate change is projected to increase price volatility for agricultural commodities and reduce food quality. Hillside surveys conducted after

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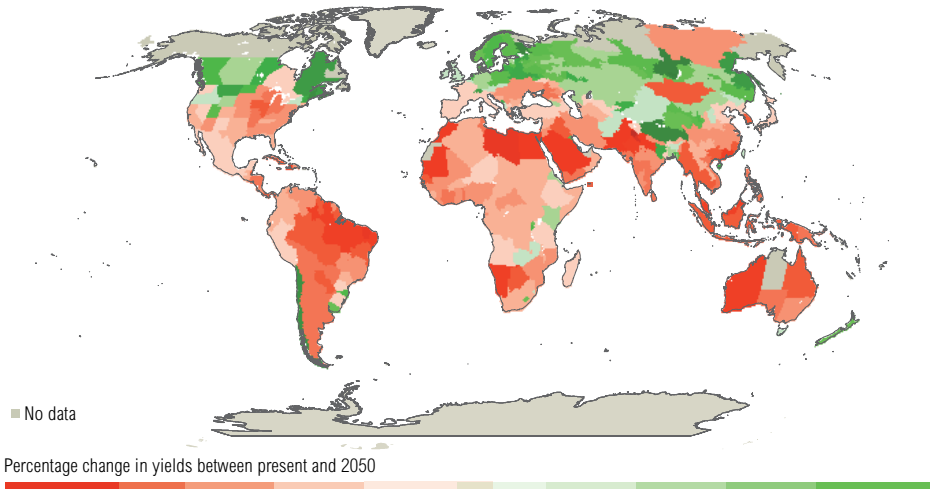

Most studies project adverse impact on cop yields due to climate change
(Source: WRI - The Global Food Challenge)

Coffee rust hits coffee plantations all over Central America (Photo: www.scaa.org)

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Hurricane Mitch hit Central America in 1998 showed that farmers using sustainable practices such as the legume "mucuna" as cover crop, intercropping and agroforestry suffered less "damage" than their conventional neighbours. The study spanning 360 communities and 24 departments in Nicaragua, Honduras and Guatemala revealed that diversified plots had 20 to 40% more top soil, greater soil moisture and less erosion and that farmers growing these plots experienced lower economic losses than their conventional neighbours. This points to the fact that a re-evaluation of indigenous technology can serve as a key source of information on adaptive capacity and resilient capabilities exhibited by small farms. These are features of strategic importance for world farmers to be able to cope with climate change.

- Farmers can adapt to some changes, but there is a limit to what can be managed. Adaptive capacity is projected to be exceeded in regions closest to the equator if temperatures increase by 3°C or more. The agricultural industry's own interests are best served by ambitious approaches to adaptation and cutting emissions.
- The opportunities for mitigation include reducing emissions from land-use changes, land management and livestock management. Carbon can be captured and stored in soil and biomass. Economy-wide emissions from energy use can be reduced, under certain conditions, by replacing fossil fuels with biofuels.
- The potential for reducing greenhouse gas (GHG) emissions from agriculture through changes in consumption could be substantially higher than with technical mitigation options. Approaches include reducing food waste, changing diets to include less GHG-intensive foods (e.g. substitution of animal products with plant-based foods) and reducing overconsumption in regions where this is prevalent.

Scientists expect the occurrence of extreme weather events – due to climate change – to increase in the future. More extreme weather events cause delays in planting crops, floods and droughts that destroy crops, etc. This, in turn, leads to higher and more volatile prices, which is detrimental for farmers. The effects of climate change will be most severe among smallholders and land workers in the poorest countries.

- In Nicaragua, the coffee harvest yielded 50% less than usual for two consecutive seasons, due to "roya" (rust disease), caused by climate change. The Nicaraguan government is deeply worried. It has predicted that, because of decreasing rainfall and rising temperatures, 80% of its current coffee-growing areas will no longer be usable by 2050. All the coffee-producing countries in Central America have seen downturns in production of 30% or more in each of the past two years. Some, such as Guatemala, report a rising number of cases of chronic malnutrition in coffee workers' children. Oxfam cited coffee among other crops in a report that warned climate change was putting back the global fight against hunger "by decades".
- West Africa: the impact of climate and environmental change on the livelihood and mobility of the population in the West African Sahel has attracted growing academic and public interest in recent years. It is estimated that countries in the Sahel could lose over 30-50% of their agricultural capacity in the next few decades. Since the majority of the population living in the West African Sahel depends on subsistence and small-scale farming, environmental changes such as increasing temperatures and rainfall variability pose considerable risks to their livelihood and food security (Hummel, 2014).

According to the IPCC, yearly global CO2 emissions (50

gigatonnes) need to be reduced by 7 gigatonnes/year for there to be a chance of keeping global warming below 2°C and preventing irreversible climate change. World carbon emissions are currently in excess of 4 tonnes per person, and this figure therefore has to fall to 2 tonnes and then 1.5 tonnes by 2050. There is also a need to converge because some countries are currently overconsuming (for example, current levels of GHG emissions (in tonnes per capita) in the US: 23.5, Australia: 26.9, Canada: 22.6, Russia: 13.7, Belgium: 13.2 and China: 5.5). Other countries (mainly developing countries) are around or below the "fair share": Indonesia 2.7, India 1.7, DRC 1.6, Pakistan 1.5, Peru 2.8 and Ecuador 3.3. This implies that industrial countries have to cut their GHG emissions drastically, whereas developing countries should get the chance to opt for a low-carbon development path, supported by developed countries through technology transfer and financial support.

GHG emissions from the forestry and agriculture sectors represent over 30% of the current annual total emissions. Both sectors are linked: forests are often cut down to free up new agricultural land. Agriculture alone accounts for around 15% of GHG emissions (IPCC, 2014).

"In relation to climate change, GHG emissions from 'agriculture' are usually the focus of attention, but 'post farm-gate' activities (i.e. farm activities not related to growing crops, such as transport) account for 40 and 60% of food-related emissions in US and UK, respectively" (Ingram, 2014).

Agriculture, however, can also contribute to the reduction of GHG emissions and thus the mitigation of climate change. This can be done by managing ecosystem services, reducing land-use changes and the related deforestation, more efficient crop varieties, better control of wildfires, improved nutrition for ruminant livestock, more efficient management of livestock waste, organic soil management, conservation agriculture and agroforestry systems. In addition to reducing GHG emissions, well-managed crop and pasture land can sequester significant amounts of carbon. Forty percent of the land biomass, and thus the biological carbon, is directly or indirectly managed by farmers, foresters or herders. It is in their interests to adopt management systems that combine mitigation and adaptation, thereby improving both local and global food security.

CO2 certificates, or "carbon credits", are a hot topic in the debate on climate change. The concept of carbon credits was initiated by the Kyoto Protocol, which authorised a market in tradable CO2 permits. A permit allows the holder to emit one tonne of CO2-equivalent GHG emissions. The carbon market for electricity production is well established in Europe. Now there are also several experiments ongoing to link carbon credits to sustainable agriculture and use carbon credits in carbon trading.

Agro-ecological practices like agroforestry, introducing hedges, low and no tillage and cover crops have significant potential to increase carbon sequestration. The total technical potential in the EU-27 is estimated to be 1,566 million tonnes CO2-equivalent per year. This corresponds to 37% of all CO2-equivalent emissions in the EU in 2007. The introduction of agroforestry is the measure with the highest potential, i.e. 90% of the total potential of the measures studied. The creation of an agroforestry parcel in a European context leads to an average yearly sequestration of 2.75 tonnes C/(ha year) or 10 tonnes CO2-eq/(ha year) when 50-100 trees are planted on the agricultural land, which on average is twice the yearly sequestration of forest land and 5 to 10 times higher than agricultural land. These agro-ecological practices have an important value for society. Taking into account only the value of climate change mitigation, the introduction of agroforestry is estimated to have a value of 282 euros/ha in 2012, which will gradually increase to 1007 euros/ha by 2030 (Aertsens et al., 2012).

The Kyoto Protocol allows participating countries to

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Photo: Neil Palmer (CIAT)

subtract the quantities of greenhouse gases sequestered by certain activities from their total emissions in order to reach the country target set. This is mainly aimed at carbon sequestration in biomass and soils, e.g. by forestry (article 3.3) and agricultural activities (article 3.4) (Hamon et al., 2009; Kula, 2010).

According to the latest report of the IPCC, climate change poses a big risk to global food production. The report also touches on the threat to bees, with concerns about the extinction of species of butterflies and other pollinating insects.

The speed of climate change will become a more important driver of change in biodiversity this century, leading to an accelerating rate of species loss. Up to 30% of all mammal, bird and amphibian species will be threatened with extinction this century (Rockström et al., 2009).

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Photo: Jimmy Kets

Sources

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