

InterBioNotes

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Organic Agriculture and Climate Change

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Introduction:

Agriculture and Climate Change, culprit, victim and possible solutions

Lorenzo Ciccarese ()*

On a global scale, CO₂ and other GHG emissions caused by men increased in the last ten years from 39,4 to 49,0 billions tons, on a rate of 0,9 billions tons per year.

From the beginning of the industrial era in 1750 (when the steam machine has been invented), the build-up of these compounds in the atmosphere has been the root of climate changing. According to the Fourth Evaluation report of the Intergovernmental Panel on Climate Change (<http://www.ipcc/ipccreports/ar4-syr.htm>) and many other scientific studies, the link between climate changing and men-caused GHG is "undeniable".

According to IPCC, 12% of the GHG (from 5,1 to 6,1 billion tons CO₂ equivalent) comes from agriculture and particularly from the enteric fermentation of the livestock, from the manure of those animals, from physic and chemical processes that take place in the soil, from rice cultivations, and from the burning of the residuals. The total emission caused by industries and by the production of electric energy is the only one which can overcome agriculture's.

In Italy as well, the agricultural sector is a big GHG producer: in 2008, the contribution of agriculture to the emission level has been of about 37 millions tCO₂ equivalent, which is about 7% of total emission (540,0 millions). Such a count gets even more relevance when is the whole agribusiness to be considered, including processing, packaging and distribution of agricultural food products.

From 1990, emissions linked to the agricultural sector decreased by 8% (at that time they were 40,6 millions tCO₂ eq.), especially because of the decreasing of livestock registered in those last years.

But agriculture also has an important role, opposed to the one we just talked about. Thanks to their photosynthetic activity, plants can capture and stock CO₂ in the soil and in the alive or dead biomass that is found on the agricultural land before being released again in the atmosphere through plant's respiration, wood harvesting, fires, death etc. This role is commonly called *carbon sink*.

Some of the more accredited studies quoted by the IPCC (e.g. Caldeira et al., 2004; Smith et al. 2007) explain how the potential of agriculture for the mitigation of greenhouse effect in 2030 could be worth about 4,5 to 5,5 billions tCO₂ per year, a goal achievable through a set of agricultural practices such as an improved managing of soils, pastures, rice fields, animals and manure, irrigation, through the production of bio-energy, the recovery of the organic soils etc. The biggest part of this potential (89%) comes out from *carbon sequestrations* measures and actions, 9% from methane mitigation, 2% from the retaining of the N₂O emissions from the soil.

This double and antithetical attitude of agricultural and forestry activities has been recognized by the Kyoto protocol, an international agreement which engages industrialized countries and developing countries to reduce the total level of emission of 5% from the 1990 level by 2008-2012.

In fact, Kyoto protocol allows industrialized countries to insert in their national balances the quantity of fixed CO₂, and symmetrically, the emissions of CO₂ and of other gases (such as carbon

monoxide, methane, nitric oxide) which are linked to forestation, reforestation and deforestation activities (article 3.3 of the Kyoto protocol), or from a new management of forests, agricultural soils, pastures and the so called re-vegetation (article 3.4).

Including agricultural and forestry activities between the options offered by Kyoto protocol created important expectations about new and relevant income sources between Italian forests owners and others involved in this sector, who want to find ways to “internalize” this public interest service. But, in reality, things are not exactly so.

To get to the Kyoto targets, in 2005 the EU set a system for the exchange of emission quotes known as *Emission Trading Scheme (ETS)*. This system establishes a maximum threshold for the European enterprises which operate in the most *energy intense* sectors of the economy granting a limited number of marketable permits. In Addition, ETS set a system for the commercialization of the emission credits, a market which allows some enterprises to respect the limits by buying emission credits from virtuous enterprises.

However this market excludes the emission credits coming from agricultural or forestry activities and doesn't allow Italian and European agriculture and forestry to take part to this regulated market in order to get incomes from the trade of carbon credits (but also to be charged of duties, risks and responsibilities in case of net losses instead of carbon sinking). In Australia and New Zealand, agriculture and forestry have access to this opportunity.

In addition, there's a trend in Italy as much as in the rest of Europe to use the carbon credits generated by forest and agriculture (commonly called Removal Units or Rmu) to get Kyoto's levels, but without giving any direct payment to the owners for any Rmu used.

At last, we have to say that Italy decided to disqualify agricultural soil management, re-vegetation, and meadows and pastures management for the 2008-2012 period from the optional activities established in Kyoto protocol (art.3.4), deciding to include only forestry management.

This exclusion is caused by the difficulty in getting data which are solid enough to build balances between absorption and emissions of GHG in 1990 (year of reference) and in the 2008-2012 period; in addition, there is a particular method to record the managing of agricultural cultivations (*net.net accounting*): it counts the difference between 1990's balance and 2010's balance (or of the average of the balances of the five years of the period 2008-2012). This method can't enhance at its best the difference between the year of reference and the period 2008-2012 in stock.

Still possible are the voluntary compensatory investments, but at the moment there's a problem because of the lack in uniformity between the standards applied to the development and selling of the voluntary forestry projects of carbon offset, and, on the other hand, the little value of the credits they generated (called *Verified Emission reduction, o VER*).

As we see, there would have been a theoretical chance, for Italian and European farmers to get an economic recognition for their role in the absorption of the GHG and in the reduction of the emissions, but concretely those opportunities gradually disappeared.

This situation doesn't give the correct importance to the role of Italian organic agriculture, which is at the moment at about 9% of the Used Agricultural Area, against the 0,09% in 1990.

It's a mistake not to consider organic agriculture as an option to achieve Kyoto goals, especially if we think to its efficiency (shown by many scientific studies, recently demonstrated by Lagomarsino *et al.*) in improving soil and water quality, to its role in the protection of biological resources, in the reduction of energy, pesticides and fertilizers consumption.

At the moment, negotiations are under way to decide which activities and methods will be used to include agricultural and forestry activities in the post-2012 deals in order to challenge the greenhouse effect. For this reason the world organic community has to understand the opportunities (which are not only market opportunities) linked to the ability of carbon sequestration of organic soils, and eventually it should act, also offering its know-how, its data

(e.g. analysis of soil samples at the beginning of the organic activity and at the current time), and its information to get to a more precise evaluation of the role of organic agriculture on the carbon cycle, the greenhouse effect and on the climatic policy of the nations.

() researcher of ISPRA Istituto Superiore per la Protezione e la Ricerca Ambientale (former Apat) , member of the 'Intergovernmental Panel on Climate Change (IPCC)*

Notes from Copenhagen

The IFOAM High Sequestration, Low Emission Food Secure Farming Campaign

Robert Jordan ()*

The UN Climate Change Conference in Copenhagen was perhaps the most talked about conference and gathering of leaders in history. Given the High Sequestration, Low Emission Food Secure Farming benefits of organic agriculture the international organic movement had to be there. Twenty-five members of the IFOAM UNFCCC delegation travelled to Copenhagen from places as far as Australia and the United States to participate in the IFOAM campaign. It was a one-off opportunity to mobilize the International Organic Movement and to showcase organic agriculture to many of the world's decision makers and actors in climate change policies and actions. The Campaign brought together the organic world to unite behind a common cause and a common opportunity.

Those that made it to Copenhagen were exposed to the scale of activity that is now attributed to climate change policy making and lobbying. NGOs, Countries and Business were all very active in pushing their solutions and needs at Copenhagen. By linking climate change to food security IFOAM helped to raise the awareness of the adaptation benefits and its potential to help address our two most urgent and biggest global challenges. The lobbying work also helped to dispel the myth that organic agriculture is a niche industry serving wealthy western consumers but rather a holistic multi benefit system that is already practiced successfully throughout the world. Exposure to our message was significantly enhanced through an exhibit booth in a prominent position at the conference for the full two weeks.

IFOAM also established some strong and synergistic working relationships with other organizations most notably IATP (Institute for Agriculture and Trade Policy) and Greenpeace. IFOAM's presence was warmly welcomed by the international NGO community largely because many NGOs have very little specific focus and resources on agriculture within the climate change debate. IFOAM is now actively cooperating with other NGOs and IATP with joint events being planned for IFAD's (International Fund for Agriculture Development) global Farmers Forum in Rome in February.

IFOAM targeted delegations from developing countries given the greatest potential for climate change mitigation within agriculture is in the developing world. It is also known that these countries are going to suffer the most from the negative impacts of climate change and urgently require affordable, productive, resilient, food secure farming systems. Targeting individual countries and raising awareness within their agriculture and environmental ministries at CoP15 proved to be beneficial given that the discussions on agriculture at the inter-governmental level in the UN are still at a very premature stage. It is also likely that developed countries will push for policy and market based mechanisms that favour the most cost effective means to mitigate global warming. To this end tapping the soil carbon sequestration potential of agriculture in developing countries seems to be a very likely outcome of future UN negotiations and ultimately of mitigation and adaptation funds.

By talking directly with governments who have the greatest mitigation potential and greatest adaptation need IFOAM has helped to raise the profile of organic agriculture and it's potential to be included in national adaptation and mitigation plans. IFOAM intends to build on this work by establishing in the first instance climate change advocacy activities in Africa that provide nations with an affordable, sustainable and food secure alternative to the unsustainable, unproven, high cost and high external input systems being aggressively pushed in Africa by multi-national agribusinesses under the guise of a new green revolution.

In the build-up to CoP15 IFOAM led the development of a publication aimed at bringing consensus amongst the movement on the benefits of organic agriculture and climate change, Organic Agriculture, a Guide to Climate Change and Food Security. The guide evolved through various reiterations with expert input from IFOAM members with proven track records and expertise in climate change including FiBL, Rodale and the Soil Association. The outcome was an informative publication that was widely distributed at the conference amongst country delegations and NGOs. It proved to be a valuable tool in being able to step delegates quickly and comprehensively through the science and multifunctional benefits of organic agriculture.

<http://www.ifoam.org/partners/advocacy/Cop15/IFOAM-CC-Guide-Web-1.pdf>

Finally IFOAM would like to thank its sponsors, who helped make its CoP15 campaign possible, Hivos, Krav, ITC, BioFach and IFOAM EU Group.

() Responsible Advocacy IFOAM*

IFOAM EU at the UN Climate Change Conference in Copenhagen

IFOAM EU Group was represented by its Vice President Thomas Dosch at the United Nations' Climate Conference in Copenhagen. Mr. Dosch said, "The potentials of organic agriculture to cool the planet and the results of the IAASTD have not been sufficiently recognised in the UN climate discussions... politicians must resist the simplistic idea that a one-dimensional technology such as a GMO and pesticide based agriculture could be the key to face future challenges."

The Constitution of the Round Table on Organic Agriculture and Climate Change (RTOACC)

Matthias Stolze ()*

Organic agriculture has a strong potential for mitigating climate change by sequestering carbon in the soils at high rates and by reducing emissions of greenhouse gases due to avoidance of synthetic fertilizers and optimal use of organic material. As a kick-off for putting organic agriculture on the agenda of the negotiations on a successor agreement to the Kyoto Protocol and that it is an effort by the global organic community to make organic agriculture the leading system of sustainable agriculture, on December 16, 2009 at the United Nations Climate Change Conference in Copenhagen nine organisations founded the Round Table on Organic Agriculture and Climate Change (FAO, IFOAM, ICEA, KRAV, Soil Association, Organic Federation of Australia, FiBL, ICROFS, Rodale Institute). The RTOACC secretariat is provided by FiBL.

At the constitutional meeting in Copenhagen, the founding members decided for 2010 an RTOACC Action Plan. This action plan includes a series of three workshops which are financially supported by FAO. However, the first RTOACC activity will be a Policy Paper addressed to the Ad Hoc Working Group on Long-term Cooperative Action under the Convention established under the UNFCCC on how organic agriculture contributes to cooperative sector approaches and sector-specific actions in agriculture.

() Head of Socio-Economic Division FiBL*

Opening remarks at the Round Table for Organic Agriculture and Climate Change constitution at Danish Agricultural Centre, Copenhagen, December 16- 2009

Alexander Mueller () and Antonio Compagnoni(**)*

- FAO is keen to support the work of the Roundtable in order to strengthen the position of organic agriculture within climate fora and hence, create opportunities to combine efforts aiming at improving food security and the environmental resilience.
- Currently, Letters of Agreements are being finalized between FAO and FiBL and FAO and ICROFS in order to support this Roundtable activities through 3 meetings in 2010 that will look into: (i) gaps and requirements; (ii) adequate carbon sequestration methodologies; and (iii) Life-Cycle Assessment proper to organic agriculture.
- FAO is involved in exploring Climate Standards for Agriculture, Forestry and Fisheries and several of you were invited to the Expert Consultation convened together with ISEAL on 11 November 2009. This Consultation's outcome will be made available in January 2010.
- FAO, in collaboration with a number of partners (including also FiBL and ICROFS) is currently launching the Organic Research Centres Alliance (ORCA) which, if and when funded, would establish a global Climate research network: this Roundtable could potentially evolve to become the ORCA Centre for organic agriculture and climate change.
- We all here know that organic agriculture contributes to climate change mitigation and adaptation. I just wish to quickly mention some challenges that deserve attention for accessing carbon markets:
 - As lower yields are often attributed to organic agriculture, a thorough analysis of emission leakage might be needed, or at least, some comparisons be made for carbon sequestration potentials in organic and conventional croplands, pastures and afforestation areas;
 - Measurements and modelling for carbon sequestration under development do not include specific default values for the diverse practices of organic agriculture and hence, reliable data is needed: emission factors for organic farming practices need to be defined and collected in a system to be recognized by the IPCC Emission Factor Database;
 - Eventually, organic agriculture should become recognized as a valid management strategy within the IPCC guidelines and an aggregated carbon offset protocol created for organic agriculture;
 - The combination of organic and carbon crediting certification will have an important role to play in terms of efficiency as well as in facilitating implementation of climate change mitigation while enhancing rural livelihoods;
 - However, costs and gains of measurements, verification, certification and transactions should be carefully evaluated in terms of suitability to small-scale farmers.
- Much work is ahead of the organic community and there is need to join hands in order to: strengthen the scientific and methodological basis; develop appropriate climate standards within organic certification schemes; and provide relevant information and services to producers.
- This work must capitalize on efforts on-going within the agriculture sector as a whole and the FAO Organic Agriculture Programme stands ready to link and integrate the efforts of the Roundtable within FAO mainstream activities on climate change.

() FAO Assistant Director-General*

Dear friends and colleagues,

it is an honour to be addressing to you - a set of the brightest world minds in organic science, policy and sustainable development.

It is also a great satisfaction to see that the organic movement is able to follow up discussions and ideas from previous years, as the FAO workshop on OA and CC hold in Modena at the Ifoam Organic World Congress last year.

Focusing now on concrete tools and actions such as the IFOAM campaign and lobby at COP 15 and today's RTOACC constitution, in order to seek effective solutions for the Climate Change great challenge.

The world nations political leaders maybe won't find agreement yet on what to do for this man caused sickened and fragile Earth; but the organic movement does know, and acts now, on how it is and will be important to take into the picture agriculture, caring for the world food security – producing high quality food while respecting nature's principles and social fairness, seeking for a durable ecological balance that can also concretely reduce GHG emissions and possibly significantly contribute to long term carbon sequestration.

ICEA (Ethical and Environmental Certification Institute) as one of the leading Italian and EU organic certifiers (a multi-stakeholders owned initiative certifying over 12000 organic farms) together with other historical and relevant organic associations such as Krav (S) and Soil Association (UK), almost a year ago started a constructive dialogue on the CC and OA issue. This dialogue opened up with other important organizations that now sit at this table. We're now committing ourselves to a common path of actions and efforts that are urgently needed in order not to miss this challenge and opportunity: positioning and enabling organic agriculture to be one of the most relevant instruments to mitigate as much as possible CC and in the same time supporting agriculture to better adapt to it.

Still waiting and hoping that Mr Obama and fellow North and South leaders will get inspired and get Copenhagen in the history books (not for its failure), but at least the organic movement has to be proud of having achieved a real milestone: the RTOACC constitution. With my best wishes of a productive most needed common work !

(**) *ICEA International Relations manager*

The RTOACC Aims and Action Plan

(extract from the RTOACC constitution documents)

The Round Table on Organic Agriculture and Climate Change (RTOACC) has as its aims to:

- Promote the potential of organic farming to mitigate climate change;
- Promote the potential of organic farming as a climate change adaptation strategy;
- Promote innovation, research, standard setting, awareness building about the advantage of organic farming systems
- Initiate, support and facilitate the research on organic agriculture and climate change;
- Identify viable ways of adaptation to the impacts of climate change;
- Develop and implement services that support smallholders;

- Advise the international community on organic agriculture and climate change issues, with a view to initiate policy change to wider adoption and support of organic agriculture;
- Support the RTOACC member organisations as well as other governmental and non-governmental organisations in developing and fully implementing policies on climate change
- Advise in the development of climate-related provisions in international standards;
- Initiate and support the development of a methodology to enable a reliable quantification and certification of GHG emissions and carbon sequestration at the various stages of the production process, and the identification of potential mitigation measures;
- Support management practices and standard development issues that look at improving organic standards from a climate change perspective.

The Round Table on Organic Agriculture and Climate Change as a multi stakeholder initiative

The RTOACC implements transparent, fair and participatory governance. New members agree to support organic agriculture, the organic movement and its potential to mitigate climate change, in line with what is mentioned in the considerations and aims above. Members promote and communicate this commitment throughout their own organisation. As per 'Criteria of Collaboration and Admission', RTOACC shall be composed of two categories of members: Participating Members representing organisations and Observing Members (individuals) The RTOACC defines the process for admission and is open for new Participating Members from the following sectors

- Associations in the organic sector, standard-setting organisations and certification bodies operating in organic agriculture;
- Environmental organisations;
- Intergovernmental Organisations (IGOs);
- Organisation involved in the management of the voluntary offset mechanisms and the CDM;
- Research organisations;
- Funding Organisations

The RTOACC should aim to ensure the representation from the global south.

IN PARTICULAR, THE ROUND TABLE ON ORGANIC AGRICULTURE AND CLIMATE CHANGE SHALL

Art. 1 – Initiate and facilitate Research on organic agriculture and climate change

Therefore, the RTOACC will support

- basic and applied research on assessment and dissemination of state of the art knowledge on the mitigation and adaptation potential of Organic Agriculture;
- compilation of consistent data for organic agriculture as a basis for the assessment of the climate change impact of organic agriculture;

- identification of the research gaps in this context, supporting and commissioning research to fill those.

Art. 2 – Adopt, further develop and disseminate concepts and methodological frameworks for measuring GHG mitigation and carbon sequestration in organic agriculture

The RTOACC adopts, further develops and disseminates concepts and methodological frameworks for measuring and accounting the GHG mitigation and carbon sequestration in organic agriculture worldwide.

The positive effects of organic agriculture on climate change, once calculated through the adoption of proper tools, should be valorised within the existing offset voluntary or mandated initiatives. To do so, the Round Table on Organic Agriculture and Climate Change will identify the best partners to co-operate with.

Art. 3 – Provide information for improving awareness and technical knowledge on climate change

The RTOACC intends to develop information on climate change to be addressed to the organic farming sector, policy makers, farmers and food retailers.

The aim is to increase understanding of the potential implications of climate change and of the available opportunities for adopting measures and best practices to address the double challenge of reducing GHG emissions while at the same time adapting to projected impacts of climate change.

Article 4: The RTOACC provides support for advocacy concerning the advantage of organic farming in adaptation and mitigation regarding climate change.

The RTOACC intends to support the international community on organic agriculture and climate change issues, with a view to initiate policy change to wider adoption and support of organic agriculture.

Art 5 – explore possibilities to develop organic standards to a higher level of climate performance.

The RTOACC intends to share results from its own and partner's work to the attention of concerned standard setters. The aim is to allow for organic standards to develop in a direction of better climate performance.

RTOACC Action Plan 2010

Action 1: RTOACC-Policy-Paper for the Ad Hoc Working Group on Long-term Cooperative Action under the Convention established under the UNFCCC: "Organic agriculture contribution to cooperative sector approaches and sector-specific actions in agriculture". (March 2010)

Action 2: RTOACC-Workshop 1 "Climate change mitigation potential of organic farming systems and the development of a methodology for the carbon market" (April 2010, funded by FAO)

Action 3: RTOACC-Workshop 2 "In-depth scientific exchange on the available data on GHG emissions and the carbon sequestration potential of organic crop and livestock systems" (June 2010, funded by FAO)

Action 4: RTOACC-Workshop 3 "Scientific exchange on LCA methods, models and databases focusing on GHG emissions and sequestration potentials of organic farming systems and organic food" (September 2010, funded by FAO)

Founding members of the RTOACC:

Intergovernmental Organisations *FAO*

Research organisations *FIBL, ICROFS, Rodale Institute*

Advocacy organisations, Networks and standard setters and certification bodies of the Organic Movement *IFOAM, ICEA (IT), KRAV (SE), Organic Federation of Australia (AU), Soil Association (UK)*

At the RTOACC constitution assembly the following organizations representatives contributed in the finalizations of the above documents:

Urs Niggli and Matthias Stolze - FIBL (CH); Antonio Compagnoni and Paolo Foglia - ICEA (IT)

Robert Jordan, Markus Arbenz and Cristina Grandi - IFOAM ; Joahn Ceje - KRAV (SE);

Andre Leu - OFA (AU); Niels Halberg - ICROFS (DK); Gundula Aizees, Soil Association (UK);

Thimoty LaSalle and Eliav Bitan – Rodale Institute (USA).

Rodale Institute: situation and perspectives from the US

Eliav Bitan ()*

The decade from 2000-2009 was the warmest on record. Erratic weather events like floods, droughts and storms are on the rise. While we'd hoped that the Copenhagen conference would produce an internationally binding treaty to deal with the problem of global climate chaos, the final result was less than optimistic. The non-binding Copenhagen Accord remains a work in progress, whose final outcomes are unknown.

Here in the United States, our House of Representatives had passed a climate bill that would cap US greenhouse gas emissions and award farmers for pulling carbon from the atmosphere and storing it in their soils. In order to make this law, the Senate has to pass a climate bill as well, and the president must sign the bill into law. We had hoped that the Copenhagen conference would push the United States, the world's historic largest emitter of greenhouse gases, into action. While we cannot return to the US with a promise of international agreement, we can return with renewed dedication to the importance of organic agriculture in creating a climate solution. At Copenhagen the international organic community rallied together in support of an agriculture that produces lower emissions, higher sequestration and more food security in the face of a changing climate. We shared data and resources, enabling each of us to return home wiser and with more science, anecdote, and references to support our arguments. In meetings with the United States Department of Agriculture, Congressional Staffers, and the UN FAO, we've already shared data and stories we learned at the Copenhagen conference.

The international advocacy team developed in the lead up to and at the Copenhagen Conference, led by IFOAM and including representatives from FIBL, Sekem, the Soil Association, Organic Federation of Australia and Tim LaSalle and I representing the Rodale Institute, is well organized to continue working with the United Nations to support organic agriculture as part of a climate change solution.

The outstanding leaders, organizers and farmers who participated in IFOAM's Copenhagen campaign were perhaps the most hopeful outcome of the event. With outstanding science, applied farming practice, and well organized leadership, the organic movement is well poised to play an active role the coming carbon-constrained economy. As the planet looks for practitioners who can produce food and ecosystem services in a changing climate, organic leadership will become even more valuable.

() Policy and Partnerships Associate Rodale Institute*

How they do it Down Under: experiences and programs in Australia

Andre Leu ()*

The Organic Federation of Australia (OFA) is the peak body for the organic sector in Australia. The OFA has been very active in the area of climate change and agriculture. We organised the first national conference on the topic in 2006 and have been involved in many other climate change conferences and workshops around Australia.

The OFA continues to promote the role of organic agriculture in mitigating and adapting to climate change. We have promoted this in the national media and to the Federal and State Governments in Australia

The OFA recently received funding from the Federal Government to run climate change workshops around Australia for organic farmers. These workshops will train farmers in both mitigation and adaptation. In particular they will concentrate on the importance of soil carbon for improving adaptability in terms of water use efficiency, especially for drought tolerance and rainfall capture. These are major issues for many parts of Australia that are being badly affected by one of the longest droughts in history.

The workshop will help farmers adopt techniques that build soil carbon and avoid the practices that destroy it.

The OFA is proud to be a member of the Round Table for Organic Agriculture and Climate Change (RTOACC) and to have participated in the meeting in Copenhagen on December 16, 2009. We believe that this meeting was one of the important events of the Copenhagen Climate Change talks and see RTOACC as having a major role in advancing the role of organic agriculture in the climate change debates.

()Chair, Organic Federation of Australia*

The Swedish way for a better climate friendly organic standard

Johan Ceje ()*

This is to briefly update on recent developments of the Swedish work to develop standards for climate certification of foods.

Recent publications:

- The first set of standards was published and translated a few months ago, but we have failed to inform a wider international audience on this. The first set includes general standards, farm requirements, plant production, green house production, milk production and fisheries. The standards are available for download at <http://www.klimatmarkningen.se/in-english/>
- We have made a major effort to collate what we know about the climate impact of agriculture and food production in our region. This has been made to lead us to understand what activities are most important to regulate in a climate standard. The scientific reports describing the state of art are published in Swedish, but are currently also being translated to English. Currently translated reports covering feed, milk, beef, pork chicken and egg production are available on line and can be found at <http://www.klimatmarkningen.se/in-english/underline-reports/>

We are expecting to publish more translated reports within shortly, and finally we intend to distribute a press release which outlines the most important findings. This e-mail is more intended to give you a quick update, as many of you have requested to be informed when these reports are on line.

Current developments:

The Climate Certification Project is currently working on standards relating to meats, transports and primary packaging. Reports and draft standards should be available within a couple of months. The standards are to be verified by the national accreditation body Swedac, to verify that they are workable under the EN45011/ISO65 accreditation system. This is on its way, but not yet complete. 2010 is the final year of the project, and we hope to deliver standards relating to a few more areas like import system and aquaculture.

How the project's outputs will be used

The project will result in a certification system, which may be used in its own right. The details on what organisation would house this system is not yet clarified. The output may also be used to upgrade already existing certification systems. But perhaps the most important result is the contribution to our understanding of how we can address climate change issues in the food sector. We will be more careful to inform you on the developments in this respect...

What will KRAV do?

KRAV is not the sole organiser of the Climate Certification Project, and the project has a general approach, rather than specifically organic. But I know some of you are most interested on how this may affect the organic sector and KRAV-certified products. KRAV will use the output of the project to upgrade its own organic standards. This will mean KRAV certified operators and products will be required to meet climate requirements beyond EU- and IFOAM-level organic. Standards will be amended during the period 2009 to 2012. The first area is green house production – for example KRAV-certified green houses that need heating are required to use less than 20% fossil energy, and to improve insulation to a certain level. The area to follow is fisheries, standards expected to be published soon. During 2010 we will work primarily on animal husbandry and general standards. These changes will also be implemented in the import standards. In the end it means producers that intend to export to a market that requires the KRAV label (mainly Sweden) will need to meet climate requirements, above those that are part of organic standards. Exactly what the import requirements will be is not yet clear, but will be submitted to a period of public comment.

() KRAV Climate Standard responsible*

The possible synergy between organic agriculture mitigation effect and adaptation to climate change.

Livia Ortolani ()*

The mitigation actions of the greenhouse effect by the agricultural sector, which are an integral part of the organic production method, can increase its positive effect when considered in synergy with adaptation strategies to climate changes. Those synergies may vary (as much as the possibility to reduce emission levels) depending on the specific agricultural practices applied in the different territories.

An organic farming which is based in the improvement of soil fertility and on biological variety within the farm, and which bases its innovativeness on personal experience, on its observation and intuition skills and on traditional knowhow, has a better resilience to water shortage and to extreme weather events as droughts and floods than industrial agricultural model. A differentiation of the production, a decrease of external inputs and a multifunctional approach allow a better economic stability, and, at the same time, can better respond to IPCC's recommendations.

Those are the typical priorities of an organic production system that considers the farmer/producer as the core of its business policies, recognizing the role of the farmer as a territory manager and giving back a decision-making role to local communities that find in this system an agro ecological model that allows them the right to control their own resources.

This model is able to address a more environmentally conscious behaviour of operators and citizens, in particular for what concerns their production and consumption habits. Organic agriculture is able to promote a diet in connection with seasonal and local productions, in which products are less manipulated and less packed, and which actually allows to reduce the emission level through all the production chain. In this sense we can observe how, although crop productions as cereals, pulses, potatoes and oilseeds requires about one-seventh of the inputs needed to produce the same amount of calories from meat (FAO 2009), it's necessary to consider that crops which are cultivated in artificially warmed greenhouses, frozen and transported by plane have an heavier impact on the environment than locally produced organic meat (Reijnders and Soret, 2003).

In Europe, such a model, which allows good synergy between mitigation and adaptation strategies, is mainly represented by family-managed organic farms, a strong reality of the Italian countryside. The constant disappearing of those farms, especially in marginal areas, is to be considered as the loss of a crucial opportunity to reduce the debt of our country to the international commitments on climate change.

In this sense is particularly important to support this model of family-managed organic farm instead of a "organic by substitution", which although complying to European regulations, doesn't really promote the applications of those techniques that eventually cause mitigation and adaptation effects. That's why mitigation and adaptation strategies have to interact with agricultural policies in order to enhance production models with a real effect on the reduction of GHG and, at the same time, on rural development.

The family-managed organic agricultural model is the predominant one in the Italian organic movement, more than in other European Countries. In this sense, the introduction of policies that recognize and consider the constant contribution of those farmers to the challenge against climate change, could give an important contribution to the environmental debt of our Country for what concerns GHG emissions. Italy has a large potential, through the promotion of organic as a model for rural development, reducing that environmental debt and, at the same time, producing new employment and new incomes, in particular in the agricultural sector.

A production model which is local and based on the management of the resources form rural community allows to limit the use of fossil fuels and providing to population livelihood needs. From this point of view, even if forest's potential in carbon sequestration is much larger than soil's (still calculated about 1,4 and 4,4 giga tons CO₂ equivalent per year -Lal,2004), a family-managed organic agricultural model, not a simple "substitution" one, represents a good compromise between environmental and social development objectives in rural areas.

In our opinion, the introduction of organic agriculture in the mitigation and adaptation strategies is a strategic opportunity to promote a production and consumption model which core will be again food sovereignty, which moves towards an ecologically sustainable production model - one that is fully represented by family managed organic farming - and consumption models respecting local traditions and cultures. This is a national interest, but is also an interest of all those Countries with still a strong family-managed agriculture which guarantees food security in a sustainable way.

() AIAB Scientific Committee*

An Innovative experience in Italy: Sustainable agrifuels chain, So.Fi.A. software for oilseed crops

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A methodology for calculating energy expenditure and emissions of greenhouse gases (GHG) has been developed to assess the stage of agricultural sectors of energy made from oilseeds.

The software performs an automated life cycle assessment (LCA) of the grain product, that is considering for each input used the financial costs, energy costs and GHG emissions required to produce it and also those that develop following its use. GHG emissions are measured in kg CO₂ equivalent. Under this method the amount of nitrous oxide (N₂O) and methane (CH₄) are multiplied by their global warming potentials (GWP) for a period of 100 years, based on their residence time in the atmosphere. In detail for fuels and nitrogen fertilizers are found not only GHG emissions necessary for their production, transport and distribution, but also, respectively, the CO₂ produced from combustion and N₂O in which the nitrogen applied is transformed, as indicated in the Intergovernmental Panel on Climate Change (IPCC, 2007) methodology. This information is provided by default, but can be controlled and modified by the user if more up to date or accurate data are available .

It is needed to frame spatially and temporally the concerned crop, insert with a guided procedure the inputs used during cultivation, the techniques used and the products obtained subdivided into primary product, co-products and biomass residue. Finally, to achieve the balance sheets of the oilseed production chain and to assess the CO₂ immobilized in the soil, you must enter some data (oil content of grain, nitrogen and carbon content of residue, yield of extraction and esterification, selling prices, values of lower calorific power, coefficients of humification and mineralization), whose default value is suggested by the software.

The outcome of the software include:

- quantifying the impact of the inputs by type of production factor and type of operation on energy and economic costs, total emissions;
- The net energy balance, the relationship between inputs and outputs of energy;
- The amount of CO₂ eq per unit of energy produced, depending on whether or not the protein cake is exploited, as required by EC Directive 28/09;
- The CO₂ removed from the atmosphere during the production cycle and that stocked in the soil after plant residues are buried;
- savings potential based on the replacement value of N buried with plant residues;
- the actual income from the sale of grain and potential sale of oil, biodiesel and protein cake.

The results are expressed per hectare, per unit of fresh product, per unit of dry weight, per GJ of biodiesel produced. May be related to the whole crop cycle (even more than a year in the case of rotations) or per day of cultivation. Evaluation may exclude the impact of the production of agricultural machinery used (as required by Directive 28/09) or the release of N₂O following application of fertilizers.

For each completed sheet, resulting data and graphs can be exported to facilitate comparison between different crops or between different growing techniques. The extensive archive of data is contained in an Excel[®] file that is possible to access and update.

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