Organic Agriculture and Carbon Markets

ALEXANDER KASTERINE[1,2]

Mitigation of climate change in agriculture

Science has delivered a grim message to the world. Cut greenhouse gas emissions by 90 percent in the next 40 years, or we risk facing ecological catastrophe.

Agriculture is responsible for 13 percent of total greenhouse gas emissions. This figure is substantially higher (around 30 to 40 percent) when land clearance for agriculture, agrochemical usage, transport, and consumer energy usage is included.

A third of agriculture's emissions come in the form of methane from ruminant meat production. Reducing this demand should be a priority. The largest potential for mitigation in agriculture, however, lies in changing cropping practices to increase the level of carbon stored in the soil. A large part of this potential for carbon "sequestration" lies in developing countries.

Key practices to increase the uptake of carbon include avoiding bare fallows, increasing the use of legumes, and the incorporation of compost - integral parts of organic agriculture (FAO 2008, ITC 2007, Soil Association 2009). Adopting these practices have co-benefits of improving yields (and thus incomes) over time and helping soils adapt to reduced water availability, increased temperatures, and more extreme weather events. Organic agriculture would at first glance appear well positioned to provide this carbon storage service. The devil however lies in the detail: markets barely exist to provide farmers with incentives to adopt climate friendly practices.

Markets for carbon storage from organic agriculture

There are three nascent or potential market mechanisms for organic to deliver carbon storage services. Table 15 presents the pros and cons of each form of carbon market for organic agriculture.

Voluntary carbon markets

Voluntary carbon markets have emerged to accommodate individuals and companies in the developed world who want to offset their emissions through financing mitigation projects in developing countries.

Pros: The market is relatively small (700 million US dollars in 2008), but growing fast. Unlike the mandatory market (e.g., the EU Emissions Trading Scheme), the voluntary market is open to applications for selling credits from land use projects, such as agroforestry

[1] Dr. Alexander Kasterine, Senior Adviser (Trade, Climate Change and Environment), International Trade Centre (UNCTAD/WTO), Geneva, Switzerland
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and no-till agriculture. There is potential in the near future for inclusion for organic agriculture.

Cons: The voluntary market periodically has a poor reputation due partly to the perceived lack of additionality and permanence of projects. Agriculture is still not accepted in the voluntary market with the exception of no-till agriculture in the Chicago Climate Exchange. The main prerequisite to having agriculture accepted by voluntary standards is to establish an inventory of carbon stocks in the soils and to monitor, report and verify (MRV) emissions reductions through sequestration. Once accepted, it is open to question as to whether current carbon values (around 10 US dollars per tonne CO_2) would be of interest to farmers. The transaction costs of preparing project proposals will still be relatively high for farm groups.

Outlook: The organic movement led by IFOAM has established a working group to draft a methodology for organic agriculture that carbon standards will accept, thus opening the door for carbon credits.

Agri-environmental schemes

Agri-environmental schemes pay farmers in developed countries for environmental services. To date, schemes cover changes in farming practices leading to reduced agrochemical usage, improved habitats, and better agricultural practice. There are only a few examples of payments for carbon services. The EU does not pay farmers to store carbon in the soil. It is possible in the medium term that schemes will be extended to include practices that lead to greater soil carbon sequestration.

Pros: a government payment for carbon sequestration would not be very interesting financially for organic farmers, (particularly after time spent on all the paperwork involved), but it would provide a valuable public relations boost for the organic sector.

Cons: As with voluntary markets, the main challenge relates to MRV. Administrators of schemes face high costs in mapping out the land, estimating carbon sequestration potential of different farm types, drawing up negotiating contracts, and finally implementing monitoring schemes to ensure agreed upon environmental actions are taken by farmers. A survey of 37 case studies of EU agri-environmental schemes revealed that administration costs as a proportion of total payments to landholders varied from 6 to 87 percent (Garnaut 2008). Public audit offices have shown interest in the past in what farmers decide to do after agri-environmental contracts end. There is nothing to stop a farmer from ploughing up his land and releasing the stored carbon. This would be an attractive option once commodity prices are high enough.

Outlook: These payments are only a medium-term prospect and more likely to be seen at first in the U.S. than Europe. Regulators will need to be convinced that organic agriculture is effective in storing carbon in soils. Despite the favorable scientific evidence in this respect, the organic movement will be competing with other (potentially better financed) agricultural lobbies. It is very unlikely that developing countries could implement schemes widely and effectively, given weak institutions in regulation, contracting, and enforcement.

Product carbon footprint labels

Product carbon footprint labels have been introduced by many retailers in the EU, U.S. and Japan in the last two years. They are intended to respond to consumer concerns about

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climate change and help differentiate products as more "climate friendly." The labels take two forms, either reporting a figure for how much CO_2 is embedded in a product (e.g., 100g CO_2) or making a claim about the product's climate "performance" (e.g., "CO_2 approved" or "climate neutral", see Bolwig 2009).

Several organic standard setters have also developed draft standards for climate "add-ons" for organic certification.

Pros: Labels that make claims about sustainability could favor organic products. For example, Hofer in Austria recently introduced a label that claimed that organic milk has 14.3 percent less emissions than the comparable conventional product.

Cons: Several carbon standards have been criticized for providing domestic products a competitive advantage over imported products. This is due to stipulations on either the mode of transport (e.g., no airfreight in the case of Bio Suisse and Coop), the length of journey from field to retailer, and season of import (e.g., draft KRAV climate standard, see Gibbon 2009). The French carbon standard will not include emissions from short journeys in France, thus giving a potential competitive advantage to French products. The UK Carbon Trust standard includes emissions from land use change (LUC) after 1990, for example in clearing trees and shrubs. The emissions from LUC are amongst the largest sources of emissions in the carbon footprint of crops produced in developing countries. It is therefore important that calculations of these emissions are done correctly. This can be difficult in developing countries where relevant data relating to the distribution of current and historical land uses are scarce or absent. There are also ethical issues that most developed countries do not need to include this source of emission as they cleared their forests decades or centuries ago (Brenton et al. 2010). At the very least, traders will face transaction costs in learning about life cycle analysis and providing information on supply chain carbon emissions. Evidence varies on the degree to which consumers will pay a premium for carbon labeled products and thus compensate these costs.

Outlook

The use of carbon labeling by retailers will grow considerably. This trend is driven partly by consumer frustration at the failure of governments at Copenhagen in December 2009 to reach a binding agreement to reduce greenhouse gas emissions. However, there is limited scope for organic to gain a competitive advantage as consumers mainly buy organic for personal health benefits not environmental reasons. Also it will be a costly exercise to establish the environmental advantages of organic over conventional in all the different food lines.

Conclusion

Organic agriculture has long been recognized for delivering multiple environmental services for society in the form of habitats for flora and fauna, improved landscape and non-polluted water courses. Recently, scientists have shown that organic delivers effective carbon sequestration services. Organic products, however, remain undersupplied, because neither consumers nor governments pay substantial sums (if at all) for these benefits. Key next steps to remedy this situation will be to build baselines and monitoring and verification frameworks ,so that the carbon markets will accept organic agriculture into their fold. Just as important is increasing levels government support for the organic sector, particu-

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larly funding for research and development. Carbon labelling schemes will be a "niche within a niche" for organics, affording a small advantage to organic products over some products from agrochemical farming. However, they also pose the risk of being new non-tariff trade barriers for farmers in developing countries exporting to the EU, the U.S., and Japan.

Table 15: Pros and cons of each form of carbon market for organic agriculture

Market mechanism	Pros	Cons
Voluntary carbon markets	- Dynamic, growing market - Scope for standards to accept organic agriculture in near future - Potential to merge organic certification with carbon to reduce costs	- No case to date of inclusion of organic - High cost to establish baseline, monitor and verify (MRV) emissions reduction Need to demonstrate "additionality" – (carbon storage would not have taken place without carbon payment) - Potential lack of permanence (farmers can revert to old practices) - High carbon price needed to compensate transaction costs
Government agri-environmental schemes that include carbon sequestration	- Carbon payments justified as environmental public good - PR boost for the organic sector	- Need for MRV – high cost for both regulators and farmers - High carbon price needed to compensate transaction costs - Potential for a lack of permanence and additionality
Retailer product carbon footprint labels	- Potential competitive advantage for organic over agro-chemical farming	- Transaction costs in measurement and reporting, therefore favors larger exporters and farmers - Potential measurement biases against imported products - Airfreighted products likely to lose out – job losses for African farmers

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