

# Smallholder Farming and Clean Development Mechanism Projects – Can they complement each other?

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*This article asks if smallholder farmers in developing countries can generate and certify carbon emission offsets through agroforestry projects that contribute to sustainable development and reduce their vulnerability to climate change effects. It discusses the practicalities of designing such a project, referring in particular to local initiatives in Brazil, as well as ways to overcome access barriers. A critique of the mechanism follows, with input from Brazilian civil society. The article concludes that the implementation and certification of small-scale agroforestry clean development mechanism projects can avoid some of the problems of large-scale projects and offer high quality credits in which countries such as Ireland can invest to achieve Kyoto compliance. Such measures will also contribute significantly to adaptation to climate change.*

We hear from many countries concern about the protection of tropical forests. Just as it is very difficult for developed countries to change their energy matrix (mix), for developing countries it is difficult to change the development model.

Marina Silva, Brazilian Minister for Environment (2006)<sup>1</sup>

# 1. Introduction<sup>2</sup>

The effects of climate change are becoming all too apparent and gradually we are realising that action is required urgently. On analysing causal relationships of climate change, we are faced with a major contemporary ethical issue as those people and countries that contribute least to the problem suffer the earliest and the worst effects.

Global warming is a truly global or trans-boundary problem and it is essential to create institutions and regional and international agreements as part of the solution.<sup>3</sup>

The United Nations Framework Convention on Climate Change (UNFCCC)<sup>4</sup> established at the 1992 UN Conference on Environment and Development, held in Rio de Janeiro, has almost worldwide membership. Its main objective is to stabilise greenhouse gas (GHG) concentrations in the atmosphere and to cope with whatever temperature increases are inevitable. It recognises “common but differentiated responsibilities” in the causes of climate change and the respective actions to address it. Developed countries are required to take the lead to reduce or limit their emissions and to assist developing countries to adapt to the inescapable impacts.

The UNFCCC’s Kyoto Protocol design was agreed in 1997 and came into force in 2005. It requires industrialised country parties to reduce their collective average emissions for the first commitment period (1 January 2008 to 31 December 2012) by 5.2%, using their 1990 level emissions as the base year. Developing country parties are not obliged to reduce their emissions in the first commitment period, in recognition that economic and social development and poverty reduction are their first and overriding priorities.

Instead of designing a “command and control” type regulation and fining for non-compliance<sup>5</sup> instrument, the Protocol has opted for an emissions trading system. Caps on emissions (or allowances) have been set carefully so as to be neither so stringent as to be unattainable nor too lenient as to be meaningless. Time (“when”) and place (“where”) flexibility allows comfort that strong reduction objectives can be set and installations are given the time and means to make or buy the necessary reduction levels.<sup>6</sup> The system consists of three “flexible mechanisms”:

- **International emissions trading** where countries that have satisfied their obligations can sell their excess carbon allowances to other countries;

- **Joint implementation** where emission reductions are purchased from GHG reducing projects in other industrialised countries (generally designed for economies in transition); and
- **Clean development mechanism (CDM)** where certified emissions reductions (CERs) are purchased from projects in developing countries.

Hence the CDM is designed for trade of CERs between industrialised and developing countries. The idea is that emissions reductions or removals (together they are often called carbon offsets) are good, regardless of location. Also, offsetting carbon in developing countries may be more cost effective.

This article questions if it is possible for rural communities of smallholder farmers in developing countries to generate and certify these offsets through agro-forestry projects that contribute to holistic sustainable development and reduce vulnerability to the effects of climate change. It discusses the practicalities of designing such a project, with reference to local initiatives in Brazil, as well as approaches to overcome barriers to access. A critique of the mechanism follows, with input from Brazilian civil society.

The article concludes that the implementation and certification of small-scale agro-forestry CDM projects can avoid some of the problems of large scale projects and can offer high-quality credits that countries such as Ireland can invest in for Kyoto compliance that will also significantly contribute to adaptation to climate change.

## 2. Toward global agreement

### How does the CDM work?

To certify emissions reductions a project must successfully prove that it is creating real, measurable and long term benefits related to the mitigation of climate change; that it is contributing to sustainable development in the host country and that without the incentive of CER income the project would not happen.<sup>7</sup> The Executive Board for the CDM approves methodologies that estimate, monitor and measure carbon offsets accurately. External auditors, or designated operational entities, validate proposals and verify results. CERs once issued are good for meeting

allocations and once bought by an industrialised country cannot be sold on to another country. Currently most CERs are globally marketed as futures or options. Prices vary depending on, among other things, the perceived risk associated with their coming into fruition.

## **The carbon market**

There is a series of linked carbon markets rather than a single carbon market. They share the common attribute of using market base instruments or economic instruments to achieve a common goal of stabilising concentrations of green house gas in the atmosphere. The Kyoto market is the best known and biggest market, in volume terms. The European Union Emissions Trading System (EU ETS), so far the biggest in value terms, is akin to a market within the Kyoto market or a tributary scheme, while the UK Emissions Trading Scheme is an experimental forerunner to Kyoto. Regional and sub-regional markets, such as those in New South Wales and Chicago, have distinct compliance arrangements. There are also voluntary carbon markets where compliance is not obligatory but is made demonstrable, and is driven by entities and individuals who want to offset their carbon on a voluntary basis.

In 2005 global aggregated markets were valued at \$10 billion. In the first quarter of 2006 overall transactions were worth \$7.5 billion which led some to predict that the market could be valued at between \$25-30 billion in 2006.<sup>8</sup> Most of this trading is between industrialised countries through so-called international emissions trading, but the CDM was worth about 28% of this market in 2005.

Private entities from Europe and Japan dominate the demand for CERs.<sup>9</sup> It is evident that a number of countries are unlikely to meet negotiated caps and will have to trade in emissions through various mechanisms.<sup>10</sup> Prospects for the project based market are quite solid as several EU governments, including Ireland, made commitments to purchase credits for Kyoto compliance.

By 2006, 78 developing countries had established national authorities to develop carbon friendly projects and more are expected to join. Supply is spread among these countries; however China, India and Brazil dominate the sell-side of the market.<sup>11</sup>

Most CDM trading is in reduced emissions of hydro fluorocarbons (HFCs) and other gases (e.g. methane emission reductions from mining and landfills and N<sub>2</sub>O from industry)

and from reduced emissions due to transition to renewable energy generation: micro-hydro, wind, solar, biomass and others.

### **3. Can the CDM be part of a new development path for small-scale farmers?**

Agriculture, which accounts for over 40% of the livelihood of workers in Latin America and the Caribbean and for 70% in Africa,<sup>12</sup> offers the best opportunity of reducing poverty for a large sector of this population.<sup>13</sup> In tropical regions farmers are already struggling to cope with a changing climate and further warming will bring higher costs and few benefits. Mitigation investment action is imperative.

Highly diverse farming systems as opposed to commercial monocultures have repeatedly been shown to be more resilient.<sup>14</sup> They can recover from a stress (e.g. drought) or shock (e.g. flood)<sup>15</sup> more quickly and place less pressure on regional hydrological systems. On marginal, rain-fed lands which have poor quality soils, erratic rainfall and often steeper slopes, such systems can better secure livelihoods and benefit from traditional and local knowledge.<sup>16</sup> Agro-forestry is one such system where particular trees and crops, such as nitrogen fixing crops, are planted together to improve soil nutrient levels. This increases crop yields, reduces the need to use synthetic fertilizers that produce GHGs, and enhances natural carbon absorption in the soil.<sup>17</sup>

By applying techniques of agro-forestry family farmers can reduce their vulnerability and at the same time provide many environmental services which include biodiversity conservation, protection of water systems, increased soil productivity and reversal of deforestation. While some services are local or regional, such as reduction of vulnerability to erosion and landslides, others such as natural removal and storage of carbon, are global, producing beneficial consequences for the global community.

The value of these services is demonstrated through the social, economic and environmental costs of their absence or under-provision. For the producer to capture this, value payments must be made.

CDM has designed modalities to provide for such payments. Small farmers, in theory, should collectively be able to produce at least two forms of global public goods or services. One service is

the removal of carbon dioxide from the atmosphere through photosynthesis and subsequent storage of carbon in vegetation and soils (living biomass). Another potential service is decentralised carbon-neutral energy options (wind, biogas, photovoltaic, micro-hydro etc.), reducing or avoiding emissions from fossil fuel burning. This article will focus on the former principally for two reasons. Firstly, forestry activities can strengthen what is already being done by many family farming programmes. The use of alternative energies, while within the capacity of smallholders, is a new theme that may not be part of the short to medium term plans for smallholder associations. Secondly, forestation activities not only mitigate the problem but can form part of strategies for the most vulnerable communities to adapt to the inevitable impacts of climate change.

### **Eligibility of projects**

For all CDM projects the country where the project is located must ratify the Kyoto Protocol and designate a national authority<sup>18</sup> to consider if projects contribute to sustainable development.

The UNFCCC's seventh Conference of Parties (COP 7) in Marrakech in 2001 agreed that afforestation (establishing new forests) and reforestation (re-establishing former forests) are eligible CDM activities. Curbing or avoiding deforestation is not yet considered an eligible activity; see Box 1.

#### **Box 1. Proposals from developing countries<sup>19</sup> for incentives to avoid deforestation**

Tropical deforestation is driven in Africa by small-scale subsistence farmers, in South America by large farming enterprises producing beef and soya for export, and by a mixture of the two in Asia, with oil palm, coffee plantation and timber as the main products. It results in the release of carbon dioxide into the atmosphere and contributes to GHG emissions. Maintaining the rainforest is a highly cost-effective way of reducing emissions and has the potential to offer significant reductions fairly quickly. It also brings with it many other benefits in the form of biodiversity conservation and soil and water quality protection. However there is no explicit incentive through the CDM for tropical countries to avoid deforestation, principally because of the concern about the risk that protecting forests in one project area would lead to deforestation in another.

Last year, at COP 11 in Montreal, Papua New Guinea and Costa Rica on behalf of the Coalition of Rainforest Nations, proposed a mechanism to enable carbon saved through reduced deforestation in developing countries to be traded internationally. Each rainforest nation would establish a national deforestation baseline and negotiate a voluntary commitment to reduce deforestation below this baseline. Reductions achieved could then be traded through Kyoto's CDM or other carbon markets.

In 2006 at COP 12 in Nairobi, Brazil proposed a mechanism for positive incentives for voluntary action by developing countries to avoid deforestation outside the CDM. This aims to establish a reference emissions rate for a certain time period and if the rate of deforestation lies below this, the participating developing country would be entitled to financial benefits calculated by converting the difference between reference and actual rates into economic value.

Both proposals are on the table for discussion in 2007.

A project which is eligible to be considered as a small-scale CDM activity can benefit from the simplified modalities and procedures adopted at COP 10 in Buenos Aires which are intended to reduce preparation and implementation transaction costs. For forestry purposes, small-scale activities are those that expect to result in net human induced GHG removals by sinks of less than 8,000 tonnes of CO<sub>2</sub> per year and are developed by low income communities and individuals as determined by the host country.

COP 9 in Milan agreed definitions for forestry, leaving a margin within which each country could choose.<sup>20</sup> Brazil, for example, chose the upper margins, where forests must have a minimum of crown density cover of 30% with a minimum tree height at maturity of five metres. Land with less than these parameters in 1990 (the base year) is eligible where it can be demonstrated that the parameters will not be reached in the future without human intervention. Brazil's decision was made with the objective of having more land eligible for reforestation and afforestation projects.

Given these parameters it is possible to envisage small-scale community forestry or agro forestry systems involving groups of small-scale projects; e.g. associations of small-scale farmers and beneficiaries of land reform.

## Practical steps for a community CDM carbon project<sup>21</sup>

*Demonstrate that the land for foresting is eligible.* Either historical aerial photos or remote sensing data or public records (or preferably all of these) can be used to determine the forest history of a parcel of land to assess if it qualifies. If none of these types of records is available applicants can supply a written testimony which is produced using a participatory rural appraisal methodology to determine the status of the land prior to 1 January 1990.

*Assess capacity to demonstrate how the project activities offset carbon and are additional to what would have occurred in the absence of the proposed activity.* In other words the project must prove that without the CDM it would not have happened. This is known as the *additionality* criterion.

*Assess carbon removal (or sequestration) rates* – some projects will have greater potential than others. It will depend on types of trees (particularly their growth rate and density) and soils to determine the amount of credits that could be potentially accrued. Methods for assessing the removal potential of the vegetation that will be propagated vary.

*Determine the level of support.* Buy-in by various actors is critical for success. Participant community interest is paramount along with a strong capacity to organise.

*Draft a technical proposal.* This will provide the basis for attracting partners and institutional support. NGOs and other entities may assist in the process in part due to the community capacity building orientated with the proposed project. A sound proposal should attract the interest of potential investment sources and CER buyers from industrialised countries.<sup>22</sup>

*Establish a carbon baseline* (determining the baseline against which future carbon removal will be measured). For small CDM forestry projects, if the baseline carbon stock is expected to remain the same or to decline in the absence of the project activity, the changes in the carbon stock are assumed to be equal to zero. Otherwise, a specific equation is provided for calculating this increase which uses density, volume and expansion factor of biomass variables. Locally developed or national variables are used if available, otherwise UNFCCC provides default values for use at this stage in the process.

*Develop a monitoring and verification plan that provides for community monitoring with a framework for third-party verification.* Before CERs can be certified a third party called a designated operational entity (DOE)<sup>23</sup> must verify that reported



activities and carbon removals are actually taking place. It is necessary to train community participants in routine vegetation sampling techniques and to secure a local research institution to assist with this process.

*Finalise project design document (PDD) in the official format, which clearly demonstrates eligibility, additionality and adheres to the aforementioned technical requirements.*

*Present PDD to the DOE for validation.*

*Send validated proposal to be considered for approval by the designated national authority (DNA) in the host country and subsequently request for registration by the executive board of the CDM.*

These activities could result in certification and the issuance of CERs and the transfer of payments from the buyer.<sup>24</sup>

## **4. Carbon projects in Brazilian rural communities**

This section explores experiences in Brazil that promote smallholders' access to the carbon market.

### **Proambiente – APA-TO**

Proambiente has evolved into a programme of the Brazilian Ministry for the Environment to compensate small farmers for providing environmental services, with emphasis on the marketing of carbon removal and preventing deforestation, where public authorities assume the costs and responsibilities for monitoring and certification of global services.<sup>25</sup> The programme, currently based in the Amazon “arc of deforestation” but intending to expand to other regions, was designed and set up by a number of social groups with support from NGOs. There are currently eleven “pioneer poles” in nine states. The programme is managed in coordination with a number of councils, with representation from stakeholder groups from the poles, implementing organisations and a wide range of public and civil society bodies.

An NGO, APA-TO, with a strong focus on social development accompanies local associations and rural workers unions in northern Tocantins in their struggle to acquire and farm land sustainably. In an area where large-scale cattle ranching, soya plantations and charcoal extraction for pig-iron production are degrading the integrity and resilience of eco-systems, APA-TO is organising the implementation of Proambiente in the local pole.

Of the 316 families who voluntarily participate, most are settlers on reformed land with technical assistance provided in agro-forestry and training for community agro-ecological technicians. A management council oversees the programme at a local level, with representation from the various participating associations and rural workers' unions.

Rural participatory appraisals articulated and prioritised by smallholders resulted in diagnostics for each community and then for each family farm which provided a basis for development plans on a 15 year time horizon. Subsequently, community accords or rules for the wise use of natural resources were collectively defined and agreed. The accords reflect the reality of each community and range from refraining from using slash and burn<sup>26</sup> techniques, minimising the use of pesticides, reforesting land around river banks and streams, and raising awareness of neighbours and colleagues. Some communities have established community managed reserves and periodic meetings address non-compliance with the community accords.

The majority of participants are reported to have changed their production techniques as a result of the participative accords. Some farmers are reversing deforestation and generating greater and more diverse incomes. One farmer who was interviewed initiated an agro-forestry before the community accords, providing a valuable example of the benefits of this alternative land use. The farmer earns more than the minimum industrial wage from three hectares of land using an agro-forestry system integrated with bee-keeping. Such systems are reported to have many other local benefits as family members are more integrated in production and commercialisation processes and working conditions are improved. Many young family members have become ecological agents for the Proambiente programme.

Another key component of promoting sustainable use is environmental and ecological education that provides different land use options. An important member of the local Proambiente network is a well-organised women's group that is raising awareness and enhancing people's perception of the value of a native palm called babaçu. This palm is often undervalued and cut down and sold as charcoal. Although the resilient palm has a high capacity to recover it is often killed off by farmers and ranchers who focus on the short term financial gains of cattle rearing. The organisation is rescuing the palm's traditional value, promoting alternative options and the positive consequences of its managed extraction. The association is promoting increased gathering and processing of the palm's fruit to commercialise its

various derivatives (nuts, oil, raw fuel etc.) with micro-agro industries.

Payment for environmental services is a direct incentive for the establishment of accords and improved resource management. This year the first two payments were made (totalling an equivalent of less than two monthly minimum wages) and were well received by Proambiente participants. It is still unclear how the environmental services provided by the farmers will be given a monetary value, and if payments will be per hectare or per participant. Future payments depend on approval of national legislation to institutionalise the use of public resources to fund environmental services. Whether such payments become part of Brazilian public policy remains to be seen.

### **Instituto Ecológica**

Instituto Ecológica (IE) was formed as an NGO and has transformed into a civil society organisation of public interest. Its principal mission is to reduce the effects of climate change through research, conservation and preservation of the environment and sustainable development of rural communities. IE works with projects directed at environmental valuation and education promotion in the south of Tocantins state. Partnerships have been formed with multilateral entities such as the IADB, the private sector, research institutions and government programmes.

Through projects such as the experimental Bananal Project the “social carbon” concept was developed to generate carbon offsets with a priority focus on social aspects.<sup>27</sup> A social carbon methodology, based on the sustainable livelihood approach,<sup>28</sup> has been developed whereby the impact of interventions are assessed based on the communities’ perceptions of the changes in their access to resources using biodiversity, carbon, finance, human, social and natural criteria.

IE’s research centre provides a base of operations for research on the development of carbon-monitoring methodologies and regional biodiversity studies. Although agro-forestry carbon stock measurement has yet to start, there have been baseline studies on the carbon content of different forest types in the region’s various ecosystems (rainforest, savannah and the Pantanal prairie). The results facilitate estimation of tonnes of carbon sequestration per hectare per year ( $tCO_2eq/ha/year$ ) for various tree types.

IE has developed a social carbon seal, whereby small producers participate in a training process to commercialise non-timber

forest products. Products are identified, developed and standardised to adhere to national quality norms facilitating wider market access. Communities use fruits and seeds from native plants and trees to produce jewellery, preserves and liquors with a view to acquiring the social carbon seal. Extraction of oils from plants such as sweet potato is also projected. The products demonstrate the standing value of fruit bearing trees.

In partnership with a national organisation to promote micro-enterprise, Sebrae, IE is working with a ceramic block factory that has adapted its technology to burn rice husk instead of firewood, which is usually extracted illegally from the savannah. Production costs have been lowered and the project predicts it will reduce local deforestation. The company has initiated a CDM project as methane emissions from the rice husks will be lower. Other ceramics companies in the vicinity are proposing to change to rice husk. However, it is unclear if enough rice husk will be generated locally to meet increased demands and what the effects will be on the income of those who make their livelihood from selling firewood.

### **Implications for CDM projects on rural communities in Brazil**

The experiences use bottom up approaches and provide valuable information in assessing the viability of small-scale community CDM agro-forestry projects.

Proambiente's innovative community accords result in smallholders defining their property rights.<sup>29</sup> Similar accords in the Amazon have been reported to promote sustainable fishing in lakes resulting in yields increasing by 152% while enhancing fish stocks.<sup>30</sup> Formalised resource use and management norms will be less vulnerable to external forces of change such as prices for fuel wood, land speculation etc.

Slow adoption of agro-forestry is a function of absence of credit and technical assistance.<sup>31</sup> Both projects have developed valuable agro-forestry know-how for farmers and technical staff. Getting credit designers to understand agro-forestry so appropriate financial packages can be facilitated is essential. Incorporating potential carbon sales and payments for environmental services as part of these packages will make agro-forestry more feasible for small farmers.

Ecológica and research partners have demonstrated the value of carbon removal services. By measuring biomass growth over time, calculations for the carbon content and carbon dioxide equivalents can be made. The price of CO<sub>2</sub>eq will then determine

the potential payment per hectare per year. The IPCC predicts a mean value of 120 metric tonnes of carbon per hectare of above ground tropical forest biomass stock which represents 440 tCO<sub>2</sub>eq per hectare.<sup>32</sup> Revenue potential from smallholder carbon sequestration from an agro-forestry system with a 25 year accumulation that results in 70 tonnes of carbon per hectare with a price of \$3.50 /tCO<sub>2</sub>eq<sup>33</sup> is \$35.95 (or just over 10 tCO<sub>2</sub>eq) per hectare, per year.<sup>34</sup> The amount that gets into the smallholders' hands will depend on the transaction costs. In Proambiente's pioneer poles these costs could be zero as it is intended that public authorities assume the monitoring and certification costs.

Both initiatives have learned that agro-forestry systems are complex and can take more than three years before benefits become evident. Exchange of experiences is an effective form of sharing knowledge on soil, native species, plagues, diseases, rainfall patterns and more. The agro-forestry process involves investment in capacity building, environmental education and the development of consensus among participating parties. Some 1,011 agro-forestry experiences have been identified by the National Agro-ecology Platform in Brazil. Carbon sales may bring new financial inputs to these and similar initiatives which can complement the evolving process by facilitating the broadening of objectives.

## **5. Overcoming barriers to entry for a community CDM forestry project**

### **Information**

Possibly the greatest barrier to access at this point is lack of information. Many small-scale organisations and social movements are not aware of or responsive to the workings of the CDM. Although procedures and modalities and proposals are publicly available few have the time or resources to evaluate the information. In Brazil, for example, the carbon market is dominated by large corporations that have resources to interpret and make the most of opportunities.

### **Eligibility**

Some projects may be ineligible as they do not meet forestry definitions as on 1 January 1990. This is the case, for example, in

parts of the south of Tocantins that have been heavily populated since 1989. It may also be difficult for areas vulnerable to desertification, such as semi-arid areas, to reach the minimum level of forest definition, particularly tree height of at least 5 metres. Early confirmation of eligibility is prudent.

### **Land tenure**

Whose rights should prevail over carbon credits becomes a cloudy issue when the land that accrues these credits belongs to the state<sup>35</sup> or when ownership is not clearly defined. It is likely that there is a significant relationship between land ownership and the permanence of carbon removals. Ownership of land can provide collateral for participation in credit programmes and facilitates investment and long term planning.

### **Transaction costs – economic viability**

Under the CDM, most of the transaction costs related to the generation and sale of CERs occur in the planning and design phase, before the actual start of the project. The first proceeds from the sale of CERs may be required to cover transaction costs. Given a value per tonne of CO<sub>2</sub>eq of \$5, minimum transaction costs estimated to range from \$30,000 to \$70,000 and a project with an output of less than 15,000 CO<sub>2</sub>eq over its lifetime would not be viable under the current conditions of the CDM. Add to this the financing of a high up-front share of transaction costs.<sup>36</sup> If carbon prices increase and transaction costs reduce, projects will become more viable.

### **Organisation**

Small community forest projects are limited to 8,000 CO<sub>2</sub>eq offsets per year. Resulting project size ranges between 204 hectares for fast growing species and quick afforestation and up to 3,500 hectares for agro-forestry systems.<sup>37</sup> Given an average lot of 5 hectares per family this would imply participation of between 40 and 700 families. Organising multiple participants or groupings of people who do not live on contiguous land or settlements is likely to imply higher monitoring transaction costs per hectare. Compliance and permanence of carbon offsets will depend on how farmers manage their lots and how similar are their circumstances. Community groups are composed of multiple actors with multiple interests and perceptions of development priorities (e.g. income generation, local property

rights etc.). Voluntary participation in a carbon project and the development of community accords should contribute to maintaining a group united.

Projects will be challenged in the trade-off of social development and carbon offset generation. There is a danger that weaker parties will be left out and that CDM projects will widen the gap between the local rich and the local poor.<sup>38</sup>

### **Technical**

Success in agro-forestry will depend on development of skills related to propagation of trees and the identification of appropriate intercropping and water retaining vegetation. Appropriate technologies such as rainwater harvesting, seed banks, fuel-efficient small stoves, and low energy building blocks can be integrated into the farming system. Sampling and report keeping skills for quantification of carbon can be developed in collaboration with research and training institutes and multiplied through exchange of experiences between smallholders.

### **Institutions**

Projects will require building consensus among various actors including farmers' associations, social movements and NGOs, local, state and national authorities, research institutes and international carbon brokers. It is crucial to identify processes, procedures and paths so that small farmers can have an entity to articulate and negotiate politically.

### **Complexity**

CDM forestry projects are criticised for their relative complexity,<sup>39</sup> although this was regarded as necessary to reach agreement as the negotiations evolved over time. Energy related projects are easier to quantify and have less risk of non-permanence. In the event of a forest fire during a crediting period buyers will have to renew their credits. Because of risk of reversal of CO<sub>2</sub> removals through their re-release to the atmosphere, "forestry" credits are distinguished as being temporary or long-term CERs. Prices paid for these carbon credits are thus likely to be less than ordinary, non-forestry, CERs. Time will tell how prices differ.

Quality standards, such as the climate, community and biodiversity project design standards (CCB standards), help to identify projects that simultaneously mitigate climate change,

support local communities and conserve biodiversity, thus providing credibility and clarity and reducing risks for project investor.

Carbon offsetting for voluntary compliance avoids some of the complexities and costs of CDM projects. The Nhambita Project in Mozambique, for example, is a carbon offsetting, poverty reduction, agro-forestry project where verified offsets are purchased by organisations and people who want to offset their carbon on a voluntary basis.<sup>40</sup>

## Scale

Although carbon offsets from highly diverse small-scale agro-forestry systems could offer greater social and ecological benefits, carbon offsets from large single species plantations of uniform growth rates (monocultures) such as eucalyptus and pine, are easier to quantify, may be easier to organise and are likely to be more attractive to carbon brokers. However, not all the costs are being counted: the plantations can effect the hydrological cycle negatively and reduce the amount of land available to local population.

## Critique of Kyoto and CDM

During the interview process for this article doubts about the CDM were expressed on how the mechanism can benefit traditional and indigenous peoples. At the moment, for many, it seems like a “surreal” macro mechanism for big players. Some of the “clean development” may not be so clean where plantation monocultures of non-native exotic plants replace fragile ecosystems for bio-fuels. There is interest to find answers to these doubts.

A common criticism of the Kyoto Protocol is that emissions reductions do not go far enough. Australia and the USA (the largest GHG emitter per capita and the largest emitter in total terms, respectively) have not ratified the Protocol. They argue that emerging giants such as China should be obliged to limit their emissions, even though China’s emissions from energy generation are less than world per capita averages. It is estimated that to keep the temperature rise below 2°C of pre-industrial levels, commitments should be progressively raised after 2012, some argue to 80% by 2050.<sup>41</sup>

The most attractive CERs for brokers are from high volume low-cost projects such as landfill gas and removal of HFCs with



limited direct benefits to local livelihoods.

Few projects make significant progress in meeting all social, environmental and economic aspects of sustainable development.<sup>42</sup> For example, over 70 unions, Church groups and individuals have denounced the Plantar project in Minas Gerais, Brazil. They wrote a letter to the CDM Executive Board criticising how the company initially acquired the land for a large-scale eucalyptus plantation to capture carbon. The company has been condemned for poor environmental management and dangerous working conditions. Also, the permanence and stability of the project's carbon removals have been challenged.

Not a single small-scale community forestry project, with potentially high development dividends, has been registered with the CDM. Questions have been asked about how carbon money can be directed to impoverished small-scale farmers rather than landowners who are responsible for much of the deforestation.

The poorer regions of the world struggle to compete for foreign direct investment *via* the CDM. By January 2007 the majority of CDM registered projects are concentrated in Brazil and India with only 13 out of 489 projects in Africa, and those are based in the relatively better off South Africa and states in northern Africa.

Currently there is no implicit incentive under the CDM to reduce deforestation. The combination of existing financial incentives to plant new forests, but with inadequate or insufficient incentives to preserve existing tropical forest, could encourage perverse behaviour, such as cutting down forest in order to replant it.<sup>43</sup>

Some argue that trading emissions is a way of avoiding responsibility and that emission markets are another attempt to commodify natural resources and turn the earth's carbon cycling capacity into a product or service that can be bought or sold.<sup>44</sup> It could also be argued, however, that monetary values have not been put on carbon environmental services in the past and therefore policymakers, business interests and individuals have ignored their social value leading to environmental degradation and natural resource depletion.

## 7. Conclusions

“The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it.”

Michelangelo (1475-1564)

The Kyoto Protocol’s CDM has shortcomings and its rules may have to be re-discussed to make small scale forestation activities, within the CDM framework, viable. However, the global warming problem requires a global solution and international consensus building is crucial. The success of one of the world’s foremost international environmental agreements is likely to rest on the extent to which tradable permits actually work.<sup>45</sup>

The design, implementation and monitoring of small-scale agro-forestry CDM projects are not beyond the capacity of well organised communities in developing countries. There are many surmountable entry challenges and barriers for such projects so that credits can accrue to small farmers.

A better understanding of climate change, the Kyoto Protocol and its CDM is urgently required to provide greater information, incentives, investment, infrastructure and institutions.

Near universal consensus has been established that the main cause of global warming is the concentration of GHGs, principally from burning fossil fuels for energy generation. Ireland is among the highest GHG polluters per capita worldwide. Dick Roche, the Minister for the Environment, said Ireland will purchase up to 3.6 million credits from the three flexible mechanisms for each of the five years from 2008 to 2012.<sup>46</sup> However it is not clear how many reductions will come from the CDM. In addition to greatly reducing emissions and assisting developing countries to adapt to the consequences of climate change, Ireland with other industrialised countries must assist capacity building for least developed countries to overcome barriers to entry and to implement CDM projects. Ireland will purchase credits from developing countries, but must not only consider their quantity and price but also place emphasis on their quality. Small-scale CDM community agro-forestry projects, if implemented, are highly likely to increase the quality of CERs, as they contribute greatly to the double aim of CDM. In buying a significant amount of these credits Ireland will, in effect, be investing in the capacity of developing countries to adapt to climate change.

## Footnotes

- <sup>1</sup> Translation of interview with Paulo Cabral, BBC Brazil, November 2006
- <sup>2</sup> I am grateful for the kind support of Guillermo Gamarra from Proyecto Dom Helder Camara, José Rego from CEPFS and ASA-PB, Yuki Ishii from APATO, Thelma Krug from INPE, Shigeo Shiki from Proambiente, Eliana Pareja from Instituto Ecológica and José Aldo from Centro Sabiá.
- <sup>3</sup> Pearce and Barbier (2000)
- <sup>4</sup> See p.113 for a full list of abbreviations.
- <sup>5</sup> If a party's emissions are greater than its assigned amount, it must make up the difference in the second commitment period, plus a penalty of 30%. It will also be barred from "selling" under emissions trading and must develop a compliance action plan detailing the action it will take to make sure that its target is met in the next commitment period.
- <sup>6</sup> Capoor and Ambrosi (2006)
- <sup>7</sup> The additionality criterion is key for CDM projects to demonstrate that something is being done that would not have been done without the CDM. In other words emissions reductions, (which, when issued, are hypothetical carbon baseline emissions less the effective project emissions), must be *additional* to any that would occur in the *absence* of the certified project activity (Art. 12.5c).
- <sup>8</sup> Capoor and Ambrosi (2006)
- <sup>9</sup> Ibid.
- <sup>10</sup> Italy, Spain, Denmark, Ireland and Portugal are the EU member states with the highest estimated Kyoto gaps and are projected by the European Environmental Agency as unlikely to meet their national targets for 2008-2012.
- <sup>11</sup> By October 2006 there were registered CDM projects in 38 countries, of which 14 are countries where Trócaire works. Vietnam was the only Irish Aid Priority Country with registered CDM projects, although Tanzania and Uganda had projects in the pipeline and Mozambique and Zambia were building their capacity through initiatives supported by the UN, EU and UK. Out of a total of 386 registered projects in October 2006, only 9 were in Africa and the bulk of the rest were registered in India, Brazil, Mexico and China. As of October 2006, for the first crediting period (2008-12), 45% of expected certified emissions reductions were to come from China. Currently, Brazil has the highest expected certified emissions reductions per capita.
- <sup>12</sup> Maxwell (2001), pp.143-9
- <sup>13</sup> GFA Consulting Group <http://www.gfa-group.de>, 1 November 2006
- <sup>14</sup> Simms and Reid (2005)
- <sup>15</sup> Conway (1987), cited in Pearce and Barbier (2000)
- <sup>16</sup> Ibid.
- <sup>17</sup> Girling (2005), cited in *Stern Review* (2006)
- <sup>18</sup> Of the countries where Trócaire works, Afghanistan, Angola, Burma, Burundi, Haiti, Iraq, Palestine, Sierra Leone, Somalia, and Timor Leste have not yet designated a national authority for the CDM as of <http://cdm.unfccc.int>, November 2006.
- <sup>19</sup> The Coalition of Rainforest Nations currently consists of Bolivia, Central African Republic, Cameroon, Congo, Colombia, Costa Rica, Dominican Republic, DR Congo, Ecuador, Fiji, Gabon, Ghana, Guatemala, Honduras, Indonesia, Kenya, Lesotho, Nicaragua, Nigeria, Panama, Papua New Guinea, Peru, Samoa, Solomon Islands, Uganda and Vanuatu (<http://www.rainforestcoalition.org/eng/>).

- <sup>20</sup> The Marrakech Accords define forests as a minimum area of land of 0.5-1 hectare with tree crown cover (or equivalent stocking level) of more than 10-30% whose trees have the potential to reach a minimum height of 2-5m at maturity *in situ*; (<http://cdm.nnfccc.int>).
- <sup>21</sup> Adapted from Poffenberger et al. (2002) and Dutschke et al. (2006)
- <sup>22</sup> It was agreed in 2001 that CERs (CO<sub>2</sub>eq from developing countries) from forestry may not exceed 1% of each Annex-1 Party's base year emissions annually, (Paragraph 14 of Marrakech Conference of Parties eleventh decision). Ireland through acquiring forestry CERs could finance more than 66 small-scale community forestry projects per year during the first commitment period.
- <sup>23</sup> A designated operational entity (DOE) is an entity accredited by the Executive Board of the CDM and later ratified by the CoP/MoP. The responsibilities of DOEs are: 1. To validate proposed CDM project activities; and 2. to verify and certify GHG emissions reductions and/or CO<sub>2</sub> removals.
- <sup>24</sup> Entities such as <http://www.ecosystemmarketplace.com/> of the Katoomba Group (<http://www.katoombagroup.org/>) offer products and services, many without charge, for generating and marketing of CERs.
- <sup>25</sup> May, et al.(2004), accessed on <http://www.cebds.org.br/cebds/pub-docs/pub-mc-may-mercado-de-carbono-2004.pdf>, November, 2006
- <sup>26</sup> Slash and burn is a cut, burn, plant and shift cropping process. In the short term it can add nutrients to the land but in the medium to long term it is ecologically destructive and reduces soil fertility.
- <sup>27</sup> May et al. (2004)
- <sup>28</sup> A sustainable livelihoods (SL) approach is a way of addressing development issues in which the livelihoods of poor people are put at the forefront of analysis and action. Many of the core elements of SL (such as participation, building on assets) are not new. However, the synthesis of best practice from many fields and disciplines into a single framework and set of principles for development action, and the central focus of building on poor people's complex livelihoods, marks a shift in approach. Accessed from <http://www.odi.org.uk/rpeg/srls.html>, November, 2006
- <sup>29</sup> Property rights can be considered as entitlements defining the owner's rights, privileges and limitations to use of a resource: Pearce and Barbier (2000).
- <sup>30</sup> ANA (2006)
- <sup>31</sup> May et al. (2004)
- <sup>32</sup> The conversion factor of tonne of carbon to tonne of carbon dioxide (tCO<sub>2</sub>/tC) is 44/12 or 3.67.
- <sup>33</sup> tCO<sub>2</sub>eq from the CDM are certified emissions reductions and are currently priced between \$4.50 and \$5.50 for delivery in 2010 (<http://www.co2e.com/trading/MarketHistory.asp>), December 2006. To deal with the risk of reversal of CO<sub>2</sub> removals through their re-release into the atmosphere, temporary CERs or tCERs were designed and agreed on at COP 9 in 2003. Their prices, due to implied risks are likely to be lower than normal CERs. Hence \$3.50 may be a good ball-park estimate.
- <sup>34</sup> Adapted from May et al. (2004)
- <sup>35</sup> May et al. (2004)
- <sup>36</sup> Adapted from Dutschke et al. (2006)
- <sup>37</sup> Locatelli and Pedroni (2004) as cited in Dutschke et al. (2006)
- <sup>38</sup> Dutschke et al. (2006)
- <sup>39</sup> For example, forestry projects have been excluded from the first phase of the EU ETS (until 31 December 2007) and from the WWF gold standard (quality standards).

- <sup>40</sup> Girling (2005), cited in *Stern Review* (2006)
- <sup>41</sup> Simms and Reid (2006)
- <sup>42</sup> Tayalib (2006)
- <sup>43</sup> Stiglitz (2006)
- <sup>44</sup> Durban Group for Climate Justice, Durban Declaration, (2004) accessed at <http://www.carbontradewatch.org/durban/durbandec.html>, December 2006
- <sup>45</sup> Pearce and Barbier (2000)
- <sup>46</sup> *The Irish Times*, 30 November 2006

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## Abbreviations

|                    |   |
|--------------------|---|
| ANA                | National Agro-ecology Articulation                            |
| APA-TO             | Small Farming Alternatives – Tocantins (Brazil)               |
| ASA-PB             | Semi-Arid Articulation Social Movement, Paraíba               |
| CCB                | Climate community and biodiversity (project design standards) |
| CDM                | Clean development mechanism                                   |
| CEPFS              | Centre for Popular Education and Social Formation             |
| CERs               | Certified emissions reductions                                |
| CO <sub>2</sub>    | Carbon dioxide  |
| CO <sub>2</sub> eq | Carbon dioxide equivalents                                    |
| COP                | Conference of parties   |
| DNA                | Designated national authority                                 |
| DOE                | Designated operational entity                                 |
| EB                 | Executive board of the CDM                                    |
| EU ETS             | European Union Emissions trading scheme                       |
| GHG                | Greenhouse gas  |
| Has                | Hectares  |
| HFCs               | Hydro fluorocarbons   |
| IADB               | Inter-American Development Bank                               |
| IE                 | Instituto Ecológica (Brazil)                                  |
| INPE               | Brazilian National Institute for Spatial Studies              |
| IPCC               | Intergovernmental Panel on Climate Change                     |
| LULUCF             | Land use, land use change, and forest                         |
| NGO                | Non-governmental organisation                                 |
| PDD                | Project design document                                       |
| tCO <sub>2</sub> e | Tonnes of carbon dioxide equivalents                          |
| UNFCCC             | United Nations Framework Convention on Climate Change         |
| WWF                | World Wildlife Fund   |