The Clean Development Mechanism in Uruguay: towards a new relation between livestock and forestry

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The Clean Development Mechanism presents opportunities to promote productive systems marrying livestock and forestry, traditional competitors for land use in Uruguay – but many barriers must first be overcome.

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Climate change is an increasing concern for the international community. The ultimate goal of the United Nations Framework Convention on Climate Change (UNFCCC) is to stabilize greenhouse gas concentrations at a level that is not dangerous for the climatic system. This goal will not be easy to achieve while economic growth continues to rely on non-renewable energy sources. Climate change can be mitigated effectively only through a portfolio approach combining emission reductions, the use of renewable energy, enhanced energy efficiency and the removal of carbon dioxide from the atmosphere through land use, land-use change and forestry activities.

The Clean Development Mechanism (CDM) is not only a tool to mitigate climate change; it is also intended as a means to help developing countries achieve sustainable, clean and environmentally sound development. The biggest challenge is to make the CDM contribute effectively to the generation and transfer of technology and investment that is required to break the link between economic growth and fossil fuels in developing countries.

The CDM is a project-based mechanism and its importance lies in its being the first global market strategy to promote environmental services. This means that agro-ecosystems can have new economically recognized functions besides producing food and fibre.

In Uruguay, cattle-raising and forestry have traditionally been competing land uses and the potential synergies between cattle and trees have not been adequately understood or exploited. This article proposes the Clean Development Mechanism (CDM) as an opportunity to promote innovative systems that integrate both activities. It explores the main barriers that limit the potential for implementing CDM projects and jeopardize their effectiveness as an international tool for sustainable development.

POTENTIAL FOR CDM FORESTRY PROJECTS IN URUGUAY

Unlike many other Latin American countries, Uruguay has low forest cover. Less than 10 percent of the territory is forested, native forests accounting for 4.6 percent and forest plantations 4 percent. Cattle and sheep farms dominate the landscape.

Of Uruguay's 17.5 million hectares, 13.5 million are natural grasslands dedicated to extensive grazing (Ministry of Livestock, Agriculture and Fisheries, 2000a). Starting at the beginning of the twentieth century, small isolated tree plantations (1 to 3 ha, mainly of *Eucalyptus* spp.) were introduced to provide shade and shelter for the cattle and sheep and wood for fuel and fences – but farmers were not interested in the trees' other functions. Livestock was the main concern. This means that traditionally farmers in Uruguay have had little or no experience in forest management or silviculture.

Over the past 15 years, as a result of incentives, policies and investors' expectations, there has been a notable increase in industrial plantations of *Pinus* spp. (*P. taeda* and *P. elliottii*) and *Eucalyptus* spp. (mainly *E. grandis* and *E. globulus*), managed for production of wood and pulp – indeed, Uruguay is

Forestry-related CDM projects under consideration in Uruguay

Proposals for CDM projects related to the rural development sector in Uruguay can be divided into two main groups: forestry projects for wood, restoration and protection; and wood-energy projects.

In the first group the following possibilities are being assessed:

- **transformation of low-productivity grasslands into forest and silvopastoral systems;**
- **integration of trees in extensive grazing systems to provide shelter and shade and to diversify income flow (through carbon credits and the sale of meat and wood);**
- **projects that join together groups of small- and medium-scale farmers to increase and diversify income and labour;**
- **restoration of degraded lands, protection of river banks and promotion of biodiversity.**

Important possibilities for wood energy projects currently being analysed in Uruguay include:

- **generation of electricity or co-generation of heat and electricity from sawmill wastes;**
- **production of charcoal and other fuel from solid wood obtained through forest management (e.g. thinning) and wastes;**
- **fuelwood production.**

Of more than 700 000 ha of forest planted in the past 15 years (Ministry of Livestock, Agriculture and Fisheries, 2004), nearly half is managed for wood products. A small and obsolete sawmill industry is being invigorated through rapid investment in medium and large sawmills whose increasing amounts of by-products (sawdust and waste) represent a great potential for energy production. The Office of Agricultural Planning and Policy (2004) estimates that by 2012 the sawmill industry will produce about 2 million cubic metres of waste annually.

becoming an important pulp and paper producer and exporter in Latin America, partly thanks to foreign investment in production capacity. Much of the plantation expansion has occurred through substitution of livestock production, with livestock farmers selling their lands mainly to foreign companies.

Until recently, however, synergies between cattle and trees have remained largely undeveloped. The explicit forestry policy of the new administration now encourages large forestry firms to make long-term contracts with national livestock farmers for wood provision instead of buying land (*Brecha*, 2006). This policy will bring trees and silvopastoral systems to the attention of livestock farmers and might change the relation between these potentially complementary production systems. As a policy instrument, the CDM could play a key part in encouraging small- and medium-scale farmers to integrate trees with livestock in those cases where the CDM criteria for additionality can be met – i.e. where the project would not take place in the absence of CDM incentives; some examples include degraded lands, very small farms with insufficient capital for tree planting, and sites distant from markets.

Uruguay has a significant land area with natural potential for afforestation activities in forest plantations grown for wood or non-wood products as well as in systems combining trees with cattle, sheep and agricultural crops. The law defines over 3 million hectares as "forestry priority land". This is land that currently has low productivity for livestock activities or is too fragile for conventional crops. Depending on site quality, mean tree growth of commercial species could range from about 15 to 35 m^3 per year on these lands (data collected by the author). However, so far only 10 percent of the forestry priority land has actually been dedicated to forestry activities. In addition, there are almost 274 000 ha of severely degraded land (Ministry of Livestock, Agriculture and Fisheries, 2000b), mostly abandoned, which could represent an interesting opportunity for forest-based restoration and sustainable rural development programmes. This means that there is still great potential for projects fulfilling the Kyoto Protocol requirements.

Many livestock farms have some portion of grasslands where trees could be introduced with economic and social benefits. Uruguay has about 2 700 intensive dairy farms (Ministry of Livestock, Agriculture and Fisheries, 2000a). Caloric stress reduces milk production during the summer (Betancourt *et al.*, 2003) and planting trees for shade could help to resolve this problem. In addition, trees could diversify and improve income flow, especially if long-rotation trees for high-quality wood, such as oaks, are introduced. However, the costs of planting represent a real barrier. Carbon credits could help facilitate the introduction of these practices by providing resources for investment and improving income. Nevertheless, it is difficult to assess the extent to which these opportunities will become reality in the medium and long term, mainly because there are still many barriers and uncertainties regarding the CDM in the forest sector. These include both national-level barriers under the country's control, and barriers at the international level which can only be removed through international collaboration.

NATIONAL-LEVEL BARRIERS

Insufficient public awareness and information

The CDM is a relatively new and international issue, and most farmers know little or nothing about the opportunities that are emerging. Rules for CDM forestry projects were only approved at the ninth Conference of the Parties of UNFCCC in December 2003, and as yet no systematic national efforts have been made to inform farmers about this mechanism. Little locally validated information has been produced regarding the economic, social and environmental benefits of CDM forestry projects or their advantages over traditional activities. As a consequence it is difficult to make decisions at the farm level.

Enhancing livestock farmers' awareness is now being prioritized in policies at the national and local levels, so positive results can be expected in the short and medium term. Research and development institutions, especially the College of Agriculture and the National Agricultural Research Institute (Instituto Nacional de Investigación Agropecuaria, INIA), have recently initiated programmes to produce the technical information (biomass factors, calibrated equations and models) necessary to formulate and implement projects that meet the CDM criteria, but some useful technical information is not yet available.

INSUFFICIENT CAPACITIES IN ELABORATING AND IMPLEMENTING CDM PROJECTS

Capacities regarding the formulation, implementation and monitoring of CDM projects are insufficient. Forest experts and legal and financial advisers are not yet familiar enough with CDM requirements. Understanding of additionality issues is poor, so proving that results would be additional to business as usual is difficult for many of the project ideas sent to the Ministry of Livestock, Agriculture and Fisheries for consideration. The concept that capturing carbon dioxide is not enough to make a project additional is unclear to most people in the private and public sectors.

In addition, most cattle farmers have limited or no technical knowledge regarding forest management, so projects of this kind could be risky for them. If forests are not well managed, and material of poor genetic quality is used, results will not be satisfactory. When small patches are afforested, technology is generally basic and genetic material and management are poor. As a consequence the amount of carbon stored – one key determinant of success – could be low.

Practical experience of the CDM is lacking; in particular, there are no pilot projects yet under way in the field to assess, learn from and demonstrate benefits to farmers. Since successful pilot projects would be of great help in promoting the CDM, a short-term priority of the ministry's policy is to assist the formulation and development of at least three local afforestation or reforestation pilot projects, with the cooperation of the governments of Spain and Japan. Additional partners are also being sought.

Lack of capital for developing unilateral projects or co-investing with foreign partners

Most small- and medium-scale livestock farmers have traditionally been unable to consider forest-based activities as viable alternatives because of the shortage of capital for investment, difficult market access and the delay of many years before income is received, which means forgoing yearly income needed for survival.

Institutional and policy limitations

Most policy-makers are not yet aware of the opportunities presented by the CDM. National forestry and energy policies and programmes do not fully incorporate CDM incentives into innovative

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The CDM can help promote plantation of trees which provide shade and shelter from wind for cattle in Uruguayan grasslands

development policies, and government agencies working on rural development are only just starting to consider the possibility of using the CDM. Some non-governmental organizations in Uruguay (and elsewhere) are opposed to the CDM because they feel that it will reduce industrialized countries' efforts to reduce domestic emissions. Therefore some key institutions for local development are not involved in promoting this mechanism.

Traditionally there have been no incentives designed to stimulate the introduction of forest on small- and medium-scale farms, and small farmers' organizations are not able to undertake CDM projects without capacity building and external support. No special debt funding to facilitate CDM projects, for example to facilitate transaction costs, is available yet in Uruguay.

The concept of trading environmental services is new. Farmers and farmers' organizations are used to producing and trading goods for the international market, but not services. The legal implications of these services are difficult to understand, and national authorities have an important role to play in alleviating this problem.

INTERNATIONAL BARRIERS

As mentioned above, the CDM is a new mechanism, and its forestry rules are even more recent. The rules are complex and procedures appear to be slow and expensive.

Afforestation- and reforestation-based CDM projects are long term, lasting from 20 to 60 years. Decisions must therefore take account of the long period and a high level of uncertainty regarding price behaviour. This makes economic calculations very problematic, especially considering that there is no history or time series to facilitate projections.

Investors tend to be negative when the rules are not clear or look unstable, and investment analysis is difficult with the present level of uncertainty. Because the CDM is new, there are not yet any price series on which to base analyses, or even a cash market.

Companies in industrialized (Annex I) countries are not currently showing much interest in investing in CDM projects. They seem to be more tempted by the risk-free option of going to the market and buying the credits once they have been produced. However, in this way they could lose the opportunity to lower their cost of compliance. A slow, complicated and risky project approval process may be contributing to the companies' conservative behaviour.

In general, Annex II countries do not yet have sufficient information access or negotiation power to influence the price of credits, so the prices do not yet well reflect the importance or value of the environmental service of mitigating climate change. If prices are low, incentives for CDM projects will also be low, and projects will be fewer.

Investors generally prefer to associate with a single partner rather than several. This means that small-scale farmers' projects under group schemes, which could provide many socio-economic benefits at the local level, may have difficulty obtaining support.

Market access is difficult and transaction costs are still very high. Even though the principle of the CDM is simple, as a result of environmental, political and economic factors its regulation involves several complicated and costly steps. Transaction costs represent a real constraint and may make many projects unfeasible if the scale is not large enough.

CONCLUSION

Effective market systems are one of the keys to climate change mitigation and sustainable development. For developing countries such as Uruguay, the CDM could be an important tool for mobilizing capital and technology transfer to promote sustainable forestry systems. The CDM could also provide incentives to move away from a national energy matrix highly dependent on fossil fuels.

Uruguay has potential as a host country for afforestation-based CDM projects to contribute to sustainable development and climate change mitigation. Its main strengths include:

- the availability of land with high potential tree growth rates;
- forestry expertise in the forest sector;
- dynamic entrepreneurs in forest services;
- lack of conflict for the land;
- an appropriate institutional environment that offers stability and low risks to investors.

However, several challenges remain at the national and international levels. At the national level, capacity building is a priority, while at the international level relevant issues include reducing transaction costs and providing finances. Availability of funds for investments, including credit for landowners, may be one of the major constraints for developing projects.

Given the emerging nature of the market and the inexperience of the different players (sellers, buyers, brokers, banks, etc.), uncertainties are considerable. The proximity of the first commitment period (2008 to 2012) and the fact that trees take several years to accumulate amounts of carbon that justify verification costs have negatively affected interest in afforestation and reforestation projects. Unknown market size and temporary carbon emission reduction prices are currently among the main constraints for afforestation projects. In addition, major market players such as the European Union, Japan and Canada have not made their policies towards afforestation and reforestation CDM projects explicit.

Capital flux to non-Annex I countries for investing in CDM projects and its equitable regional distribution seem to be critical. If national- and company-level policies focus on buying credits instead

of investing in projects to produce them, the potential of the CDM to contribute to sustainable development could be much less than expected. Small countries like Uruguay have scarce resources for investment, so the capacity to identify and generate a significant number of projects will depend highly on maximizing external investment.

The next two years are going to be crucial to define the real practical potential of afforestation and reforestation within the CDM. There is no doubt that decision-makers in the private sector are waiting for clear, long-term signs of the role of this mechanism in the future climate change mitigation regime. ◆

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