

Carbon farming

Land and management, or caring for country, is an important cultural and economic activity for Indigenous landholders. Activities such as revegetation and land rehabilitation are taking place in an effort to address problems associated with land degradation in and around communities or on lands formerly used for other ventures, particularly pastoralism.

The emerging economy of 'carbon trading' places economic value on certain forms of land management. Might Indigenous landholders benefit from participating in 'carbon farming' enterprises? There are many questions to be asked and answered. This *Bush Tech* brings together some of the issues to assist the debate.

Background

Through the Kyoto Protocol, the international community has formulated strategies for governments and industry to reduce net global greenhouse gas (GHG) emissions. Industries that emit greenhouse gases (through factories, smelters etc.) will be required to invest resources into 'carbon sequestration' projects. Carbon sequestration is the absorption and storage of carbon from the atmosphere by plants during photosynthesis. Such projects could include afforestation, reforestation, revegetation or other changes to land use.

The Kyoto Protocol proposes several mechanisms for 'emissions trading'. The most likely mechanism is an international market for trade in 'carbon credits'. Owners of new carbon sinks would receive carbon credits for each tonne of CO₂ equivalent sequestered. Carbon credits could then be sold to emitters and used to authorise their emissions. This system would place a direct economic value on activities, such as revegetation, which lead to increased 'sequestration' of atmospheric carbon.

Questions

The formation of emissions trading markets in Australia largely depends upon whether Australia signs up to the Kyoto Protocol. The Commonwealth Government is yet to make a decision on the establishment of a national emissions trading system. Participation in any formal international emissions trading market is unlikely to be possible until 2008. Under current rules only carbon sequestered in the first commitment period (2008 to 2012) will be eligible.

Assuming that Australia does participate in an emissions trading market, there are many additional questions for Indigenous landholders.

- From an ecological perspective, which regions or land types would be suited to 'carbon farming' according to the trading rules?
- Is participation in emissions trading economically viable for Indigenous landholders?
- What benefits and/or impacts does participation in emissions trading present for Indigenous land management?
- Are there management models that could be used to make best use of opportunities?

Study brief

CAT, in conjunction with EcoCarbon and the CRC for Greenhouse Accounting, carried out a preliminary assessment of the potential of 'carbon farming'. The study included contributions from the Indigenous Land Corporation (ILC), WA Conservation and Land Management (CALM) and emissions trading expert Tony Beck. The work was funded by ATSIC. The study considered issues under the following headings.

• Applicability

Assessment of the degree to which Indigenous controlled lands in remote regions are suitable for 'carbon farming'.

• Feasibility and Impacts

Preliminary assessment of the economic feasibility of Indigenous participation and identification of possible social and environmental benefits and impacts.



• Implementation Strategies

Proposal of models to facilitate the implementation of 'carbon farming' enterprises on Indigenous lands. This included an assessment of institutional, organisational and administrative requirements, and discussion of risk.

What we found

Applicability

The main activity that will be allowed under the Kyoto Protocol is reforestation (or afforestation) on land that was not forested in 1990. This often will be in the form of plantations. For some Indigenous landholders, plantation development may be a valid option if the resources and infrastructure are available.

Revegetation (i.e. establishing vegetation other than trees) will be allowed but there is uncertainty as to the rules for accounting carbon stored by such activities. There is also potential for including de-stocking of land or other forms of land use change that result in increased sequestration. This offers perhaps the greatest opportunity for Indigenous landholders, particularly those taking over pastoral properties. However, Australia is yet to declare whether it will include revegetation or land-use change activities within the Kyoto process.

A desktop study revealed only limited data on carbon storage within rangelands throughout Australia. This introduced a significant level of uncertainty. The study found there may be potential for carbon farming activities in areas of remote Western Australia, Northern Territory and South Australia. Regions in Queensland were not considered owing to a lack of accessible data on carbon storage but there may be potential in that state.

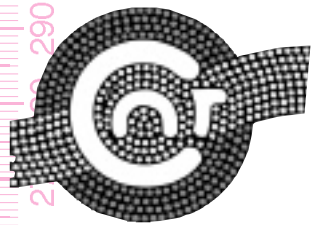
Specific regions aside, the areas with the highest potential for carbon farming are:

- Degraded lands (though severely degraded lands may need significant effort to achieve potential);
- Land where vegetation has been thinned;
- Areas that have the highest rainfall, especially if developing plantations; and
- The largest properties, particularly if undertaking de-stocking/rehabilitation as this will provide an area large enough to compensate for low per-hectare sequestration rates.

Feasibility and impacts

Economics

Analysis carried out by CALM in Western Australia made estimates of likely commercial returns from carbon sequestration projects in WA, using a variety of species. Of particular interest for this study, was consideration of Mallee eucalypts and non-commercial (Landcare) species, often used for land rehabilitation. The study found sequestration rates for these species to be around 30 tonne/hectare over a 30-year period, or about one tonne of carbon/hectare/year. This was consistent with expected sequestration rates in arid and semi-arid regions.



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Carbon farming (continued)

Preliminary modelling of expected market prices for sequestered carbon suggests a range from A\$37 to A\$117 per tonne of sequestered carbon. This would represent the potential income from carbon farming.

There will also be a range of costs and expenses associated with a carbon-farming project. These would be costs associated with:

- Administration, legal and contractual costs;
- Project design, implementation and maintenance;
- Monitoring, verification and certification costs; and
- Marketing.

An analysis carried out by CALM suggests that total expenses may be around \$52 per tonne of sequestered carbon. The assumptions made by CALM will not necessarily apply in the case of Indigenous land management.

These figures indicate that, under favourable conditions, there may be potential for a net income to be derived from carbon farming.

Control over country

Having said this, it is important to note that future buyers of carbon credits and future government regulations will place conditions on those producing carbon credits through carbon farming activities. These conditions will be aimed at ensuring that the sequestered carbon is protected for the long term (possibly as long as 100 years) in order to provide a full offset for emissions. If the carbon is released prematurely by fire or harvesting a liability could result for landholders.

Indigenous landholders will need to consider the implications these conditions would have on their needs and aspirations for country. 'Locking up' country for possibly as long as 100 years has the potential to restrict and impact on other cultural, social and economic priorities.

Where such a long-term commitment is not practical, the sale of credits on a tonne-year basis may be more appropriate. Under this approach landholders only would be paid for the annual value of their sequestered carbon but no liability would attach to the release of the carbon after the year has passed. The tonne-year approach doesn't lock up country to the same extent.

Management issues

Systematic planning and management of carbon farming projects will be necessary so that buyers of carbon credits can be confident that the specified volume of carbon has in fact been sequestered for the specified period. Planning and management processes will need to be long term and ongoing. A high importance will be placed on 'carbon accounting'. This will involve the measurement, certification and verification of the

amount of carbon stored. This requirement could be challenging for projects based on revegetation or land rehabilitation projects. Carbon accounting will also represent a key administrative cost for projects.

Clear ownership of carbon stock (i.e. trees and other vegetation) will need to be demonstrated. Some states already have legislation that provides for rights to sequestered carbon separate from land title.

Risk Management

Risks factors associated with these projects include risks to the carbon stock through fire, disease and pests. In some cases this could extend to unscheduled harvesting. A common approach to risk management will be to market only a proportion of the carbon sequestered. This 'risk discounting' allows a buffer for unforeseen circumstances and/or inaccurate estimation. The use of a 'risk discounting' approach would act to reduce the marketable quantity of sequestered carbon. For example, a risk discount of 50% on land yielding one tonne/hectare/year, would mean only 0.5 tonne/hectare/year is actually marketable.

Implementation Strategies

The study also considered possible management models. It was found that, for small-scale projects, the concept of carbon pooling may provide the best approach in trying to balance management and accounting standards against cost. Under such an approach, a 'pool manager' would act as a broker between numerous small Indigenous carbon farming projects, and corporations seeking to purchase carbon credits on the market.

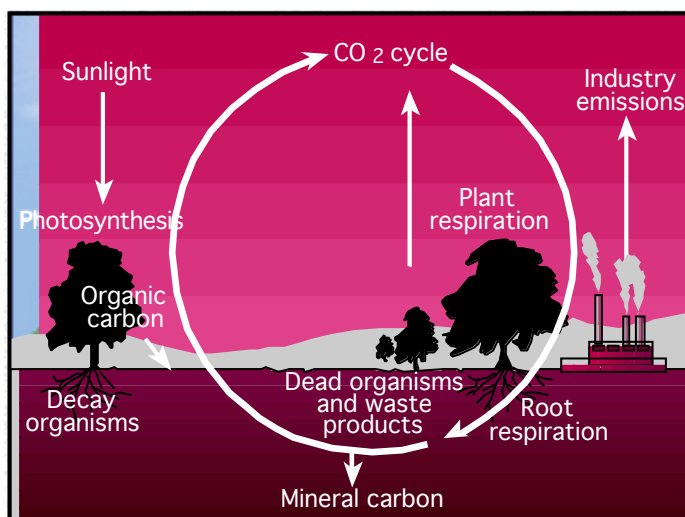
Future Directions

There is a great deal of uncertainty surrounding any future international emissions trading market for carbon credits, and more particularly exactly how Australia will participate. Currently, there are as many questions as there are answers about the benefits of carbon farming for Indigenous landholders. CAT will be keeping a watch on future developments, and discussing the issues with landholders and the Indigenous organisations that are exploring the issues.

More information

www.ecocarbon.org.au
www.greenhouse.gov.au
www.calm.wa.gov.au
www.greenhouse.crc.org.au

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Photosynthesis – the basis of life on Earth

The Sun provides the energy input for life on Earth. Sunlight provides the energy for the process of photosynthesis whereby carbon atoms are taken from carbon dioxide in the air and combined with hydrogen atoms from water to produce hydrocarbons (see carbon cycle diagram, left).

Hydrocarbons are the building blocks of the trees, plants, and vegetation we see around us today. In their ancient form hydrocarbons comprise the fossil fuels – coal, oil and natural gas.

Over the last hundred or so years of industrial development, the burning of vast quantities of fossil fuels has led to an increased amount of carbon dioxide in the Earth's atmosphere. This increase, combined with ongoing deforestation, is leading to a point where the Earth's vegetation can no longer keep up.

Carbon sequestration (sequester meaning to take possession of, or to secure against a debt) is a strategy to require industries producing carbon dioxide to buy 'carbon credits' from enterprises which grow or manage trees or vegetation to 'lock up' carbon to keep it out of the atmosphere for a specified period of time.