

Certainty and Silviculture Sequestration

(*sil.vi.cul.ture*: *n* the care and cultivation of forest trees; forestry)

Carbon sequestration is one way to reduce greenhouse gas (GHG) emissions. It complements the two other major approaches to GHG reduction, the improving of energy efficiency and the increased use of non-carbon energy sources.

Interest in the carbon sequestration option has been increasing because it fits the needs of large energy producers in developed countries. That has made it a first approach although all three approaches will be needed in order to deliver GHG levels in the atmosphere to a level that will prevent dangerous anthropogenic interference with the climate system.

Much effort continues into geo-sequestration; that is the capturing of GHG at its source (e.g., power plants, industrial processes) and subsequently storing it in reservoirs (e.g., depleted oil and gas wells, unmineable coal seams, and deep saline formations).

There is another option. That is silviculture. It has an equally promising technology that allows for broad-based participation while attracting few of the concerns and uncertainties associated with geo-sequestration. Silviculture sequestration costs are low, the potential is large, and silviculture is available for use right now.

Silviculture can reduce the net GHG emissions that cause climate change by:

- Storing carbon in soils and plants;
- Producing fuels and electricity to replace fossil fuels; and
- Reducing emissions from livestock operations and agricultural lands.

Developing a market in tradeable sequestration certificates will encourage community wide participation and has the capacity to provide significant medium term offsets to GHG emissions.

This is particularly true in Australia. There are large areas of marginal farmland that are suitable for silviculture makeover and we possess more resources and knowhow than almost any other country. Australia has another advantage, which is not so obvious.

One of the international concerns about silviculture sequestration is the difficulty, and hence excessive cost, of validating performance and providing certainty to tradeable sequestration certificates. There is a view that this may render it impracticable.

There are two issues here - the first being confirmation that the tradeable sequestration certificates are valid, that is confirming their "chain of ownership" The second is that the tradeable sequestration certificates accurately reflect the carbon stored.

Since the advent of satellite sensing the measurement of annual silvicultural production has been dramatically simplified. Remote sensing satellites accurately measure the silviculture crop data and reference sites provide a simple on-ground basis for correlating and computing the annual production. Minimal effort plus computing power delivers accurate, low-cost measurement for sequestration certificates.

However the first issue is far more complex than this. The potential buyers of any tradeable items whether they are certificates for company shares or certificates for sequestered carbon need certainty that the item is what it is claimed to be.

For instance buyers of shares on the Stock Exchange have certainty, both that the shares exist and that the seller has the right to sell. [The exchange is limited to companies which maintain a register of shareholders, and traders who guarantee their trades.](#)

[Tradeable sequestration certificates need the same level of certainty, but company registers, bonded traders, or exchanges cannot provide it. Nor will a simple registry of certificates. To give that same certainty there has to be a traceable link that can validate the continued existence of the silviculture resource and the land.](#)

For example, the buyer of a silviculture sequestration certificate would need to know each year that the sequestration resource continues to exist. Also that the number of certificates issued matches the potential for the area of sequestration. The buyer would need to know who is the rightful owner, of not just that measure of sequestered carbon, but also of the tree and the land it stands on.. In reverse, any would-be purchaser of the land or the silviculture resource, should understand that there have been sequestration certificates issued which would, in turn, limit use of the land for other purposes.

In the absence of land-linked comprehensive central registers there exists ample opportunity for fraudulent and erroneous transactions. Under a simple contract-based system, a silvicultural sequesterer could issue more certificates than the resource provided, or lose the resource to a natural disaster (fire) and neglect to replace it, or issue certificates and subsequently harvest the resource for other uses, or on-sell the resource land to an unsuspecting third party whose intent was to harvest the resource or who had alternative use for the land. Mere contracts might promise the hapless certificate holder a hope of recovery, but that hope is likely to fade fast when confronted with a variety of fraudulent arrangements that are available in the country so well remembered for inventing the "bottom of the harbour" company. In short while a contract may exist, it does not provide certainty.

But there is a well structured solution. Australia is unique in the developed world in having the perfect support for this. Underlying the creation of carbon stores and silviculture operations is the land. Australia provides for the recording of the ownership and subsequent changes of all (or nearly all) land to be carried out by the state. This also in a single, computer accessible, register, accurately documents the location and layout of each parcel, which is matched with satellite data. Silviculture sequestered carbon depends on the continuing existence of its trees and knowledge of their location. All this is possible with just a minor extension to the comprehensive register of every (or nearly every) piece of land in Australia and easily accessed from a national register.

But it is not just the register that provides the certainty. It is the "chain of ownership" it provides and its ability to be matched with remote sensing data which provides a simple inexpensive way of providing certainty.

Central registers have always been a good solution in providing certainty to transactions, clarifying ownership issues whether the transacted items are shares, motor cars or land. Australia's great advantage is that unlike other developed nations it has central register mechanisms for land. These

have already been expanded in some cases to register elements attached to land and by extension potentially - sequestered carbon.

Certainty in market transactions is markedly improved where quickly available and low cost pre-sale information can confirm the seller as the undisputed owner and entitled to sell the item (and list any other arrangements, including financing, access rights etc). On the other hand it takes only a few fraudulent or incorrect transactions to emerge in a government sponsored market to raise a furore and demands for an inquiry. To this could be added the loss of confidence in government programs and the destruction of an effective mechanism in GHG emission management.

Fortunately Australia can implement this certainty, relatively quickly and easily. Other countries cannot yet link land ownership, elements attached to land, and remote sensing data. They certainly cannot provide simple electronic access; they are, instead, dependent on cumbersome 19th century paper document trails that have long since ceased to operate in Australia. It is unlikely that any other country can match Australia's land registry system for decades to come.

So this Australian system can provide the necessary certainty to silviculture sequestration certificates and because most of it is already in place, at remarkably low cost. There is much more to tell about the system and its capabilities but the priority issue is certainty.

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