Framing Forest Carbon for Policy in Temperate North America: Baby Steps toward National Carbon Goals

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Why have a special issue on North American options for reducing national CO2 footprints through forest management? While the US and Canada contain extensive forests, they are also heavy producers and users of fossil fuels. Canada is a Kyoto signatory, while the US is not. Both nations are large producers and users and even exporters of lumber, wood panels, and some paper products. They also employ wood fiber to generate industrial, commercial, utility, and residential energy. One good reason for a special issue on this topic is that both countries have seen extensive research, development, and business activity on forests and carbon, and it is time for a thoughtful assessment of progress and policy. Further, their experiences with forests and carbon are distinct institutionally, ecologically, and operationally from activities under REDD and other efforts elsewhere in the world.

First, though, some historical perspective may be useful.

1. Evolving Policy Landscape on Forest Sequestration

From the earliest days of the Intergovernmental Panel on Climate Change (IPCC) assessment process, forest loss was recognized as a significant source of CO2 input into the atmosphere. Over the years, empirical estimates of forest loss and associated CO2 emissions have been improved. A focus on how to reduce deforestation was intensified and generated major new lines of research and assessment. Following the ratification of the Kyoto Treaty, with its emphasis on flexibility mechanisms, programs began to be designed to use carbon funding to protect significant forests from destruction, especially in the tropics, where biomass stocking is the highest [1]. The concept of offsets was developed to allow nations to meet their emissions targets in ways other than emissions reductions, thus having the same net effect on the atmosphere as an actual emissions reduction. These offsets could be monetized by governments, international agencies, NGOs, or private companies paying for them. A range of international programs emerged under titles such as Clean Development Mechanism (CDM), Joint Implementation (JI), Reduced Emissions from Deforestation and Degradation (REDD), and Land Use, Land Use Change, and Forestry (LULUCF), and were initiated to develop rigorous, standardized accounting systems to measure carbon emission changes due to changes in land use, including forests. These served both to measure national progress toward declared commitments to emissions reduction, and as a guide to policymaking.

In CDM, forest offsets were important in the early years. Not only did forests gain a foothold in national planning for implementing carbon goals, but extensive research and inventory efforts were stimulated, e.g., [2–4]. In addition, private firms and NGOs began to gear up to work with landowners to develop carbon projects that would route carbon market funding to forest conservation, planting, and improvement projects worldwide.

Several rounds of reports produced “CO2 reduction supply curves” that usually showed forests as fairly low in the spectrum of costs per tonne of CO2 emissions sequestered. The Stern Review [5] in the UK captured wide attention with these curves; a private consulting firm, McKinsey, issued its own cost curves as early as 2007. Today, a web search yields page after page of such curves, with different definitions of forest
opportunities and showing them at different points in the cost curves. Generally, however, forest options fall in the low to middle ranges of these curves. Further, in contrast to hardware solutions in chemical plants or generating stations, forests offer a “green” feel to many people and offer sought-after “co-benefits” in addition to carbon sequestration, such as biodiversity conservation.

The Kyoto flexibility mechanisms were significantly influenced by the US’s successful experience with its NOx-SOx trading scheme run by the EPA [6]. However, several efforts to create US national cap and trade systems through national legislation failed, despite early support from several presidents. All of the policy debate and political advocacy and opposition on this issue was not entirely in vain though, and a short primer on forest carbon was prepared by a congressional research unit [7]. More and more energy-intensive industrial companies and utilities began serious programs to measure their own carbon footprints. They sought cost-saving CO\(_2\) sequestration first, but also hoped to forestall federal regulation by showing activity along these lines.

The first emissions trading scheme functioning at scale was the European Trading System (ETS). After due consideration, the ETS did not admit forest offsets to be used in its compliance program, a major setback to any market-oriented approach. Still, programs pricing and taxing carbon have spread widely across the globe [8].

Thus, today, dominated by activity in the USA, extensive investment and business and policy innovation is resulting in increasing investment in CO\(_2\) offsets under a variety of forest offset programs. Large sums of money are changing hands to produce and purchase these credits. There is no question that implementing forest C storage at scale will require mobilization of capital in quantity. Government funds are lacking, and sales of credits to capped emitters will generate nothing if there are no capped emitters. It could be said that a “Forest carbon storage industrial complex” is taking form before our eyes. Further, an emerging field of “Climate Finance” is gaining ever wider academic and applied interest [9,10]. How can this be in a country that is not a Kyoto signatory, and that has hopped into and out of the Paris Agreement and back in again?

There are three explanations. First a “voluntary market” has emerged in the private, for-profit sector (Forest Trends, 2020). Second, in the US, the states have long been seen as “the laboratories of democracy” [11]. Several states established their own cap & trade systems. The California system has produced a number of large projects; others are being funded by foundations. Third, important interest groups and large private funders have supported the idea of developing schemes that would pay landowners, especially smallholders, for carbon projects, whether in farms or in forests.

2. The Voluntary Market

It soon became clear that national compliance markets in CO\(_2\) were not going to happen in either the US or Canada. However, many image-conscious corporations and private groups as well as service firms sought ways to both directly reduce their own carbon footprints through efficiency and energy management practices and fuel switching. Companies such as Amazon, Microsoft, Apple, and Google come to mind. All four have engaged directly with forest carbon issues in various ways. Early programs developing carbon projects have been subject to intense controversy from a number of viewpoints.

States and Business as Laboratories: Subnational Cap and Trade Programs

California, with its extensive experience in air quality regulation and its enormous economy, initiated its own cap & trade system in 2013. It admitted forest offsets into its compliance program to a limited degree, and wrote detailed rules for such projects. In the northeast US, the Regional Greenhouse Gas Initiative, a collective program currently involving 11 states, invested considerable effort on forest offset systems but, in the end, did not adopt a forest program.

The Chicago Climate Exchange, a private entity, operated for several years as a voluntary cap & trade system. After doing a huge effort to educate private corporations
on how such markets might work, it passed out of existence in 2010 as it became evident that a national cap & trade system would not emerge in the US. During this time, a small number of forest offset credits were created under this program.

Further, in the absence of U.S. federal government action, many states have developed ambitious plans for future reductions in CO$_2$ emissions and conversion to fossil-fuel free economies (http://www.usclimatealliance.org, accessed date on 2 July 2021). These plans have varying degrees of detail, operational clarity, and financial commitments. These state level plans and commitments have added fuel to the focus on forests. It seems to the planners that abundant opportunities for C storage are offered by the forests that would be politically easy to achieve.

3. Interest Group Support

Energy intensive industries have considered cap & trade and offset programs as preferable to a carbon tax. Further, they have perceived land use offsets as far cheaper than the costly end-of-smokestack options that were available, such as carbon capture and storage.

- Forest owner and farm groups liked the idea of being able to get paid for C storage.
- Agency/interest group/Legislative committee iron triangles saw opportunities.
- NGO funders and advocacy groups concerned with deforestation and conservation saw opportunities for increasing preservation and restoration programs.

On the other hand, traditional “green” groups and some scientists fear the spread of extensive and uncontrolled monocultures unleashed by “Trillion Trees” and similar proposals [12–15]. They have been prominent critics of some forest carbon programs, raising long standing concerns about ill effects of fiber farming and monocultures on the environment. Others have pointed to weaknesses in design and implementation of forest offset programs that can render them ineffective in reducing CO$_2$ in the atmosphere [16–18].

4. Our Questions

Perhaps our research question can be summarized in one question: How well are these programs working for the atmosphere? Policymakers, offset credit buyers, and the public need to know. To answer this question will require attending to specific issues, and perhaps most prominently:

- How can permanence, for as long as 100 years, be accounted for in forest offset projects?
- How can implementation of long-term management commitments underlying estimates of marketable credits be guaranteed?

- How can additionality be credibly measured? Put another way, how can credible Business as Usual scenarios be formulated?
- How can leakage be assessed from the viewpoint of regional and national markets and the atmosphere?

Are current methods of establishing accountability for results working?
- How can sound projects be developed while minimizing the “soft costs” required for design and monitoring them?

- How can—or should—the large cumulative areas owned by small family owners be made eligible for carbon storage payments?
- Should voluntary market offsets be counted in assessing state or national compliance with announced goals?

What sizes of projects make sense for reaching long-term carbon goals?
- How can we speak of a voluntary “market” when price transparency is limited in contrast with established allowance markets?

How, then, in these countries with no national cap & trade programs, can forest carbon offsets meet national, regional, and state or provincial CO$_2$ emissions reduction goals? This has been a focus of increasing research and advocacy attention for decades. The earliest programs designed to make use of forests and forest products have been controversial to say the least. Many issues still need clarification with searching and careful policy analysis.
We hope that the articles in this issue will help take stock of the operational experience with carbon projects, as well as research that has been accomplished and is ongoing, and aid in clarifying these issues.

To address these questions, Forests seeks submissions that address in productive ways the interface between science and policy in this field. We seek papers that frame important issues in a context of a real world with multiple policy goals and constraints, including costs, social acceptability, and biodiversity. These need to assemble and review a range of relevant existing literature bearing on the questions. In depth evaluations of recent forest carbon offset projects are especially encouraged. We seek articulate deployment of existing analyses and information in a policy relevant context. New data or modelling projects need to specifically address these goals. Focus matters. No one paper can productively address all of the questions listed above.

Conflicts of Interest: The authors declare no conflict of interest.

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