



Economic Instruments for Adaptation to Climate Change in Forestry

Climate change is expected to have significant impacts on Ontario's forests such as increased frequency and severity of wildfire, pest and disease outbreaks, and changes in ecosystem dynamics (tree regeneration, growth and mortality). These types of impacts can have wide-ranging economic, environmental and social consequences.

Adaptation involves undertaking activities to better prepare for these impacts. The nature of forest management in Canada, where many management decisions are delegated to the private sector, means that the private sector will play a significant role in adaptation. Thus, moving forward on adaptation will require understanding how to best engage the private sector.

Economic instruments refer to the range of tools and approaches that operate on a more decentralized basis by increasing the cost of more environmentally damaging activities while increasing the return from more sustainable activities. Such approaches have been employed to address environmental issues, including the use of pollution taxes, emissions charges, cap and trade systems, and deposit-refund systems as ways to address pollution.

The benefits of economic instruments relative to regulatory approaches are that they offer **increased flexibility**, may require **less regulatory expenditures**, and in some cases can **raise revenues** that can be used to achieve policy objectives. However, there are challenges in moving from theory to practical application including identifying the appropriate tools and how they can be integrated into pre-existing regulatory structures. Other policy constraints, such as political factions, legal gaps, and institutional weakness may also affect which types of tools can be used.

A 2015 report titled [Economic Instruments for Adaptation to Climate Change in Forestry](#) explored how different types of economic instruments could be adopted to encourage forest managers, licensees and communities to take a pro-active approach to addressing the risks of climate change to Canada's forests. The goal was to identify economic instruments that could support adaptation in forests by drawing on the experiences and

efforts taken to date in leading jurisdictions. To do this, the authors undertook three case studies oriented around specific climate-change related risks.

Case Study 1: Wildland Urban Interface Fire

This case study explored wildfire risks in the context of communities and the use of **municipal development permits** – planning tools that local governments can use to manage development, protect the environment and address local health and safety issues. The system can be used to combine management of zoning, site planning and minor variants into a single process. Some communities in British Columbia and Alberta have begun to use development permits to control the extent, nature and location of new residential development in the wildland-urban interface, establishing an emerging policy instrument for local governments to address the risk of loss from wildland fire. The potential instruments identified in this case study include:

- Incorporating development permit approvals within a comprehensive strategy for communities to manage the risk of loss in the interface;
- Using local planning authorities to influence the extent and location of new residential development; and
- Using permits to require fire resilience construction and landscaping for new homes built in the interface.

Case Study 2: Maladaptation

This case study examined the economic implications of using **climate-based seed transfer (CBST)** to implement assisted migration of commercial tree species. One of the most cost-effective approaches to adaptation in forestry is ensuring that seedlings planted following harvest are adequately adapted to the future climate. CBST is the process of allocating seedlings to planting sites based on climatic attributes. Assisted migration is potentially very beneficial to both the provincial economy and to government revenues, even if an increase in short-term risk of regeneration failure is required to achieve a reduction in the long-term risk of plantation failure. However, as private-sector resource

tenants on crown land, forest licensees are highly sensitive to real or perceived increases in regeneration risks; thus in the context of the budding scientific basis for CBST, a conservative approach to assisted migration is warranted. The potential instruments identified in this case study include:

- Incorporating climate maladaptation into timber supply review to facilitate allowable cut effects; and
- Prioritizing CBST research to minimize short-term economic risk to licensees.

Case Study 3: Landscape Wildfire

This case study identified incentives to support collaborative wildfire planning and management and focused on wildfire risk across the forested landscape. Allocating financial resources to support planning or to implement activities is a common challenge. The case study describes different financing mechanisms to support different adaptation activities and explores the use of an additional **levy on stumpage in British Columbia** as a way to generate funds for adaptation.

While this case study focuses specifically on identifying instruments to support adaptation and reduce the risk of wildfires through collaborative planning and management, it is expected that such processes can be amended to address other climate-related risks in the future, including finding ways to finance associated activities. Some of the potential instruments identified in this case study include:

- Landscape Fire Management Planning
- Innovative Forest Practices Agreements
- Forest Renewal BC and Super-Stumpage
- US Forest Service Programs

Key Conclusions from the Report

- ✓ There is a need for a new **risk-sharing framework** between government and licensees that would allow the incorporation of a wider set of values at risk and help motivate action by identifying the benefits.
- ✓ Lack of positive incentives was not necessarily a key issue in limiting adaptation action; instead, it was **concerns about the disincentives** created if these increased costs were not recognized.
- ✓ Working across **jurisdictional boundaries** and across the different groups to identify promising approaches and tools was viewed as important.
- ✓ **Sharing information** such as case studies of communities using development permits and providing examples of model bylaws to reduce fire risk was seen as effective in facilitating longer-term uptake by others of new strategies, ideas and tools.

To learn more about this research and to view the full case studies, please visit: <http://harry-w-nelson-forestry.sites.olt.ubc.ca/files/2015/06/Final-Report-Economic-Instruments-for-Adaptation-to-Climate-Change-June-2-2015.pdf>

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Canada

“Economic instruments offer an alternative to command and control approaches... where properly designed, they can provide more efficient and cost-effective ways of meeting environmental objectives.”

