Nature United

LEVERAGING THE POWER OF NATURAL CLIMATE SOLUTIONS IN CANADA'S NEXT AGRICULTURAL POLICY FRAMEWORK

Five steps towards a resilient, competitive and climate-smart Canadian agricultural sector

Peer-reviewed research published in June 2021 through a collaboration between Nature United and 38 leading experts from 16 institutions[1] highlights the potential of Natural Climate Solutions (NCS)[2] to reduce Canada's greenhouse gas (GHG) emissions by the equivalent of 11% of our 2018 annual emissions.

The study makes a compelling case for agricultural NCS.[3] Practices such as cover cropping, nutrient management, and avoided grassland conversion can deliver a **triple benefit** when deployed properly, supporting agricultural production and resilience, mitigating climate change, and enhancing nature and biodiversity.

Triple Benefit of Agricultural NCS

- ✓ **Climate-smart:** Agricultural NCS can help Canada achieve existing commitments, including its target to reduce emissions by 40-45% by 2030, the Global Methane Pledge and the fertilizer emissions reduction target.
- ✓ **Resilient**: Agricultural NCS can support adaptive benefits such as water retention, drainage, and erosion avoidance, helping minimize losses due to drought, flooding and other intensifying climactic conditions.[4]
- ✓ **Competitive**: Agricultural NCS can help maintain Canadian producers' competitive edge amid changing consumer tastes, value chains and policy frameworks in other jurisdictions.[5]

Though the uptake of NCS is accelerating, there remains significant room to scale adoption. Some agricultural NCS are cost-effective and can increase farmers' revenues by up to 30%. Others will require support from the public sector, regulatory changes, and adaptations in value chains and market signals.

Building on the framework provided by the Guelph Statement, this paper proposes five interventions by which Canada's Next Agricultural Policy Framework can ensure that policymakers and producers have the information they require to make **informed decisions** and resource allocations; producers choosing to adopt agricultural NCS are **supported** through the transition period, and compensated for the ecosystem services and reduced risk they provide; and producers' contributions towards emissions reduction and food systems resilience are **recognized and rewarded** in value chains and ecosystem service markets.[6]

1. **Equip markets to value and reward climate-smart practices**
2. **Adapt Business Risk Management programs to account for climate risk**
3. **Ensure Canada's GHG Inventory accurately accounts for agricultural NCS**
4. **Scale research and programs that quantify and promote the economic, social and environmental benefits of NCS**
5. **Foster a systems approach to extension services**

1. Equip markets to value and reward climate-smart practices

Canada is lagging globally in positioning its agricultural sector to be rewarded and recognized for climate action. Whereas producers in the United States, Europe, Brazil and India have access to a range of agriculture-based carbon market projects, value chain interventions and novel climate-friendly certification and labelling programs,[7] Canada has barely scratched the surface of these opportunities. With global agri-food markets increasingly prioritizing verified sustainability performance and climate action, a sparsity of carbon insetting (e.g., Nutrien and Maple Leaf Foods' Carbon Program pilot project) and offsetting (e.g., Canada Grasslands Protocol pilot offset project) puts Canadian producers at a disadvantage.

Canada's Next Agricultural Policy Framework must provide new standards and stimulate new partnerships and collaborations to enable markets to recognize and reward climate-smart choices by actors along agri-food supply chains.

- Facilitate public-private partnerships to test and implement innovative financial instruments that show promise in improving the climate resiliency of agri-food supply chains.
- Ensure alignment and coherency among government and corporate-led NCS programs, carbon insetting interventions, and carbon offset projects so that their rules, regulations and requirements provide producers with clear signals on the demand for NCS adoption.
- Invest in knowledge-sharing between supply chain actors, civil society organizations and the public sector to improve awareness about green economy opportunities, their associated risks and impacts on businesses.[8]
- Foster multi-stakeholder partnerships that facilitate the integration and sharing of data to develop comprehensive accounting of GHG emissions along key supply chains in Canada.
- Prioritize and expedite the development and approval of offset protocols for the agriculture sector to enable widespread adoption of NCS-based carbon offset and inset projects.

2. Adapt Business Risk Management programs to account for climate risk

Current Business Risk Management (BRM) programs in Canada, which reach large numbers of farms and significant acreage,[9,10] have been primarily aimed at enabling producers to overcome the inherent risks associated with agriculture and stabilizing incomes.[11,12] This stands in contrast to similar programs elsewhere, which have adopted measures to help farmers and ranchers manage significant risks associated with climate change, including drought, extreme heat waves, flooding and fire. The Next Agricultural Policy Framework provides an opportunity to adapt BRM programs to better respond to environmental risks and objectives, including by establishing new incentives to promote longer-term climate resiliency for producers.

- Create a Climate Risk Reduction Fund to provide new and additional resources that BRM implementing partners can use to issue voluntary incentives such as premium discounts or enhanced payouts to producers that adopt agricultural NCS (e.g., improved nutrient management, diverse rotations, cover cropping, avoided grassland conversion and wetland management).
- Measure and monitor interventions promoted through the Climate Risk Reduction Fund so that impacts on climate risk can be evaluated, and associated GHG reductions counted, in the National Inventory Report.

- Develop a pilot program within the Climate Risk Reduction Fund for producers, policy makers, and researchers to co-design and test BRM innovations that help manage and reduce climate risks in agriculture.[13,14]
- Improve data collection and transparency on program and policy efficacy to identify and eventually eliminate counter-productive incentives or subsidies causing environmental harm and undermining innovation.

3. Ensure Canada's GHG Inventory accurately accounts for agricultural NCS

Agricultural producers' adoption of NCS is not being effectively reported within Canada's National Inventory Report. Improved data integration, collection, management and quantification methodologies will help ensure that policies and programs aimed at encouraging NCS adoption are informed by accurate and accessible data. These features would also improve producers' understanding of the impacts of a given practice and their contributions to national GHG emission targets. Lastly, improving data collection and GHG quantification methodologies that inform the inventory would stimulate efforts to develop more robust baseline agri-environmental indicators, such as soil organic carbon (SOC) levels and nitrous oxide emissions, that are needed to scale the agriculture sector's participation in ecosystem service markets and programs.

- Fund, coordinate and scale research programs under the Next Agricultural Policy Framework to develop refined regionally specific emission factors so that Canada can more accurately account for agricultural NCS impacts on GHG sources and sinks.
- Develop an accessible and integrated toolkit to support producers' efforts to measure and monitor GHG sources and sinks, while ensuring comprehensive collection and data channeling into the national inventory (e.g., integrate findings from remote sensing, computed models and soil samples).
- Improve data sharing and utilization between government agencies (notably StatsCan, AAFC and ECCC) and address data gaps and discrepancies.
- Scale and accelerate investment in agricultural NCS science, innovation and measurement systems under the Next Agricultural Policy Framework.

4. Scale research and programs that quantify and promote the economic, social, and environmental benefits of NCS

A recent study by Bain & Company and Nature United suggests that producers adopting practices such as reduced tillage and nutrient management may experience two seasons of yield loss before breaking even around the fourth season and witnessing greater profitability by the fifth or sixth season (see Figure 1). The study underscores the need for further evidence and research on the environmental impacts and economic viability of NCS adoption at regional and national scales to give producers the confidence to select and adopt practices that are best suited to their operations.

- Collaborate with universities and researchers, especially next-generation researchers, to develop and deploy sustainable agriculture education and research programs using regionally-specific knowledge, tools and technologies. This should include a focus on the impacts and outcomes of agricultural NCS adoption.
- Integrate monitoring and evaluation of agri-environmental indicators and return-on-investments into cost-share programs, and begin a reporting series that shares aggregated findings back to

producers, policymakers, researchers and other key stakeholders to inform decision-making, future program decision and the National Inventory Report.

- Ensure programs and policies that promote agricultural NCS adoption embed adaptive management models where research and data collection on policy and program performance informs ongoing improvements and modifications to their design.

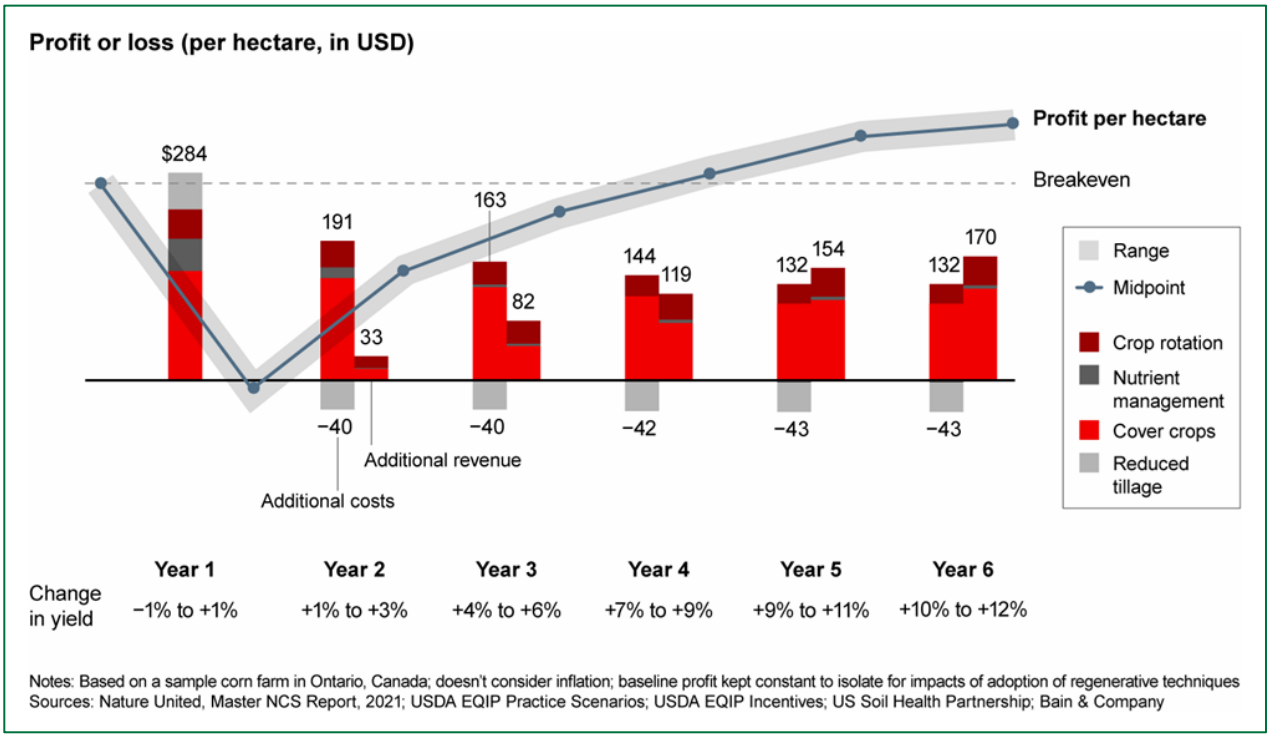

Figure 1. *With four years to break even, most farmers will need reliable information, as well as incentives and financial support, to give them confidence for adopting new practices*

5. Foster a systems approach to extension services

Crop producers typically receive advice centered around plant productivity, nutrient balance and pest control. While these issues are critical for a sustainable and successful farm operation, they fall short of supporting producers in adopting agricultural NCS and allowing them to evaluate their operations through a systems lens that balances climate, productivity and overall sustainability goals. Canadian producers are also not well prepared to capitalize on new opportunities provided by the green economy, including revenue streams (e.g., ecosystem service markets), premium prices (e.g., carbon labels), and market access (e.g., sustainable sourcing). As governments, agribusinesses and agri-food companies continue to utilize these market mechanisms to incentivize agricultural NCS adoption to help meet their GHG targets and reduce climate risks in supply chains, producers need advice on how to navigate and select opportunities that are best suited for their operation.[15]

It is critical that the government play a leadership role in addressing the 'extension gap' confronted by Canadian producers looking to understand the environmental and economic implications of agricultural NCS.[16] Trusted advisors who are informed and experienced with agricultural NCS are critical partners—including through public, private, peer-to-peer and hybrid models—to provide evidence-based, non-biased advice that can help producers make informed, climate-resilient decisions.

- Expand support for independent extension services, including programs that combine advisory services with peer-to-peer learning, and training on sustainability (aligning economic, social and environmental goals), agricultural NCS adoption, and new financial opportunities.[17]
- Provide support for Environmental Farm Plans and other extension tools to couple technical assistance on agricultural NCS with improved access to evidence and research on the outcomes of NCS adoption. This will enable producers to evaluate practices based on the outcomes they value.[18]
- Establish a multi-stakeholder taskforce (including producers, government, industry, and non-profit organizations) and advisory committee to devise approaches for knowledge development and translation on agricultural NCS adoption and to oversee the development of education and certification programs for trusted advisors.[19]

ABOUT NATURE UNITED

Nature United is a Canadian conservation organization that was founded in 2014, building on decades of work done in partnership in Canada. Headquartered in Toronto, and with field staff across the country, we are working towards a Canada where people and nature are united, and ecosystems, communities and economies are thriving. Nature United builds partnerships with governments, Indigenous communities, industries and other groups to define new pathways towards a sustainable future; to advance reconciliation; and to conserve nature, the foundation of all life on Earth.

Agricultural Natural Climate Solutions

Our organization is working to accelerate Natural Climate Solutions (NCS) in Canada.

Peer-reviewed science led by Nature United has shown that NCS can reduce Canada's greenhouse gas (GHG) emissions by the equivalent of 11% of our 2018 annual emissions, with approximately 48% of that opportunity coming from agriculture. Building on the expertise and partnerships of our global affiliate, The Nature Conservancy, we are building relationships across governments and with communities and corporations to ultimately mitigate over 37 megatonnes of CO_2 annually in 2030 by leveraging the power of NCS through agricultural value chains.

---

[1] Drever *et al*., Natural climate solutions for Canada, *Science Advances*, was co-authored by researchers from the following 16 institutions: Agriculture and Agri-Food Canada, University of Waterloo, McGill University, Clark University, Cornell University, Ducks Unlimited Canada, University of British Columbia, Viresco Solutions, Canadian Forest Service, University of Wisconsin-Madison, The Nature Conservancy, University of Vermont, University of Guelph, University of Toronto, Hakai Institute

[2] Natural Climate Solutions are conservation, restoration and improved land management actions that increase carbon storage or avoid greenhouse gas emissions in landscapes and wetlands.

[3] Agricultural NCS is a subcategory of activities commonly known as beneficial management practices (BMPs). Agricultural NCS encompass a range of practices that in many cases have been honed by Indigenous stewards or known to advocates of "conservation agriculture," and that directly contribute to climate change mitigation, but remain underutilized in mainstream agriculture.

[4] United States Department of Agriculture (n.d.) "Cover Crops - Keeping Soil in Place While Providing Other Benefits." Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/?cid=nrcs144p2_027252

[5] The February 2022 announcement of a $1 billion Partnership for Climate-Smart Commodities labelling and funding program by the United States Department of Agriculture is case in point (See The Nature Conservancy Statement of Support)

[6] This document builds upon findings from the research project, "Co-designing strategies to scale natural climate solutions in Canada's agriculture sector" led by Lisa Ashton (PhD Candidate, University of Guelph), and co-funded by Nature United and Mitacs.

[7] The EU's move to develop a sustainability food labelling framework, for example, will facilitate informed consumer choice. In the USA, programs such as the Conservation Innovation Grant enables implementation partners, government researchers and corporate actors to test, implement and accelerate NCS adoption via innovative financial instruments. See: SustainCERT (2020, September.) "Bayer and Partners Break New Ground on Certifying Value Chain Greenhouse Gas Impacts with SustainCERT." Retrieved from https://www.sustain-cert.com/wp-content/uploads/2020/09/BAYER-Press-Release_Final.pdf

[8] For example, Purdue University explainers on carbon markets.

[9] Agriculture and Agri-Food Canada. (2017, March.) "Evaluation of AgriStability, AgriInvest, AgriInsurance and the Wildlife Compensation Program." Retrieved from https://agriculture.canada.ca/en/about-our-department/transparency-and-corporate-reporting/evaluation-agristability-agriinvest-agriinsurance-and-wildlife-compensation-program#tb-6

[10] The AGree E2 Coalition is a United States based group that explores how to improve crop insurance so that it better positions producers to reduce risks and adopt environmentally sound practices.

[11] The Nature Conservancy. (2016.) "Re-Think Soil Health." Retrieved from https://www.nature.org/content/dam/tnc/nature/en/documents/rethink-soil-executive-summary.pdf

[12] Bryant, L., O'Connor, C. (2017). Creating Incentives to Improve Soil Health Through the Federal Crop Insurance Program. In: Field, D.J., Morgan, C.L.S., McBratney, A.B. (eds) Global Soil Security. Progress in Soil Science. Springer, Cham. https://doi.org/10.1007/978-3-319-43394-3_37

[13] Pilots could be linked to programs that already enrol producers in experimental design, such as the Living Labs

[14] Van der Pol, L. K., Tibbetts, C.A, and Hunter, D. (2021). Removing Barriers and Creating Opportunities for Climate-Resilient Agriculture by Optimizing Federal Crop Insurance. Journal of Science Policy and Governance, 8(2). https://doi.org/10.38126/JSPG180213 This study presents the rationale for pilots and pathways for implementation.

[15]For example, General Mills is working with producers in Saskatchewan and Manitoba to adopt regenerative practices that will improve on-farm sustainability and enable General Mills to meet their commitment to expand regenerative agriculture on one million acres by 2030

[16] Agronomists that work for agri-retailers and independently and other farmers providing peer support can be collectively referred to as 'trusted advisors'.

[17] See Quebec's agroecological 'clubs conseils' – groups of producers supported by independent agronomists – and regional advisory programs. See also farm advisory system in the EU.

[18] Tools such as the COMET-Planner in the United States enable producers to conduct this evaluation. If scaled, AAFC's Holos Model shows promise in equipping producers with comparable evaluations.

[19] See USDA program to certify GHG technical assistance providers and third-party verifiers under the Growing Climate Solutions Act.