ASPEN TECH POLICY HUB

POLICY

Mira Chokshi

Nicole Jain Capizzi

with support from
Emma Crow-Willard
and Mary Kombolias

aspeninstitute

Proposal for a Revolving Loan Fund to Expand Climate-Smart Agriculture in Washington

EXECUTIVE SUMMARY

Nearly 1 billion acres of US farmland could be catalyzed to help slow the effects of climate change while still ensuring a reliable food supply. To achieve this goal, we first need new regional models of farm financing to set the stage for a widespread pivot toward agricultural systems that are productive, resilient, and effective in solving climate change. **The Washington State Department of Agriculture (WSDA) should plant the seeds for this transition by leading the establishment of a revolving loan fund (RLF), titled "FarmPivot," to help farmers adopt new, climate-smart practices.**

Climate-smart agriculture encompasses a dynamic suite of practices that can be adapted to a farm's specific conditions and cropping system. These practices help to reduce greenhouse gas (GHG) emissions, increase soil carbon, and build resilience for a changing climate.

This FarmPivot RLF would transform agriculture in Washington and beyond by:

1. Increasing farmers' profitability and climate resilience through finance and technical expertise that leads to the adoption of climate-smart practices;

2. Supporting government and industry climate commitments by reducing GHG emissions, increasing carbon sequestration, and sharing data on business and climate impacts from climate-smart farming; and

3. Creating a new model for financing the transition to climate-smart agriculture.

The success of the FarmPivot RLF depends on establishing a robust public-private partnership structure between 3 key stakeholder groups that will benefit from climate-smart agriculture: the State of Washington, represented by the Washington State Department of Agriculture (WSDA); corporations; and farmers.

Working in partnership through the FarmPivot RLF, the stakeholders should do the following:

1. WSDA should establish the FarmPivot RLF, a dedicated RLF to provide low-interest, long-term loans and technical assistance to Washington farmers ready to add or expand climate-smart practices.

2. Corporations with public climate pledges and business interests in Washington should donate seed capital toward the FarmPivot RLF.

3. Washington farmers should join the FarmPivot RLF and transition to climate-smart practices, such as reduced tillage, cover cropping, and improved nutrient management.

To share insights about business and climate impacts resulting from the change in farming practices, the fund would also produce an Annual Impact Report, using anonymized data from enrolled farms. This report would provide critical information about the program's return on investment as well as measured impacts on GHG emissions reductions and soil carbon storage.

By establishing the FarmPivot revolving loan fund, the state, corporations and farmers will all play a critical role in reducing GHG emissions in the state.

BACKGROUND

Climate-Smart Practices in Washington State

Experts agree that transitioning agricultural systems to become more climate-smart – through practices such as reduced tillage, cover cropping, and improved nutrient management – would make a measurable and immediate impact in adapting to and mitigating the effects of climate change. The current annual GHG emissions in Washington State are 98.5 million metric tonnes (MMT), with the agriculture sector generating about 7 MMT. Based on the 2021 Transformative Investment in Climate-Smart Agriculture Report developed by US Farmers and Ranchers in Action, climate-smart agricultural practices can reduce the current total US GHG emissions in the agriculture sector from 9.9% to 3.8% within 5 years. Furthermore, within 15 years of widespread adoption of climate-smart practices, the agricultural sector can become carbon negative, sequestering enough carbon dioxide from the atmosphere to account for its own

emissions plus additional emissions from other "hard-to-decarbonize" industries.

Benefits of Climate-Smart Practices

Recent research suggests that climate-smart farms would see long-term financial benefits. Early research on climate-smart practices, also called regenerative agriculture, shows that transitioning to more sustainable options increases farmer profits through improved soil health, increased nutrient efficiency, and reduced water usage. Furthermore, climate-smart farms have healthier soil and crops that are more resilient to the effects of climate change, such as changing patterns of drought, flooding, pests, and disease.

Washington State Climate Commitments

The government of Washington State is a leader in agricultural innovation and climate policy. The state is a leading producer of crops, including apples, hops, potatoes, and wheat, and has a history of innovation in organic and sustainable agriculture. In 2021, the Washington State Legislature passed the Climate Commitment Act, requiring the state to become carbon neutral by 2050 by reducing 95% of GHG emissions and increasing carbon sequestration. Agricultural land in Washington State can play a critical role in meeting these goals, as healthy, carbon-rich soils provide a carbon removal service that offsets the remaining emissions. In addition, the state's government agencies support carbon removal through the state's cap-and-invest program and soil health research and grantmaking.

Many corporations with business interests in Washington State have pledged to reduce emissions and become carbon neutral. Washington is also home to major food and technology corporations that are setting the standard for environmental, social, and governance (ESG) commitments. Major food corporations that buy Washington-grown crops, including Cargill, General Mills, and McDonald's, have ESG goals that are leading them to buy climate-smart crops throughout their supply chain. Furthermore, Washington-based corporations like Microsoft and Amazon are using investment and philanthropic funds to support innovative approaches to reduce and offset overall GHG emissions, including through carbon removal in the food and agriculture system.

Opportunity for Transition

Despite Washington's strong climate policy, the agriculture sector has not made a widespread transition to climate-smart farming. Of Washington State's 7.5 million acres of cropland, only 4.8% use cover

crops — plants grown in between cash crop cycles, mainly to protect and enrich the soil — and just 25% use "no-till", a method of eliminating or reducing tractor tillage and planting directly into crop residue in order to maintain soil structure and organic matter from decomposing plant material. Both practices increase the amount of carbon being stored in cropland and improve the health and function of the soil. Depending on their cropping system, farmers may be able to adopt either or both of these practices with minimal disruptions to their seasonal work flow. Increasing the total acreage of crops farmed using these key practices, as well as a host of other climate-focused agricultural solutions, would help Washington State meet its mandate to become carbon neutral and increase carbon sequestration.

There is significant interest within the Washington farm community in transitioning toward more climate-smart practices. Farmers also prioritize changes that help them become more sustainable and profitable. For example, a recent seminar run by Washington State University found that farmers are interested in transitioning to new farming practices, both to increase efficiency and to meet their customers' requirements. Customers are clamoring for more net zero practices; in the 2022 FoodBytes Innovation Report, the global financial services provider Rabobank predicts that the concepts of "decarbonization" and "net zero" will replace "sustainability" in the global food and agriculture supply chain.

A key barrier to a widespread transition to climate-smart practices is farmers' limited access to effective financial tools and incentives. Existing financing options for farmers do not support a systemwide transition to climate-smart agriculture:

▸ **Traditional farm loans** provide annual operating capital, but the short payback terms incentivize maximum yields over long-term land stewardship.

▸ **Government conservation** programs provide payments for soil and water protection, but they support piecemeal projects rather than systemwide practice change. In Washington, only 15% of farmers participated in government subsidy and conservation programs, according to the most recent census.

▸ **Emerging carbon markets** promise to pay farmers per tonne of carbon sequestered in soil, but they rely on carbon measurement and verification systems that are still being defined. Current carbon markets pay a range of $15–$40 per metric tonne of carbon stored, which most industry experts agree is too low to cover the operational costs of transition.
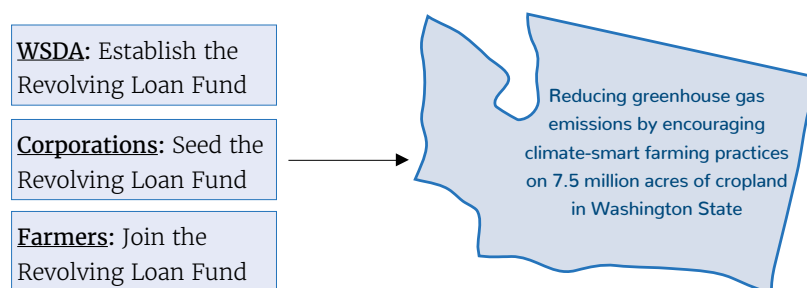
RECOMMENDATIONS

To help achieve public- and private-sector climate goals while strengthening their farming businesses, Washington farmers must swiftly transition significant cropland acreage toward adoption of cli-

mate-smart practices. Farmers willing to take the risk of making this transition should not have to do it alone. They need effective financing tools that encourage a long-term, systemwide transition to climate-smart practices.

Operating loans are a familiar financial tool for farms and allow the business to make independent decisions that are best for their operations. As a leader in state agricultural policy and programs, WSDA should leverage funds and support from the multiple stakeholders seeking climate solutions through agriculture and establish an RLF.

Government conservation programs and carbon markets are other types of financial incentives available for farmers adopting climate-smart practices; however, neither offers the flexibility and independence of a long-term loan. New research funded by the US Department of Agriculture (USDA) and universities will improve the quantification methods for soil carbon and GHG emissions in the future, which will then improve the payment structure for agricultural practices that remove and store carbon and reduce emissions. Farmers who have already adopted climate-smart practices through the FarmPivot RLF would be well-positioned to add a new revenue stream from these carbon markets and conservation programs. Stacking these incentives would further increase farm revenue and allow the farmer to pay off the loan earlier, thus benefiting the farmer and the RLF.

The success of this new financing structure requires coordinated action from a **robust public-private partnership between 3 key stakeholder groups: WSDA, corporations, and farmers.**

WSDA: Establish the Revolving Loan Fund

Corporations: Seed the Revolving Loan Fund

Farmers: Join the Revolving Loan Fund

Reducing greenhouse gas emissions by encouraging climate-smart farming practices on 7.5 million acres of cropland in Washington State

Establish the Revolving Loan Fund

WSDA should establish the FarmPivot RLF, a dedicated revolving loan fund to provide low-interest, long-term loans and technical assistance to Washington farmers ready to add or expand climate-smart practices.

The Washington State Government has committed to becoming carbon neutral by 2050 and prioritizing carbon sequestration on working lands. WSDA, through its position as a leading state agency, should support these climate goals by establishing an innovative new farm financing model and sharing business and climate impacts resulting from the transition to climate-smart farming. To do this, WSDA should establish a strong administrative foundation for the FarmPivot RLF and also identify public funding for climate action, such as the Inflation Reduction Act and Climate Commitment Act, to help support and seed the fund. To ensure a successful transition, WSDA should connect farmers enrolled in the fund with technical assistance by leveraging internal programs as well as relationships with other conservation and agriculture extension organizations.

> A revolving loan fund (RLF) is a financing measure that provides a flexible source of capital to small and local businesses to support a change or expansion of specific practices. It is a self-replenishing pool of money, using interest and principal payments on old loans to issue new loans.
> Source: Council of Development Finance Agencies

Seed the Revolving Loan Fund

Corporations with public climate pledges and business interests in the state of Washington should donate seed capital toward the FarmPivot RLF. Washington-based technology corporations like Microsoft and Amazon have committed to supporting innovative climate solutions, including through carbon removal in the food and agriculture system. Major food corporations with ESG goals need an increased supply of Washington-grown, climate-smart crops, such as apples, potatoes, and wheat, to satisfy both their customer and shareholder demands. To meet the public- and private-sector demand for carbon removal and climate-smart crops, private corporations should support farmers in transitioning to climate-smart practices. With a total of $5 million raised over a 5-year period, this fund would create a simple and effective financing tool that should become self-sustaining by year 10. With this amount, the fund would scale

climate-smart agriculture across Washington and create a new model for financing a transformation in agriculture.

Join the Revolving Loan Fund

Washington State farmers should join the FarmPivot RLF and transition their acreage to the climate-smart practices best suited to their operation, such as reduced tillage, cover cropping, and improved nutrient management.

A successful transition to climate-smart practices requires time, upfront capital, and technical knowledge. Research shows that over several years, a suite of farming practices that build soil health also leads to lower input costs, lower water usage, higher profits, and greater resilience to extreme weather.

Farmers enrolled in the fund would benefit from important performance data in an annual impact report showing the return-on-investment to help them make business decisions. The specific practices farmers adopt to become climate-smart must fit their cropping system and conditions, but as a baseline, they must reduce GHG emissions and sequester additional carbon.

To be eligible for the RLF, farmers would provide records showing active adoption or expansion of at least 1 climate-smart practice on 50% or more of their total acreage. A list of key climate-smart practices is included in Appendix A (Climate-Smart Agricultural Practices Matrix). Applicants would provide available crop production records (e.g., results from harvest records, water bills, spray records, equipment use logs, custom work receipts, fertilizer receipts, cover crop seed receipts, soil sampling, field photos, etc.) for prior years before the loan application and then annually during the life of the loan. These records would be used to establish eligibility and inform annual reporting of the climate and business impacts of the FarmPivot RLF.

BUDGET AND TIMELINE

The FarmPivot RLF should be established with a total capital raise of $5 million in order to achieve the goal of supporting farmers transitioning to climate-smart agricultural practices. However, the capital for the fund can be raised in phases, with $1 million annually for the first 5 years. This fund size would establish a model, self-sustaining RLF that could be replicated by other state agencies or agricultural trade groups around the US. The Annual Impact Report, informed by anonymized data about the program's return on investment and climate impact, could be used to encourage more widespread adoption of climate-smart agricultural practices in Washington and beyond.

Modeling the fund performance with a 5% interest rate and average 8-year payback period, the fund would become self-sustaining by year 10. The fund could support an estimated 40-60 farms per year in the target scale of 50-500 acres, resulting in a total annual loan disbursement of $500,000. At this scale, each farm transitioning to climate-smart practices would provide quantifiable benefits in terms of GHG emissions reductions and carbon sequestration. This range also allows the FarmPivot RLF to diversify across various cropping systems and regions to reduce risk, while keeping the number of farm loans per year manageable from a fund administration standpoint.

On an annual basis, the farm loans, plus $100,000 per year in operating costs, would require total funds of $600,000 per year. The estimated $100,000 in annual operating costs would include fundraising costs, partnership costs, and a portion of staff salaries or consultant support. To start, the administrative staff should include a fund manager and part-time and/or contract assistance in technical areas (e.g., a farm specialist, a financial specialist, as well as marketing and partnership support). The organization hosting the fund should provide compensation for the fund manager from existing staff budgets, though a portion of the FarmPivot RLF operating budget could supplement a portion of the staff salaries and any short-term contract consultant(s) as needed. Initial seeding of $1 million in the first year would cover the loans and operating costs and provide a financial buffer for fund development. The remaining $4 million could be raised in subsequent years to continue providing new loans and operational costs, while growing the total fund balance of $5 million.

CONCLUSION

In order for the US to successfully address the climate crisis, the public sector, private sector, and society at large need farmers to transition to adopting climate-smart practices. Farmers need a new financing model to support them in this transition. The FarmPivot RLF for Washington farmers will help scale climate-smart practices across the state, share data on the climate and business impacts of these practices, and create a new model for financing a transformation in agriculture in Washington and beyond.

The attached operational plan provides in-depth information on the establishment, administration, performance, and requirements of the RLF.

Appendix A: Climate-Smart Agricultural Practices

The table presents a matrix of climate-smart agricultural practices that are most appropriate for Washington farmers applying to the FarmPivot RLF. The practices are defined by the USDA's Natural Resources Conservation Service (NRCS). The practices are ranked by the FarmPivot RLF as Tier 1, 2, or 3 according to their benefit in reducing GHG emissions, their benefit in sequestering carbon, and their applicability to Washington croplands.[1] Loans would be provided to eligible farmers seeking to add or expand at least 1 climate-smart practice on 50% or more of their acreage.

Tier	NRCS Code	Practice	Description
1	CPS 329	Residue and Tillage Management: No-Till/Strip-Till/Direct Seed	Limiting soil-disturbing activities, which improves soil carbon retention and minimizes carbon emissions from soils.
1	CPS 340	Cover Crop	Growing a crop of grass, small grain, or legumes primarily for seasonal protection and soil improvement.
2	CPS 484	Mulching	Applying plant residues or other suitable materials to the land surface.
2	CPS 585	Strip Cropping	Growing planned rotations of erosion-resistant and erosion-susceptible crops or fallow in a systematic arrangement of strips across a field.
2	CPS 601	Vegetative Barriers	Utilizing permanent strips of dense vegetation to increase biomass carbon sequestration and soil carbon.
2	CPS 590	Nutrient Management	Precisely managing the amount, source, timing, placement, and form of nutrient and soil amendments to ensure ample nitrogen availability and avoid excess nitrogen application reduces N_2O emissions into the atmosphere.
2	CPS 512	Forage and Biomass Planting	Growing deep-rooted perennial biomass, which sequesters carbon and may have slight soil carbon benefits. Harvested biomass can serve as a renewable fuel and feedstock.
2	CPS 528	Prescribed Grazing	Managing the harvest of vegetation with grazing and/or browsing animals.

Tier	NRCS Code	Practice	Description
2	CPS 379	Multi-Story Cropping	Establishing trees and shrubs that are managed as an overstory to crops, which increases net carbon storage in woody biomass and soils. Harvested biomass can serve as a renewable fuel and feedstock.
2	CPS 381	Silvopasture	Establishing trees, shrubs, and compatible forages on the same acreage, which increases biomass carbon stocks and enhances soil carbon.
2	CPS 380	Windbreak/Shelter Belt Establishment and Renovation	Establishing linear plantings of woody plants, which increases biomass carbon stocks and enhances soil carbon.
2	CPS 612	Tree/Shrub Establishment	Establishing trees and shrubs on a site where trees/shrubs were not previously established, which increases biomass carbon and increases soil carbon. Mature biomass can serve as a renewable fuel and feedstock.
3	CPS 332	Contour Buffer Strips	Planting permanent herbaceous vegetative cover in narrow strips, which increases biomass carbon sequestration and increases soil carbon stocks.
3	CPS 603	Herbaceous Wind Barriers	Planting perennial herbaceous vegetation in narrow strips to reduce wind speed and wind erosion, which ultimately increases biomass carbon sequestration and soil carbon.
3	CPS 550	Range Planting	Establishing deep-rooted perennial and self-sustaining vegetation such as grasses, forbs, legumes, shrubs, and trees, which improves biomass carbon sequestration and enhances soil carbon.
3	CPS 311	Alley Cropping	Planting trees and/or shrubs in combination with crops and forages. This increase in biomass density increases carbon sequestration and enhances soil carbon stocks.
3	CPS 390	Riparian Herbaceous Cover	Planting perennial herbaceous riparian cover, which increases biomass carbon and soil carbon stocks.
3	CPS 391	Riparian Forest Buffer	Planting trees and shrubs for riparian benefits, which also increases biomass carbon sequestration and increases soil carbon stocks.

ENDNOTES

1 We created this matrix specifically for FarmPivot RLF by analyzing and selecting climate-smart farming practices from 4 sources: 1) NRCS's GHG and Carbon Sequestration Ranking Tool; 2) Farmers Business Network's Regenerative Practices Rebate program; 3) Washington State Conservation Commission's Sustainable Farms and Fields grant program guidance; and 4) USDA's Environmental Quality Incentives Program (EQIP) Climate-Smart Agriculture and Forestry Pilot.