

Scaling a Sustainable Finance Solution: Agricultural Lending to Reward Environmental Performance

STUDENT AUTHORS

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CLIENT AND CO-AUTHOR

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OBJECTIVES

This project will focus on agricultural production practices in the Salinas Valley, part of California's Central Coast, where Sustainable Conservation works to advance approaches that boost clean water and support healthy communities, while bolstering the resiliency of California's farming regions. Water quality and supply issues on the Central Coast are a source of contention between farmers, regulators, and urban communities. Efforts to integrate these issues are critical in gaining widespread acceptance and support. New approaches are required to create collaborative, sustainable and local solutions to agricultural water management.

The objectives of this project are to contribute to the development of an innovative pay-for-performance incentive to support farmers in achieving sustainable groundwater and fertilizer use. To accomplish this, students will:

- 1) Model the impacts of 'business as usual' versus 'improved' water and fertilizer use on Salinas Valley water supplies, water quality (in terms of nitrate pollution), and agricultural economic viability over a 20-year time period;
- 2) Develop and conduct a survey of lenders to understand natural resource issues that they consider in their lending risk analyses/assessments and their readiness to offer an environmental incentive in their lending practices; and
- 3) Package the forecasted impact modeling results for a lender audience.

SIGNIFICANCE

California's agricultural sector significantly contributes to the state's economy and global food supply (1). Over time, agricultural production has contributed to groundwater overdraft (2) and nitrate pollution of groundwater via over-application of synthetic fertilizer to crops (3). In the Salinas Valley, farmers' fertilizer applications are attributed as the source of more than 75 percent of the nitrogen loading to the underlying aquifers (3). Due to climate change, California's future precipitation is expected to fall more as rain than snow with more frequent and intense droughts (4), which will increase reliance on already overdrafted groundwater supplies for crop irrigation.

Additionally, the State and Regional Water Quality Control Boards continue to update regulatory requirements to meet water quantity and quality objectives, which have cost implications to farmers. For example, a 2018 case study found that water quality compliance costs for a lettuce grower in the Salinas

Valley increased 331% from 2006 to 2017 (5). There is also a \$4.79 per acre fee currently being charged to support the Salinas Valley Groundwater Sustainability Agency's administrative costs and is likely to increase further with the implementation of the basin's Groundwater Sustainability Plan, as required by the Sustainable Groundwater Management Act (6).

Banking, financing, and insurance institutions have become more aware of the economic risks their agricultural clients face regarding water-related issues. According to the World Economic Forum (WEF), water has been among the top ten risks to our global economy for five consecutive years (7). Along with an increased awareness of economic risk due to water-related issues, investors are increasingly interested in supporting companies to achieve positive environmental, social and governance outcomes (8). The WEF recently released a report that highlights the role that institutional investment can play in addressing climate and societal risks, where one of the challenges is the lack of information to inform investment decisions (9).

BACKGROUND

Farmers and other water managers in the Salinas Valley must address complex, interrelated water quality and supply issues, including: 1) groundwater overdraft and saltwater intrusion; 2) nitrogen leaching into groundwater basins that supply drinking water to thousands of local residents; and 3) nutrient runoff into streams and sensitive aquatic and marine habitats. Current regulatory requirements focus on single resource concerns that do not address interconnected water and ecosystem management problems, and few incentives reward farmers for managing their agricultural water for regional environmental benefit. Furthermore, these water scarcity and quality issues present physical, regulatory and reputational risks that are critical to agricultural business viability.

To address this problem, Sustainable Conservation and partners have developed performance metrics to provide important feedback to farmers about the efficiency of their water and fertilizer use. Sustainable Conservation brought together the Resource Conservation District (RCD) of Santa Cruz County and [California FarmLink](#) to create an innovative pay-for-performance incentive offered by FarmLink, who pays a rebate on loan interest to the farmer for their measured improvement in water and fertilizer use efficiency. California FarmLink is a unique lender. It is a non-profit organization that is certified as a Community Development Financial Institution and is working to achieve equity in agricultural lending by solely supporting beginning, limited-resource, immigrant and other underserved farmers. FarmLink helps them build strong business skills, gain access to fair financing and establish secure land tenure.

In 2018, three farmers enrolled in the rebate loan program. The RCD found that the farmers applied water with maximum efficiency and followed the protocol to establish a first-year baseline using the water efficiency metric. FarmLink then provided these growers with a small refund for setting a baseline. The loan program is designed to allow growers to participate for up to five years and are eligible for a larger rebate for increasing their efficiency based upon their own baseline up to matching exactly the crop's demand for water and fertilizer.

EQUITY

There are many small communities and rural residents in the Salinas Valley that are solely dependent on groundwater for drinking water. Often pumped from shallow wells, the water is at high risk for nitrate contamination (3). Many of these areas are identified as Disadvantaged Communities, as defined by the state to be "a community with an annual median household income that is less than 80 percent of the statewide annual median household income" (10). This project will address the right to clean, safe and affordable drinking water as required by state law (11) through the mitigation of a major source of nitrogen in groundwater by supporting and incentivizing sustainable agricultural use of

groundwater and fertilizer. We recognize that changes made today will not address the existing nitrate pollution in groundwater drinking water supplies. However, it is critical to prevent additional loading of nitrate to groundwater so that the problem is not perpetuated.

AVAILABLE DATA

- Statewide Agricultural Production Model is a multi-region, multi-input and output economic optimization model of the agricultural economy in California.
- Central Coast Regional Water Quality Control Board's staff report ([2018](#)) and Salinas Valley Groundwater Sustainability Plan ([2020](#)) describing monitored groundwater quality constituents such as nitrate, and groundwater overdraft, respectively.
- California Department of Water Resources [2016](#) land use dataset, which is the most up-to-date spatially explicit crop mapping data available.
- Hartz, et al. 2017. Efficient Nitrogen Fertility and Irrigation Management of Cool-Season Vegetables in Coastal California ([link](#)) that provides crop-specific nitrogen uptake and water demand numbers to use for most vegetable crops grown in the Salinas Valley.
- Sustainable Conservation's data from 2015, 2016 and 2019 of anonymized lettuce growers' water and fertilizer use, which represents approximately 30 fields.
- RCD's time and cost worksheet for implementing water and fertilizer use performance metrics.

POSSIBLE APPROACHES

- Review modeling and forecasting methods used by UC Davis Center for Watershed Sciences in their study, Addressing Nitrate in California's Drinking Water;
- Use the Statewide Agricultural Production Model and the available data listed above to forecast conditions under two main scenarios: 1) business-as-usual (no changes made by farmers), and 2) scaled implementation of water and nitrogen use efficiency;
- Conduct research on risk assessment methods used by finance institutions;
- Develop a survey and use Sustainable Conservation's contacts at lending institutions and others to disseminate survey to California agricultural lenders and synthesize and analyze survey results.

DELIVERABLES

Products:

- Modeled 20-year forecasts of water supply, water quality (nitrate), and economic impact estimates for vegetable crop production in the Salinas Valley;
- Written brief detailing the analysis of methods used and regional natural resource issues included in lenders' risk analyses;
- Synthesized results of 'willingness to participate' survey that summarizes the lenders' readiness to offer an incentive for farmers who improve water and fertilizer use efficiency.

INTERNSHIPS

Sustainable Conservation commits to host and mentor one paid intern at their San Francisco office during the summer of 2020. The level of compensation will be within the \$5,000-8,000 range.

SUPPORTING MATERIALS

REFERENCES

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4. William O'Daly. "California Water Plan Update 2018." June 2019.
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7. *The Global Risks Report 2019: 14th Edition*. World Economic Forum, 2019, www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf.
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9. *Incentivizing Food System Transformations*. World Economic Forum, Jan 2020, http://www3.weforum.org/docs/WEF_Incentivizing_Food_Systems_Transformation.pdf.
10. "Disadvantaged Community Plan for Drinking Water and Wastewater." *Greater Monterey County*, California State Water Resources Control Board, Nov. 2017, www.greatermontereyirwmp.org/documents/disadvantaged-community-plan-for-drinking-water-and-wastewater/.
11. "Assembly Bill No. 685." *Bill Text - AB-685 State Water Policy.*, California Legislative Information, 25 Sept. 2012, leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201120120AB685.

BUDGET JUSTIFICATION

It is not anticipated that the proposed project would require additional funding beyond the \$1,300 contributed by the Bren School.

CLIENT LETTER OF SUPPORT

See attached.



Sustainable Conservation

January 23, 2020

Group Project Committee
Bren School of Environmental Science and Management
2400 Bren Hall
UC Santa Barbara, CA 93106-5131

Dear Group Project Committee,

I am writing to express Sustainable Conservation's enthusiastic support for a Group Project from the Bren School of Environmental Science & Management. Our proposal, "Making the Case for Scaling a Sustainable Finance Solution: Agricultural Lending to Reward Environmental Benefit," has been co-authored by Bren students Alexandria Wilkins and Grace Brofman.

We view the Group Project as an exciting opportunity to collaborate with Bren students on a meaningful and timely component of our work. This project would advance our work on the Central Coast of California where we are supporting new methods for managing water to improve stewardship of our natural resources, support healthy communities and keep the agricultural economy thriving. Specifically, the proposed project would address 1) the potential for region-scale improvement in environmental, social and economic outcomes, and 2) agricultural lenders' readiness to offer incentives for environmental performance.

Sustainable Conservation is committed to supporting the group in multiple ways. We will sponsor a paid student intern during the summer of 2020, and we will provide necessary data, most of which is publicly available, with no restriction for publication. We will connect the student group with our contacts at Bank of America, Rabobank and Wells Fargo and our broader network, who can help with survey review and dissemination to a larger set of agricultural lenders. Finally, as a Bren alum, I am looking forward to work with a group of students. I will work to ensure they have a meaningful experience while helping us to achieve our objectives.

Sincerely,

Kelli McCune, MESM 2009
Project Director, Conservation Incentives