

The Future of San Joaquin Valley Agriculture Under Climate Change and SGMA

Project Summary

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Introduction

The purpose of this research project is to analyze the likely economic impacts of climate change on disadvantaged communities in the San Joaquin Valley (SJV) in the context of pending regulations and changing resource conditions and to provide actionable solutions for mitigating those impacts.

Since disadvantaged communities in the SJV are disproportionately dependent on agriculture and linked industries, and these industries are more vulnerable to climate change and new regulations, this study focuses on the agricultural economy. Climate change impacts to SJV agriculture are often analyzed in isolation. However, climate change is one of many factors affecting the agricultural economy in the SJV, and thus climate change impacts to the SJV depend critically on these other factors.

This research project provides a holistic view of climate impacts to SJV agriculture on disadvantaged communities by considering pending Sustainable Groundwater Management Act (SGMA) requirements that will limit water supply, and current air and water regulations that increase farming costs in the SJV.

Research Approach

The research project utilized multiple objectives, with main project partners focusing on specific areas, to build the broader picture of the impact, and what can be done to mitigate it, of sustainable groundwater withdrawals on agriculture and linked communities.

The first objective was to identify linkages between agriculture, climate change, and the quality of life and employment stability for rural disadvantaged communities (DACs) within the SJV. This objective was conducted by UC Merced project partners and information was collected through community engagement workshops and a primary data gathering survey with agricultural producers operating in the SJV.

The second objective leverage existing work on other regulations affecting SJV agriculture. Project partners at Cal Poly focused on expanding the knowledge base of the regulatory environment that agricultural producers operate in. This information allows for a more comprehensive view of how future regulation, namely SGMA, and environmental changes will impact production.

The third objective conducted by project partners ITRC at Cal Poly, utilized a special model/process called the Net To/From Groundwater (NTFGW) method to examine future water availability. Availability was first examined in the Tule Subbasin of the SJV to feed into the following objective's modeling process, then expanded to the entire SJV to provide a view of where similar impacts may be sustained.

The fourth objective was completed by project partners at ERA Economics and focused on the calibration and simulation of a regional hydroeconomic model. After calibrating the link between climate change and employment using the data generated from the previous objectives, simulations of

the impact of climate change policies on crop mix, planted acreage, and employment were performed using the Statewide Agricultural Production (SWAP-RTS) model.

Stakeholder Engagement

Engagement with non-academic partners occurred on each objective with various outcomes. The first objective focused on interaction with leaders and residents in disadvantaged communities to better understand their tie to agriculture. The second objective required extensive engagement with agricultural producers and producer groups, as well as the California Air Resources Board, to create a picture of the regulatory environment they currently face. The third objective and the SWAP-RTS model both required interaction with and incorporation of Groundwater Sustainability Plans and water districts to examine future water availability.

Research Findings

Research findings have been presented across various platforms via presentations, posters, published peer-reviewed papers, and working papers. These materials are archived on the website

<https://sjvagricultureclimatechange.org> and cover the following topics:

- Reduction in acreage/value/employment by crop and GSA due to SGMA and climate change (86,400 acres, \$595million, and 3,391-6,927 jobs)
- The mitigating effects that a water market and trading would have on those reductions (20,000 thousand acres stay in production, \$324million of loss value saved, and 2,275-4,694 jobs maintained)
- Water availability across the SJV
- Resources for DACs focused on climate change resiliency

Advancing the State's Climate Goals

The project relates most closely to the State's Climate Strategy goal of safeguarding California. Understanding how climate change and climate change policy will affect those working in California will allow the State to be more resilient. Simply put, you can better plan for outcomes you foresee. For instance, knowing that in just the Tule Subbasin there will be between 2,000-7,000 fewer direct agricultural jobs now, should help the transition. se.

Future Projects

Project members continue to work on research that focuses on advancing the State's climate goals. Notably, members are

- Facilitating the *California Clean Biomass Collaborative*, a multi-agency private-public partnership tasked with examining sustainable alternatives for the inventory of agricultural biomass that was previously burned.
- Working directly with GSAs to evaluate sustainable groundwater withdrawals.
- Examining multi-benefit approaches to improve conditions in disadvantaged communities.