

PhD project presentation

**Geospatial modelling of region-scale
crop water use to forecast climate
change impacts on irrigation demand**

Shahin Solgi



About me



- **University of Tehran**
 - M.Sc., Irrigation and Drainage Engineering (2019-2022)
- **Shiraz University**
 - B.Sc., Water Science and Engineering (2014-2019)
 - *Research Assistant (2019-2024)*



Joining One Basin CRC



Charles Sturt University

- Ph.D., Agricultural and Environmental Sciences (from 2024)

Joining Regional Hub: July 2024 (Loxton)

- 10 months



Industry partners involved in establishing this project:

- Mallee Catchment Management Authority
- South Australian Research and Development Institute
- Almond Board of Australia



Context

- Better decisions
- Plan for future
- Manage risks
- Stay ahead



Being more resilient,
adaptable, and sustainable



Context

- More food in future will be required
- Climate change impacts food production
- More irrigation water will be required
- Forecasting climate change impacts on irrigation



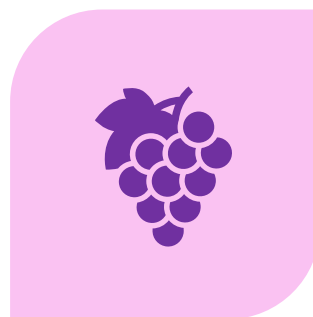
To enhance the resilience of agricultural and food production systems against challenges



Goal

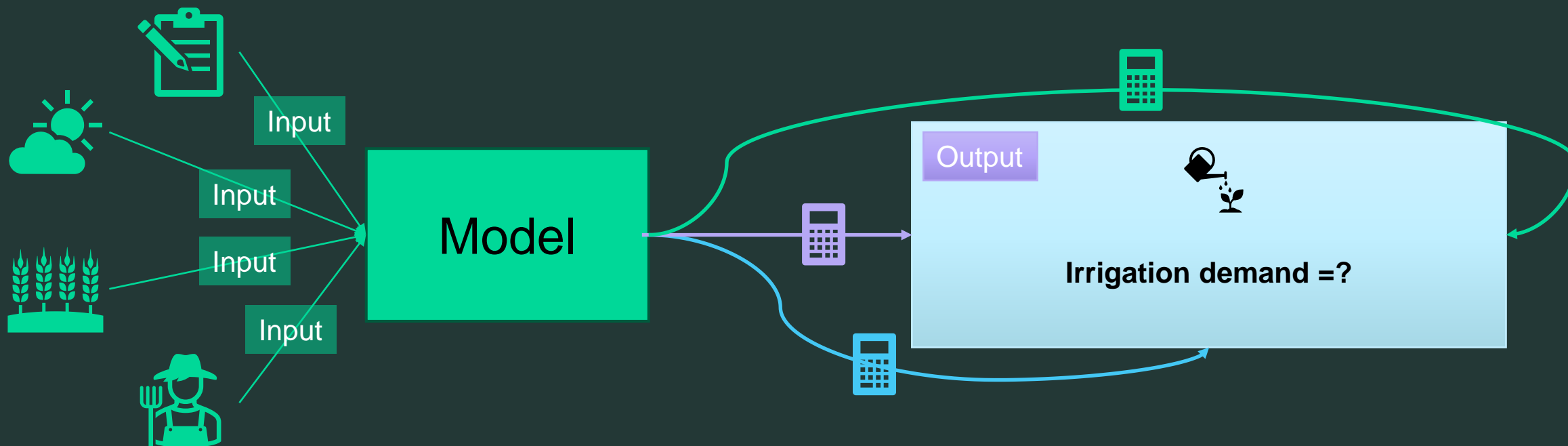


- To provide a reliable tool for future irrigation demand of grapevines under future climate change within the Lower Murray Region of the Murray-Darling Basin by the end of the 21st century



How To Forecast Irrigation?

There are different methods/models for irrigation forecasting



Local Industries: Goals and Challenges



- What are their goals?
- What are the approaches undertaken to achieve these goals?
- What limits them in achieving their goals?
- How can I use my skills and my research to help the industries?



Research Question

Grapevine

How I Developed Research Questions Based on Industry Challenges

- Major crop
- Long-term investment (20-60 years)
- Consistent water supply without failure



Research Question

Grapevine

- Major crop
- Long-term investment (20-60 years)
- Consistent water supply without failure

Region

- The river water is regulated
- Long-term droughts in the past
- The region is vulnerable to climate change



Research Question

Grapevine

- Major crop
- Long-term investment (20-60 years)
- Consistent water supply without failure

Region

- The river water is regulated
- Long-term droughts in the past
- The region is vulnerable to climate change

Other project inspiration

- Desalinating brackish groundwater
 - Alternative water resources to be more resilient



Research Question



Grapevine

- Major crop
- Long-term investment (20-60 years)
- Consistent water supply without failure

Region

- The river water is regulated
- Long-term droughts in the past
- The region is vulnerable to climate change

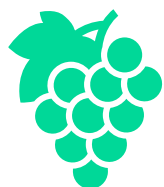
Other project inspiration

- Desalinating brackish groundwater
 - Alternative water resources to be more resilient

Broad research question:

Given the current climate situation, along with future climate change considerations, is it still appropriate to continue developing vineyards in this region?

Research Contribution



Industrial:

Help industries to:

- Manage existing and future challenges
- Shift towards sustainability
- Make timely decisions



Academic:

Grapevine irrigation demand modelling

Top five industry partners

South Australian Research and Development Institute (SARDI)



Murray-darling Basin Authority (MDBA)



Mallee Catchment Management Authority



The Australian Wine Research Institute



Wine Australia

Wine Australia

Industry Engagement: SARDI



Industry Engagement: SARDI

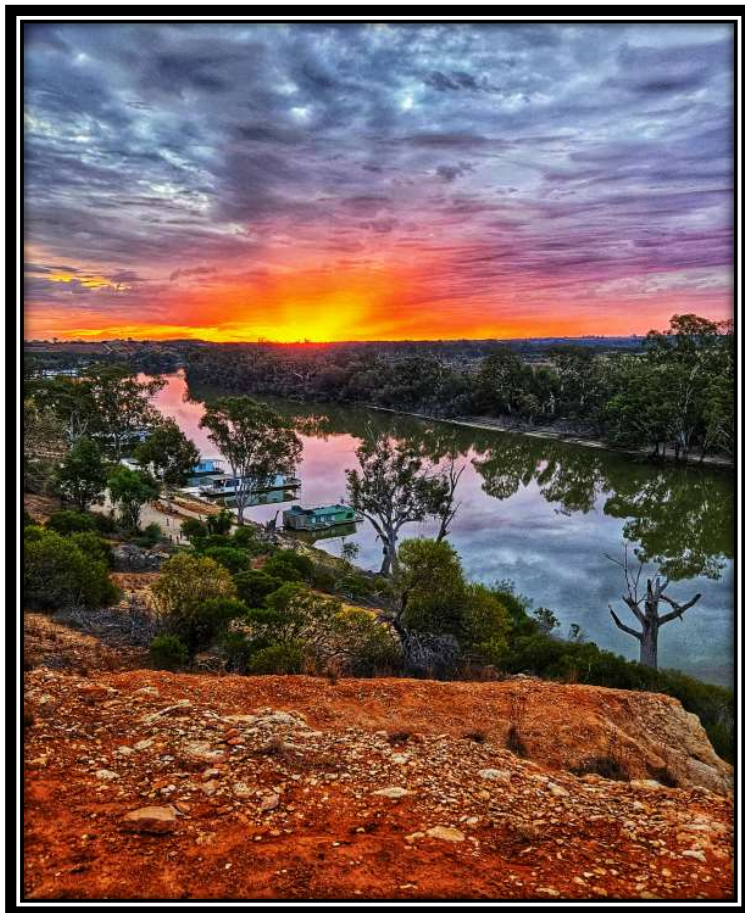


Benefits:

- Connecting to the researchers
- Regional knowledge
- Common techniques and equipment
- Theoretical insights
- Data
- Field measurement support



Personal Impression



- Smooth transition from academia to industry
- Community and industry engagement
- Regional knowledge and experience
- Real-world problems and solutions

Thank you



www.onebasin.com.au