

An Indian-Australian research partnership

Project Title: **Evaporation and Precipitation changes from cultivated rural regions of India**

Project Number **IMURA0933**

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Research Clusters:

Research Themes:

Highlight which of the Academy's CLUSTERS this project will address? <i>(Please nominate JUST <u>one</u>. For more information, see www.iitbmonash.org)</i>		Highlight which of the Academy's Theme(s) this project will address? <i>(Feel free to nominate more than one. For more information, see www.iitbmonash.org)</i>	
1	Material Science/Engineering (including Nano, Metallurgy)	1	Advanced computational engineering, simulation and manufacture
2	Energy, Green Chem, Chemistry, Catalysis, Reaction Eng	2	Infrastructure Engineering
3	Math, CFD, Modelling, Manufacturing	3	Clean Energy
4	CSE, IT, Optimisation, Data, Sensors, Systems, Signal Processing, Control	4	Water
5	Earth Sciences and Civil Engineering (Geo, Water, Climate)	5	Nanotechnology
6	Bio, Stem Cells, Bio Chem, Pharma, Food	6	Biotechnology and Stem Cell Research
7	Semi-Conductors, Optics, Photonics, Networks, Telecomm, Power Eng	7	Humanities and social sciences
8	HSS, Design, Management	8	Design

The research problem

Climate Change can have drastic impacts on the hydrological cycle (erratic rainfall, floods and droughts). India is a rural economy driven country, and with most population under rural livelihood, it is of utmost important to understand the climate change impacts on agricultural productivity and water sustainability. Under such circumstances, it is necessary to understand changes in the hydrological parameters, especially precipitation and evapotranspiration.

In India, much rural regions have witnessed a change in land use and land cover due to accelerated agriculture practices and urbanization. It is therefore necessary to understand the potential changes to evapotranspiration and precipitation rates in rural India.

Project aims

Primary objective of the project is to understand the changes in evapotranspiration and precipitation rates in rural regions, where observation data is limited. Secondary objectives include deriving methodologies to estimate evapotranspiration rates and land use patterns.

Expected outcomes

- Sensitization of ongoing agriculture water stress and climate change impacts
- Assessment of land use and land cover change impact on hydrological parameters
- Sustainable agricultural water use practices
- Realistic scenarios for agricultural water management

How will the project address the Goals of the above Themes?

The project will primarily focus on WATER theme, wherein holistic water management practices will be researched. Also, novel information on site specific surface water groundwater interactions will be studied and researched in this project, which are related to WATER theme. This project will also use GIS and computer simulation models for data processing and simulation of surface water and groundwater interactions. This requires high level of simulation expertise which will be under the SIMULATION theme.

Capabilities and Degrees Required

- The student should have a Masters degree that has a hydrological focus (e.g. water resources management, civil engineering, hydro informatics, etc.)
- Experience in field work, remote sensing GIS and computer simulation models.
- Programming skills/data management skills to manage large datasets
- Excellent writing skills

Potential Collaborators

Please visit the IITB website www.iitb.ac.in OR Monash Website www.monash.edu to highlight some potential collaborators that would be best suited for the area of research you are intending to float.

Prof. Marc Parlange has been identified as the potential research collaborator. He has extensive experience on groundwater modelling. A Skype meeting has been conducted and details of the collaboration discussed.

Select up to **(4)** keywords from the Academy's approved keyword list (**available at <http://www.iitbmonash.org/becoming-a-research-supervisor/>**) relating to this project to make it easier for the students to apply.

**Water resources management, Climate change; Modelling and simulation;
Hydrogeology.**