

An Indian-Australian research partnership

Project Title: Supporting farmers' decision making for resourceful utilization of electricity

Project Number IMURA0826

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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
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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

Farmers in India deal with many issues relating to grid electricity supply for irrigation due to the political economic structure of the sector and the availability of knowledge of how to use electricity effectively and efficiently. This study aims to develop knowledge of the optimal ways of designing education for farmers concerning the best use of available technology. In doing so, it will contribute to theories and methods for program design, and the diffusion and use of technologies

throughout communities.

The background to this topic is a system with implicit and explicit subsidies, which result in utilities providing very poor quality service. At the same time farmers who are poor manage their own pumping systems. The situation is defined by a farmer class that tries to keep costs down in every way, and a physical system that is dispersed/remote and hard to maintain by third parties. In such a situation the farmers try to maintain their own systems with poor knowledge. There is therefore room to explore what training / information would help farmers have more control over their own systems, and even investigate what value there may be for a certain maintenance.

In order to examine these challenges there is a need for developing awareness from the bottom-up where we involve these farmers and support their decision making process.

Project aims

In order to achieve this outcome, we will use a participatory approach to develop training content, which will be instructive for the farmer. Based on a variety of stakeholder interviews, the training will be created to enable a farmer centred understanding of electricity and its use in agriculture. This project is a participative socio-technical intervention and will involve inter-disciplinary knowledge of electrical engineering, participatory design, user-centred instructional design and modelling, design for development, and rural community management. We will develop an experimental design with control and treatment groups to test the effectiveness of our interventions.

Expected outcomes

The training content developed through the participatory approach will be disseminated using a community based awareness program.

By the end of those project, the student will be able to acquire and inter-disciplinary understanding of pathways through which farmers can be supported to make decisions for resourceful utilization of electricity.

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

The project directly addresses the problems of the rural poor with regard to pump usage. It also addresses aspects of clean energy through better usage of available resources.

Capabilities and Degrees Required

The student should have an undergraduate degree in engineering from a reputed institute with a strong academic record. The student should be interested in sociological aspects considering the interdisciplinary nature of the project. An electrical engineer or energy systems engineer is the preferred engineering discipline.

Potential Collaborators

Prof. Thomson is an expert on comparative policy analysis. He is part of an international research project that is comparing states' Nationally Determined Contributions. He is also interested in the development and application of models of collective decision-making.

Prof. Jadhav is an expert on energy policy, rural electrification and renewable energy. She has particular expertise in rural electrification, energy efficiency, energy usage in irrigation, technology and farmer behaviour, solar photovoltaics, organizational models in electricity distribution.

Vivek Kant works in the areas of sociotechnical systems and systems design (human factors). He has expertise in the areas of interpretive sociology and cognitive psychology, along with design. He is interested in supporting designers with tools and frameworks that will help them to develop socially relevant designs for multi-stakeholder sociotechnical systems.

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.

Energy, humanities