

An Indian-Australian research partnership

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| <b>Project Title:</b>                                  | <b>What does safe, affordable drinking water mean?</b> |                         |
| <b>Project Number</b>                                  | IMURA0954  |                         |
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### Research Clusters:

### Research Themes:

| Highlight which of the Academy's CLUSTERS this project will address?<br><i>(Please nominate JUST <b>one</b>. For more information, see <a href="http://www.iitbmonash.org">www.iitbmonash.org</a>)</i> |   | Highlight which of the Academy's Theme(s) this project will address?<br><i>(Feel free to nominate more than one. For more information, see <a href="http://www.iitbmonash.org">www.iitbmonash.org</a>)</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

### *Define the problem*

Population growth and climate change are creating huge challenges for communities globally and impacting their ability to access safe drinking water. The quality of groundwater has deteriorated steadily with high salinity, pollution from industry and agriculture being some of the main culprits. In urban situations, the last mile delivery of water can result in further contamination of water. Purification of water to render it potable and safe for human consumption is thus a huge challenge.

Many technologies are available in the market for point-of-use water purification. Criteria that customers use in deciding which technology and water purifier to purchase include the safety claims made by the company, marketing, third party certification regarding safety and affordability. Safety norms adopted by water purifier companies in turn are guided by water standards policy prevalent at that time in that geography/country. A key question that the research will seek to engage with is whether one set of guidelines and standards are appropriate for countries with different social, geographical and economic realities. How can water quality standards be responsive to the multiple and complex realities of the context where it is to be made available.

This study will critically evaluate the intersection of technology, water standards and affordability to inform government policy on water standards, customers on appropriate, affordable water purifier technologies and provide direction to corporations on ratings for their water purifiers.

## Project aims

### *Define the aims of the project*

1. A detailed study of current technologies for point-of-use water purification and their pros and cons
2. A critical analysis of water purification standards in India and Australia and mapping water quality in a few relevant geographies in each country
3. Developing criteria to rate quality of water to be purified based on estimation of the disease burden through DALYS. Use of this criterion to rate quality of water provided by different water purifiers
4. Develop a methodology to rate water purifiers along the lines of energy star rating for electrical goods
5. Gain an understanding into what constitutes affordability and how this maps to the technology used in different water purifiers
6. Evaluate how safety standards impact the cost of technologies for water purification

## Expected outcomes

### *Highlight the expected outcomes of the project*

This study will attempt to develop sound methodology to rate point-of-use domestic water purifiers and water purification standards holistically. This will then assist policy makers to develop appropriate safety norms that will take into consideration affordability together with disease burden and relevance of appropriate technologies. This study will be beneficial for government water standards agencies, companies that manufacture water purifiers and will create a platform for customers to make an informed decision when purchasing a domestic water purifier.

The outcomes of the study will be published in scholarly journals, presented in conferences and white

papers will be circulated to relevant government and industry bodies.

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

*Describe how the project will address the goals of one or more of the 6 Themes listed above.*

This study is highly interdisciplinary and is at the intersection of policy/social sciences, engineering and economics. It addresses the theme of 'Water' which is an area of great topical relevance.

### **Capabilities and Degrees Required**

*List the ideal set of capabilities that a student should have for this project. Feel free to be as specific or as general as you like. These capabilities will be input into the online application form and students who opt for this project will be required to show that they can demonstrate these capabilities.*

Students with background in engineering and sciences, and humanities and social sciences are welcome to apply. This is an interdisciplinary project and requires a keen willingness and interest from the applicant to explore new areas with great impact.

### **Potential Collaborators**

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