



# TCTD Challenge PS

7th Inter IIT Tech Meet, IIT Bombay

## Preamble

Rapidly changing climatic conditions and diminishing natural resources demand a change in traditional agriculture practices and techniques in food production. In India, some 190 million people are being fed by food produced by over-pumping groundwater leading to aquifer depletion. The soil has been overburdened and is fast losing its capacity to produce food. All these problems require some thought into bringing in technological interventions.

Tata Centre for Technology and Development ([TCTD](#)) at IIT Bombay was established in 2014 with support from the Tata Trusts. The centre aims to develop solutions to challenges faced by resource-constrained communities within India and across the world using an end to end innovation approach. Through this process the centre aims to develop human resources who are trained in technology, design and entrepreneurship by way of project work, coursework and field practice. The centre nurtures next generation leaders in engineering and business fields who deal with pressing problems in society in the context of complex economic, social and environment factors.

## Problem Statement

TCTD would like to invite contingent teams to identify problems around the central theme **“Farm tools that reduce drudgery and provide intelligent automation”**, develop a technology driven solution for them and demonstrate the prototype / Proof Of Concept in action during the 7th Inter IIT Tech Meet at IIT Bombay.

Some examples of identified problems under this theme are:

1. Paddy(Rice) transplanter
  - a. Solutions exist but aren't suitable for the Indian condition. Existing solutions have not been absorbed for utilization by the community due to various reasons like - land levels, small plot size, affordability etc.
2. Drumstick pod harvester
  - a. Branches of the tree are weak
  - b. Removal of the pods from 15-30 feet high
3. Jamun plucking



- a. Fruits are very soft and small, they break on impact after falling on ground
  - b. Unripe/partially ripe fruits taste astringent, can't be harvested early
  - c. Branch of tree doesn't bear the load - risky for a human to climb for harvesting
4. SRI System of Rice Intensification
- a. A device for marking spots for transplanting to be designed and developed
  - b. Refer to [https://en.wikipedia.org/wiki/System\\_of\\_Rice\\_Intensification](https://en.wikipedia.org/wiki/System_of_Rice_Intensification)

Contingents are welcome to focus on any agricultural activity (different from the ones mentioned above or may also choose to proceed with one mentioned above) which is labour intensive and propose some technology driven solution to solve it, prototype an instrument required for the activity, and if possible, demonstrate it. Also, It would be helpful for the contingent to identify problem for an agricultural activity to which they have access, allowing them to interact with the people who are actually involved in the labour intensive activity. This can help in better understanding the problems faced and the implementability of the proposed solutions.

Each contingent shall have an interdisciplinary team of maximum team size of 10 members. At Tata centre, we look at solving challenges in a holistic way. We take an end to end innovation approach, which has the following steps:

1. Understanding the problem
2. Reviewing of existing solutions
3. Designing novel solutions with an optimal combination of performance and cost
4. Taking the solutions to the society through various scale up mechanisms.

TCTD wants to inculcate this design process amongst the interdisciplinary teams and enable them to solve the problems which can impact millions across the globe.

## Judging Criteria

- Evaluation will be based on a) Presentation b) Technical Design Report and c) Video of demonstration of solution.
- Presentation and showcase of video will be given a maximum of 15 min covering aspects related to design, impact of solution developed and business analysis.
- Report will be upto 10 pages encompassing detailed engineering analysis and design of solution, overview of existing agricultural practices/solutions, cost of solution/prototype developed and business case analysis, results of field survey and discussion with relevant stakeholders etc.
- The video should demonstrate the working of solution being developed. At least one presenter should be part of the video.



## 7<sup>TH</sup> INTER IIT TECH MEET 2018 IIT BOMBAY



- Participants are welcomed to carry their prototype/product developed for better explanation during presentation.
- All entries will be judged on following criteria:
  - Economic Feasibility of solution developed
  - Novelty/innovation of the solution proposed
  - Analysis of existing solution, discussion with relevant stakeholders, field visits/surveys etc.
  - Demonstration of the product/prototype in relevant scenario
- The event is categorised as **High Prep** and shall yield a maximum of **400 points** towards overall tally
- Minimum Qualifying score : 150 points out of 400
- Timeline :
  - Submission of technical design report & demonstration video:15th December 2018
  - Final presentation :19th December 2018

## Rules and Regulations

- A maximum of 10 participants shall be awarded participation/merit certificate. A maximum of 4 student from team will be allowed to present during tech meet. An Interdisciplinary team of people from different backgrounds is preferred
- The team is required to submit their technical design report & demonstration video through the respective Contingent Leader/General Secretary Technical Affairs or Equivalent to [interiit.tech@iitb.ac.in](mailto:interiit.tech@iitb.ac.in) with the subject 'TCTD\_IITX\_TDR\_2018', by **15th December 2018**. Eg. IIT B will send with subject : 'TCTD\_IITB\_TDR\_2018'. Submissions after 15th December 23:59 PM will entail reduction of 20% of the points earned by the team.
- The decision of the judges shall be final

The problem statement has been provided by Tata Centre for Technology and Design, IIT Bombay. The most promising teams will be mentored by Tata Centre for product realisation of the solution developed.