



# Rural Development and Agriculture

## Project Title

**Improving Post-Harvest Supply Chain for Organic Produce in Bannerghatta Landscape.**

**Funding  
Requirement  
INR- 30L over  
3 years**

## Objective

- To foster organic farming in the Bannerghatta landscape and serve as a model for larger-scale implementation later.
- Organic food sowing and harvesting by 2021, entering the market by end of 2022, organic food certification by 2024.

## Impact

There is substantial knowledge of organic farming practices, but smallholding farmers lack the critical mass to enter the market and manage the supply chain. Our intervention, with the help of a local NGO a Rocha solves this by roping in experts in farming practices and connecting the farmers to the Bangalore markets profitably.

## Project Description

- Field intervention with the help of local NGOs.
- Field surveys to gauge the target farmer sentiment, implement training and facilitate post-harvest supply chain management.
- Covert about 30 farmers to organic farming and penetrate the market profitably and sustainably.



## Principal Investigator

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# Rural Development and Agriculture

## Project Title

**Low-cost sustainable seismic isolators for earthquake safety of communities in villages and small towns.**

**Funding Requirement**  
INR- 50L over 3 years

## Objective

- Process development for recycling of scrap tyres and fabrication of Scrap Tyre Rubber Pad (STRP) of adequate capacity.
- Evaluation of dynamic properties of the STRP bearings through cyclic tests.
- Demonstration of effectiveness (technology readiness) of STRP isolators through shake-table testing on scaled target applications.

## Impact

The project aims to reduce the seismic vulnerability of rural communities at high seismic risks which do not access to advanced and costly seismic retrofit measures. The successful outcome of the project would be a ready-to-use device that can be used at mass scale for structures and systems vulnerable to earthquakes. Existing facilities, including school buildings and medical clinics, can be retrofitted with these isolators without disrupting the services. Overhead water tanks and power generators can be isolated using STRPs to ensure vital supply of essentials during post-earthquake recovery.

## Project Description

The project demonstrates a seismic isolation technology developed using scrap rubber tyre pads (STRPs) that can be used for seismic protection of low-cost houses, dwellings, footbridges, and overhead water supply tanks in regions of high seismicity. The STRPs seismic isolators are horizontally flexible and vertically stiff devices that significantly reduce the earthquake forces. Scrap tyres have wire-reinforced pads that provide superior strength without making them significantly stiffer. Rubber pads cut from scrap tyres can be bonded with steel shims and undergo a vulcanization process at high temperature and pressure to fabricate STRP bearings that have desired properties as seismic isolators.



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# Rural Development and Agriculture

## Project Title

**Assessment of Response and Resilience of Vegetation to Droughts in India.**

**Funding  
Requirement  
INR- 45L over  
2 years**

## Objective

- To assess the response and resilience to soil water droughts in India.
- To understand better the resilience of plants to withstand extreme weather events.
- To understand the resilience of forests of India.

## Impact

Asian countries, including India, are prone to risk to food security due to projected increases in temperature extremes, rainfall variability, and droughts.

Understanding plant resilience would help develop sustainable crop and forest planning strategies under climate change. Crop planning would assist in managing the food demand of the nation in the future and improve the sustainable livelihood of farmers. With the advent of satellite technology, it is possible to carry out large-scale monitoring of vegetation by studying its water content, which is a crucial element for resilience assessment.

This project could help to identify the regions that exhibit strong resilience to droughts, understand the causes, and attempt/propose to implement the findings in the vulnerable areas.

## Project Description

- 1-6 months – Downloading and processing soil moisture, vegetation, and climate variables.
- 7-12 months – Estimation of agricultural drought parameters and flash drought.
- 13-18 months – Assessment of plants' response to droughts, Interaction with farmers.
- 19-24 months – Estimation of plants' resilience to droughts.



## Principal Investigator

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# Rural Development and Agriculture

## Project Title

**Technology Solutions and Local Ecosystem Support for Low-cost Decentralised Mushroom Production for Rural Population.**

**Funding Requirement**  
INR- 25L over 2 years

## Objective

- Creation of Mushroom Farming system which can be easily managed by an individual in a rural setup.
- Design and development of a Low-cost and Energy Efficient Climate Control Chamber, with IoT enabled sensors, for precise, faster and uniform temperature, humidity and CO2 level control.
- AI-ML based health diagnostics system and Local Ecosystem Support - Timely identification of health issues for the optimum yield.

## Impact

Proposed work attempts to provide the solution through technology intervention. Design and development of a low-cost Climate Control Chamber is proposed for faster and uniform temperature, humidity and CO2 level control. Overall technology, health diagnosis and support eco-system, supply chain management and business plan are targeted towards small farmers, landless farmers etc. from remote rural areas across the nation.

## Project Description

Mushroom Cultivation is relatively new to the majority of Indian population. Unlike the traditional crops where the rich knowledge base comes handy in the local population and market access is well defined, farmers feel Mushroom cultivation a little riskier. The current investment in the Mushroom Cultivation with climate chambers about 10-20 lakhs is inefficient design and needs dedicated man power for monitoring and other support activities.

The high initial investment, lack of local ecosystem for expert advice, troubleshooting and lack of supply chain and market access for rural community desist them from taking up Mushroom cultivation. The support system for mushroom health and diseases is also virtually unavailable in larger rural landscape. It is feasible in hilly and cold climatic conditions only, in areas with good market access, and popular in states like parts of Himachal Pradesh and Uttarakhand for significant part of the year but need climate control chamber for other plain and relatively hotter regions. The market of Mushroom is significantly high and profitable, but the Mushroom farming is not able to percolate in the remote/rural areas in large plain and relatively hotter climate region.



### Principal Investigator

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# Rural Development and Agriculture

## Project Title

**Dissemination of Mobile Jaggery Unit.**

**Funding  
Requirement  
INR- 50L over  
2 years**

## Objective

- Deployment of Mobile Jaggery Unit for production of jaggery and jaggery-based value-added products.
- Utilization of cane available at remote locations.

## Impact

The innovation lies in the process of intensification of jaggery making to bring cost-effectiveness and compactness to the plant. Such a plant would provide tremendous flexibility in terms of access to cane from remote farms, maximum use of the machinery throughout the year, a better quality product made from freshly harvested cane, and substantial savings on the transport of cane. Jaggery powder is made by patented know-how transferred by IITB to Revotech Industries Pvt. Ltd. (IITB start up) We propose to bring in engineering innovations, namely, the thermosyphon evaporator, a novel compact steam boiler that runs on loose bagasse, and the agitated thin-film evaporator- all of them to be designed and developed in-house as a part of the proposed project. The need for such a movable plant is assessed through a systematic customer discovery program. The 3-D isometric drawing of the proposed unit, corresponding block process diagram, and the overall business plan are given in Figures 1-2. Dissemination of such units would result in making a reliable, high-quality product available to the sweetener market and indirectly increase farmers' income.

## Project Description

Jaggery, unrefined natural sugar, mostly produced from sugarcane continues to be an important sweetening agent in the Indian diet because of its characteristic taste and nutritional value.

The jaggery industry occupies a prominent place in the sugarcane economy, as it processes about 21 percent of the total sugarcane grown in India. Currently, jaggery is produced in India in the cottage industry. At the beginning of the 20th century, entire sugarcane was utilized for jaggery making in rural areas till the introduction of the modern sugar industry. Thereafter, it did not see much growth due to the rapid growth of sugar mills. A recent survey by an IITB project team in Kolhapur indicates that some 40 percent of 900 units have closed down due to these reasons. The major factors responsible for the jaggery sector downfall have been poor efficiency of juice extraction, open pan furnace inefficiency, jaggery moulding and packaging, quality control and hygiene issues, lack of technical skill, and meagre financial and policy support, etc. We have developed a technology of making jaggery powder in a cost-effective and compact manner so that plants can be moved from farm to farm to access fresh cane in remote areas.



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# Rural Development and Agriculture

## Project Title

**Secretariat for Societal Solutions (Prayog Initiative).**

**Funding  
Requirement  
INR- 4Cr over  
2 years**

## Objective

- Identify problems in society and convert them into problem statements/definitions to be shared on a platform so that solution providers can take up the projects.
- Identifying interesting research/academics/training/think tank institutions to conduct research and provide solutions through projects
- Coordinating project activities with various stakeholders, disseminating and translating research into field action and promoting the use of the solutions on the field by providing a database and a web platform

## Impact

The initiative includes establishment of a platform where the members of society (citizens, govt officials, NGOs, CSRs) can approach with their issues and problems related to social, environmental, technical in various sectors. This experts in the initiative will reshape and define problem in structured way (through field visits/interviews/meetings) so as to understand the size, scale and intensity of the problem and then channelize them to the solution providers in a format/style understandable to them. This platform will connect the solution providers with the solution seekers.

## Project Description

Many of society's/societal problems remain unsolved due to a lack of proper identification/defining of problems. Wrong assumptions (many a time due to lack of fieldwork) lead to unsatisfactory solutions and hence rejection or less accessibility by people. Thus it is important to understand the requirement of the people through an approach that will target the needs of ground people and reshape the research of solutions so as to solve them.



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