

Detailed Technical Programme

TITLE : Developing a soil microbiome atlas and location-specific microbial consortia for Natural Farming systems in Telangana

DURATION : 2 Years

OBJECTIVES :

1. To characterize the diversity of soil microbiomes in different soils across agroclimatic zones of Telangana
2. To identify and develop beneficial microbial consortia useful for soil health, nutrient efficiency, stress resilience, and crop productivity.
3. To develop a GIS-based soil microbiome atlas and decision support system (DSS) for recommending site-specific microbial consortia and practices to promote Natural Farming systems in Telangana.

PARTICIPATING INSTITUTES :

Sole/Lead Institution

1. School of Agriculture, Kaveri University, Gowraram (V), Wargal (M), Siddipet – 502279.

Rationale of the Study

- **Critical Knowledge Gap:** Despite extensive data on soil *chemical* properties and crop yields in Telangana, there is a **severe lack of comprehensive, systematic data** on the *biological* component, the soil microbiome - across the state's diverse agroclimatic zones. This creates a fundamental blind spot in understanding total soil health.
- **Limitations of Current Management:** Agricultural recommendations (for fertilizers, irrigation, cropping patterns) are primarily based on **physical and chemical parameters only**. The absence of microbial data prevents the development of **bio-informed, precision agriculture strategies** that could be more sustainable and efficient.
- **Untested Scientific Assumption:** It is widely hypothesized that **agroclimatic zones** (varying in climate, soil type, and cropping systems) harbour distinct microbial communities. However, this has **not been empirically validated at a state-wide scale in Telangana**, leaving a key ecological principle unconfirmed in this critical agricultural region.
- **Inability to Explain Yield Variations:** Observed differences in crop productivity and resilience under similar chemical fertilizer regimens may be driven by **unseen variations in microbial functions** (e.g., nutrient solubilization, pathogen suppression). Without a microbiome baseline, these biological drivers cannot be identified or harnessed.
- **Foundational Need for Advanced Research:** Future work on developing microbial biofertilizers, diagnosing soil biological degradation, or studying climate change

Competitive Research Grants under National Mission on Natural Farming

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Name of Participating Institute / Organizations

Sole/Lead	School of Agriculture, Kaveri University
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Details of Scientists/Researchers/Others involved

Principal Investigator (PI)	Dr. K. Mahendra	School of Agriculture, Kaveri University
Co-PI: Co-Principal Investigator	Dr. P. Surendra Babu	School of Agriculture, Kaveri University
Co-PI: Co-Principal Investigator	Dr. Dugyala Sheshanka	School of Agriculture, Kaveri University
Co-PI: Co-Principal Investigator	Dr. D. Gopal	School of Agriculture, Kaveri University
Co-PI: Co-Principal Investigator	Dr. B. Srinivasulu	Kaveri University
Co-PI: Co-Principal Investigator	Dr. A. Pratap Kumar Reddy	School of Agriculture, Kaveri University

Budget : Rs. 47,23,950/-

Duration : 2 Years