

**S.A.F.E<sup>2</sup>.T.Y.**

## **Smart Warehouses with Application of Frontier EM & Electronics Based Technology**

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*GAP-023*

### **Project Objectives**

- Development of Electronic Vision System (E-Vision) for Quality characterization of rice
- Development of moisture content measurement system for paddy using dielectric properties
- Development of suitable sensors for continuous monitoring of temperature and Relative Humidity in the warehouses
- Design and Development of continuous thermal disinfestations system using High Power Radio Frequency systems for warehouses
- Design and Development of continuous High Power Radio Frequency system for controlling moisture of paddy before putting it in the warehouses
- Development of warehouse management (WMS) system for the paddy storage

### **Description**

About 70-80% of total food grains produced in India is stored in the warehouses. An estimate concludes that nearly 150 million tons of paddy is stored in warehouses for 6 months to up to 2 years before they are distributed for public consumption. Due to lack of adequate technologies, India loses 10-30% of grains in warehouses due to high moisture, insects, rodents and fungi. This is mainly because of poor management practices in the warehouses. In warehouses, the biotic and abiotic factors determine the quality of the grain stored. Proper controlling the abiotic environment one can safely and easily extend the shelf life of the stored food grains. The physical environment includes the temperature and the moisture content of the stored grain, and the inter-granular gaseous environment. Monitoring and controlling physical, chemical, physiological, biological can minimize the losses during storage in the warehouses. Electronics and electromagnetic engineering are potential tools for monitoring and controlling the above variables during storage of grains in warehouses.

IIFPT is working for the development of Technologies and gadgets required for monitoring the abiotic environments in the storage warehouse and management tools for safe management of paddy in collaboration with SAMEER, Mumbai, C-DAC, Kolkatta and Food Corporation India.