PANIMALAR ENGINEERING COLLEGE
An Autonomous Institution

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Bangalore Trunk Road,Varadharajapuram, Poonamallee, Chennai- 600 123

INDIA'S WOMEN CENTRIC NATIONAL LEVEL 24 – HOUR HACKATHON
TECHDIVATHON – 2.0
She blooms. She leads. She conquers

Domain:AGRICULTURE

Problem Statements:

S.No	Title	Problem Statement	Description
1	AI-Integrated Soil Health and Nutrient Analysis System	Farmers lack real-time intelligent insights into soil nutrient dynamics, reducing productivity.	Combines IoT sensors with AI models to analyze soil pH, moisture, and nutrient levels, predicting deficiencies and recommending corrective actions.
2	Market Price Discovery Without Internet or Phone	Farmers with no phone, no internet, and low literacy cannot access daily crop prices, demand trends, and buyer information.	Design an agri-marketing solution using community solar-powered kiosks with voice-based multilingual interfaces, SMS gateways via local agents, and physical price boards updated through village cooperatives, enabling real-time market intelligence dissemination through trusted local networks.
3	Edge-AI Smart Irrigation System	Cloud-based systems face delays and connectivity issues affecting irrigation accuracy.	Uses edge computing and AI algorithms on-site to control irrigation in real time, conserving water and power.
4	AI-Driven Pest Detection and Repelling System	Manual pest monitoring lacks predictive capability and real-time eco-safe responses.	Integrates image-based AI pest detection with ultrasonic and light-based repelling for sustainable crop protection.
5	IoT-Based Smart Greenhouse with Predictive Climate Control	Static sensor systems fail to predict changing environmental conditions.	AI models forecast temperature and humidity trends, automatically adjusting conditions for optimal plant growth.
6	Vision-Guided Autonomous Seed Sowing Robot	Uniform seed placement remains a challenge for automation in diverse terrains.	Uses computer vision and GPS for precision seed sowing with terrain adaptation and real-time progress tracking.
7	AI-Powered Hyperlocal Weather Prediction Station	Farmers need micro-level weather predictions rather than generic regional forecasts.	Uses local sensor data and ML models to predict farm-specific weather patterns and alert farmers.

8	Smart Livestock Health and Behavior Monitoring using IoT & AI	Existing trackers lack behavior-based disease detection and predictive analytics.	Wearable AI sensors analyze livestock movements, vitals, and feeding behavior to detect illness early.
9	Portable AI Soil Analyzer with Cloud Connectivity	Traditional soil kits give limited insights and lack digital data logging.	A handheld device analyzes soil instantly and uploads results to a cloud dashboard for long-term tracking.
10	AI Crop Growth and Yield Tracking System with Image Analytics	Manual growth tracking is error-prone and doesn't correlate with yield metrics.	Uses time-lapse imaging and AI to assess crop stages, growth rates, and predict yield outcomes.
11	AI Mobile App for Real-Time Crop Disease Detection and Cure Advisory	Farmers face delays in receiving expert advice after disease identification.	Uses deep learning for instant diagnosis from images and connects farmers with local experts for treatment.
12	Satellite and AI-Based Crop Yield Forecasting System	Current tools don't combine soil, weather, and remote sensing data efficiently.	Integrates satellite imagery, IoT, and AI regression models for accurate region-specific yield forecasts.
13	Blockchain-Based Farm-to-Market Traceability Platform	Food supply chains lack transparency and authentication of produce origin.	A blockchain ledger records each stage of the supply chain, ensuring fair pricing and authentic tracking.
14	AI-Based Fertilizer Recommendation and Dosage System	Farmers rely on guesswork for fertilizer application.	Analyzes soil and crop data to recommend fertilizer type, timing, and dosage using machine learning.
15	Unified Agri-Analytics Dashboard with Predictive Insights	Farmers struggle to interpret raw sensor data for actionable insights.	Aggregates soil, weather, and crop data into a visual dashboard offering AI-based recommendations.
16	Farmer-to-Buyer Market Access	Small farmers cannot sell produce directly to buyers without relying on smartphones, apps, or internet connectivity.	Create a decentralized marketplace using community radio broadcasts, toll-free voice hotlines, physical QR-coded produce tags scanned at buyer collection points, and local agent networks that match farmers with buyers through SMS confirmations and cash-on-delivery logistics.
17	**AI Weather-Adaptive Crop Planning Application**	**Sudden climate changes require adaptive crop planning strategies.**	**Suggests ideal crop types and schedules based on real-time and forecasted weather conditions.**
18	Blockchain-Enabled Agricultural Supply Chain Tracker	Lack of trust and transparency in agricultural trade.	Tracks farm produce using QR and blockchain verification for end-to-end traceability.
19	Smart Pest Management and Advisory Mobile App	Farmers need region-specific, eco-friendly pest management strategies.	Logs pest occurrences, predicts outbreaks using AI, and recommends organic treatments.
20	IoT Water Flow Analytics and Smart Irrigation Advisor	Water waste continues due to lack of consumption pattern analysis.	Monitors water flow and usage through IoT sensors, suggesting efficient irrigation schedules.

21	AI-Powered Precision Farming Robot for Small Farms	Small farmers lack affordable robotic solutions for soil and crop analysis.	Compact robot equipped with sensors and AI vision to assess soil health and crop conditions autonomously.
22	Community-Driven Agri Information Network	Agricultural market and advisory information fails to reach farmers without personal devices or connectivity.	Develop a community-based information dissemination model using village megaphones, shared community blackboards, cooperative-led voice announcements, and bicycle messenger networks that relay daily market prices, weather alerts, and farming tips through trusted local leaders and group gatherings.
23	AI-Based Automated Greenhouse Control and Monitoring System	Manual systems fail to maintain consistent growth environments.	Predictive AI models autonomously control lighting, humidity, and temperature in real-time.
24	IoT-Based Livestock Monitoring and Geo-Fencing Alert System	Livestock theft and health issues cause losses.	Smart collars track movement and health, triggering alerts for unsafe zones or anomalies.
25	Solar-Powered IoT Smart Irrigation with AI Scheduling	Water and power inefficiency persists in solar irrigation setups.	Integrates solar energy, soil sensors, and AI algorithms to optimize irrigation and reduce waste.
26	Real-Time Pest & Disease Detection	A group of vegetable farmers in Hosur struggle to identify early pest outbreaks.	Develop a mobile image-based model and advisory dashboard that detects common pests and diseases from leaf images and instantly pushes remedy suggestions verified against agri-science datasets and expert recommendations.

Reviewer's Digital Signature

Reviewer's Name:
Position:
Organization:
Date:

Digital Signature: