

S.No	Title	Category	Theme	Description	Objectives
1	Smart Traffic Signal Automation for Prioritizing Emergency Vehicles.	Hardware	Embedded & Automation	In urban areas, ambulances and other emergency vehicles often face significant delays at traffic signals due to congestion and	Design and implement a sensor-enabled traffic signal system that detects emergency vehicles using RFID, GPS, or siren-based
2	Real-Time Waste Bin Monitoring and Automatic Collection System.	Hardware	Embedded	In many municipalities, waste collection faces significant challenges due to delayed pickup schedules and improper	Develop sensor-based modules (ultrasonic, weight, or IR) to continuously measure bin fill levels.
3	Smartphone-Linked Off-Grid Mesh Communication for Reserve Forests.	Hardware	Resilient Connectivity	Reserve forests often lack public cellular coverage and strict rules limit use of standard radio frequencies. As trekking in these areas	Design a lightweight, battery-efficient communication module compatible with standard smartphones.
4	Integrated Pruning Tool for Jackfruit Branches and Pepper in Sloped Cardamom Estates	Hardware	Agriculture / IoT / AI	Cardamom plantations are typically established on sloping terrains with wet, soft soils, making intercropping additional	Develop a pruning tool with dual modes for safe trimming of jackfruit and precise planting of pepper cuttings.
5	Design IoT-enabled modules for early detection of bird and rat damage in paddy fields	Hardware	Agriculture / IoT / AI	Use embedded sensors and AI models to identify animal damage and alert farmers locally.	Enable early response, reduce crop loss, and facilitate eco-friendly deterrence strategies.
6	Create low-cost wireless sensor nodes for water level and irrigation pattern analysis	Hardware	Agriculture / IoT / Water Management	Develop economical, battery-operated sensor nodes for monitoring irrigation and tank water levels.	Reduce water waste, optimize irrigation schedules, and support sustainable resource management.
7	Automated Banana Flower Processing System	Hardware	Agriculture / IoT	Develop an automated banana Flower processing system that integrates cutting, shaping, and moisture removal into a single,	Combine Flower cutting, shaping, and dewatering into one efficient automated solution for consistent product quality.
8	Smart Streetlight Failure Reporter	Hardware	Smart City / IoT / Infrastructure	Equip a single streetlight (simulated) with an IoT sensor that automatically detects when the bulb or driver fails (e.g., by	1. Detect the failure state of the load (no current flow). 2. Transmit the status and ID wirelessly. 3. Be robust enough for
9	Low-Power Multi-Sensor Weather Station for Agriculture	Hardware	Agriculture / IoT / Environment	Combine basic sensors to measure essential weather parameters (temperature, humidity, and rainfall simulation) and display them	1. Integrate multiple sensor readings into one system. 2. Display real-time data on a simple screen. 3. Ensure the system is battery-
10	Battery Theft and Over-Discharge Lockout for E-Bikes	Hardware	Energy / E-Mobility / IoT / Security	Create a system that monitors the battery level of a rural e-bike/e-scooter and, if it drops too low or is tampered with (e.g.,	1. Monitor battery voltage and trigger a low-voltage cutoff. 2. Implement a simple, key-based authentication (switch/RFID). 3.
11	Harmonics and Overloading of Distribution Transformers	Hardware	Electrical Engineering / Power Systems / EV	the uncoordinated charging of a high density of Electric Vehicles (EVs) introduces non-linear loads into the grid. This leads to the	Design and implement smart charging strategies and/or active power filters/harmonic mitigation transformers (HMTs) to
12	Thermal Management and Life Extension for Charging Station Transformers	Hardware	Electrical Engineering / Thermal Management / EV	Dedicated transformers for high-power DC fast charging stations face extreme and variable load cycles, leading to	Design an advanced, active thermal management system and model the transformer's thermal-aging profile under various fast-
13	Transformer-less Charging Systems Reliability and Safety	Hardware	Power Electronics / EV Infrastructure / Safety	The trend toward transformer-less (non-isolated) EV charging infrastructure or power systems aims to reduce cost and size, but	Investigate and develop highly reliable solid-state fault isolation and protection schemes (electronic fuses, switches) to replace the
14	Condition Monitoring and Predictive Maintenance for Charging Infrastructure Transformers	Hardware	AI / Predictive Maintenance / EV Power Systems	The demanding and variable load profile of EV charging accelerates the degradation of transformers. Current condition	Design and implement an AI-driven condition monitoring system specifically trained to detect and predict faults in
15	Solid Waste Recycle & Reuse	Hardware	Environment / Waste Management / IoT	This problem statement addresses the critical challenge of managing solid waste through recycling and reuse. Recycling	The primary objective of this initiative is to minimize the environmental impact of solid waste by promoting sustainable
16	Plastic Waste in Waterways	Hardware	Environment / Pollution Control / Public Engagement	Plastic pollution in waterways has emerged as a critical environmental challenge with farreaching consequences for	To reduce and prevent the accumulation of plastic waste in rivers, lakes, and oceans by identifying pollution sources, promoting
17	Disaster Response Drone for Remote Areas	Hardware	Disaster Management / Drones / AI / Logistics	Develop a drone-based system to deliver medical supplies and communication devices to remote areas during natural disasters	A working drone prototype with a mobile app for disaster management teams to coordinate deliveries, reducing response
18	Renewable Energy Monitoring System for Microgrids	Hardware	Energy / IoT / Renewable Power Systems	Develop an IoT-based monitoring system for solar or wind microgrids in rural areas, providing real-time data on energy	A hardware-software prototype improving microgrid efficiency by 15%, with a mobile app for community operators to manage
19	360 degree pesticide spraying robot with remote control or joy stick control	Hardware	Agriculture / Robotics / IoT	A 360-degree pesticide spraying robot is an autonomous or remotely controlled device equipped with rotating nozzles for	-To enable uniform pesticide distribution over 360 degrees to cover all plant surfaces.
20	Weed management rover with AI support	Hardware	Agriculture / Robotics / IoT	An AI-supported weed management rover is a robotic vehicle using computer vision and machine learning to identify and	- To use AI algorithms for real-time weed detection and classification.
21	Quality sorting machine for any crop	Hardware	Agri-Tech / Smart Farming	A quality sorting machine for crops is an optical or automated system using cameras, sensors, and AI to grade and separate	- To sort crops by color, size, and defects for uniform quality [16].
22	Tomato/Onion storage system for long period	Hardware	Post-Harvest Technology and Cold Chain Management	A long-period tomato/Onion storage system involves controlled atmosphere (CA) chambers or modified atmosphere packaging	- To regulate temperature and CO ₂ /O ₂ levels to delay ripening [20].
23	Tamarind storage system for retaining the natural colour	Hardware	Food Preservation and Agro-Processing	A tamarind storage system for color retention uses sulphur fumigation (0.2%), aluminum foil packaging, and refrigerated	- To apply anti-browning agents like sulphur fumes to inhibit enzymatic reactions.
24	Root zone irrigation system to reach the roots fast without evaporation	Hardware	Precision Irrigation and Water Management	A root zone irrigation system delivers water directly to plant roots via subsurface drip lines or deep root watering devices, bypassing	- To inject water subsurface to minimize evaporation losses. - To encourage deep root development for drought resistance .
25	Reducing Solid Waste Mismanagement	Software	Sustainability	Theni generates 40 MT of garbage daily, with inefficient collection and dumping leading to environmental pollution and	Design an AI-optimized waste collection route planner app for municipal vehicles. Include community features for segregation
26	Reducing School Dropout Rates Among Rural Girls	Software	Empowerment	High school dropout rates in Theni, especially for girls, stem from poverty, negative parental attitudes, poor school	Develop a mobile app for tracking attendance and sending alerts to parents and schools. Include educational modules on the value

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31	Mobile Application to Analyse the Health of Heavy Machinery Using Sound	Software	Predictive Maintenance	Thermal power plants have a lot of heavy equipment like motors, pumps, valves, heatexchangers etc. Different parts of the	Design a cost-effective and scalable system that analyzes equipment sound patterns to detect early abnormalities in motors,
32	Flood Warning and Forecasting System	Software	Preparedness	Hydropower projects situated at Uttarakhand / Himachal, typically in the Himalayan region are subject to serious natural	Develop an accurate monitoring and early warning system for hydropower projects in Himalayan regions to predict natural
33	Fake News Detection	Software	Authenticity	Misinformation spreads fast on social media. Build a browser plugin or app that flags potential fake news using fact-checking	Create a browser plugin or mobile app that leverages fact-checking APIs and community-driven ratings to detect, flag, and
34	Smart E-Waste Management and Awareness System	Software	Eco Responsibility	Electronic waste (e-waste), such as discarded mobile phones, laptops, televisions, and batteries, is one of the fastest-growing	To support participants, several resources are available for research and inspiration. Reports such as the United Nations
35	Rural Awareness and Accessibility of Tamil Nadu Government Schemes	Software	Inclusion	Despite the Tamil Nadu government implementing numerous welfare schemes for education, health, livelihood, women	The objective is to empower rural citizens by providing timely information about government schemes and services. The
36	Tourism Development and Eco-Sustainability	Software	Eco Tourism	Theni district is home to natural attractions such as Suruli Falls, Vaigai Dam, and Meghamalai. Despite this, the district's tourism	The goal is to design a tourism development plan that promotes local attractions responsibly, encourages eco-friendly practices,
37	Orphanage and oldaged Management System	Software	Care Connect	Develop a comprehensive management system for orphanages in Theni District, including features for tracking child welfare,	An integrated system for orphanages in Theni District to monitor child welfare records, manage case histories, log daily routines,
38	Sign Language Interpreter App	Software	Accessibility	Create a mobile app that uses AI-powered sign language recognition to facilitate communication between physically	Communication for those using sign language is hindered in public and official settings due to limited sign language literacy
39	AI-Powered Depression Detection among Young People using Drug Consumption Patterns	Software	Mental Wellness	Depression among young people is a rising public health challenge, drug and alcohol consumption patterns can be early	Use drug consumption datasets (legal and illegal substances, alcohol, tobacco, etc.).
40	Village Road Damage Detector	Software	Infrastructure	Remote and hilly villages in Theni, such as Meghamalai and Bodhi Hills, face frequent road damages due to landslides, heavy rains,	1. Detect road damages using AI and drone imagery. 2. Provide real-time alerts to panchayat authorities.
41	Forest Fire Early Warning System	Software	Wildfire Prevention	Western Ghats near Theni are prone to forest fires during dry seasons, threatening wildlife and local communities. Current	1. Detect fire outbreaks using IoT sensors and satellite imagery. 2. Provide early alerts to forest departments and villagers.
42	Grapes Cold Storage with IoT Monitoring	Software	Agri Preservation	Grape farmers in Cumbum valley face post-harvest losses due to lack of temperature and humidity control in storage facilities.	1. Maintain optimal temperature and humidity for grapes. 2. Reduce post-harvest losses.
43	AI Dengue Outbreak Predictor	Software	Disease Prevention	Villages in Theni experience seasonal dengue outbreaks, but predictive measures are limited, causing delays in prevention and	1. Predict dengue outbreak hotspots using AI. 2. Inform local health authorities for early intervention.
44	Interactive Farming Education for Students	Software	Agri Learning	Students in rural areas lack practical exposure to modern farming techniques.	Educate students about modern farming practices; Increase interest in agriculture among youth; Provide hands-on virtual
45	Canal Cleaning AI Robot	Software	Water Conservation	Manual cleaning of canals is time-consuming and inefficient, leading to water pollution.	Automate canal cleaning; Reduce labor dependency; Improve water quality. Solar-powered cleaning robot; IoT-based
46	Banana Smart Farming	Software	Smart Agriculture	Banana farmers face crop diseases and low yield due to lack of monitoring and predictive analysis.	Early detection of diseases; Optimize water and nutrient usage; Increase yield and profitability. Integrate weather forecasting;
47	Women Self-Help Group (SHG) Digital Platform	Software	Women Empowerment	Lack of digital integration limits financial independence and market access for SHGs.	Empower women economically; Provide digital literacy and finance management; Improve product marketing and
48	Image based breed recognition for cattle and buffaloes of India	Software	Agri Analytics	Breed identification errors in BPA often arise due to manual judgment and lack of breed-specific awareness among FLWs.	Uses Artificial Intelligence (AI) and image analysis to recognize and classify the breed of cattle and buffaloes based on images.
49	Gamified Environmental Education Platform for Schools and Colleges	Software	Eco Gamification	Despite the rising urgency of climate change and environmental degradation, environmental education remains largely theoretical	Not specified
50	Automated Drone system for Precise field Marking	Hardware	Precision Mapping	This project aims to develop an advanced drone-based system for accurate and efficient marking of construction	o To develop a drone-based system capable of accurately identifying and marking construction site