

ANNEXURE III - PROBLEM STATEMENTS

Sl. No.	Curated Problem Statements	Innovation Context	Innovation / Output Expected
Agritech & Food Technology			
1	How can we design safer alternatives and improved application techniques to address health hazards associated with pesticides, reducing human exposure and safeguarding both the environment and public health?	Design an advanced technology for safer pesticide alternatives and application methods minimizing health risks, reducing human exposure and protecting the environment and public health.	Organic farming practices
2	How might we develop an affordable specialized vegetable harvester to improve automation and productivity in the agriculture sector, meeting the needs of the masses?	Develop a vegetable harvester to reduce waste and improve productivity	Prototype of an Vegetable harvester
3	How might we develop an innovative, thermally controlled storage system to address challenges in postharvest tomato storage, overcoming limitations in current preservation methods? The goal is to extend shelf life and minimize degradation, marking a significant stride in enhancing storage practices.	Create an innovative storage mechanism to prevent post harvest damages in tomato processing	Storage mechanism system for tomatoes, as are highly perishable and too delicate
4	How might we innovate to address urban excess food waste, hunger-related deaths, and create a logistic network with innovative technology and cost-effective storage solutions? This aims to efficiently transfer surplus food from cities to areas in deficit.	Create an application that facilitates the connection between surplus and deficient food resources within a community's network.	App - cooked food supply chain - ERP model
5	How might we innovate in detection methods for mycotoxins, toxic secondary metabolites in food, to minimize contamination and ensure the safety of food processing units? The goal is to enhance current techniques, primarily chromatographic, for more effective results.	Develop innovative mycotoxin detection methods in food processing units enhancing safety, improving upon current chromatographic techniques for more effective results.	Effective mechanism to detect mycotoxin to ensure safety
6	How can we create an advanced agricultural bot to address challenges faced by small-scale farmers? This involves enhancing crop management, income, and food security through real-time soil testing, pest detection, and autonomous operations, with the aim of doubling agricultural output and income.	Create an AI-driven agricultural bot featuring voice chat capabilities to tackle issues encountered by small-scale farmers. This includes real-time soil testing, pest detection, and autonomous operations, aiming to address challenges related to crop management, income, and food security.	Chatbot - AI driven interactive agri bot providing realtime assistance in cultivation and market linkages
7	How we design a cost-effective, energy-efficient small-scale cold storage unit for horticultural produce to extend perishable crop shelf life, specifically catering to the preservation needs of small-scale farmers.	Construct a cost-effective prototype for a cold storage unit designed to preserve horticultural produce.	Low cost Cold storage unit for horticulture produce

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8	How might we develop an effective Harvesting machine for crops that is lightweight, cost-effective, and convenient to handle and transport across various wet fields to address the challenges of the current model?	Create a functional model to enhance harvesting efficiency and address losses during transportation.	Loss prevention mechanism during harvesting and transportation
9	How might we implement semi-automation for the raw cutting process in cashew processing to reduce dependency, increase efficiency, and enhance overall productivity in the cashew industry?	Create a semi-automated raw cutting process in cashew processing to reduce labour, improve efficiency, and elevate overall productivity in the cashew industry.	Semi automated cashew processing mechanism
10	How might we develop suitable technology to estimate crop yield, leveraging technology to analyze agricultural data, optimize farming practices, and ensure accurate predictions for improved food production and security?	Develop a mobile app that integrates AI and data analytics to examine agricultural inputs, providing optimal farming suggestions along with corresponding crop yields.	AI assisted App for farmers on agri practices and suggestive crops
11	How might we create a system that leverages satellite imagery and machine learning to detect vegetation height beneath transmission lines, anticipate growth patterns, and generate alerts for timely trimming when needed?	Develop a system using satellite imagery and machine learning to detect vegetation height below transmission lines, predict growth, and raise alerts for necessary trimming.	Satelite imagery system for pruning vegetation interference in power transmission lines
12	How might we optimize water management in piped and micro irrigation? Integrating AI to predict crop water needs, automate valves, and boost yield.	Develop an AI-driven solution for precise water management in piped and micro irrigation networks by predicting dynamic crop water demands, integrating real-time soil moisture data, and automating valve control mechanisms to optimize water usage and crop yield.	AI driven sensor driven system for irrigation and water waste minimization
13	How might we develop image processing software using machine learning to identify medicinal plants, enhancing authenticity and ensuring integrity in the medicinal plant supply chain?	Develop image processing software using machine learning to identify medicinal plants, aiding authenticity and supply chain integrity.	ML assisted image processing software in medicinal plants management and related supply chain
Clean and Green Technology			
14	How might a comprehensive strategy be designed to mitigate the environmental impact of plastic degradation in the marine ecosystem? This multifaceted initiative seeks to create effective anti-pollutants, innovative methods for plastic disposal in oceans, tactics to boost algae growth, and the deployment of boats with robots for efficient plastic waste collection.	Build a working model using robot for effective plastic waste collection from oceans.	Device to collect plastic wastes in oceans
15	How might we design a cost-effective home composting solution for daily kitchen waste, ensuring quick and odor-free decomposition? The current lack of such an efficient system poses a challenge for homemakers seeking sustainable waste management.	Design a cost-effective composting solution for easy decomposing of home wastes	Household waste Decomposter

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16	How can we design a solution to address the challenge of fugitive dust emissions from stone crusher units & crematorium causing air pollution?	Create a prototype for collecting fugitive dust emissions from stone crusher and crematorium units.	Prototype - atmospheric dust collector
17	How might we develop eco-friendly construction materials, specifically suitable for high-rise buildings, to mitigate the environmental impact of carbon dioxide emissions from cement production, exacerbated by urbanization and excessive concrete use?	Develop eco-friendly construction materials suitable for high-rise buildings to mitigate CO2 emissions from concrete use	Alternate to cement and iron with strong characteristics to be identified
18	How we create a solution for efficient autonomous dust cleaning beneath roofs in industries, marriage halls, cinema theaters, and college auditoriums to maintain clean and healthy environments?	Develop technology for autonomous dust cleaning in industrial, commercial, and educational spaces to ensure a clean, healthy environment under roofs.	Commercial robotic cleaner for higher surface coverage
19	How might we develop a low-cost automation system to address the labor-intensive manual extraction of dry coir pith? The industry requires an innovative suction system capable of efficiently collecting and transporting pith to manufacturing units, handling various materials simultaneously.	Create a cost and time effective automation model to reduce labour intensive manual extraction of dry coir pit.	Device for extraction of dry coir pith
20	How can we reduce the contribution of Cement Industries in global CO2 emissions and come up with alternate sustainable solutions.	Develop sustainable alternatives and technology to minimize CO2 emissions from Cement Industries, mitigating their environmental impact effectively.	Manufacturing technique to reduce CO2 emissions in cement manufacturing
21	How can we create an automatic sensor model to address ammonia/H2S gas emissions from bird litter in the poultry sector, managing odor and fly issues? The goal is to assess gas emissions and trigger alerts when limits are exceeded, prompting necessary measures for effective management.	Create a automatic sensor model to address ammonia/H2S gas emissions from bird litter in poultry sector	Sensory detector of hazardous gases in poultry farms
22	How might we develop a sustainable and eco-friendly extraction method for chitosan from shrimp shells to meet the increasing demand for chitosan across various industries?	Develop a cost and time effective extraction method for chitosan from shrimp shells	Develop a cost and time effective extraction method for chitosan from shrimp shells

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Education 4.0			
23	How might we explore the adoption of game-based education to cultivate diverse skills, motivate students with points and leaderboards, and ensure inclusivity for students with disabilities? The goal is to enhance learning outcomes and confidence.	Develop an interactive game-based education app integrating points and leaderboards, ensuring inclusivity for disabled students, aiming for improved learning and confidence.	Gamified app for learning by PwDs
24	How might we create a skill/job recommender application using suitable technology, transforming career guidance by leveraging technology to match individuals with suitable jobs, fostering efficient employment and career development?	Develop a app integrating AI methodology using open source data as career guidance and job recommender for aspiring youth.	Career guidance app for students - AI assisted
Health/Med Tech			
25	How might we design a cost-effective Myoelectric prosthetic arm using 3D printing, servo motors, Arduino, and Myoware muscle sensors, ensuring affordability without compromising functionality and quality?	Build a cost effective and intuitive prosthetic arm for seamless integration in natural body movements	Prototype - prosthetic arm
26	How can we design an image processing algorithm for portable X-ray devices to reduce noise, enhance contrast, and sharpen images without altering critical diagnostic details? This includes considering hardware limitations, ensuring computational efficiency, and validating with diverse datasets for accurate clinical application.	Design an image processing algorithm for portable X-ray devices in refining images by minimizing noise, improving contrast, and preserving critical diagnostic details, considering hardware constraints and ensuring computational efficiency.	Prototype user friendly multifunctional & precision diagnostic device with inbuilt data storage and retrieving system
27	How might we utilize AI chatbots and machine learning to address the challenges of incomplete alleviation of depression symptoms, attrition, and loss of follow-up in mental health treatment?	Create interactive chatbot integrating AI and ML to address the challenges in mental health treatment	Interactive AI infused chatbot for treatment of mental illness
28	How might we develop analytics for hospitals' health-care data, optimizing data utilization to improve patient care, streamline operations, and enhance overall efficiency in healthcare institutions?	Develop analytics to optimize healthcare data in hospitals, aiming to improve patient care, streamline operations, and enhance overall institutional efficiency in healthcare.	Analytic tool for healthcare data of patients in hospitals and other institutions
29	How might we create a telemedicine robotic kiosk for rural India, utilizing AI, biometric ID, and the e-sanjeevani App for personalized access to expert doctors and timely medication delivery?	Develop an AI-assisted telemedicine robotic kiosk for rural India, allowing easy access to expert doctors based on individual health conditions, facilitated by biometric identification and e-sanjeevani App, enabling timely medication delivery.	Robotic AI enabled medical kiosk for remote consultation

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Heritage & Culture			
30	How might we develop a digital platform that creates a comprehensive repository, ensures authenticity, and fosters cross-generational dialogue for the appreciation and revitalization of diverse cultural elements to preserve endangered indigenous heritage and culture amidst modern challenges?	Develop a digital platform to preserve endangered indigenous heritage, fostering cross-generational dialogue, and revitalizing diverse cultural elements amid modern challenges.	Interactive digital platform for preserving details pertaining to heritage
Smart Manufacturing			
31	How might we design cost effective personalized motorcycles and tricycles for individuals with disabilities, addressing their unique challenges and offering inclusive and accessible transportation solutions that cater to their specific needs and preferences?	Develop personalized motorcycles and tricycles for people with disabilities involves designing inclusive and cost-effective transportation solutions tailored to their specific requirements and preferences.	Customized motor vehicles for PwDs
32	How might we safeguard sensitive data in IIoT systems? Addressing cybersecurity threats, securing data transmission, and implementing robust access controls are critical for ensuring the safe deployment of interconnected industrial solutions.	Develop robust cybersecurity measures in safeguarding sensitive data in IIoT systems, ensuring secure data transmission, addressing threats, and implementing stringent access controls.	Cybersecurity measures to ensure privacy in IoT with proper controls
33	How we innovate to enhance multimedia and animation, addressing challenges in realism, efficiency, cross-platform compatibility, compression, VR/AR, education, ethics, and inclusivity? The project aims is to promote innovative techniques and tools for immersive, inclusive, and ethical content creation across various industries.	Develop innovative multimedia and animation based app that tackles challenges in realism, efficiency, cross-platform compatibility, compression, VR/AR, education, ethics, and inclusivity for diverse industry content creation.	App - Industry 4.0 compliant with cross functional capabilities using VR/AR for usage across various industries
34	How might we create an innovative shopping assistance system using industrial automation specifically designed for disabled individuals? The focus is on integrating eye blink technology, elevator enhancements, and a human-following bot to enhance independence, save costs, secure purchases, and overall improve the quality of life for people with disabilities.	Develop an innovative AI based interactive shopping assistance system for disabled individuals with specifics on eye blink technology, elevator enhancements	Sensor based shopping assistance system for PwDs
35	How might we develop a suitable technology to track deep-sea fishermen or their locations, ensuring effective monitoring and enhancing safety measures in maritime activities?	Develop a AI/ML based GIS app for detecting fishermens location in deep sea fishing.	GIS - deep sea fishing App

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Renewable & Sustainable Energy			
36	How might we develop a solution to enhance solar panel efficiency by addressing the challenges of dust and atmospheric moisture accumulation, which currently diminish their performance below intended levels?	Develop a working model to boost solar panel efficiency by tackling dust and moisture accumulation challenges, crucial factors affecting performance.	Coating on solar panels to repel foreign agents accumulation
Smart Town/City			
37	How to solve the challenge of honeycombing in high-rise buildings with a 100-meter elevation by developing innovative construction techniques or materials that enhance structural integrity and ensure the safety and durability of tall structures.	Develop an innovative construction technique to repel honeycomb structures in high rise buildings	Preventive construction technique that the surface repels formation of any external layers
38	How might an innovative solution address communication challenges in remote areas, such as hilly and forest regions with weak or no network coverage? The goal is to develop an affordable and accessible emergency communication system, considering that satellite phones are financially unfeasible for most of the population.	Develop an Emergency Communication system for hilly & forest regions	System for penetrative emergency communication system
39	How might the utilization of the digital twin technology for virtual city creation seeks to enhance urban planning, decision-making, and resource management, providing a cost-effective solution for more efficient and informed urban development.	Develop digital twin technology for virtual city creation enhances urban planning, decision-making, and cost-effective resource management in urban development.	Digital twin system for virtual planning
40	How might we design a GIS-based solution to identify and manage harmful plants infestation, ensuring real-time updates on infestation patterns, and addressing ecological and socio-economic impacts?	Design a GIS based solution to identify harmful infestation patterns with real time updates	GIS - Alerts on infestations and remedial measures
41	How might we develop an Autonomous Firefighting Drone to overcome challenges in firefighting, addressing urban traffic, narrow streets, and remote terrains? The goal is to enhance efficiency, reduce response times, and overcome access limitations.	Build an autonomous firefighting drone to overcome challenges in urban firefighting, enhancing efficiency by reducing response times.	Prototype automatic sensory firefighting drone
42	How we innovate in designing an, cost-effective shelter solution to shield Live Stocks from harsh weather conditions during rainy seasons, mitigating health risks, minimizing hoof problems, and fostering herd well-being and productivity.	Develop cost-effective shelter solutions for livestock during rainy seasons, minimizing health risks, hoof problems, and ensuring herd well-being and productivity.	Cost effective and hygienic shelter for livestock

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43	How can we create a chatbot that can provide reliable and relevant information about various government schemes to the citizens, and help them identify their eligibility criteria for different programs, using an intuitive interface, engaging conversation, and diverse scenarios?	Develop a chatbot offering citizens information on government schemes, eligibility criteria, and engagement through an intuitive interface and diverse scenarios.	Chatbot - schemes of Government and who can avail and how to avail
44	How might we develop a unique platform to market traditional products, supporting the livelihood of rural artisans and pottery makers, fostering economic sustainability and preserving cultural heritage?	Create a AI enabled app for promoting traditional products, supporting the livelihoods of rural artisans and pottery makers, fostering economic sustainability, and preserving cultural heritage.	AI enabled App for artisans to facilitate market linkages
45	How might we create an AI-powered nutrition analyzer for fitness enthusiasts, revolutionizing dietary tracking and personalizing nutritional insights to optimize health and fitness goals effectively?	Develop AI powered nutrition analyser for fitness enthusiast for regulating overall fitness goals	AI enabled fitness analyser
46	How might we create an innovative drone system utilizing AI for automatic human detection in disaster situations, generating alarms, and efficiently dropping payloads, integrating technologies like cameras, processors, and payload mechanisms?	Create an AI enabled drone in automatic detection of human movements in disaster situations	AI enabled drone to track human movements during disasters
47	How might we develop a reliable explosion risk detection system for the oil and gas industries that can effectively identify potential threat zones and issue early warnings to nearby workers?	Develop an explosion risk detection system for oil and gas industries to identify threat zones and issue early warnings to nearby workers.	Sensor based alarm in oil and gas industry to alert any threats
48	How might we develop impactful solutions using Government Land Information System (GLIS) data to address urban planning, infrastructure, environmental conservation, land governance, and socio-economic challenges? Enabling evidence-based decision-making for sustainable development.	Develop analytics solutions leveraging Government Land Information System (GLIS) data to address societal challenges in urban planning, infrastructure, environmental conservation, land governance, and socio-economic analysis, enabling evidence-based decision-making and sustainable development.	Analytical tool for local governance using GLIS for strategic planning
49	How might we design a tool to assess an organization's ransomware readiness? Emphasizing prevention, detection, usability, and reporting to enhance overall resilience against potential cyber threats.	Design a tool to evaluate an organization's readiness against ransomware attacks, focusing on assessing prevention, detection, usability, and reporting.	Tool to detect ransomware attack in organizations
50	How might we develop a blockchain-based application to identify and counter fake social media profiles? Tailored for investigative agencies and law enforcement, enhancing profile authenticity and security.	Develop a blockchain-based application to detect and mitigate fake social media profiles, serving the requirements of investigative agencies and law enforcement	Application to detect fake social media profiles using block chain to support law enforcement

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51	How might we develop AI/ML-based technology to efficiently detect avalanche victims in harsh conditions? Exploring innovative ground-penetrating radar alternatives for improved accuracy and response.	Develop AI/ML-based technology for detecting avalanche victims efficiently in harsh conditions using innovative ground-penetrating radar alternatives.	GIS enabled spotting of avalanche victims powered by AI/ML
52	How might we develop an AI-ML-based GIS application, utilizing open-source software, to analyze past flood imageries and project new images for specific flood levels? Aiding spatial assessment in flood-prone areas for enhanced rescue and relief efforts.	Develop an AI-ML-based GIS application using open-source software to analyze past flood imageries, project new images for specific flood levels, aiding spatial assessment for rescue and relief in flood prone areas	GIS app for flood management
53	How might we develop an automatic self-cleaning toilet system, incorporating UV disinfection, hot air drying, water-saving features, and real-time availability tracking for nearby functional toilets?	Develop an automatic self-cleaning toilet system with UV disinfection, hot air drying, water-saving features, and real-time availability tracking of nearby functional toilets.	Automated toilet cleaner with minimal cleaning resources
54	How might we create prosthetic solutions for lower limb amputees, enabling motorcycle riding? Emphasizing brake and gear operation aligned with ankle movements for a seamless and adaptive experience.	Create prosthetic solutions for lower limb amputees to enable motorcycle riding, focusing on brake and gear operation aligned with ankle movements.	Prosthetic limb with ankle movements facilitating motor cycle riding
55	How might we create an AI-powered sentiment analysis solution specialized in interpreting emotions within social media content? Empowering individuals and organizations to manage online reputation and perception effectively.	Create an AI-powered sentiment analysis solution specialized in interpreting emotions within social media content, empowering individuals and organizations to manage their online reputation and perception effectively.	AI enabled analytical tool to interpret social media content to manage online reputation
56	How might we develop tech solutions to support undertrial prisoners in India? Designing a mobile app for legal aid, connecting them with lawyers, clinics, and providing rehabilitation through education, vocational training, and mental health support.	Develop tech solutions aiding undertrial prisoners in India: a mobile app for legal aid, connecting them to lawyers, clinics, and offering rehabilitation via education, vocational training, and mental health support.	Proctored AI kiosk/ app for prisoners rehabilitation
57	How might we develop an automated system for real-time street light fault detection, precise location tracking, and efficient maintenance in cities to enhance urban lighting infrastructure?	Develop an automated system for real-time street light fault detection, precise location tracking, and efficient maintenance in cities.	Automated controller of street light management systems
58	How might we develop a user-friendly digital assistant providing legal information in multiple languages? Aiming to enhance accessibility and improve legal awareness among marginalized communities in India.	Develop a user-friendly digital assistant providing legal information in multiple languages, aiding accessibility and improving legal awareness among marginalized communities in India.	Digital AI assisted chatbot for legal support of marginalized communities

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Waste Management			
59	How can we create a process to transform non-biodegradable products into useful ones, mitigating environmental impact and promoting sustainable solutions?	Build a working prototype for remodelling non-biodegradable products into useful items	Prototype for recycling non bio degradable materials into products
60	How might we create an integrated e-waste management chain within educational institutions through collaborative industry partnerships? The project aims to collect, segregate, process, recycle, and reuse electronic waste, promoting environmental sustainability while generating financial returns.	Design an integrated e-waste management cycle within educational institution promoting environmental sustainability while generating financial returns for students	Device and system to recycle e-waste. Raw e-waste to an output or non-harardus decompostable waste
61	How might we develop a sustainable and eco-friendly method to create biodegradable/edible food packaging materials from fish waste using marine biopolymers to replace synthetic plastics, mitigating pollution in land, water, and air?	Develop a biodegradable edible food packaging material using marine biopolymers	Biodegradable food packaging materials using biopolymers
62	How might we innovate solutions for the proper disposal of sanitary waste, ensuring environmental safety, cost-effectiveness, and scalability across diverse settings such as villages and educational institutions?	Develop cost effective and innovative solutions for proper sanitary waste disposal ensures environmental safety, cost-effectiveness, and scalability across diverse settings like villages and educational institutions'	Cost effective environment friendly sanitary waste disposal mechanism
Water & Soil Conservation			
63	How might we address the significant problem of contamination in groundwater by seeking solutions for detection, remediation, and prevention and the goal is to safeguard public health and ensure the sustainability of groundwater resources in affected areas.	Develop innovative technology to tackle plastic degradation in marine ecosystems through anti-pollutants, novel disposal methods, and robotic waste collection.	Device and an operating mechanism to collect plastic waste and dispose and/or recycle
64	How might we address the excessive water usage in textile fabric dyeing, seeking solutions to significantly reduce water consumption during the dyeing process?	Develop innovative process flow to drastically reduce water consumption in textile fabric dyeing without compromising the quality of the dyeing process.	Dyeing process with less water consumption or no water consumption
65	How might we develop a solution to combat global water depletion by creating an efficient water distribution network? The solution involves implementing a cloud-based dashboard for analytics, improving service, enhancing repair efficiency, reducing leakage, enabling GIS mapping, and overcoming deployment constraints for accurate water supply line assessment.	Develop a cloud-based dashboard for global water depletion to enhance repair efficiency, reduce leakage, enable GIS mapping, and assess water supply lines accurately.	Data management system - water supply and channelling with GIS mapping