

Topper Mantra Innovation Challenge (TMIC) 2026

Theme 3: Environment, Climate Change & Agriculture Risk

50 Premium Hackathon Problem Statements | Classes 8-12

Readable edition with bold section labels, objective bullets, proper spacing, and publication-style formatting.

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Segment A: Climate Awareness, Local Risk & Disaster Preparedness

TMIC-ECA-001

Local Climate Risk Mapping for Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many climate-related problems are experienced locally before they are understood globally. Around schools, students may notice heat zones, waterlogging points, dust-heavy roads, unsafe open spaces, tree loss, or flood-prone routes. However, such local risks are rarely mapped in a structured way. A student-led mapping system can help schools understand risk and plan practical actions.

Problem Statement: Design an innovative solution that helps students identify, document, and map local climate-related risks around their school or locality.

Objectives:

- Identify local environmental and climate risks
- Create student-friendly maps or records
- Support safer campus and route planning
- Encourage observation-based climate learning

Scope of Innovation: Participants may use surveys, physical maps, GPS-based mapping, community interviews, photo documentation, risk scorecards, or digital dashboards to identify and present local climate vulnerabilities.

Expected Impact: Schools and students gain a clearer understanding of local climate risks and can take informed action for safety and preparedness.

Challenge Tags: Climate Mapping • Local Risk • School Safety • Student Research

TMIC-ECA-002

Heatwave Safety System for Students

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Heatwaves are becoming more frequent and intense in many parts of India. Students are especially vulnerable during assemblies, sports periods, travel, and long school hours. Lack of shade, hydration, and awareness can lead to dizziness, fatigue, headaches, or heat-related illness. Schools need simple systems to protect students during extreme heat.

Problem Statement: Design a school-friendly solution that helps students, teachers, and parents prepare for heatwaves through alerts, hydration planning, shade mapping, and safer activity scheduling.

Objectives:

- Improve heatwave awareness
- Reduce dehydration and heat stress
- Support safer school routines
- Help teachers plan outdoor activities responsibly

Scope of Innovation: Solutions may include heat-risk alerts, hydration reminders, shaded-route maps, cool classroom ideas, sports-day protocols, water point planning, or student safety cards.

Expected Impact: Students remain safer and more comfortable during high-temperature days, and schools become better prepared for heat-related risks.

Challenge Tags: Heatwave • Hydration • Climate Safety • School Health

TMIC-ECA-003

Flood Preparedness for School Communities

Background: Heavy rainfall, poor drainage, river overflow, and waterlogging can disrupt school attendance, transport, and community movement. In flood-prone areas, students may face unsafe roads, blocked routes, contaminated water, and communication challenges. Schools can become important centres for preparedness and awareness.

Problem Statement: Design an innovative solution that helps schools and nearby communities prepare for floods, waterlogging, road blockage, emergency movement, and safe communication during heavy rainfall.

Objectives:

- Improve flood preparedness
- Identify safe routes and unsafe zones
- Support emergency communication
- Reduce panic during heavy rainfall situations

Scope of Innovation: Participants may design flood-risk maps, emergency route boards, community alert systems, school flood kits, waterlogging reports, evacuation plans, or student awareness modules.

Expected Impact: Schools and communities become more prepared to respond safely and quickly during flood or waterlogging situations.

Challenge Tags: Flood Preparedness • Waterlogging • Emergency Planning • Community Safety

TMIC-ECA-004

Climate-Safe School Timetable

Background: School routines are often fixed even when weather conditions change. Extreme heat, heavy rain, poor air quality, storms, and seasonal illness risks can affect outdoor activities, sports, assemblies, travel, and student comfort. A climate-sensitive timetable can make school operations safer and more flexible.

Problem Statement: Design a smart timetable or activity planning system that adjusts school routines during extreme heat, heavy rain, pollution days, or seasonal climate risks.

Objectives:

- Make school schedules climate-responsive
- Protect students during risky weather
- Reduce disruption to learning
- Help schools plan activities more safely

Scope of Innovation: Participants may propose weather-based scheduling rules, activity rescheduling tools, school alert boards, class-wise routine changes, assembly alternatives, or manual planning templates.

Expected Impact: Schools manage climate-related disruptions better while maintaining learning continuity and student safety.

Challenge Tags: Timetable • Climate Adaptation • School Operations • Safety

TMIC-ECA-005

Student Climate Diary and Behaviour Tracker

Background: Students observe weather, water use, energy habits, waste, crop changes, and local environmental problems every day. However, these observations often remain informal. A climate diary can help students connect daily behaviour with environmental outcomes and build a habit of scientific observation.

Problem Statement: Design a solution that helps students observe local climate patterns, record daily environmental changes, and connect them with health, agriculture, water, or school-life impacts.

Objectives:

- Build observation and documentation habits

- Connect climate with daily life
- Encourage responsible behaviour
- Support data-based student learning

Scope of Innovation: Solutions may include climate diaries, mobile logs, class observation boards, weather journals, behaviour trackers, reflection cards, or community data collection models.

Expected Impact: Students become more aware of climate change through real observations and develop stronger responsibility toward environmental action.

Challenge Tags: Climate Diary • Observation • Behaviour Change • Student Learning

TMIC-ECA-006

Early Warning System for Local Environmental Hazards

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Environmental hazards such as high temperature, heavy rainfall, poor air quality, waterlogging, unsafe waste burning, or dust exposure can affect students and communities quickly. Many localities do not receive timely, understandable alerts. Student-led early warning systems can make risk information simple and actionable.

Problem Statement: Design a low-cost solution that alerts students and communities about local environmental hazards in a timely and understandable way.

Objectives:

- Provide early hazard information
- Improve community preparedness
- Reduce exposure to risky conditions
- Make alerts easy to understand and act upon

Scope of Innovation: Participants may build alert boards, SMS/WhatsApp workflows, colour-coded risk signals, sensor-based warnings, community notice systems, or student monitoring teams.

Expected Impact: Communities receive timely information and can take preventive action before environmental hazards cause serious disruption.

Challenge Tags: Early Warning • Environmental Hazards • Alerts • Community Preparedness

TMIC-ECA-007

Climate-Resilient School Campus

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: A school campus should be able to handle heat, rain, water scarcity, dust, and extreme weather. Many schools have open grounds without shade, poor drainage, hot classrooms, and weak water management. A climate-resilient campus can improve safety, comfort, and learning conditions.

Problem Statement: Design a practical model for a school campus that can better handle heat, rain, dust, water scarcity, and extreme weather while remaining affordable for Indian schools.

Objectives:

- Improve campus resilience
- Reduce climate-related discomfort
- Support safer learning spaces
- Use affordable and practical design ideas

Scope of Innovation: Teams may propose shade structures, cool roofs, drainage plans, rainwater systems, green zones, dust control, heat-safe classrooms, or climate-resilient campus layouts.

Expected Impact: Schools become safer and more comfortable during extreme weather while using practical, student-led environmental solutions.

Challenge Tags: Resilient Campus • Climate Adaptation • School Design • Safety

TMIC-ECA-008

Disaster-Ready Green School Kit

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools may face disasters such as floods, storms, fires, heatwaves, earthquakes, or health-related emergencies. Preparedness is often limited to occasional drills. A practical kit can combine disaster readiness with environmental safety, safe water, waste control, communication, and student awareness.

Problem Statement: Design a school emergency kit or preparedness model that combines disaster readiness with environmental safety and student-friendly response guidance.

Objectives:

- Improve emergency preparedness
- Combine safety with environmental responsibility
- Support quick response during disruptions
- Build student awareness through practical tools

Scope of Innovation: Participants may design physical kits, emergency cards, safe water tools, communication plans, waste-control supplies, hazard maps, drill guides, or classroom safety modules.

Expected Impact: Schools become better prepared for emergencies while students learn practical safety and environmental responsibility.

Challenge Tags: Disaster Readiness • Green School • Emergency Kit • Safety

TMIC-ECA-009

Climate Awareness Through Local Storytelling

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Climate change is often explained through global data, but students understand it better when connected to local stories. Farmers, elders, shopkeepers, parents, and community members can describe changes in rainfall, heat, water, crops, trees, and seasonal patterns. Storytelling can make climate learning personal and relatable.

Problem Statement: Design an engaging solution that uses local stories, student observations, community interviews, maps, or visual media to explain climate change in a way students can understand and act upon.

Objectives:

- Make climate awareness relatable
- Connect students with community knowledge
- Encourage local evidence collection
- Promote action-oriented climate learning

Scope of Innovation: Solutions may include story maps, short films, audio archives, exhibitions, interview projects, local climate museums, comic books, or student-led storytelling campaigns.

Expected Impact: Students understand climate change through real local experiences and feel motivated to take meaningful action.

Challenge Tags: Climate Awareness • Storytelling • Community Knowledge • Local Action

TMIC-ECA-010

School Climate Action Dashboard

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools may conduct plantation drives, cleanliness campaigns, electricity-saving activities, water-saving efforts, and awareness programmes, but they rarely track progress over time. Without measurement, climate actions may become symbolic. A dashboard can help schools monitor real progress and student participation.

Problem Statement: Design a dashboard or tracking model that helps schools monitor their climate actions such as plantation survival, waste reduction, water saving, electricity saving, and student participation.

Objectives:

- Track school climate actions
- Measure progress over time
- Increase accountability
- Encourage student participation

Scope of Innovation: Participants may create digital dashboards, wall trackers, class scorecards, climate action registers, participation boards, impact indicators, or annual climate report formats.

Expected Impact: Schools move from one-time activities to measurable climate action and continuous improvement.

Challenge Tags: Climate Dashboard • Impact Tracking • Green School • Student Participation

Segment B: Waste Management & Circular Economy

TMIC-ECA-011

Smart Waste Segregation in Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools generate different types of waste every day, including food waste, paper, plastic, wrappers, sanitary waste, and recyclable materials. When waste is mixed, recycling and safe disposal become difficult. Students often know that segregation is important but do not follow it consistently.

Problem Statement: Design an innovative solution that helps students correctly separate dry waste, wet waste, paper waste, plastic waste, sanitary waste, and recyclable material inside the school campus.

Objectives:

- Improve waste segregation habits
- Reduce mixed waste
- Make disposal simple and visible
- Support recycling and safe handling

Scope of Innovation: Teams may create colour-coded bins, smart labels, student waste monitors, gamified segregation systems, awareness boards, QR instructions, or waste sorting challenges.

Expected Impact: Schools manage waste more responsibly and students develop everyday habits for cleaner surroundings.

Challenge Tags: Waste Segregation • Clean Campus • Recycling • Student Behaviour

TMIC-ECA-012

Plastic-Free School Challenge

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Single-use plastic items such as wrappers, bottles, bags, disposable plates, and packaging are common in school environments. Simply banning plastic may not work if students and vendors do not have practical alternatives. A successful solution must reduce plastic without creating inconvenience.

Problem Statement: Design a practical system that helps schools reduce single-use plastic items without disrupting student routines or canteen operations.

Objectives:

- Reduce single-use plastic
- Promote practical alternatives
- Involve students and vendors
- Build long-term plastic-free habits

Scope of Innovation: Solutions may include refill stations, reusable container systems, vendor guidelines, student campaigns, plastic audits, reward challenges, or eco-friendly packaging alternatives.

Expected Impact: The school campus reduces plastic waste while students learn realistic and sustainable consumption habits.

Challenge Tags: Plastic-Free School • Sustainability • Waste Reduction • Behaviour Change

TMIC-ECA-013

Food Waste to Useful Resource

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Food waste from tiffins, canteens, hostels, and school events can create bad odour, attract pests, and waste valuable resources. At the same time, biodegradable waste can be converted into compost, garden support, or learning material. Schools need a practical way to treat food waste as a resource.

Problem Statement: Design a solution that converts or redirects school food waste into useful outcomes such as compost, garden support, animal feed linkage, or waste reduction insights.

Objectives:

- Reduce food waste
- Convert waste into useful resources
- Support school gardens
- Promote responsible consumption

Scope of Innovation: Participants may design composting units, food waste logs, collection systems, garden-link models, awareness campaigns, or feedback tools to reduce waste at the source.

Expected Impact: Schools reduce waste disposal problems and students understand the value of circular resource use.

Challenge Tags: Food Waste • Composting • Circular Economy • School Garden

TMIC-ECA-014

Paper Waste Reduction in Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools use paper for assignments, notices, forms, registers, permissions, circulars, rough work, and administrative records. Much of this paper is wasted due to poor planning or repeated printing. Reducing paper waste can save cost, time, storage space, and trees.

Problem Statement: Design an innovative solution that reduces unnecessary paper use in academic and administrative school activities while keeping processes simple and accessible.

Objectives:

- Reduce paper consumption
- Simplify documentation
- Improve reuse and recycling
- Promote sustainable school operations

Scope of Innovation: Solutions may include reusable templates, digital forms, notice alternatives, paper reuse stations, print monitoring, paper audits, or hybrid low-resource models.

Expected Impact: Schools reduce paper waste and operational cost while students learn sustainable resource management.

Challenge Tags: Paper Waste • Sustainable Administration • Resource Saving • Green School

TMIC-ECA-015

Smart Dustbin Usage Monitoring

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Dustbins are often placed on campus, but students may not use them correctly, bins may overflow, or cleaning schedules may not match actual usage. Poor bin placement and monitoring can lead to littering and unhygienic surroundings. Schools need a simple way to make dustbin use more effective.

Problem Statement: Design a solution that helps schools monitor whether dustbins are being used correctly, filled on time, cleaned regularly, and placed at the right locations.

Objectives:

- Improve dustbin placement and usage
- Prevent overflowing bins
- Support cleaning staff

- Reduce littering on campus

Scope of Innovation: Participants may use fill-level indicators, bin maps, QR reporting, student audits, cleaning schedules, behaviour campaigns, or smart/low-tech monitoring tools.

Expected Impact: School campuses become cleaner, and waste collection becomes more efficient and accountable.

Challenge Tags: Dustbin Monitoring • Waste Management • Clean Campus • School Operations

TMIC-ECA-016

School Recycling Reward System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Recycling works best when students actively participate. However, many students do not feel motivated to collect recyclable items or separate reusable materials. Reward systems, class challenges, and visible recognition can turn recycling into a positive school culture.

Problem Statement: Design a system that motivates students to participate in recycling through points, class challenges, collection drives, creativity projects, or school-level recognition.

Objectives:

- Increase recycling participation
- Make sustainability engaging
- Encourage class-level teamwork
- Promote long-term recycling habits

Scope of Innovation: Solutions may include recycling scoreboards, class competitions, eco-points, reward cards, monthly drives, recycling clubs, or creative reuse exhibitions.

Expected Impact: Students become active participants in recycling and schools reduce the amount of waste sent for disposal.

Challenge Tags: Recycling • Student Motivation • Rewards • Green Culture

TMIC-ECA-017

E-Waste Awareness and Collection System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Old batteries, chargers, wires, keyboards, gadgets, and electronic accessories can contain harmful materials if thrown with regular waste. Students often do not know how to handle e-waste safely. Schools can become collection and awareness points for responsible e-waste management.

Problem Statement: Design a solution that helps schools safely collect, record, and manage e-waste generated by students, families, and school offices.

Objectives:

- Increase e-waste awareness
- Prevent unsafe disposal
- Create safe collection methods
- Connect schools with responsible recycling channels

Scope of Innovation: Participants may design e-waste bins, collection drives, awareness cards, tracking registers, school-family campaigns, repair/reuse corners, or recycler-linkage models.

Expected Impact: Students learn responsible electronics disposal and schools reduce harmful waste entering regular garbage streams.

Challenge Tags: E-Waste • Safe Disposal • Recycling • Environmental Awareness

TMIC-ECA-018

Upcycling Lab for Students

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many discarded materials such as cardboard, bottles, cloth, old charts, wood pieces, and packaging can be creatively reused. Instead of treating waste only as garbage, students can convert it into learning tools, art, school utilities, or community products. An upcycling lab can build creativity and sustainability together.

Problem Statement: Design a student-led upcycling lab where waste materials can be converted into useful school items, art, learning tools, decorations, models, or community products.

Objectives:

- Promote creative reuse
- Reduce waste
- Build design thinking
- Create useful products from discarded materials

Scope of Innovation: Solutions may include upcycling workstations, material banks, design challenges, student maker clubs, product showcases, or community sale models.

Expected Impact: Students learn innovation through reuse while schools reduce waste and encourage hands-on creativity.

Challenge Tags: Upcycling • Maker Lab • Circular Economy • Student Creativity

TMIC-ECA-019

Waste Audit System for School Campus

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools often do not know how much waste they generate, what type of waste is most common, or where it comes from. Without data, waste reduction efforts remain guesswork. A student-led waste audit can reveal patterns and help schools plan targeted solutions.

Problem Statement: Design a practical solution that helps students measure what type of waste their school generates, where it comes from, and how it can be reduced.

Objectives:

- Measure school waste generation
- Identify major waste sources
- Support data-based reduction plans
- Build student research skills

Scope of Innovation: Participants may create audit forms, waste weighing systems, category charts, classroom surveys, dashboards, source maps, or monthly waste reports.

Expected Impact: Schools understand their waste patterns and can reduce waste using evidence-based action plans.

Challenge Tags: Waste Audit • Data Tracking • Sustainability • School Research

TMIC-ECA-020

Zero-Waste School Event Model

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Annual functions, science fairs, sports days, exhibitions, and celebrations often generate plastic, paper, food waste, decoration waste, and disposable items. Events can still be successful while producing much less waste if planning starts early. Students can redesign event systems with sustainability in mind.

Problem Statement: Design an event planning model that helps schools organize annual days, science fairs, sports days, and celebrations with minimum waste generation.

Objectives:

- Reduce event-related waste
- Promote reusable materials
- Improve food and decoration planning
- Make sustainability part of school events

Scope of Innovation: Solutions may include zero-waste checklists, reusable decoration banks, food planning tools, waste stations, eco-volunteer teams, or post-event waste audits.

Expected Impact: School events become cleaner, more responsible, and better aligned with environmental values.

Challenge Tags: Zero Waste • School Events • Sustainability • Event Planning

Segment C: Water, Air & Pollution Control

TMIC-ECA-021

Rainwater Harvesting Awareness and Tracking

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many schools receive large amounts of rainwater during monsoon but allow it to drain away unused. Rainwater harvesting can support groundwater recharge, gardens, cleaning, and water security. Students often learn about it in textbooks but do not calculate the real potential of their own campus.

Problem Statement: Design a solution that helps schools understand, plan, or monitor rainwater harvesting potential within their campus or nearby community.

Objectives:

- Build rainwater harvesting awareness
- Estimate campus water potential
- Promote water conservation
- Support practical planning

Scope of Innovation: Participants may create rooftop measurement tools, rainwater calculators, recharge pit models, awareness boards, monitoring logs, or school-level planning maps.

Expected Impact: Students connect water conservation with real campus data and schools become more prepared for water scarcity.

Challenge Tags: Rainwater Harvesting • Water Conservation • Campus Planning • Sustainability

TMIC-ECA-022

Smart Water Leakage Detection in Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Leaking taps, overflowing tanks, broken pipes, and continuously running water points waste large quantities of water. Many leaks remain unnoticed because schools lack a simple reporting or monitoring process. Preventing water leakage is one of the easiest ways to save water.

Problem Statement: Design an innovative solution that helps schools identify leaking taps, overflowing tanks, broken pipelines, or unnecessary water wastage quickly.

Objectives:

- Detect water wastage early
- Improve maintenance response
- Reduce water bills and waste
- Build student responsibility for conservation

Scope of Innovation: Teams may propose leak reporting systems, water-point audits, sensor alerts, student inspection teams, maintenance logs, visual indicators, or QR complaint tools.

Expected Impact: Schools save water and repair leakage problems faster through simple monitoring and accountability.

Challenge Tags: Water Leakage • Conservation • Maintenance • School Operations

TMIC-ECA-023

Water Usage Reduction Challenge

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Water is used daily in washrooms, gardens, laboratories, canteens, cleaning, and drinking points. Students may waste water unintentionally when taps are left open or water use is not visible. A challenge-based system can make

conservation measurable and engaging.

Problem Statement: Design a student-driven system that encourages classrooms, washrooms, labs, gardens, and canteens to reduce water wastage through tracking and behaviour change.

Objectives:

- Reduce unnecessary water use
- Make water saving measurable
- Encourage class participation
- Promote daily conservation habits

Scope of Innovation: Solutions may include water scorecards, class competitions, tap-use reminders, garden watering plans, water audits, or conservation dashboards.

Expected Impact: Students build water-saving habits and schools reduce unnecessary water consumption.

Challenge Tags: Water Saving • Behaviour Change • Conservation Challenge • Green School

TMIC-ECA-024

Safe Pond, Lake or River Adoption Model

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many local water bodies suffer from waste dumping, sewage entry, plastic pollution, weed growth, and lack of monitoring. Students often live near ponds, canals, rivers, or lakes but rarely participate in their protection. A student adoption model can build environmental ownership.

Problem Statement: Design a solution that enables students to monitor, document, and improve the cleanliness of a nearby pond, lake, canal, riverbank, or local water body.

Objectives:

- Monitor local water bodies
- Document pollution and cleanliness issues
- Encourage community involvement
- Promote water ecosystem protection

Scope of Innovation: Participants may create adoption plans, cleanliness scorecards, photo records, awareness drives, waste mapping, community reporting systems, or restoration activity plans.

Expected Impact: Students become local water guardians and communities gain awareness about protecting water bodies.

Challenge Tags: Water Body Adoption • Clean Water • Community Action • Ecology

TMIC-ECA-025

Air Quality Awareness Near Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Air pollution near schools can come from traffic, dust, waste burning, construction, diesel vehicles, and nearby industries. Poor air quality affects breathing, concentration, sports participation, and long-term health. Students need practical ways to understand sources and reduce exposure.

Problem Statement: Design a solution that helps students understand and monitor air pollution sources near schools and communicate simple preventive actions.

Objectives:

- Identify local air pollution sources
- Increase awareness of health impact
- Support exposure reduction
- Encourage community action

Scope of Innovation: Solutions may include air quality displays, pollution source maps, dust diaries, awareness campaigns, low-cost sensors, traffic observations, or anti-burning reports.

Expected Impact: Students understand air pollution through local evidence and schools can take practical steps to reduce exposure.

Challenge Tags: Air Quality • Pollution Awareness • Student Health • Local Monitoring

TMIC-ECA-026

Dust-Free School Pathways

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Dust from unpaved roads, playgrounds, construction, dry soil, and heavy traffic can affect breathing, cleanliness, and student comfort. Dust is especially problematic during dry seasons and around school entry routes. Schools need low-cost methods to reduce dust exposure.

Problem Statement: Design an innovative solution that reduces dust exposure on school roads, playgrounds, corridors, or construction-affected areas.

Objectives:

- Identify dust-prone areas
- Reduce student dust exposure
- Improve campus cleanliness
- Promote healthier school pathways

Scope of Innovation: Participants may design dust maps, green barriers, pathway improvements, watering schedules, mat systems, traffic control ideas, or awareness boards for dust reduction.

Expected Impact: Students experience cleaner and healthier movement across school spaces.

Challenge Tags: Dust Control • School Pathways • Air Health • Campus Cleanliness

TMIC-ECA-027

Anti-Waste-Burning Awareness System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Open burning of leaves, garbage, plastic, and crop residue releases smoke and harmful particles. Many communities continue burning waste because it appears easy and quick. Students can help show the health and environmental impact while promoting safer alternatives.

Problem Statement: Design a solution that discourages open burning of leaves, plastic, garbage, and crop residue by showing its health and environmental impact.

Objectives:

- Reduce open waste burning
- Spread health and pollution awareness
- Promote safer disposal alternatives
- Support community behaviour change

Scope of Innovation: Solutions may include smoke-impact displays, community campaigns, reporting tools, composting alternatives, awareness posters, street plays, or local pledge systems.

Expected Impact: Communities reduce harmful burning practices and adopt cleaner waste handling methods.

Challenge Tags: Waste Burning • Air Pollution • Community Awareness • Behaviour Change

TMIC-ECA-028

Clean Drainage and Waterlogging Prevention

Background: Blocked drains and poor drainage cause waterlogging, bad smell, mosquito breeding, road damage, and disease risk. Around schools, waterlogging can affect attendance and safety. Students can help identify blocked points and support preventive action before rainfall.

Problem Statement: Design a local solution that helps schools or communities identify blocked drains, prevent waterlogging, and reduce mosquito-breeding risks.

Objectives:

- Identify drainage problems early
- Reduce waterlogging
- Prevent mosquito breeding
- Improve campus and community hygiene

Scope of Innovation: Participants may create drainage maps, blockage reporting tools, pre-monsoon checklists, mosquito-risk boards, community clean-up plans, or waterlogging alert systems.

Expected Impact: Schools and localities become cleaner, safer, and better prepared for rainy seasons.

Challenge Tags: Drainage • Waterlogging • Mosquito Prevention • Community Hygiene

TMIC-ECA-029

Noise Pollution Mapping Around Schools

Background: Noise from traffic, loudspeakers, construction, markets, and crowded roads can disturb classes and affect concentration. Noise pollution is often ignored because it is invisible. Mapping and measuring noise can help students understand its impact and suggest practical solutions.

Problem Statement: Design a solution that helps students measure, map, and reduce noise pollution from traffic, loudspeakers, construction, or crowded areas near schools.

Objectives:

- Measure noise levels
- Identify major noise sources
- Protect classroom focus
- Suggest practical reduction methods

Scope of Innovation: Solutions may include noise maps, decibel observation logs, quiet-zone campaigns, traffic coordination ideas, classroom sound barriers, or awareness boards.

Expected Impact: Schools understand noise problems better and can create calmer learning environments.

Challenge Tags: Noise Pollution • School Focus • Mapping • Learning Environment

TMIC-ECA-030

Pollution-Free School Commute

Background: Daily school commuting can create traffic congestion, fuel use, air pollution, and unsafe road conditions. Many students travel separately even when routes overlap. Schools can reduce commute-related pollution through better planning and student participation.

Problem Statement: Design an innovative solution that reduces pollution caused by school commuting through carpooling, walking groups, cycling support, route planning, or bus optimization.

Objectives:

- Reduce commute-related pollution
- Improve route planning

- Promote safe shared travel
- Encourage sustainable transport habits

Scope of Innovation: Participants may create carpool models, walking school buses, bicycle support plans, bus route maps, parent coordination tools, or safe commute scorecards.

Expected Impact: School travel becomes cleaner, safer, and more efficient for students and families.

Challenge Tags: Sustainable Commute • Pollution Reduction • Transport • School Safety

Segment D: Green Campus, Energy & Biodiversity

TMIC-ECA-031

School Energy Saving System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools use electricity for lights, fans, computers, projectors, pumps, laboratories, and air conditioners. Energy is often wasted when devices remain on in empty rooms or when natural light is not used well. Students can help schools reduce energy waste through monitoring and habit change.

Problem Statement: Design a solution that helps schools reduce electricity wastage from lights, fans, projectors, computers, air conditioners, and unused rooms.

Objectives:

- Reduce electricity wastage
- Track energy habits
- Encourage responsible device use
- Lower school energy costs

Scope of Innovation: Solutions may include switch-off campaigns, energy monitors, classroom energy captains, smart reminders, audit sheets, sensor-based alerts, or energy dashboards.

Expected Impact: Schools save electricity and students develop responsible energy-use habits.

Challenge Tags: Energy Saving • Electricity Audit • Green School • Behaviour Change

TMIC-ECA-032

Solar Energy Awareness and Campus Planning

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Solar energy is a practical renewable energy option for many schools, but students and school leaders may not know where panels could be placed or what energy needs they can support. Campus-level solar planning can turn renewable energy learning into a real project.

Problem Statement: Design a student-friendly model that helps schools understand where and how solar energy can be used on campus.

Objectives:

- Build solar energy awareness
- Identify suitable campus areas
- Estimate basic energy use
- Promote renewable energy adoption

Scope of Innovation: Participants may create rooftop surveys, solar potential maps, model panels, cost-benefit awareness charts, energy-use calculators, or solar-powered school utility concepts.

Expected Impact: Students understand renewable energy practically and schools get a starting point for solar planning.

Challenge Tags: Solar Energy • Renewable Power • Campus Planning • Energy Literacy

TMIC-ECA-033

Classroom Light and Ventilation Optimizer

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Good natural light and ventilation can improve comfort, reduce electricity use, and support healthier classrooms. Many classrooms depend on artificial lighting or fans even when better layout, windows, shading, or airflow planning could help. Students can redesign spaces for comfort and efficiency.

Problem Statement: Design a solution that improves natural light and ventilation in classrooms to reduce electricity use and improve student comfort.

Objectives:

- Improve classroom comfort
- Reduce unnecessary electricity use
- Support better airflow
- Use design thinking for learning spaces

Scope of Innovation: Solutions may include seating plans, window-use routines, reflector ideas, ventilation maps, shade planning, classroom audits, or low-cost airflow improvement models.

Expected Impact: Classrooms become more comfortable and energy-efficient with practical design improvements.

Challenge Tags: Ventilation • Natural Light • Classroom Design • Energy Saving

TMIC-ECA-034

Tree Survival Tracking System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Plantation drives are common, but many planted saplings do not survive due to lack of watering, protection, soil care, or ownership. Counting planted trees is less important than ensuring survival. Students can create systems that make plantation measurable and accountable.

Problem Statement: Design a solution that ensures planted trees actually survive by tracking watering, care, growth, protection, and student responsibility.

Objectives:

- Improve sapling survival
- Assign care responsibility
- Track growth over time
- Make plantation drives accountable

Scope of Innovation: Participants may build tree adoption cards, QR tree profiles, watering schedules, growth logs, student duty groups, survival dashboards, or protection models.

Expected Impact: Schools move from symbolic plantation to successful long-term greenery.

Challenge Tags: Tree Survival • Plantation Care • Green Campus • Accountability

TMIC-ECA-035

Native Plant Garden for Schools

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many campuses plant decorative species that may need high maintenance or may not support local biodiversity. Native plants are better adapted to local climate, require less care, and support birds, insects, and soil health. A native garden can become a living classroom.

Problem Statement: Design a school garden model using native plants that supports biodiversity, shade, learning, and low-maintenance greenery.

Objectives:

- Promote native plant awareness
- Support local biodiversity
- Reduce garden maintenance
- Use gardens for environmental learning

Scope of Innovation: Teams may propose plant selection guides, native garden layouts, student care plans, biodiversity boards, nursery models, or seasonal observation activities.

Expected Impact: Schools develop greener, more resilient campuses while students learn about local ecology.

Challenge Tags: Native Plants • Biodiversity • School Garden • Ecology

TMIC-ECA-036

Butterfly, Bird and Pollinator-Friendly Campus

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Birds, butterflies, bees, and other pollinators support biodiversity and ecological balance. Many school campuses do not provide safe habitats, water points, flowering plants, or awareness spaces. A pollinator-friendly campus can make biodiversity visible to students.

Problem Statement: Design an innovation that makes the school campus more supportive for birds, butterflies, bees, and other pollinators through safe habitats and awareness.

Objectives:

- Support pollinator habitats
- Increase biodiversity awareness
- Create student observation opportunities
- Improve campus greenery

Scope of Innovation: Solutions may include butterfly gardens, bird water stations, native flower beds, habitat maps, observation logs, awareness boards, or student biodiversity clubs.

Expected Impact: The campus becomes more biodiverse and students learn ecological responsibility through direct observation.

Challenge Tags: Pollinators • Birds • Biodiversity • Green Campus

TMIC-ECA-037

Green Wall or Cool Roof for Heat Reduction

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: School buildings can become very hot during summer, especially when roofs and walls absorb heat. High indoor temperature affects comfort and concentration. Low-cost cooling ideas such as green walls, cool roofs, shade nets, reflective surfaces, and plant barriers can reduce heat.

Problem Statement: Design a low-cost solution such as green walls, cool roofs, shade structures, or reflective surfaces to reduce heat inside school buildings.

Objectives:

- Reduce indoor heat
- Improve student comfort
- Promote passive cooling
- Use affordable climate-friendly design

Scope of Innovation: Participants may create models of cool roofs, wall gardens, shade structures, reflective paint plans, plant barriers, temperature comparison studies, or school building improvement designs.

Expected Impact: School spaces become cooler, more comfortable, and less dependent on electrical cooling.

Challenge Tags: Cool Roof • Green Wall • Heat Reduction • Passive Cooling

TMIC-ECA-038

Eco-Friendly Classroom Materials

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Classrooms often use plastic files, synthetic decorations, disposable craft items, laminated charts, and non-recyclable supplies. These materials may look attractive but create waste. Students can redesign classroom materials to be reusable, recyclable, low-cost, and environmentally responsible.

Problem Statement: Design alternatives that reduce environmentally harmful classroom materials while keeping learning spaces functional and attractive.

Objectives:

- Reduce harmful classroom materials
- Promote reusable supplies
- Encourage eco-friendly creativity
- Lower waste from school activities

Scope of Innovation: Solutions may include reusable display boards, cloth folders, recycled paper tools, natural decoration kits, modular charts, eco-craft materials, or classroom material guidelines.

Expected Impact: Classrooms become more sustainable without losing creativity or usefulness.

Challenge Tags: Eco Materials • Classroom Supplies • Reuse • Sustainable Design

TMIC-ECA-039

School Biodiversity Mapping Project

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Students often walk past plants, insects, birds, and small species without noticing them. Biodiversity becomes meaningful when students identify and document life around them. A school biodiversity map can help protect species and create curiosity about nature.

Problem Statement: Design a solution that helps students identify, document, and protect plants, insects, birds, and small species found in and around the school campus.

Objectives:

- Document school biodiversity
- Build observation skills
- Increase ecological awareness
- Support protection of local species

Scope of Innovation: Participants may create biodiversity maps, species cards, photo logs, campus trails, student field notebooks, QR nature labels, or seasonal biodiversity surveys.

Expected Impact: Students understand biodiversity through their own campus and become more sensitive toward local ecosystems.

Challenge Tags: Biodiversity Mapping • Nature Trail • Ecology • Student Research

TMIC-ECA-040

Green House System for School Plants

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Schools can grow plants for gardens, science projects, nutrition awareness, and community distribution. However, seedlings often fail because of poor care, heat, lack of water, or unplanned planting. A small greenhouse or nursery can support plant growth and hands-on learning.

Problem Statement: Design a small greenhouse, nursery, or plant-care system where students can grow plants for campus greening, science learning, or community distribution.

Objectives:

- Support plant growth and care
- Create hands-on environmental learning
- Supply plants for campus greening

- Teach responsibility and observation

Scope of Innovation: Solutions may include mini-greenhouse models, seedling trays, watering systems, nursery schedules, student caretaker groups, plant growth logs, or low-cost protective structures.

Expected Impact: Students learn plant care practically and schools gain a sustainable source of greenery.

Challenge Tags: Greenhouse • Nursery • Plant Care • Experiential Learning

Segment E: Agriculture Risk, Rural Environment & Community Resilience

TMIC-ECA-041

Farmer Weather Advisory for Students' Families

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Many students come from farming families that depend on weather for sowing, irrigation, harvesting, and crop protection. Weather information is available, but it may not always be understandable or locally useful. Students can help translate weather guidance into simple action messages for families.

Problem Statement: Design a simple solution that helps farming families receive understandable weather-based guidance related to sowing, irrigation, harvesting, or crop protection.

Objectives:

- Make weather information understandable
- Support farming decisions
- Connect students with family livelihoods
- Reduce weather-related crop risk

Scope of Innovation: Participants may create advisory cards, WhatsApp message formats, local language alerts, weather calendars, crop-stage guidance, or school-community information boards.

Expected Impact: Farming families receive clearer guidance and students learn how climate information supports agriculture.

Challenge Tags: Weather Advisory • Farming Families • Climate Services • Rural Innovation

TMIC-ECA-042

Crop Disease Early Observation System

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Crop diseases, pest attacks, and plant stress can reduce yield if not noticed early. Farmers may miss early signs such as leaf spots, colour change, wilting, insects, or unusual growth. Students can contribute by creating observation-based reporting and awareness systems.

Problem Statement: Design a student-friendly solution that helps identify early signs of crop diseases, pest attacks, or plant stress using observation, images, local knowledge, or reporting.

Objectives:

- Improve early crop issue detection
- Support farmers with observation tools
- Use local knowledge responsibly
- Reduce crop loss risk

Scope of Innovation: Solutions may include crop symptom cards, photo reporting, field diaries, plant health checklists, local expert networks, mobile tools, or school agriculture clubs.

Expected Impact: Farmers receive earlier warnings about crop problems and students engage with real agricultural challenges.

Challenge Tags: Crop Disease • Pest Awareness • Agriculture Risk • Student Observation

TMIC-ECA-043

Soil Health Awareness for Rural Students

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Healthy soil is essential for farming, but soil quality can decline due to erosion, low organic matter, overuse of chemicals, poor moisture retention, or wrong fertilizer practices. Students in rural areas can help families understand soil as a living resource that needs care.

Problem Statement: Design a solution that helps students and farming communities understand soil health, organic matter, moisture, erosion, and responsible fertilizer use.

Objectives:

- Improve soil health awareness
- Promote responsible fertilizer use
- Encourage organic matter improvement
- Connect science learning with farming

Scope of Innovation: Participants may develop soil health cards, demonstration plots, moisture observation tools, compost awareness, erosion maps, farmer-student workshops, or soil care calendars.

Expected Impact: Students and families gain practical understanding of soil care, supporting better farming and environmental health.

Challenge Tags: Soil Health • Rural Education • Farming • Sustainability

TMIC-ECA-044

Smart Irrigation Planning for Small Farmers

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Small farmers often face water scarcity, uncertain rainfall, and high irrigation costs. Over-irrigation wastes water, while under-irrigation affects crop growth. Low-cost irrigation planning can help farmers decide when and how much to water based on crop need and local conditions.

Problem Statement: Design a low-cost solution that helps small farmers use water more efficiently for irrigation based on crop need, weather, soil moisture, and local conditions.

Objectives:

- Improve irrigation efficiency
- Reduce water wastage
- Support small farmers
- Use local conditions for decision-making

Scope of Innovation: Solutions may include soil moisture indicators, irrigation calendars, crop-stage guides, weather-based reminders, water-use logs, or simple sensor and non-sensor models.

Expected Impact: Farmers use water more efficiently and reduce climate-related crop stress.

Challenge Tags: Smart Irrigation • Water Saving • Small Farmers • Agriculture Innovation

TMIC-ECA-045

Reducing Crop Loss After Harvest

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: A significant amount of crop loss happens after harvesting due to poor storage, moisture, pests, transport delays, handling damage, or lack of timely market information. Small farmers are especially affected because they may not have access to proper storage or coordination systems.

Problem Statement: Design an innovative solution that helps reduce post-harvest losses caused by poor storage, moisture, pests, transport delay, or lack of local market information.

Objectives:

- Reduce post-harvest loss
- Improve storage and handling awareness
- Support small farmers

- Improve market and transport coordination

Scope of Innovation: Participants may design low-cost storage models, moisture alerts, pest-prevention methods, farmer coordination tools, transport planning, or local market information systems.

Expected Impact: Farmers retain more produce value and reduce waste after harvest.

Challenge Tags: Post-Harvest Loss • Storage • Farmer Support • Rural Economy

TMIC-ECA-046

Climate Risk Calendar for Farmers

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Farmers face seasonal risks such as drought, flood, heatwave, pest cycles, crop disease, irregular rainfall, and storms. Many risks repeat in patterns, but planning is often reactive. A climate risk calendar can help farmers prepare before the risk period arrives.

Problem Statement: Design a practical calendar that helps farming communities prepare for seasonal risks such as drought, flood, heatwave, pest cycles, crop disease, and irregular rainfall.

Objectives:

- Create seasonal risk awareness
- Support advance preparation
- Reduce crop vulnerability
- Make climate planning simple for farmers

Scope of Innovation: Solutions may include crop-wise risk calendars, local language charts, SMS reminders, school-community boards, farmer notebooks, or digital planning tools.

Expected Impact: Farming families prepare earlier for climate risks and reduce avoidable crop damage.

Challenge Tags: Climate Risk • Farmer Calendar • Seasonal Planning • Agriculture Resilience

TMIC-ECA-047

Kitchen Garden for Nutrition and Sustainability

Theme: Environment, Climate Change & Agriculture Risk

Category: Classes 8-12

Background: Kitchen gardens can improve access to fresh vegetables, teach plant care, reduce dependence on packaged food, and connect students with sustainable growing practices. Schools and homes can use small spaces for useful food production and nutrition education.

Problem Statement: Design a school or home kitchen garden model that improves nutrition awareness, reduces dependence on packaged food, and teaches sustainable growing practices.

Objectives:

- Promote nutrition through gardening
- Teach sustainable food growing
- Use small spaces creatively
- Encourage family and student participation

Scope of Innovation: Participants may create container gardens, vertical gardens, seasonal crop plans, seed banks, student garden clubs, nutrition-linked planting charts, or low-cost irrigation systems.

Expected Impact: Students learn sustainability and nutrition through hands-on growing and family participation.

Challenge Tags: Kitchen Garden • Nutrition • Sustainable Farming • Student Learning

TMIC-ECA-048

Composting Model for Schools and Villages

Background: Biodegradable waste from kitchens, gardens, markets, farms, and schools often ends up in open dumping areas. Composting can convert this waste into useful manure for plants and farms. However, many communities avoid composting because of smell, space, or lack of awareness.

Problem Statement: Design a low-cost composting system that converts biodegradable waste from schools or households into useful compost for gardens or farms.

Objectives:

- Convert organic waste into compost
- Reduce open dumping
- Support gardens and farms
- Make composting easy and acceptable

Scope of Innovation: Participants may design compost bins, pit models, odour-control methods, segregation routines, school-village compost clubs, compost quality tracking, or awareness kits.

Expected Impact: Communities reduce organic waste and produce useful compost for local greenery and agriculture.

Challenge Tags: Composting • Organic Waste • Soil Health • Community Sustainability

TMIC-ECA-049

Local Market Linkage for Eco-Friendly Farm Products

Background: Small farmers who grow seasonal, local, or chemical-conscious produce may struggle to reach buyers or communicate the value of their products. Better local market linkage can reduce transport waste, support local food systems, and improve farmer income. Students can help design awareness and connection models.

Problem Statement: Design a solution that helps small farmers or student communities promote locally grown, seasonal, chemical-conscious, or eco-friendly farm products.

Objectives:

- Support local farmers
- Promote seasonal and eco-friendly products
- Improve market visibility
- Encourage local food systems

Scope of Innovation: Solutions may include local product directories, school-community markets, farmer profile cards, digital listing tools, awareness campaigns, or buyer-farmer connection models.

Expected Impact: Farmers gain better visibility and communities make more informed local food choices.

Challenge Tags: Local Market • Farmer Linkage • Eco Products • Rural Entrepreneurship

TMIC-ECA-050

Student-Led Green Village or Green Locality Model

Background: Environmental change becomes meaningful when students improve their own village, ward, colony, or locality. Local issues may include waste dumping, plastic use, water wastage, open burning, lack of trees, poor drainage, or low awareness. A student-led model can connect school learning with real community action.

Problem Statement: Design a student-led model that improves environmental practices in a village or locality through waste reduction, water saving, plantation care, pollution control, and community participation.

Objectives:

- Promote student-led community action
- Improve local environmental practices

- Encourage teamwork and leadership
- Create measurable green impact

Scope of Innovation: Participants may create green locality scorecards, community campaigns, plantation care systems, waste reduction plans, water-saving drives, street mapping, or local volunteer networks.

Expected Impact: Students become environmental leaders and create visible improvements in their local community.

Challenge Tags: Green Village • Locality Improvement • Student Leadership • Community Impact
