Thematic Areas & Problem Statements

1. Air Quality

Rajasthan faces significant air quality challenges due to road dust, construction activities, vehicular emissions, and industrial pollution. Innovations are invited to develop solutions that enable better monitoring, analysis, and mitigation of air pollution.

Problem Statements

- Develop a **low-cost, scalable air quality monitoring network** capable of measuring $PM_{2.5}$, PM_{10}, and dust levels across urban and industrial zones with real-time data accessibility.

- Design an **AI-enabled source identification and early-warning system** that can distinguish between major pollution sources such as road dust, construction dust, vehicles, and industrial emissions.

- Create a **community-level air pollution alert and exposure advisory tool** for vulnerable groups such as schoolchildren, outdoor workers, and patients.

---

2. Industrial Effluent & Onsite Treatment

Many small and medium-scale industries face challenges in managing effluent due to limited infrastructure, high operational costs, and regulatory compliance requirements.

Problem Statements

- Develop a **compact and modular effluent treatment system** suitable for small and medium industries that enables onsite treatment and reuse of wastewater.

- Design a **decentralized wastewater and chemical management solution** that allows industrial units to monitor, treat, and recycle effluent with minimal operational complexity.

- Create a **low-maintenance treatment and reuse solution** for small industrial clusters operating in water-scarce regions of Rajasthan.

---

3. Solid Waste & Circularity

Urban local bodies in Rajasthan are increasingly facing challenges related to waste segregation, processing, and landfill management.

Problem Statements

- Design a **scalable e-waste collection and safe recycling model** that integrates formal recyclers with the informal waste sector to improve collection efficiency.

- Develop a **plastic waste segregation, aggregation, and recycling solution** for urban and peri-urban areas to reduce open dumping, littering, and landfill burden.

- **Geo- tagged, block chain enabled or GIS based End of Life Vehicle (ELV) tracking system** integrated with Transport Department data.

---

4. Monitoring & Compliance

Effective environmental governance requires continuous monitoring and transparent reporting mechanisms for pollution control and waste management.

Problem Statements

- Create an **IoT-based environmental monitoring platform** that enables real-time tracking of emissions, effluent parameters, and waste management practices while generating automated compliance reports.

- Develop a **GIS-enabled environmental intelligence dashboard** for local authorities that integrates pollution data, waste generation hotspots, and citizen complaints for better decision-making.

- Build **an automated inspection support system** that flags likely non-compliance events and prioritizes sites for enforcement action.

---

5. Behavioural & Governance Interventions

Public participation and institutional accountability are critical to improving environmental outcomes.

Problem Statements

- Develop a **citizen engagement platform** that enables residents to report environmental issues such as illegal dumping, air pollution, and sewage discharge using geo-tagged evidence.

- Design a **digital compliance and incentive system** that encourages industries and commercial establishments to adopt sustainable environmental practices.

- Create a **community awareness and nudging solution** that improves waste segregation, anti-littering behaviour, and complaint resolution participation.

---

6. **Energy–Waste Nexus**

Innovations that connect waste management with energy generation and resource efficiency are essential for building sustainable urban systems.

Problem Statements

- Develop **micro-scale waste-to-energy technologies** suitable for institutional campuses, markets, and small urban clusters.

- Create a **waste-derived fuel or resource recovery model** that converts segregated non-recyclable waste into useful energy or alternative products.

7. **Other (Anything related to environment and pollution control not falling under the above themes)**