INTEGRATED
PROBLEM STATEMENT

Title: "The Price of Power" — hints at India's nuclear ambitions and how the people at the margins have paid for it.

Context:

In Jharkhand's mineral belt, the Uranium Corporation of India Ltd. (UCIL) has operated for decades to support India's nuclear energy ambitions. But beneath the strategic importance lies a complex web of environmental degradation, displaced indigenous communities, and opaque governance structures.

With health impacts, contaminated water, and regulatory blind spots, UCIL's operations demand a new lens—one that integrates sustainable economics, just governance, and technological foresight.

Can a public-sector enterprise like UCIL transform into a model of responsible mining—balancing national interest with environmental and social justice?

The Challenge:

You are tasked with building an interdisciplinary action blueprint for the ethical transformation of uranium mining in Jharkhand. Drawing from both policy frameworks and technological capabilities, your teams will create a comprehensive set of solutions to realign UCIL's operations with India's net-zero commitments, global ESG norms, and local community rights.

Track-wise Task Distribution:

Track: ESP Industry Track

Focus: Sustainable Business Models, ESG Design, and Mining Analysis

Tasks:
1. Analyze UCIL's Business Model
   - Use a Business Model Canvas (BMC) to decode UCIL's current structure.
   - Identify key sustainability gaps: Who bears the cost? Who benefits?
2. Design a Contextual ESG Framework
   - Create an ESG scorecard tailored for public-sector mining.
   - Define metrics that measure environmental harm, community equity, and institutional accountability.
3. Global Benchmarking Study
   - Compare UCIL with global mining firms like BHP, Rio Tinto, and Cameco.
   - Identify practices that could realistically be localized or adopted.

Deliverables:
- Before vs. After Business Model Canvas
- Custom ESG Scorecard with Reporting Template
- Case Comparison Document with 3–5 Actionable Learnings for UCIL

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Track: ESP Governance Track

Focus: Policy, Redressal Systems, and Public Accountability

Tasks:

1. Map Mining-Related Laws and Institutions
   - Simplify and visualize key policies: Atomic Energy Act, PESA, Forest Rights Act
   - Show how these laws operate (or fail) in tribal areas like Jaduguda.
2. Identify Policy-Practice Gaps
   - Contrast legal rights vs. lived realities for affected communities.
   - Use secondary reports, media stories, and testimonies to spot recurring failures.
3. Design a Grievance and Participation Toolkit
   - Build a draft framework for reporting, redressal, and participatory decision-making.
   - It should work offline + online and be language-accessible.

Deliverables:
- Simplified Legal & Power Flowchart
- Rights vs. Reality Gap Matrix
- Grievance Redressal + Civic Participation Toolkit

Track: Tech-AI/ML Track

Focus: Data-Driven Environmental Monitoring and Risk Prediction

Tasks:

1. Environmental Change Detection via Satellite
   - Use tools like Google Earth Engine or Copernicus Open Data to observe land/vegetation change over 10 years.
   - Map and compare deforestation, land use shifts, and settlement encroachment.
2. Develop a Risk Prediction Model
   - Collect proxy data: distance to mines, forest cover loss, reported illnesses.
   - Train a classification model to predict "high-risk" zones.
3. Visualize the Findings
   - Build simple maps, dashboards, or heatmaps using matplotlib / seaborn.
   - Ensure clarity and storytelling in data presentation.

Deliverables:

- Before/After Maps of Mining Zones (2010–2024)
- Risk Heatmap + Basic Model Notebook
- Interpretation Slides Explaining the Output

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Track: Tech-Development Track

Focus: Digital Tools for Awareness, Engagement, and Grievance Redressal

Tasks:

1. Design a Public-Facing Information Portal
   - Include: About UCIL, Know Your Rights, Environmental Impact, News.
   - Mobile-first design. Dual language preferred (Hindi & English).
2. Develop an Interactive Grievance Tool
   - A form-based or chatbot-style interface to log grievances.
   - Add dummy inputs + submission pathways (no backend needed).
3. Create a Digital Storytelling Microsite
   - Build an interactive scroll story or video series on "Life Around the Mine".
   - Use publicly available quotes, testimonies, images, and maps.

Deliverables:

- Working Web Portal (or Demo via Figma/Framer/React)
- Prototype Grievance Interface
- Microsite/Slide Story on Jaduguda's Impact

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THANK YOU

Let's co-create bold, grounded, and people-first solutions—where every code written, every policy proposed, and every model built contributes to a fairer, cleaner, and more accountable future.