DASGRI-2026 – Special Session Proposal Form

Special Session Title:
Data-Driven Resilience: AI for Climate Action, Environmental Justice, and Planetary Health

Proposer's Name(s) and Affiliation(s):
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Proposed Session Convenor (if different):

Brief Description of Session
This special session aims to explore the critical intersection of advanced data science, AI, and the urgent global challenges of climate change, environmental degradation, and their disproportionate social impacts. We seek contributions that move beyond efficiency gains to focus on transformative solutions for mitigation, adaptation, and justice. The session will highlight how responsibly designed AI systems can model complex earth systems, empower vulnerable communities, optimize resource use for a circular economy, and ensure that the transition to a sustainable future is equitable and inclusive.

Relevance to Conference Themes:
The proposed special session, **"Data-Driven Resilience: AI for Climate Action, Environmental Justice, and Planetary Health,"** is intrinsically and profoundly aligned with the core mission of DASGRI-2026: **"Data Science and AI for Social Good and Responsible Innovation."** It addresses this mission by grounding abstract principles in the most urgent and concrete global challenge of our time: the environmental crisis. 1. **Foundational Alignment with "Social Good":** Social good cannot be achieved on an unstable planet. This session directly operationalizes "social good" by focusing on the **long-term well-being and survival of communities** threatened by climate change, pollution, and biodiversity loss. We explore how AI can be leveraged for good at a planetary scale, protecting the fundamental ecological systems upon which all human society

depends. This moves the concept of social good beyond immediate human-centric applications to include **intergenerational justice and ecological stewardship.**

2. **Core to "Responsible Innovation":** Innovation is only truly responsible if it accounts for its environmental footprint and long-term sustainability. This session tackles responsibility from two critical angles:
   - ✓ **AI *for* Responsible Environmental Outcomes:** We promote innovation that actively solves environmental problems (e.g., conservation, clean energy).
   - ✓ **Responsibility *in* AI Development:** We address the need for "Green AI"—innovating in ways that minimize the environmental cost of the AI models themselves. This dual focus ensures a holistic view of responsibility, where the tool and its purpose are both aligned with sustainable principles.
3. **Fills a Critical Gap in the Conference Portfolio:** An analysis of the already proposed special sessions reveals a robust coverage of cybersecurity, digital ethics, explainability, and inclusive technology. However, the **primary application domain of environmental sustainability and climate action is not explicitly represented.** This session is not a duplicate but a vital complement. It applies the conference's core technical and ethical discussions—explainability, trust, inclusivity—to the singularly important domain of planetary health. It asks: *How do we build trustworthy AI for climate models? How do we ensure inclusive AI that serves environmental justice communities?* This creates essential interdisciplinary bridges.
4. **Addresses Global Priorities and Policy Frameworks:** The session's themes are at the forefront of global policy, directly supporting the United Nations Sustainable Development Goals (SDGs), particularly **SDG 13 (Climate Action), 11 (Sustainable Cities), 14 (Life Below Water), and 15 (Life on Land).** By focusing here, DASGRI positions itself as a conference contributing to actionable, policy-relevant scientific discourse, amplifying its real-world impact.

Suggested Format of Session:

☐ **Regular paper presentations ✓**

~~☐ Panel discussion~~

~~☐ Industry session/presentations~~

~~☐ Tutorial / Workshop~~

~~☐ Other~~

Expected Number of submissions (please note that the submissions will go through the standard review process except for invited speakers):
25-30

Preliminary (invited) Speaker Names / Affiliations (max two per session):
Dr. Binod Kumar Mishra, Chandigarh University, Mohali India

Special Requirements (AV / hybrid / demo space):
Hybrid Mode

Motivation and Expected Outcomes:
Motivation: The climate crisis demands transformative tools. This session mobilizes the AI community to develop actionable, ethical solutions for planetary health, ensuring environmental sustainability is central to the "AI for good" discourse. **Expected Outcomes:** A curated collection of innovative research, fostering interdisciplinary collaboration, and establishing a roadmap for deploying responsible AI in service of ecological resilience and just climate action.

Keywords (3–5):
Data-Driven Resilience, Artificial Intelligence, Climate Action

Key Topics of Interest:

I. **AI for Climate Science & Extreme Event Forecasting:** High-resolution climate Modeling, prediction of floods, wildfires, and droughts, and improving early warning systems.

II. **Environmental Monitoring & Biodiversity Conservation:** AI analysis of satellite/IoT data for deforestation tracking, pollution detection, wildlife protection, and ecosystem health assessment.

III. **AI for a Just Energy Transition:** Optimizing renewable energy grids, demand forecasting, and ensuring equitable access to clean energy.

IV. **Sustainable & Green AI:** Techniques for reducing the carbon footprint of AI models themselves (e.g., energy-efficient algorithms, sustainable ML).

V. **AI for Circular Economy & Resource Management:** Smart agriculture, precision recycling, water management, and reducing waste in supply chains.

VI. **Environmental Justice & Community-Centric AI:** Tools for mapping environmental risks (e.g., pollution, heat islands) on vulnerable populations, participatory data governance, and AI to support climate resilience in frontline communities.

VII. **Policy, Governance, and Ethical AI for the Planet:** Frameworks for auditing the environmental impact of AI, policy-driven AI solutions, and preventing "climate washing" with AI.

Why this session is different and necessary:

While other sessions address "Responsible Innovation" broadly or "Social Good" in human-centric domains, this session explicitly grounds itself in the **planetary foundation of all social good**. It connects algorithmic innovation directly to the UN Sustainable Development Goals (SDGs) related to climate action (13), life on land (15), life below water (14), and sustainable cities (11). It fills a crucial niche by focusing on the **environment as the ultimate stakeholder** in responsible innovation.