

Agenda item 4(a) v. Digital Technologies

Policy Brief: Opportunities, Risks, and Challenges of Artificial Intelligence for Climate Action

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United Nations Climate Change
Technology Executive Committee

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Artificial Intelligence: An Enabler for Climate Goals

- Combatting the global climate crisis requires transformative solutions
- AI and machine learning have the potential to serve as a powerful enabler for climate action in developing countries
- The development and deployment of AI-powered climate solution is challenged by several factors in developing countries
- Drawn from the findings of the TEC technical paper on AI for climate action, this policy brief identifies strategic opportunities, structural barriers, inherent risks and key policy recommendations



Source: itsoli



Harnessing AI for Climate Adaptation and Resilience

- **Early Warning Systems (EWS):** AI can enhance flood and hurricane forecasts, improving lead times for anticipatory action
- **Resource Management:** AI-powered precision farming shows promise in reducing climate-related losses and improving food security for smallholder farmers
- **Urban Resilience:** AI and machine learning can strengthen infrastructure planning and enable rapid post-disaster assessment through vulnerability mapping



Source: digital.global



Advancing Decarbonization and System Optimization for Climate Mitigation

- **Energy Management:** AI can optimize energy consumption, distribution, and grid reliability, enabling better integration of variable renewables like solar and wind power
- **Transport Optimization:** AI analyses traffic patterns to reduce fuel consumption, congestion, and associated emissions
- **Ecosystem Conservation:** Machine learning identifies and classifies High Carbon Stock (HCS) forests for targeted conservation and accurate carbon accounting



Source: digital.global



Critical Risks and Challenges to Achieve Responsible and Sustainable AI-powered Solutions

- **Digital / Compute Divide:** Lack of reliable infrastructure, connectivity, and localized, high-quality data in vulnerable regions
- **Environmental Footprint:** High energy and water consumption from advanced models, risking offset of climate benefits
- **Ethical Governance and Bias:** Algorithmic bias, data security risks, and potential for misuse
- **Transparency, Accountability, Technology Transfer:** Robust Frameworks are needed to assess the impact of AI and account for transparency



Source: Unsplash



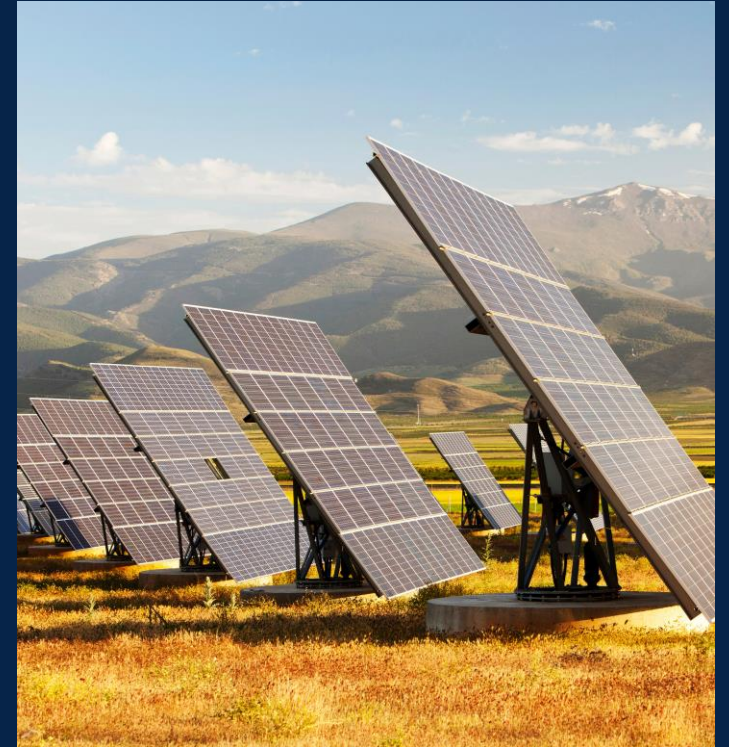
Policy and Partnerships

- **Promote Open-Source AI:** Encourage applications suitable for the task to ensure local ownership
- **Integrate AI into National Strategies:** Embed AI technologies into climate strategies for areas like early-warning systems and resource allocation
- **Strengthen Global Partnerships:** Foster international cooperation and capacity-building programs for local stakeholders
- **Invest in Local Innovation:** Support R&D tailored to local contexts and create local AI innovation hubs



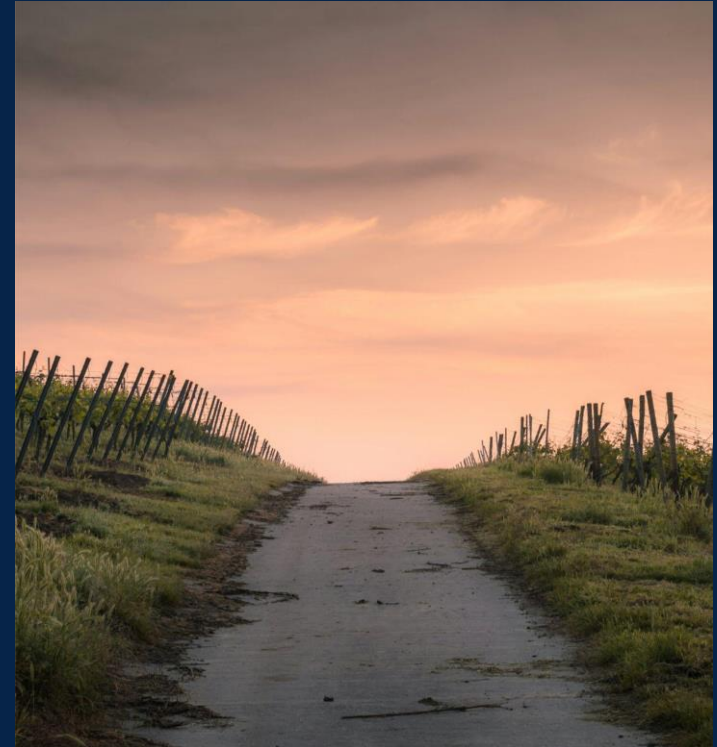
Sustainable and Equitable AI Deployment

- **Reduce Environmental Footprint:** Implement energy-efficient algorithms and adopt renewable energy for AI infrastructure.
- **Bridge the Digital Divide:** Invest in infrastructure development and capacity-building for equitable access.
- **Strengthen Ethical Governance:** Develop robust data governance frameworks to ensure privacy, security, and address gender bias through inclusive design.
- **Integrate Local Knowledge:** Incorporate traditional and indigenous knowledge into datasets and AI model development, ensuring cultural relevance and trust.



A Coordinated Path Forward

- AI offers a potential tool to support climate action.
- Success is critically dependent on overcoming structural hurdles and mitigating environmental and ethical risks.
- **Call to Action:** Implement coordinated, inclusive, and ethical policies to responsibly harness AI's potential for a resilient, low-carbon future.



Source: Unsplash



Thank you.



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