United Nations Framework Convention on Climate Change

Agenda item 4 (a) iii. Digital technologies: artificial intelligence

Draft technical paper on AI for climate action

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Introduction

- Climate change is one of the most pressing challenges of the 21st century.
- Developing countries, particularly LDCs and SIDS, are disproportionately affected.
- AI offers significant opportunities to mitigate and adapt to climate change impacts.
- AI also presents challenges and risks that must me addressed for effective and equitable implementation.

Objectives

1. Explore AI's role as a technological tool to advance and scale up transformative climate solutions for mitigation and adaptation in developing countries, with a focus on LDCs and SIDS.

2. Address the challenges and risks posed by AI, particularly those relevant to Climate Action, including concerns about energy consumption and its climate and environmental impact, data security, gender bias, the digital divide, and harmful practices.

3. Provide recommendations to policymakers on leveraging AI as a technological tool to advance and scale up transformative climate solutions, while overcoming identified risks and challenges.

4. Showcase the opportunities and challenges of existing AI applications in developing countries, in particular for LDCs and SIDS in addressing climate change and improving environmental outcomes.

Methodology and Peer Review Process

Methodology:

- A comprehensive review of existing research on AI for climate action.
- Case studies identified to provide real-world examples of AI applications.

Peer Review:

- The report underwent a **rigorous peer review process** involving experts in both AI and climate change.
- Peer review ensured **accuracy, credibility**, and **relevance** of the findings and recommendations.
- The process was designed to maintain **high-quality standards** and ensures that the technical report provides **reliable and actionable insights**.

Key Findings – AI for Climate Action

Monitoring and Prediction:

- AI-enabled satellite imagery and sensor networks monitor sea level rise, deforestation, and GHG emissions.
- AI enhances climate modeling and prediction and improving the accuracy of forecasts for extreme weather events and long-term ecosystem impacts.

Resource Optimization:

- AI optimizes fisheries, agriculture, water management, transportation systems, and industrial processes for environmental sustainability and efficiency.

Disaster Risk Management:

- AI-driven analytics improve disaster preparedness, response, and recovery efforts.

Key Findings – AI for Climate Action

Artificial Intelligence of Things (AIoT) for Energy Systems:

- AIoT supports real-time energy optimization, predictive maintenance, and renewable energy integration.

Education and Community Engagement:

- AI tools make climate information more accessible and engaging for communities.
- AI supports communities in understanding climate issues and encourages proactive adaptation and resilience-building.

Key Findings – Challenges and Risks of AI for Climate Action

- Energy and Water Consumption: AI systems are resource-intensive.
- Data Security: Concerns about unauthorized access, data breaches, and data privacy
- Digital Divide: Limited access to AI infrastructure, expertise, and resources.
- Bias: Gender and social biases can worsen or deepen inequalities.
- Environmental Sustainability: AI drives consumerism, supports fossil fuel exploration, and spread climate misinformation

Conclusions

- AI holds great potential to support climate action in LDCs and SIDS, particularly in areas like disaster forecasting, resource optimization, and renewable energy management.

- Addressing challenges such as high energy consumption, data security, the digital divide, and gender bias is key for ensuring inclusive and sustainable AI implementation.

Policy Recommendations for AI in Climate Action

- Integrate and promote open-source AI applications in climate change mitigation and adaptation strategies.
- Foster international cooperation, capacity-building, and knowledge sharing.
- Develop sustainable and inclusive policies.
- Invest in AI research, development, and innovation tailored to local contexts and needs.
- Integrate Indigenous knowledge and gender-responsive approaches in AI-powered climate solutions.
- Establish monitoring and evaluation frameworks to assess the impact and effectiveness of AI applications in achieving climate goals.

Next Steps: Finalization of the Technical Paper

- Incorporate comments and suggestions from TEC members and observers.
- Ensure all sections of the paper are refined and aligned with TEC and UNFCCC standards.
- Share the finalized draft with the TEC for final approval.
- Coordinate with the relevant bodies for the official publication and dissemination of the paper.
- Plan outreach and communication to ensure the technical paper's findings and recommendations reach decision-makers.

Thank you!

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