Agenda item 4.b.i- Early warning systems

Emerging and transformational adaptation technologies: early warning systems

Technology Executive Committee, 28th meeting and TEC-CTCN Joint session

16-18 and 19 April 2024, Copenhagen, Denmark

Organization of the discussions under this agenda item

1. Updates on the status and organization of work, including proposed next steps

- Expected action by the TEC : consider and provide guidance

2. Draft joint knowledge product on innovation & technology for risk knowledge

- Expected action by the TEC : consider and provide guidance

3. Preliminary findings

- Expected action by the TEC : consider and discuss

4. EW4All update

- Expected action by the TEC: take note

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1- Updates on the status and organization of work

Sergio La Motta
Activity co-lead for emerging and transformational adaptation technologies (Activity A.3.1)
Technology Executive Committee (TEC)

Work of the activity group at a glance

- **March 2023 – TEC 26**: Agreement on the topic of EWS for the TEC work on adaptation technologies
- **September 2023 – TEC 27**: Launch of work in partnership with GEO under the EW4All and agreement on key elements of a joint knowledge product
- **November 2023 – GEO Week**: Engagement with the GEO community and gathering inputs and good practices
- **December 2023 – COP 28**: Engagement with relevant stakeholders to raise the visibility of the work and inform the development of the knowledge product
- **February 2024** – Draft annotated outline reviewed by the TEC activity group and GEO/EW4All experts
- **March 2024** – Soliciting inputs from the GEO and EW4All communities, and meeting of the activity group in discussion with representatives of climate funds (Adaptation Fund, GCF, GEF)
- **April 2024 – TEC 28:** Presentation of the 1st draft of policy brief/paper & preliminary findings
- September 2024 – TEC 29: Finalizing the draft policy brief/paper and key messages
- November 2024 – COP 29: Launch of the policy brief/paper

Highlight from the work of the activity group since the launch of work

September 2023 - Launch of work as part of the EW4All

Early Warnings for All

November 2023 - GEO Week and Ministerial Summit

December 2023 - COP28 in Dubai

- **10+** bilateral engagements with interested partners e.g. at the margins of GEO Week & COP28
- **10+** events and meetings per invitation by stakeholders and partners to present the ongoing work (e.g. Adaptation Fund, Space Pavilion, RINGO, EW4All meetings)
- **15+** entities from the GEO community, EW4All partners, and funding entities provided inputs to the first draft
- **UNFCCC newsroom:** Powering climate action through Earth observations technology (Nov 2023)

Zooming in on the joint TEC-GEO knowledge product under the EW4All

Type: policy brief / policy paper

Content: policy insights and practical technology solutions for improving climate information and risk knowledge and fostering risk-informed adaptation policy and action in vulnerable contexts

Contributors: GEO community, EW4All partners, climate funds, UNFCCC constitutes bodies and other interested stakeholders

Target audience: policy makers and project teams, especially in SIDS and LDCs

Key milestones

Advanced draft

First draft

TEC 28

- Why this brief
- Introduction
- Section 1: policy landscape
- Section 2: technology solutions including practical examples

by TEC 29

- Section 3: findings and key messages

- Published policy brief **by COP 29**

+ launch event @ COP29

Looking ahead

Timeline	Proposed milestones in the implementation of work on EWS
Q2 2024	Updating the 1st draft of the policy brief/paper on the basis of feedback received up to and during the TEC 28 meeting
Q3 2024	Developing the final chapter on “conclusions” including any key messages and policy recommendations, building on the preliminary findings presented at TEC 28 meeting
Q4 2024	Finalizing the document and disseminating it through suitable channels including at COP29
2025-2027	Potential follow-up work on EWS, including linked with other activities of the TEC rolling workplan 2023-2027

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2. Draft Joint Knowledge Product on Innovation & Technology for risk knowledge

Rui Kotani
DRR coordinator, GEO Secretariat

TEC-GEO knowledge product on 'innovation & technology for risk knowledge'

Why this brief

- **Significance** of climate information and risk knowledge in achieving global climate and development goals
- Underscoring the **role of technology and innovation** in enhancing climate information and risk knowledge, i.e. in SIDS and LDCs
- Highlighting the collaborative work of the **TEC and GEO** and outlining the **key elements** of the policy brief

Introduction

- Introducing **MHEWS** and the **EW4All** and the foundational role of risk information in their implementation
- Explaining the **positioning of the policy brief** and highlighting its relevance to the goals of the Paris Agreement and EW4All
- Providing a **snapshot of the contents** of the brief
- **Target audience and users** of the brief are stakeholders in EWS value chain, esp. policy-makers who formulate and implement DRR, CCA, Climate tech plans, policies and actions

Section 1: policy landscape

1. **The Status of MHEWS in countries: risk knowledge and information in the spotlight** (i.e. insights from SFDRR)
   - Challenges
   - Opportunities

2. **Technology needs and priorities for improving climate information and disaster risk knowledge** (i.e. insights from UNFCCC process)
   - Nationally Determined Contribution (NDC)
   - Adaptation Communications
   - National Adaptation Plans (NAPs)
   - Technology Needs Assessment (TNA)

3. **Barriers and enablers to implementing and scaling up technologies and innovations for climate information and early warning systems** (i.e. insights from TNAs, CTCN and funding entities GCF, GEF, AF)

4. **Trends and key considerations in technology applications for advancing climate information and disaster risk knowledge** (i.e. insights from mid-term review of the SFDRR)

- *Lack of EWS, esp. RK in LDCs and SIDS*
- *RK least progress, esp. in Arab States*
- *NAP: EWS tech also for L/D, Biodivsersity, food, energy, infra*
- *NAPs/TNAs: Floods, droughts*
- *40% of NAPs highlights EWS+DRR but 10% submits proposal to GCF*

Section 2: Innovation & Technology solutions for risk knowledge (RK) of MHEWS

Production of RK:

1. Sensors (Surface-, air, ocean-, space-based)
2. Citizen Science
3. Artificial Intelligence (AI) (Machine Learning)

Use of RK:

4. Simulation models
5. Internet of Things (IoT)
6. Global Navigation Satellite Systems (GNSS) & Terrestrial Reference Frame (TRF)
7. Advanced Computing (Cloud Computing)

Access to RK:

7. Geographic Information System (GIS)
8. Application Programming Interface (API)
9. Analysis Ready Data (ARD) & Data Cubes

Enabling Environment for improving RK:

10. Capacity-building (Data-Sharing & Data Integration)
11. Partnerships and International Cooperation
12. Indigenous and Traditional Knowledge

Opportunities and considerations

13. Analysis of Section 2
14. Emerging technologies for future considerations

8 proven technology measures *with* ***20 illustrative country use cases*** *from:*

- *20 non-Annex I countries*
- *4 regions*
- *6 SIDS*
- *6 LDCs*
- *4 LLDCs*
- *6 EW4All initial cohort countries*

3. Preliminary findings from this work

Sousan Torabi Parizi
Programme Officer, Technology subdivision

Preliminary findings

1. **Combining technology solutions and measures to boost effectiveness** e.g. hardware, software, and orgware measures, scientific processes and traditional knowledge and practices, and high-tech, low-tech, open solutions, tailored to context-specific needs
2. **Addressing global disparity in disaster risk knowledge and data** especially in LDCs and SIDS from the Arab States and Africa regions
3. **Identifying common and critical issues of developing countries in technology implementation for MHEWS** e.g. access to finance, stakeholder engagement, public participation and awareness ("last mile" challenges), data quality, technical capacity, regulatory frameworks and institutional arrangements, timeframe, and costing/valuation
4. **Recognizing the role of technology for improving climate information and EWS in the UNFCCC process and Paris Agreement** in planning documents (e.g. NDCs, NAPs and TNAs), as well as associated proposals to climate funds
5. **Supporting locally-led, people-centered MHEWS** including through the integration of local, traditional, and Indigenous knowledge and citizen science in the production, access and use of risk knowledge and climate information
6. **Building capacity to interpret data and generate risk information** particularly digital capacity-building in developing countries, with considerations of gender-equality and technology ethics

Preliminary findings

7. **Reinforcing the virtuous cycle of data quality and effective technology applications for EWS** to ultimately improve the data landscape of vulnerable countries and regions, including through utilization of open data and solutions
8. **Promoting quality open data, knowledge and solutions as 'public goods'** including through awareness raising, capacity-building efforts, technical assistance, and programming guidance of climate funds
9. **Investing in multi-sectoral technology solutions for improved climate information and risk knowledge** that can tackle multiple hazards in multiple sectors over the short and long run
10. **Promoting sectoral applications of artificial intelligence** including through initiatives such as the EW4All and the UNFCCC Technology Mechanism initiative on AI for Climate Action
11. **Leveraging public-private partnerships (PPP) for risk reduction** e.g. in strengthening governments' capacity to understand and mitigate context-specific disaster risks and reducing costs associated with accessing international climate finance
12. **Utilizing emerging technologies for improving climate information and risk knowledge** that may offer implementation-ready innovative solutions in vulnerable contexts at scale

4. Discussions and feedback

Guiding questions for discussions

While discussing the issue, the TEC may wish to consider the following guiding questions to inform the work of the A.3.1 Activity group in the months ahead:

1. Are there any comments or inputs to **improve the 1st draft**, including in the introduction of work, section 1 and section 2?
2. Among the presented preliminary findings, what are the **key issues to be highlighted when developing key messages and policy recommendations** from this work? Are there any key topics missing from the preliminary findings?
3. Are you in agreement with the **proposed next steps and approach to the organization of work** in 2024?
4. Are there **other matters related** to the implementation of work on EWS that you may wish to highlight?

Thank you!