Early Warning System Programming and Investment Opportunities in

MONGOLIA

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Early Warning System Investment Planning Workshop

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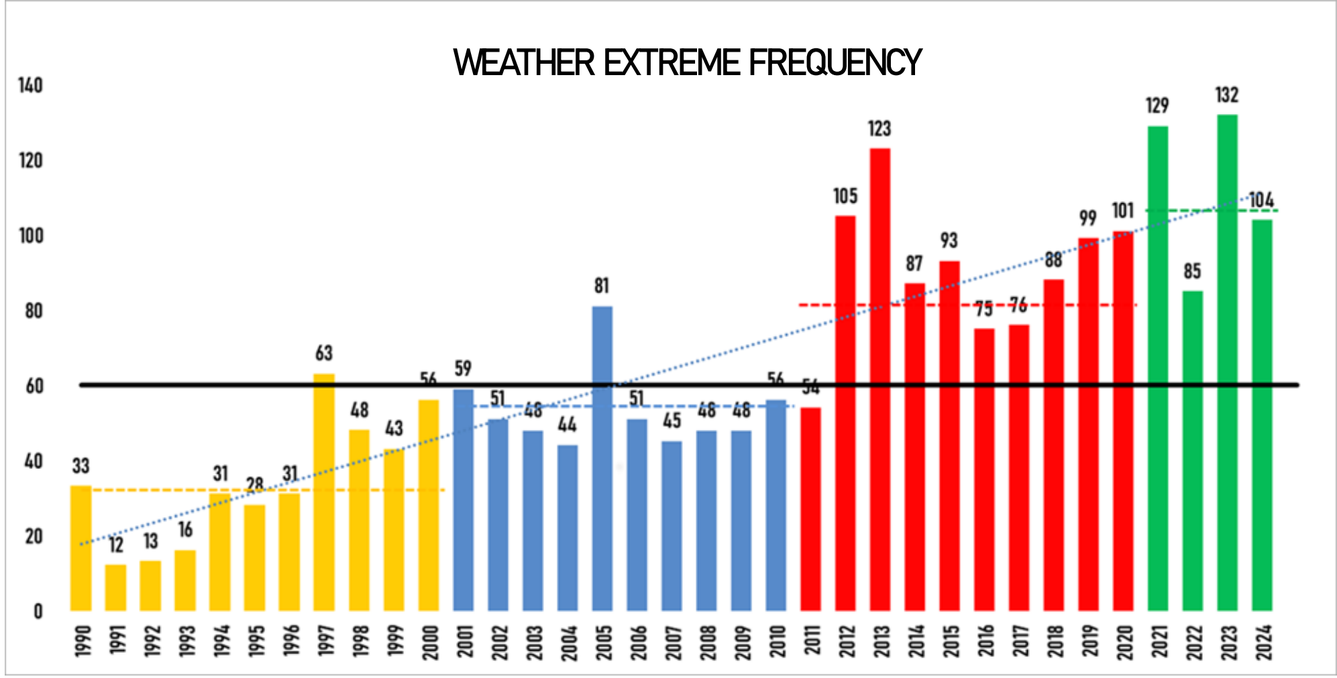
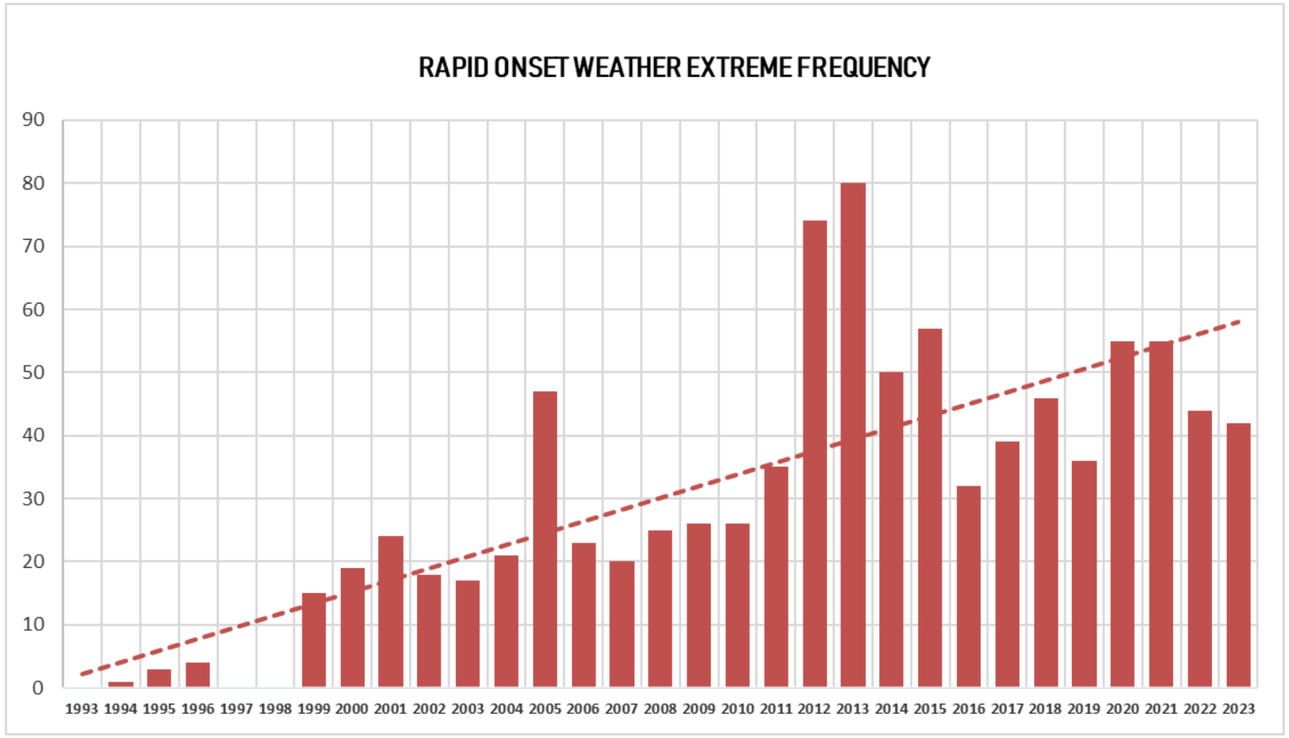
Weather extremes

- In last decade, the frequency of weather extreme is increased by 3 times compared to that in decade of 1990-2000
- Meanwhile, the frequency of rapid onset weather extreme is increased by 7 times compared to that in decade of 1990-2000





Climate extreme

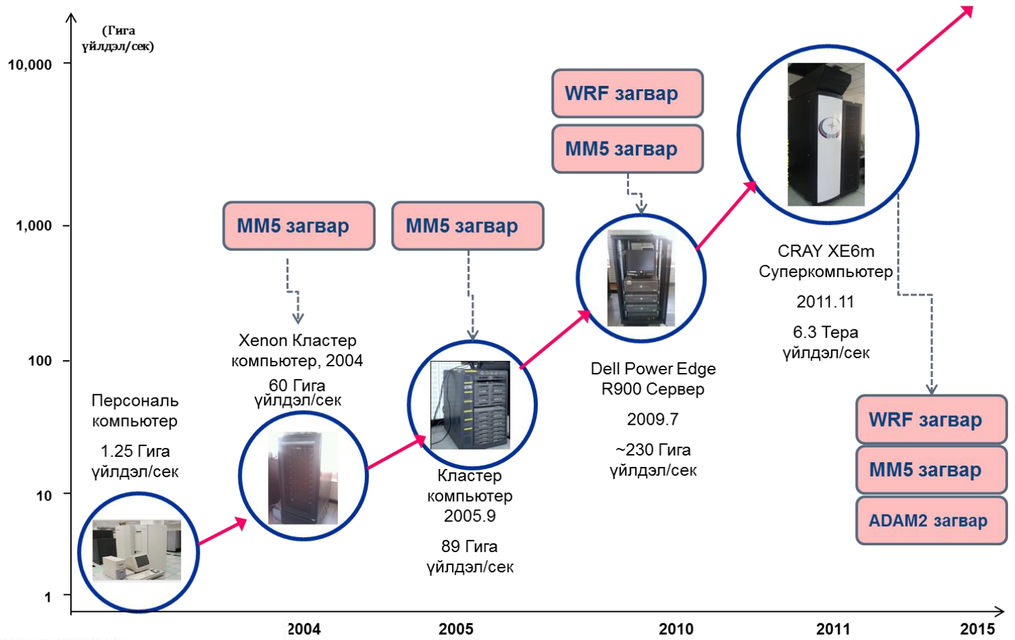
- Drought
- Dzud /severe winter condition/

Institutional arrangement

- National Emergency Commission
- National Emergency Agency / Pillar 3, pillar 1,pillar 4 /
  - Preparedness
  - Warning dissemination
  - Rescue
- National Agency for Meteorology and Environment Monitoring /Pillar 2, pillar 3, pillar 1/
  - Monitoring the weather and climate extremes
  - Forecasting and warning the weather and climate extremes
  - Dissemination
- Provincial/district branches of NAMEM and NEMA

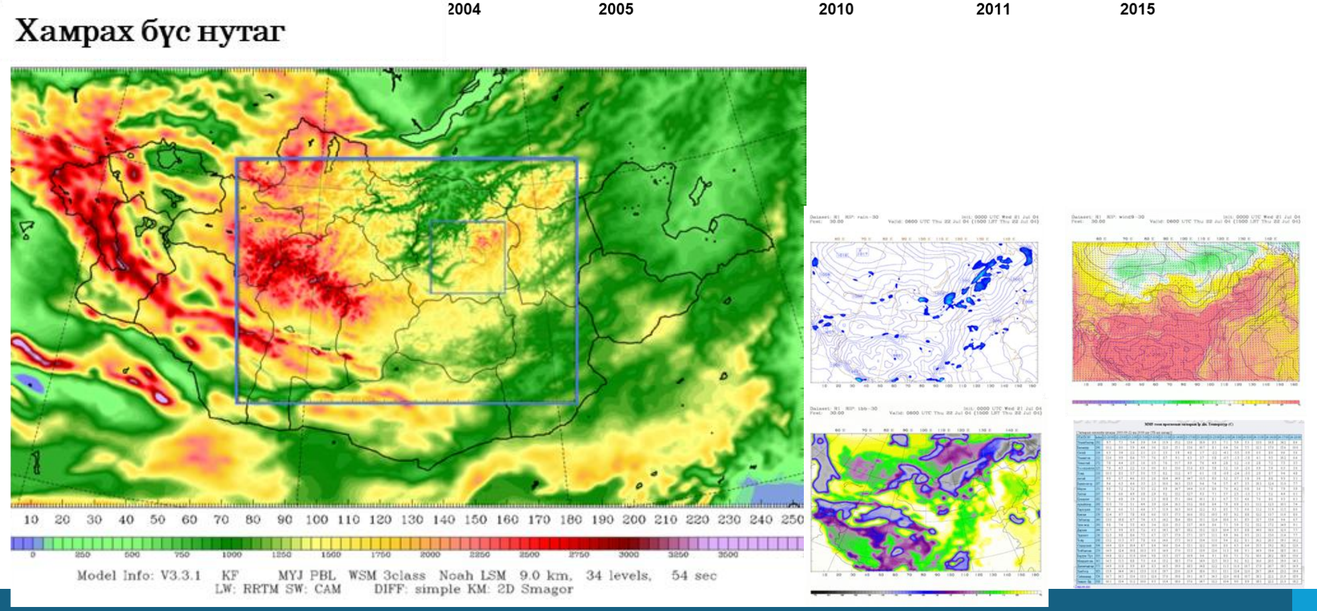
DEVELOPMENT OF EARLY WARNING SYSTEM

- In 1947, weather forecast office is established.



HAZARD FORECASTING

- In SEP 2025, new HPC will be in operation.

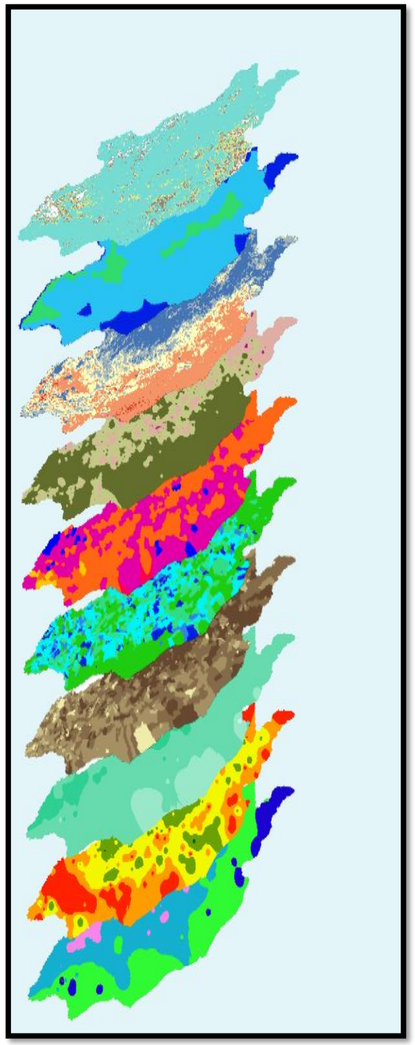


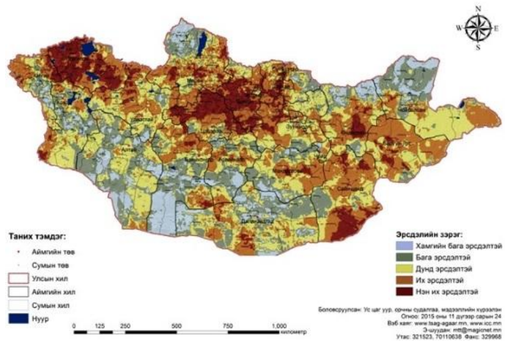
HAZARD IMPACT FORECASTING

Classification of extreme weather warning

Extreme weather	POTENTIALLY DANGEROUS	DANGEROUS	VERY DANGEROUS
Strong wind	Mean wind speed >=10m/s Wind gust >= 20-23m/s	Mean wind speed >=18m/s Wind gust >= 24m/s Duration: no limit	Mean wind speed >=24m/s in mountainous area Wind speed >= 28m/s in steppe and gobi area Wind gust >= 34m/s in Duration: no limit
Snow storm	Expected to be dangerous	Snowstorm with mean wind speed >=10m/s Visibility =< 2000m Duration: >=3 hours	Snowstorm with mean wind speed >=15m/s Wind gust >= 24m/s Visibility =< 2000m Duration: >=6 hours
Dust storm	Mean wind speed >=10-15m/s Visibility =< 10km by dust	Mean wind speed >=18m/s Visibility =< 1km by dust	-
Snow and wet snow /OCT-MAR/	RR>=2.0mm/12hours Further expected to be dangerous	RR>=5.0mm Duration: =< 12hours	RR>=10.0mm Duration: =< 12hours

DZUD risk map





- The risk map is produced on 20 Oct, 20 Nov and 31 Dec. using ground observation data and remote sensing data
- Risk classification: very high, high, medium, low, and very low.

1. What are the policies/roadmap/strategies that prioritize Early Warning System and Climate Information Services in your country?

- VISION 2050: Long term development Policy of Mongolia
- NATIONAL ADAPTATION PLAN
- Government Action Program 2025-2028
- Hydro-Meteorological Development Strategy 2025-2028 /draft/

2. Has Climate Information Services been piloted or operationalized for any sector in your country (agriculture, water, energy, transport, tourism, or others)? What challenges did you encounter and lessons learned from these?

Sector	Institutional Arrangement of Climate Service Delivery	Challenges	Lessons Learned
Livestock	Information and Research Institute of Meteorology, Hydrology and Environment, NAMEM	• Limited zoo meteorological observation network • Socio-economic data exchange and analysis	• Improve product quality • Improve herders' knowledge
Transport	Information and Research Institute of Meteorology, Hydrology and Environment, NAMEM	• Lack of meteorological and road condition observation network along the road, and railway. • Limitation of Related research study • Lack of knowledge and advanced technology	• Do have some outdated climate standard for railway and auto road those are needed to update •
Agriculture	Information and Research Institute of Meteorology, Hydrology and Environment, NAMEM	• Lack of site-specific observation and technology • No decision-support system • Lack of knowledge and advanced technology	• Needs to closely collaborate with users

3. Are your country's Climate Information and Early Warning System priorities articulated in ADB's Country Program Strategy (CPS) and programming pipeline/projects in your country? YES

ADB CPS Priority/ Strategic Objective	ADB Programming Pipeline/ Projects
Growth CPS Priority/ Strategic Objective: 1. Promote Diversified and Inclusive Growth 2. Strengthen Sustainability and Resilience 3. Advance Empowerment and Opportunity	Strengthening Integrated Early Warning System in Mongolia Year: 2025-2028 Theme: Advancing Diversified, Inclusive, and Sustainable
	Scaling Up Clean Air Actions for Better Health and Resilience

ADB project: Strengthening Integrated Early Warning System in Mongolia Project

Impact:
Mongolia's **national early warning capacity** to various disasters enhanced

(Mongolia, Vision-2050)

Outcome:
Disaster preparedness at the national and local levels strengthened

Output 1:
Nationwide **multi hazard monitoring and early warning dissemination** enhanced.

Physical
- DS dispatching center
- TRS trunked radio system
- EBS emergency broadcasting system
- CBS cell broadcasting system
- PWT public warning tower system
- MCC mobile communication system
- NEMA PR system

Output 2:
Disasters Risk Monitoring System (DRMS) established.

Software
- Data collection & integration
- Data processing and storage
- GIS mapping
- Reporting

Output 3:
Technical capacity for early warning systems and disaster preparedness strengthened.

- **Community** group set up, mobilization, strengthening
- Improvement of **knowledge base** for disaster management
- **Harmonizing** multi hazard early warning systems nationwide
- Building **NEMA and LEMA** capacity building

Early Warning Cycles / Stages

Integrated Decision Support System

Stage 1: Risk Knowledge

- …
- Community Engagement
- Community Exposure, Vulnerability and Coping Capacity
- Natural Hazards Characteristics
- …

Stage 2: Monitoring and Data Acquisition

- …
- Data Agreements and Interagency Protocols
- Monitoring Systems Developed
- Technical equipment, suit… local conditions
- Data received… …ssed and availabl…
- D… …inely archived and …essible
- …

Stage 3: Forecas…ing and Warning

- …
- Warni… …m partners
- P… …ts in place to define …ommunication responsibilities and channels
- Warning Systems
- Data and warning products
- Warnings generated and disseminated
- …

Stage 4: Dissemination and Communication

- …
- Volunteer network trained
- Warning communication technolog… reaches the entire population
- Multiple communicati… …ams used
- Agreement… …oped
- Consiste… …arning dissemination and communication systems
- Equipment maintenance and upgrade program
- …

Stage 5: Information Type and Reliability

- …
- Warning Messages Recognized and Understood
- Warning alerts
- Warnings specific
- …

Stage 6: Response Capability

- …
- Up-to-date emergency preparedness and response plans
- Regular tests and drills undertaken
- Community ability to respond
- Community and volunteer education and training program
- Public Awareness and Education Enhanced
- …

4. What potential Climate Information and Early Warning System sectoral investments could your country and ADB work together?

Indicative Project/ Investment Title	Timeframe	Sectors Involved	Implementing Agency
Flood forecasting and warning system	2026-2028	Disaster prevention Urban management Health	National Agency for Meteorology and Environment Monitoring
Development of the Integrated Climate information service system	2026-2028	Agriculture Transport Infrastructure Health	National Agency for Meteorology and Environment Monitoring
Integrated Decision support system		All sector DRR	National Emergency Management Agency

5. What measures and reforms are needed to ensure sustainability of the identified Climate Information and Early Warning System investments?

Indicative Project/ Investment Title	Institutional Arrangement	Policy Reform	Budget Reform
Flood forecasting and warning system	No change		Need to increase number of staffs and Operational cost
Development of the Integrated Climate information service system	No change	Needed to clarify the public-private partnership	
Integrated Decision support system		To amend law and Regulation related to decision or right	National Emergency Management Agency

THANK YOU FOR YOUR ATTENTION