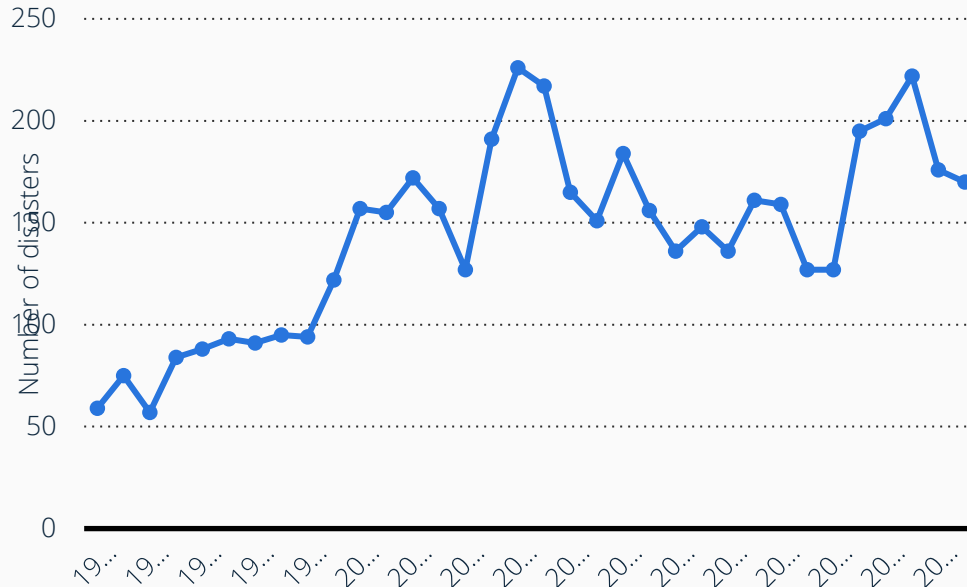


Mobile Phone and Navigation Map for Real-Time Flood Warning

Chang Yong Son, Ph.D

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in National Radio Research Agency, Ministry of Science and ICT of Republic of Korea
(ITU-D, Vice Rapporteur Q3/1)

Number of flood disasters worldwide



Note(s): Worldwide; 1990 to 2023

Source: Statista (2026). Number of flood disasters worldwide from 1990 to 2023.

Further information regarding this statistic can be found on IMF; EM-DAT

In 2023, there were 170 flood disaster events recorded worldwide. This marks a slight decrease from the 176 disasters in 2022 but remains significantly higher than the average 86 floods per year reported in the 1990s.

Floods continue to take a heavy toll on human lives and economies worldwide. In 2023, approximately 32 million people were impacted by flooding, including injuries and displacement.

Economic loss caused by floods amounted to 453 billion U.S. dollars in the past decade, the highest since the 1970s.



Mounting flood in cities

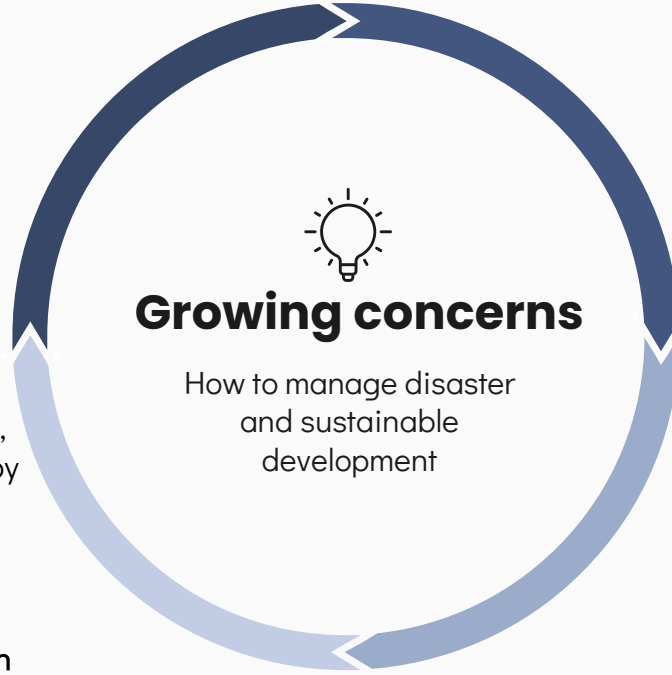
July 2023

(Osong underpass disaster)



Following record-breaking torrential rains, a temporary embankment along the nearby Miho River collapsed, rushing millions of gallons of water and mud into the 430-meter-long underpass within less than three minutes. **The flash flood trapped 17 vehicles—including a city bus—resulting in 14 deaths and 16 injuries**

Source: KBS, Yonhap news



July 2026



August 2026



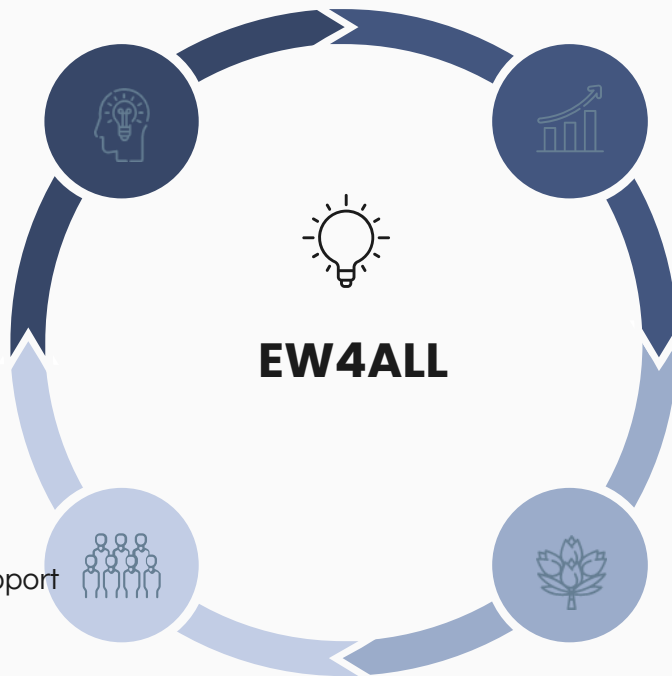
Early Warnings for All initiative

Pillar 1:
**Disaster risk
knowledge**

Pillar 2: Detection,
observation,
monitoring, analysis,
and forecasting

Pillar 3: Warning
dissemination and
communication

Pillar 4: Preparedness
and response
capabilities



ITU leads the initiative's Pillar 3 with support from the GSMA, Microsoft, Google, REAP, IFRC, and other partners

Pressure to develop a new EWS against floods

Before 2024

Post alerts of road & underpass closures

- Road hazard information **mainly focuses on conditions like icing, fog, and collisions**
- Information on flood risks are displayed on navigation systems only **after roads are closed**
- Drivers are **unaware of flood risks before road closures**

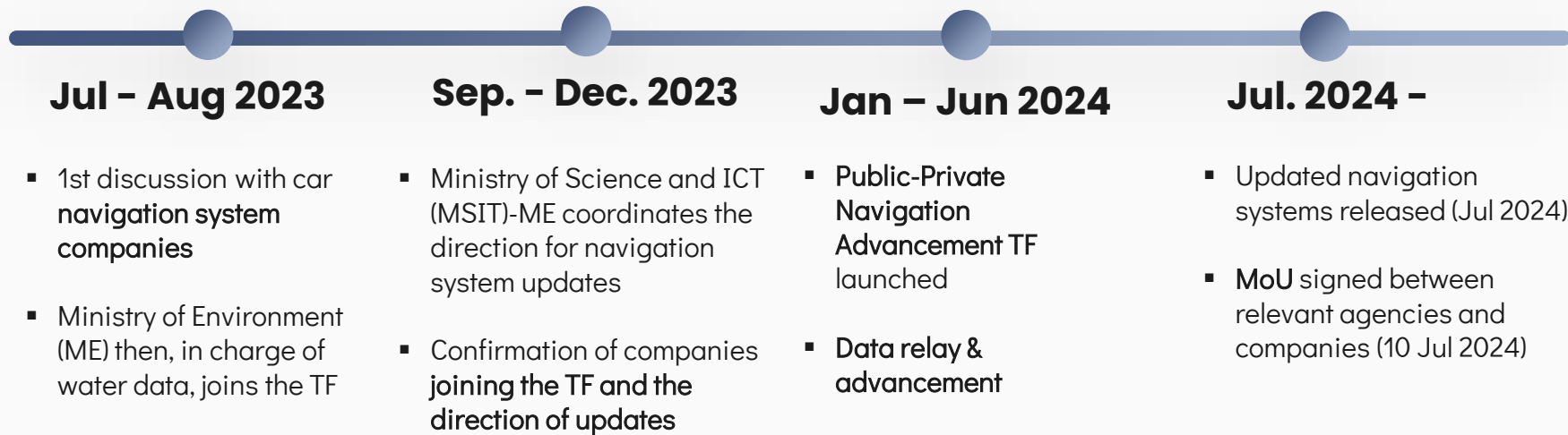
After 2024

Adding flood risk alerts on mobile devices

- Updated navigation systems will inform drivers through screen displays and voice **alerts to be aware of nearby flood risks**
- Using flood risk information provided by the Ministry of Environment, alerts to be displayed on navigation systems **when drivers approach areas near such risks.**
- **Real-time flood risk alerts displayed** on screen to inform drivers **ahead of road closures**

With the occurrence of unpredictable torrential rains rising due to climate change, public authorities are forming an intelligent safety network to provide real-time guidance in areas at risk of road flooding

Timeline to introduce flood warning system



The Early Warnings for All (EW4All) initiative aims to **ensure universal protection from hazardous hydrometeorological, climatological and related environmental events** through life-saving multi-hazard early warning systems, anticipatory action and resilience efforts

Actions through Public-Private Collaboration



Flood warnings for 223 locations nationwide & notifications for 37 dam release in real time (As of 2023)

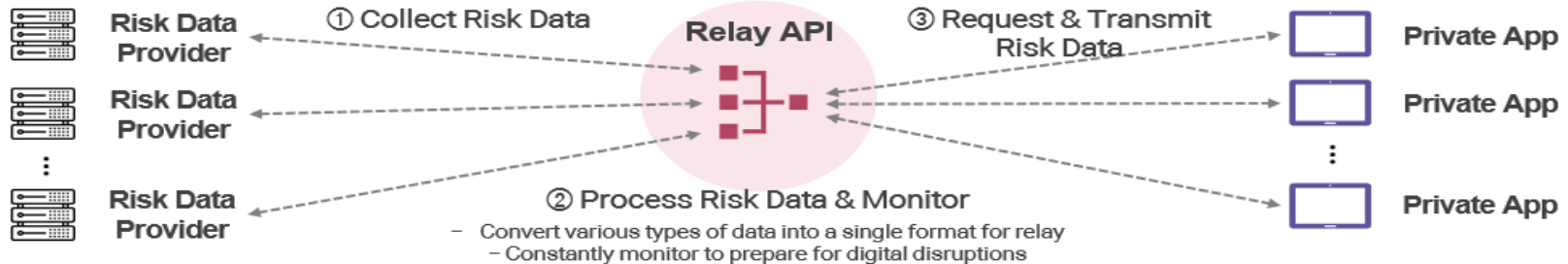


Real-time data processing and provision through relay APIs based on the risk response digital platform



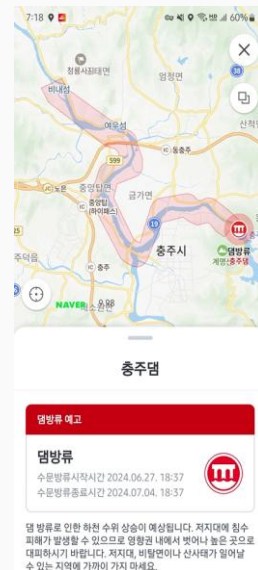
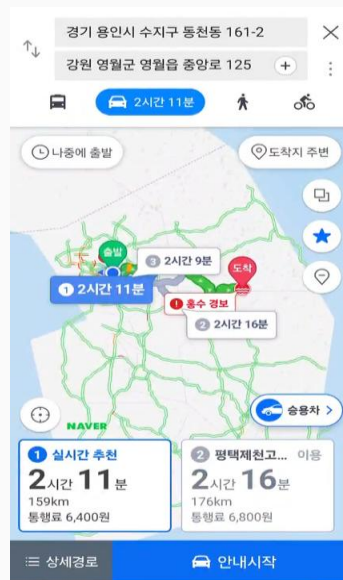
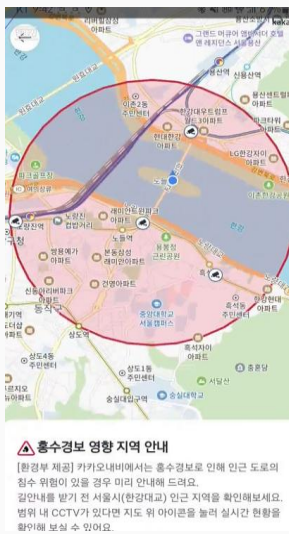
Navigation updates to display the relayed data in real time

Data flows and responsibilities



New functions in Map & Navigation for EWS

- Real-time flood risk alerts with text & voice messages
- Flood warning sign display & voice alerts
- Display of flood warning areas on route search results
- Dam release notification screen display with text & voice messages



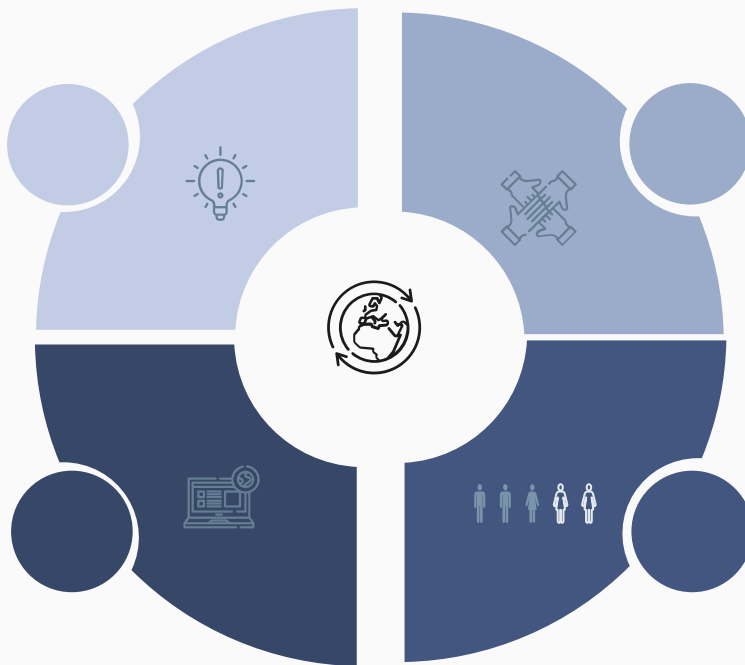
Learned lessons

Government initiative

Recognition of problems in disasters particularly in floods, and how to employ **innovative technologies** to address the issues

Digital infrastructure

Advanced telecommunication **infrastructure** and high diffusion of mobile devices in Korea



Cooperation

Inter-ministerial coordination, public and private cooperation to disaster management

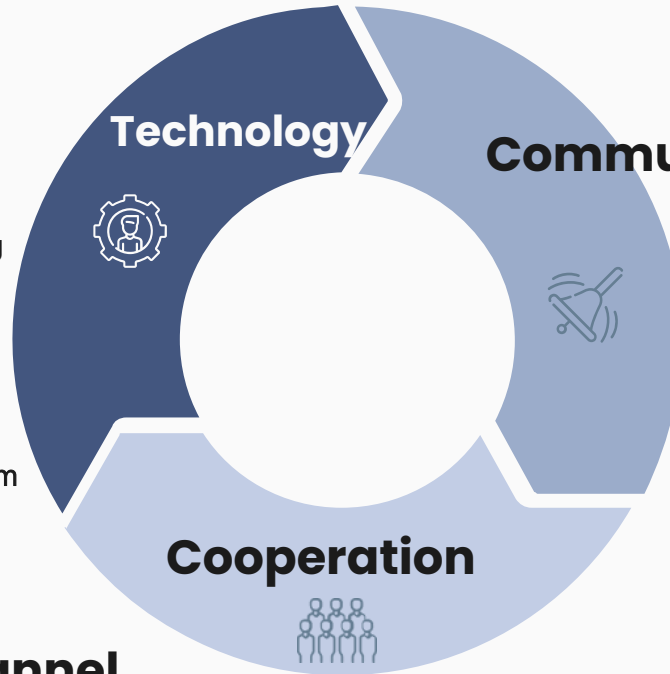
People and users

Early adaptation of new **services** and responses to updated services to disasters to save life

Takeaways and way forward

Continuous Updates

- Detour guidance for hazardous areas
- Marking of underpass at risk of flooding
- Information on landslides and slope collapses to be added
- **For instance**, in 2026 the Ministry of Science and ICT and the Ministry of Climate, Energy and Environment have adopted the **AI Flood Forecasting System** based on a digital platform



Communication

Raising Public Awareness

- Joint promotion to enhance public awareness
- Press release and collaboration
- Ongoing discussion to add services

Unified Channel

- Collect policy recommendations for the government & review of public collaboration requests through MoU between **Ministry-Companies-Institutions**

Collaboration between the public and private sectors in data release and reservation was launched during the COVID-19 pandemic, and this served as **the cornerstone for innovation of disaster response system in Korea**

Q&A

Thank you