



**Asia-Pacific
Economic Cooperation**

2025/SOM3/EPWG/SDMOF/003

Agenda Item: S2.1.2

Applications of Identified Emerging Risk to Disaster Managements

Purpose: Information

Submitted by: Korea



**18th Senior Disaster Management
Officials' Forum
Incheon, Korea
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Applications of Identified Emerging Risk to Disaster Managements

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Progress Update (so far)

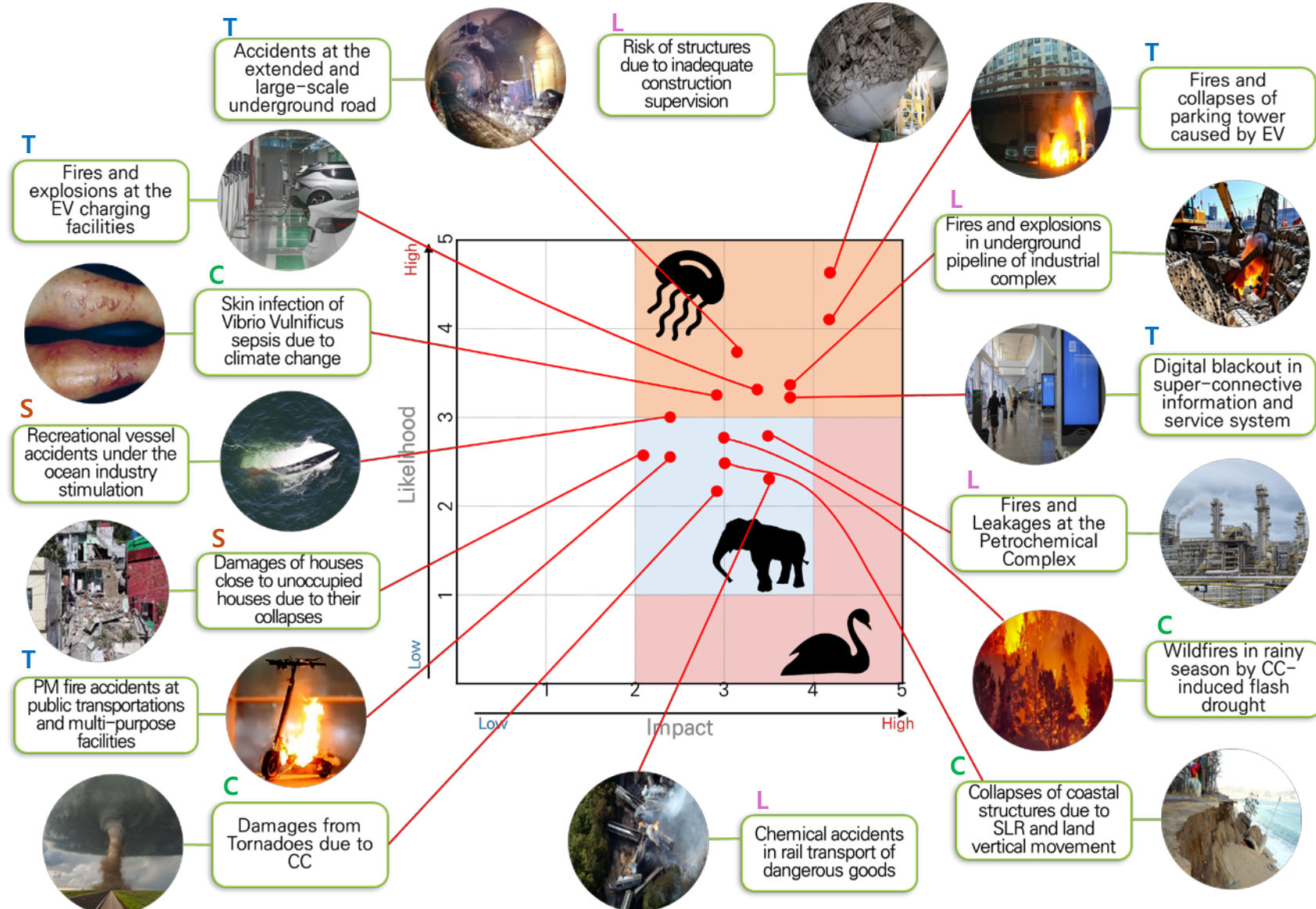
- ◇ Announced the Reform Plan for National Safety System (27 of Jan.. 2023)
- ◇ Established the dedicated organization (20 of Feb., 2023)
- ◇ Organized the Emerging Risk Assessment Committee (14 of Mar. , 2023)
- ◇ Held the kick-off meeting (21 of Mar., 2023)
- ◇ Held the committee 9 times (29 items identified → 18 reviewed & evaluated → 15 selected)
- (2023) 5.22., 6.20., 8.17., 11.21., (2024) 4.30., 8.27., 11.1., 11.25., (2025) 5.21.



Emerging Risks identified in Korea – Overview

15 Emerging Risks w.r.t. Drivers

- **Technical** Advances: 5 items
* EV, PM, DT, underground Developments ...
- **Climate** Change: 4 items
* tornadoes, vibrio., flash drought, SLR ...
- **Social** Change: 2 items
* unoccupied houses, ocean industry stimulation ...
- **Latent** Issues: 4 items
(e.g. aging infra., problematic custom...)
* aging chemical complex, inadequate construction supervision ...



Emerging Risks identified in Korea –

Recreational Vessel

Recreational vessel's safety management

◇ Growth of the marine industry for leisure

- Yachting (Korea) : ('13) 2,307 → ('23) 83,416 pers./yr.
 - ※ based on continuous statistics from 6 yacht marinas
- #Boat rental service (Korea) : ('19) 162 → ('23) 259

◇ Change in industry related to maritime leisure

- Enactment of Marine Leisure Tourism Promotion Act (2025)
- Pan-governmental plan to promote maritime leisure (2019)
- National plan for developing marinas (2010)

◇ Problems (management maturity)

- * Relevant agencies: MOF, KCG, MOIS
- Difficulty in tracking vessel's location during an accident
 - ※ #Distress incidents (Korea) : ('15) 1,411 → ('21) 2,581
 - ※ w/o AIS, excluded from vessel traffic service (V-Pass) and notification of port entry and departure
- Poor safety education for crews and tourists

◇ Recommendations

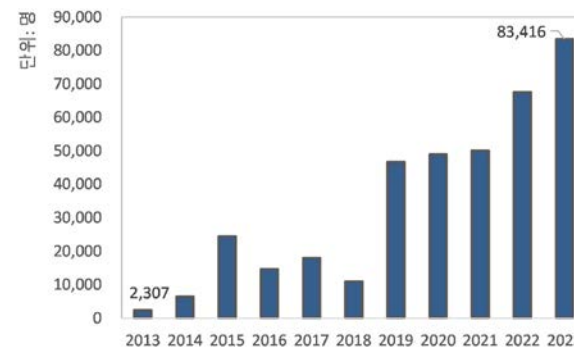
- Mandatory installation of AIS & V-Pass (MOF) and safety education for crews and tourists (KCG)



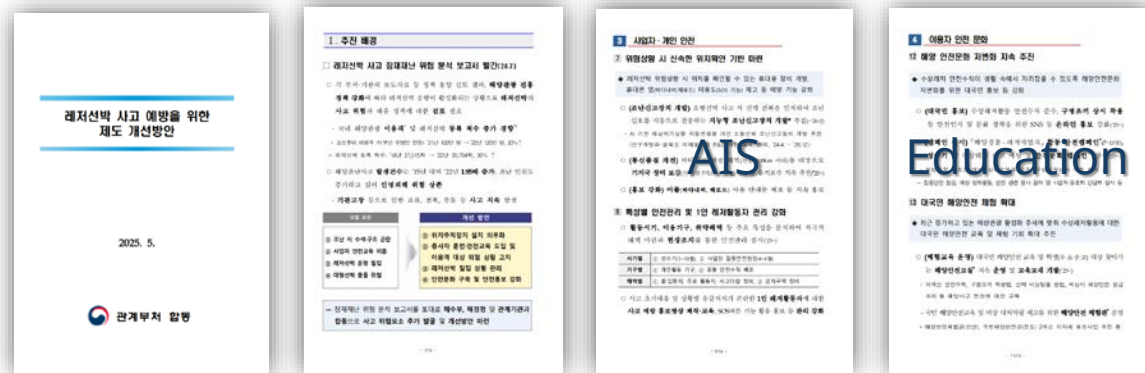
【 Yacht 】



【 Boat 】



【 # annual yachting tourists in Korea 】 【 National Plan for developing marinas 】



【 Institutional Improvement Strategy for Leisure Boat Accident Prevention 】

Emerging Risks identified in Korea –

Unoccupied Houses

Unoccupied houses at the steep slope

◇ Population hollowing

- Depopulation of old downtown at steep slope
- ※ Mountainous area in Korea : 65% of the national territory
- Growing vacant houses by 4.3% per year

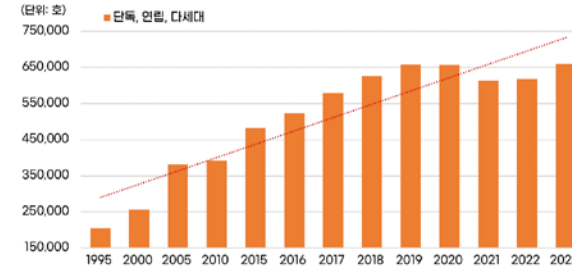
◇ Problems (management maturity)

* Relevant agencies: MOLIT, MOIS, MOEF

- Survey on vacant homes NOT considering the impact on neighboring properties
- Unresolved liability issues when causing damage to neighboring properties
- Difficulty in voluntarily demolishing vacant homes
- ※ Increased land taxes after demolition

◇ Recommendations

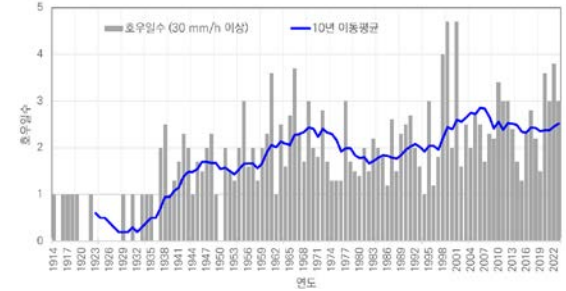
- Enhancing the regular survey system for assessing the impact on neighboring properties (MOLIT)
- Introduction of disaster liability insurance for vacant homes-related accidents (MOIS)
- Tax system reform (MOEF, MOIS)
- ※ Vacant home tax, capital gains tax reduction, ...



【 #unoccupied Houses in Korea 】



【 Collapse Accident (Oct. of 2024) 】



【 #days of heavy rainfall in Korea 】



【 Field Investigation (Oct. of 2024) 】



Emerging Risks identified in Korea –

Ultra-long Underground Road



Ultra-long and deep underground road

◇ Growing # underground road in Korea

- #constructions (Korea) : ('21) 890 → ('24) 938
- #accidents (Korea) : ('14) 257 → ('23) 2,651

◇ More long and deep underground road

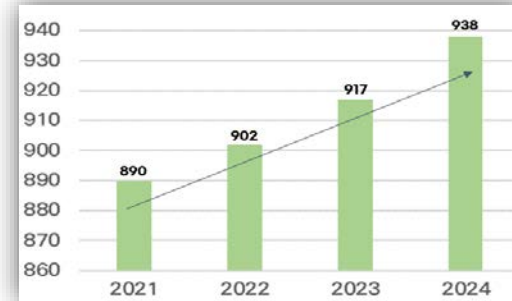
- ※ No exits except at both ends
- Seobu urban expressway : 9.4km (along the river)
- Boryeong undersea Tunnel : 6.9km

◇ Problems (management maturity)

- * Relevant agencies: MOLIT, NFA, MOIS
- Confusion over fire station jurisdiction for rescue operations
- No restriction for the transport of hazardous materials
- Lack of specialized training for firefighting and rescue

◇ Recommendations

- Adjustment of jurisdictional boundaries for more effective firefighting and rescue (NFA)
- Enactment on restriction for the transport (MOLIT)
- ※ hazardous materials
- Regular training considering various risk factors (NFA)
- ※ EV fires, Inundations, ...



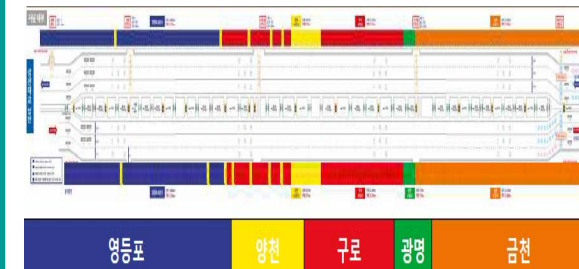
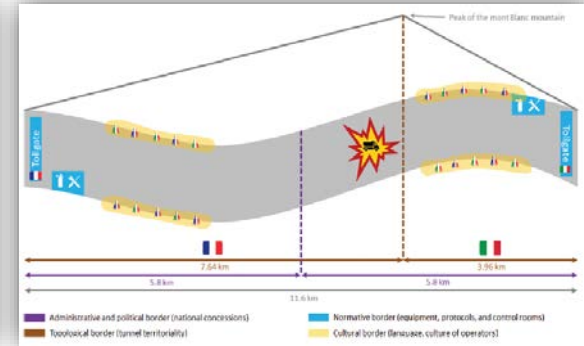
【 Number of Underground Roads 】



【 Plan for Underground road Construction (Metropolitan Area) 】



【 The Mont Blanc Tunnel Fire (1999) 】



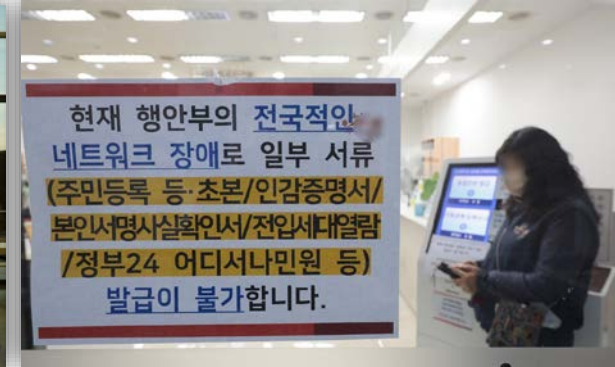
【 Fire station jurisdiction of Seobu expressway (L: current, R: recommended) 】

Hyper-connected digital services outage

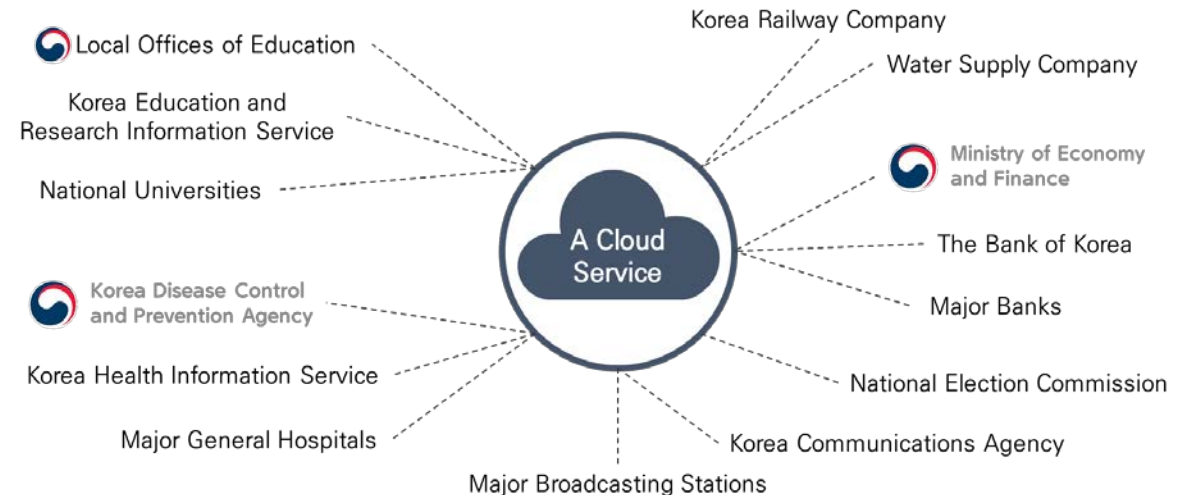
- ◇ National promotion of 'Digital Transformation'
(National DT Strategy, Sep. of 2022)
 - Promotion of hyper-connectivity of information and service between public and private sectors
 - ※ Cloud-based hospital and education information system...
 - Damage nationwide and worldwide
 - ※ Fire-accident at the data center in Korea (Oct. of 2022)
 - 'Kakao talk' service outage (most widely used in Korea)
 - ※ MS's cloud service outage (Jul. of 2024)
 - Disruption of aviation, finance, healthcare service, and more
- ◇ Problems (management maturity)
 - * Relevant agencies: MSIT, MOIS
 - Unpreparedness of protective measures against additional treats (e.g. C.C-induced inundations)
 - Inadequate drills to respond to the Digital Blackout
- ◇ Recommendations
 - Systematic accident investigations and their information (statistics) collection (MSIT, MOIS)
 - Improvement of drills (MSIT, MOIS)
 - ※ Nationwide disaster exercises 'Ready Korea'



【 MS Cloud Service Outage
(Jul. of 2024) 】



【 Administrative Information Service
Outage (Nov. of 2023, Korea) 】



【 Example of Linkages of Public and Private Digital Service and Information 】

Emerging Risks identified in Korea – EVs

Fire and collapse accidents due to EVs

◇ Electronic Vehicles (EVs)

- Battery (fire) : Lithium ion Battery 'Thermal Runaway'
- Weight (collapse) : Heavier than general cars

◇ Changes in environments

- Mandatory installation of charging station including in underground spaces (Eco-friendly energy promotion)
 - * Difficulty of fire suppression in confined underground areas
- Growing number of parking towers in the city center

◇ Problems (management maturity)

- * Relevant agencies: ME, MOTIE, MOLIT, NFA
- Absence of EV-specific fire suppression technique
- No regulation of exclusive EV charging zone
- Inadequate building code for EVs' weight
- Lax restrictions on EVs using the parking tower

◇ Recommendations

- Enactment of regulation on exclusive EV charging zone (NFA)
- Introducing the battery registration and pre-certification (MOTIE)
- Revision of building code for parking tower (MOLIT)



【 EV Fire accidents in Incheon, Apr. of 2025 】



【 Layout of underground parking lot 】

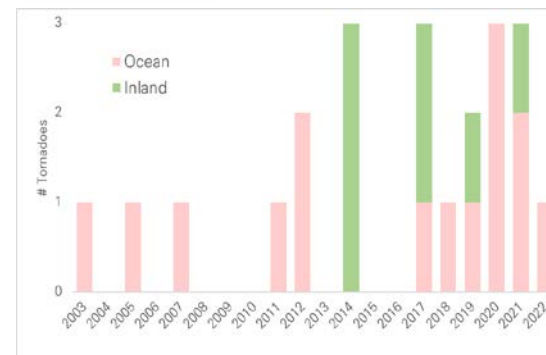
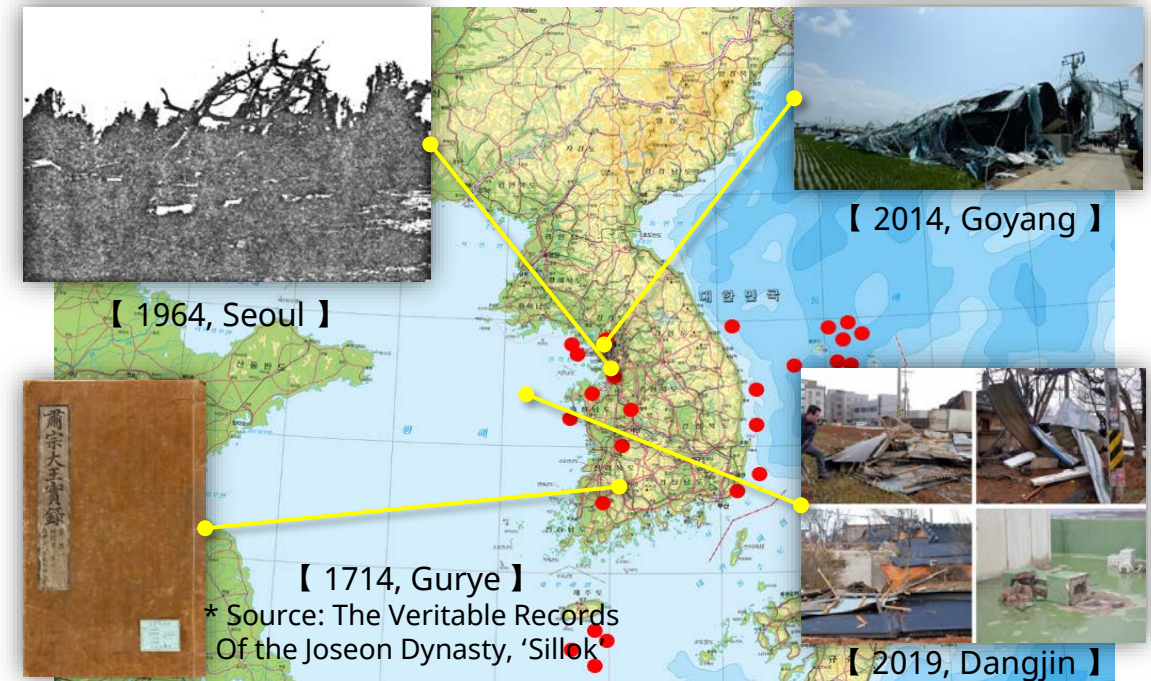


General cars		EVs	
Model	Weight	Model	Weight
현대 디올 뉴 코나	1,360~1,495kg	현대 디올 뉴 코나 Electric	1,630~1,740kg
제네시스 G80	1,785~1,965kg	제네시스 Electrified G80	2,265kg
BMW 520i	1,670kg	BMW i5	2,205kg
현대 포터2	1,740~1,770kg	현대 포터2 일렉트릭	1,930kg
지프 그랜드 체로키	2,130~2,190kg	지프 그랜드 체로키 4xe	2,475~2,555kg
GMC 허머 H3	2,087~2,223kg	GMC 허머 EV	4,103~4,282kg

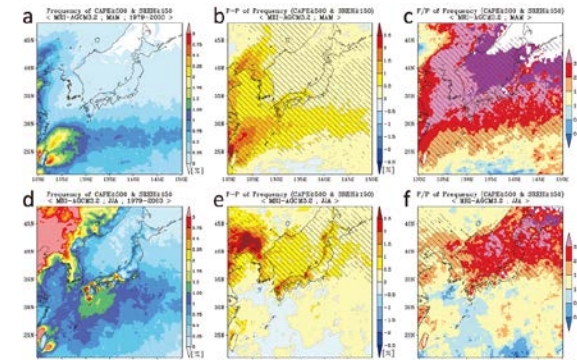
Emerging Risks identified in Korea – Tornadoes

Tornadoes due to C.C.

- ◇ One of the Common Myths
“Tornadoes do NOT occur in mountainous area”
- ◇ Climate Change
drives the atmosphere more unstable
→ Tornado favorable condition
- ◇ Problems (management maturity)
 - * Relevant agencies: MOIS, MOLIT, KMA
 - Limited understanding of tornado-related risks
 - No systematic data collection and management
 - Lack of comprehensive system to respond tornado threats
- ◇ Recommendations
 - Revision of response guideline (MOIS)
 - Development of tornado monitoring and investigation system (KMA)
 - Public relation on risk and action protocol against tornado (MOIS)
 - Review and revision of the building codes (MOLIT)



【 Trend of #Tornadoes in Korea 】



National Comprehensive Plan for Disaster Risk Reduction

- Comprehensive Plan for National Safety Management (every five years)
- Executive Plans for National Safety Management (every year)

→ Line ministries, local governments, relevant institutes of private sector should involve the measures against the emerging risks identified by NDMI in their annual executive plans based on the guideline.



Revisions of Laws and Regulations

- About 150 recommendations on laws and regulations, response protocols (manuals) and so on
- EV fire protection facilities (National Fire Agency), Safety Codes of EV Charging Facility (Ministry of Trade, Industry and Energy)

Public Relations

- Press release on the publications of the National Emerging Risk Report
- Media coverages of about 230 articles



Exercises and Trainings

- Nationwide 'Ready Korea', 'Safe Korea' exercises



Research and Development (R&Ds)

- MOLIT(Ministry of Land, Infrastructure and Transport) : Design code for parking tower
- KMA(Korea Meteorological Administration) : Monitoring system of tornadoes

Thank you for your Attention

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