



# Progress of DRR Systems in the 25 years since the Taiwan 9/21 Earthquake

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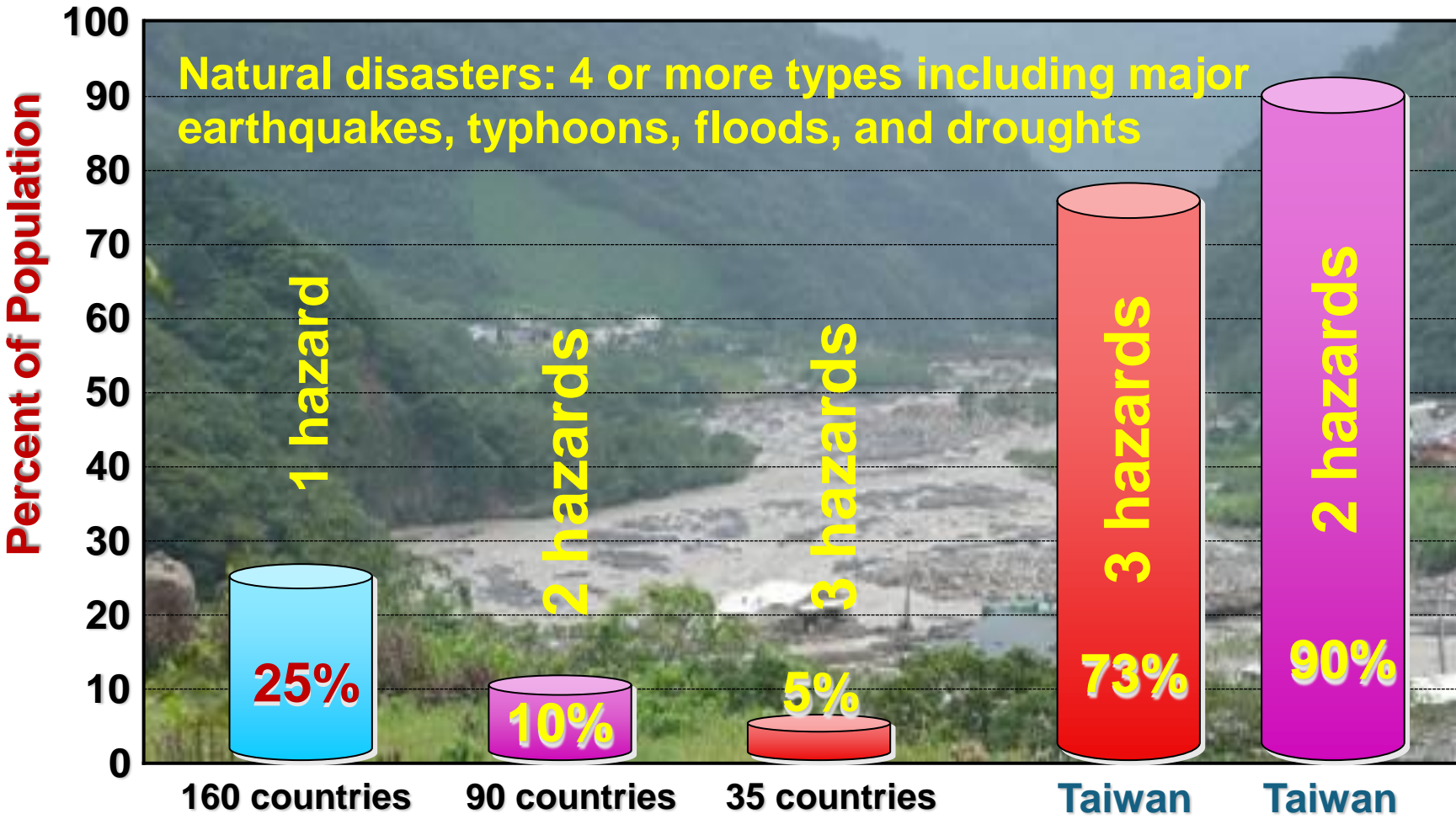
International Disaster Reduction Alliance Forum (DRA Forum 2024)



# Content

- Overview of the 9/21 Earthquake
- Relationship between the 9/21 Earthquake and DRR Systems
- History of National and Regional DRR Systems
- Promotion of Disaster Resilient Community Development in Regional Areas
- Recent Threats: Responses to Climate Change
- Future Challenges

# Taiwan is one of the regions in the world with relatively high disaster potential.



World Bank report (2005), Natural Disaster Hotspots: A Global Risk Analysis



# Natural disasters that often occur in Taiwan



9/21 Earthquake, Source: Central News Agency



2001 Nari Typhoon, Source: Photo by Tu Chien-Tsung



2009 Morakot Typhoon, Source: United Daily News materials

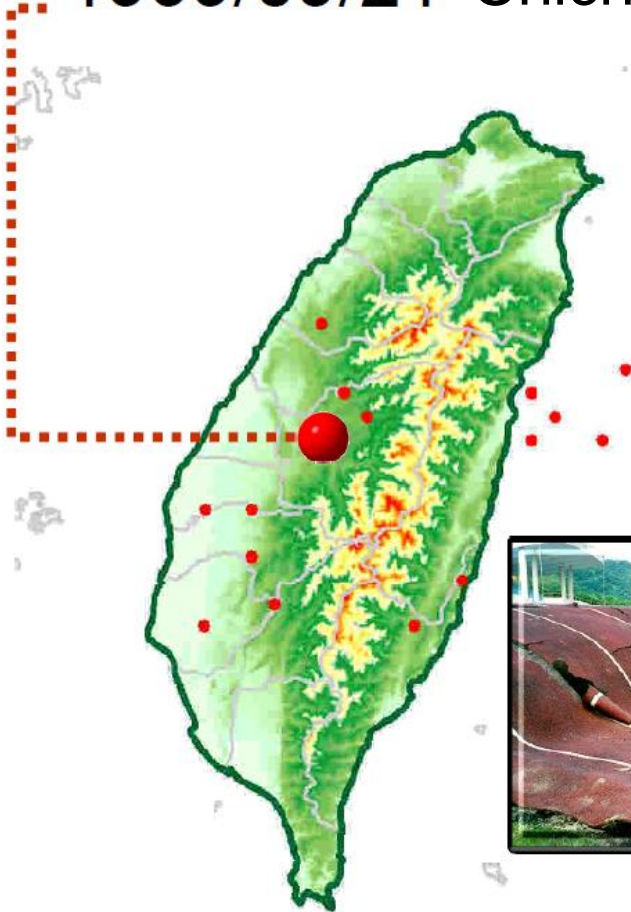


2023 Drought in Sun Moon Lake, Source: Commercial Times



# Summary of the Damage Caused by the 9/21 Earthquake

1999/09/21 Chichi earthquake



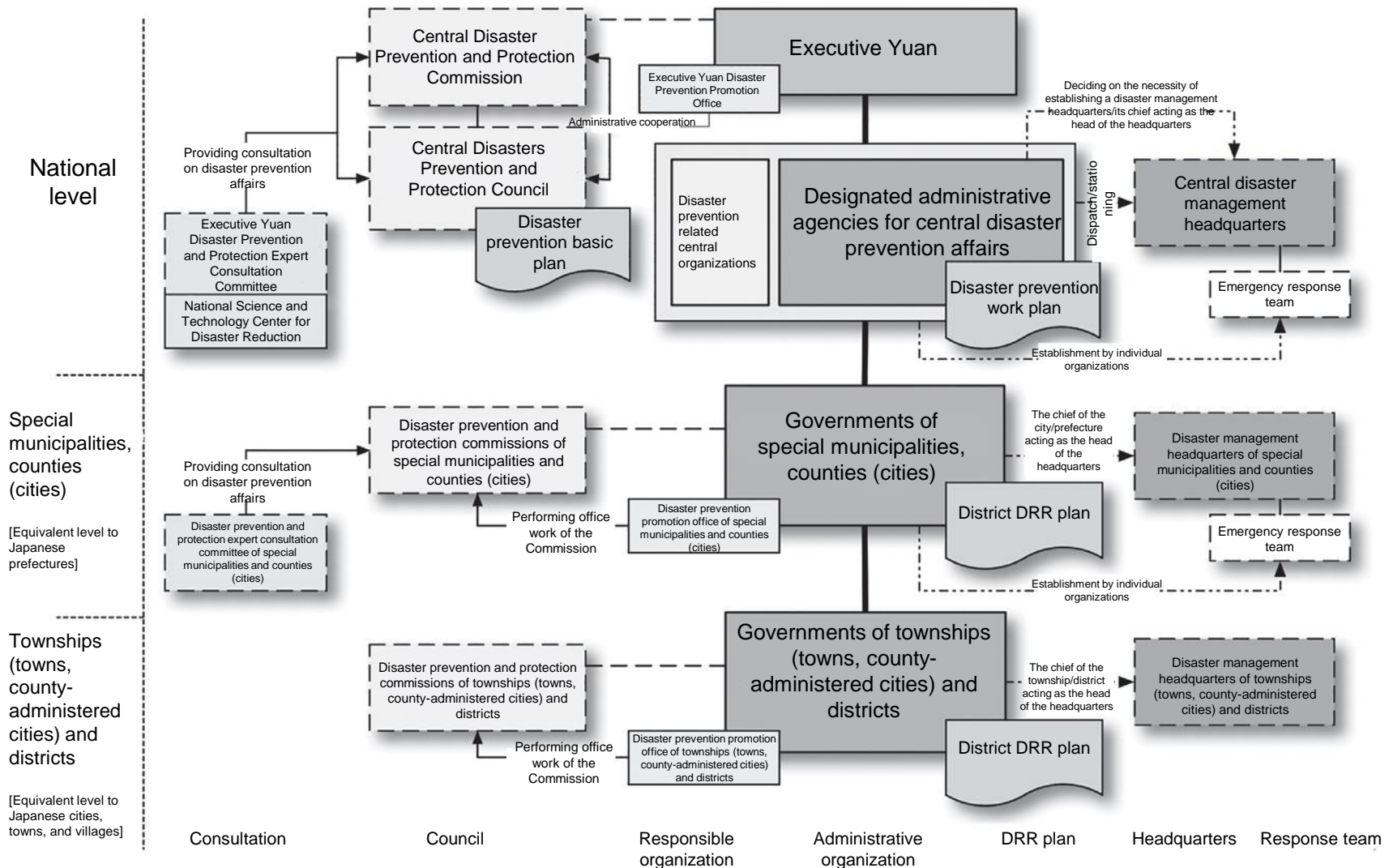


# Start of a DRR system: Establishment of Disaster Prevention and Protection Act

- ◆ Before the 9/21 earthquake : Disaster relief was the main objective.
  - 1945–1965: “Earthquake Relief Guidelines” and “Relief Guidelines for Deaths, Injuries, and House Collapses Due to Disasters”
  - 1965–1994: “Taiwan Province’s Measures for Preventing and Recovering from Natural Disasters and Dealing with the Aftermath”
- ◆ After 1994, the year in which the Northridge Earthquake and Nagoya Airport accident occurred
  - March 1995: The Fire Agency of the Ministry of Interior was established, and the Disaster Prevention and Protection Act was drafted.
  - The emergency response to disasters was primarily the responsibility of the national government. The Great Hanshin-Awaji Earthquake had a substantial influence.
- ◆ After the 9/21 Earthquake: Efforts started toward the promulgation of the Disaster Prevention and Protection Act in 2000.
  - Positioning of the Central Disasters Prevention and Protection Council of the Executive Yuan, the formulation of a third-class disaster response system, and the establishment of the National Science and Technology Center for Disaster Reduction
- ◆ Major revisions since then:
  - After the 2009 Morakot typhoon: wide-area support, land use restrictions, regional mutual assistance, etc.
  - After the 2016 southern Taiwan earthquake: Enhancement of reconstruction support
  - 2022: Regarding climate change, a provision was added to strengthen public awareness of disaster prevention.



# National and regional DRR systems



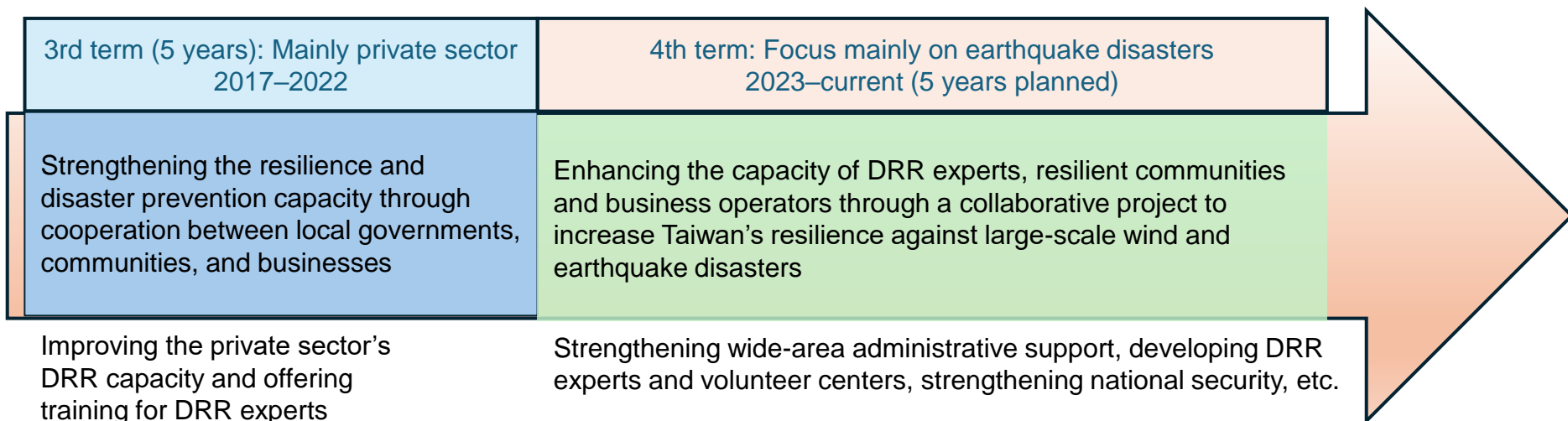
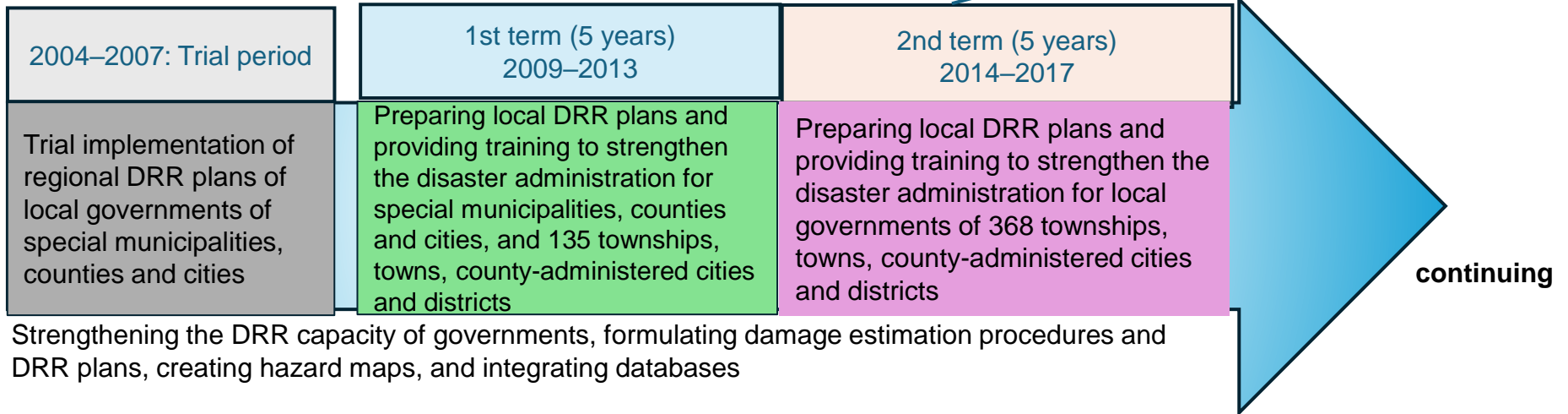
Source: Data by National Disaster Prevention and Protection Commission of the Executive Yuan





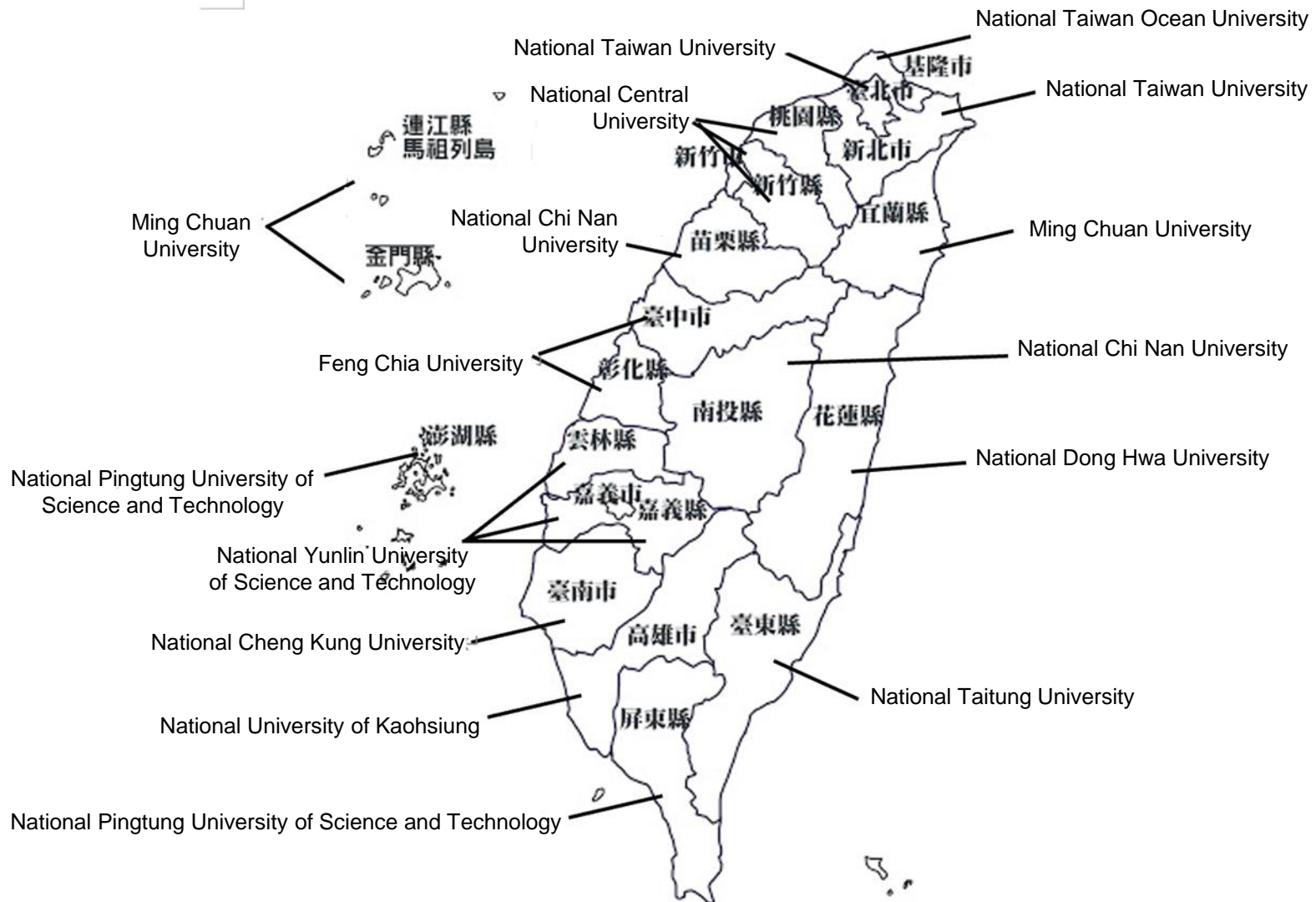
# Strengthening the DRR capacity of local governments (2003 to present): Collaboration with universities

Sendai Framework for Disaster Risk Reduction 2015–2030







# Relationship between DRR functions of counties/cities and cooperative universities

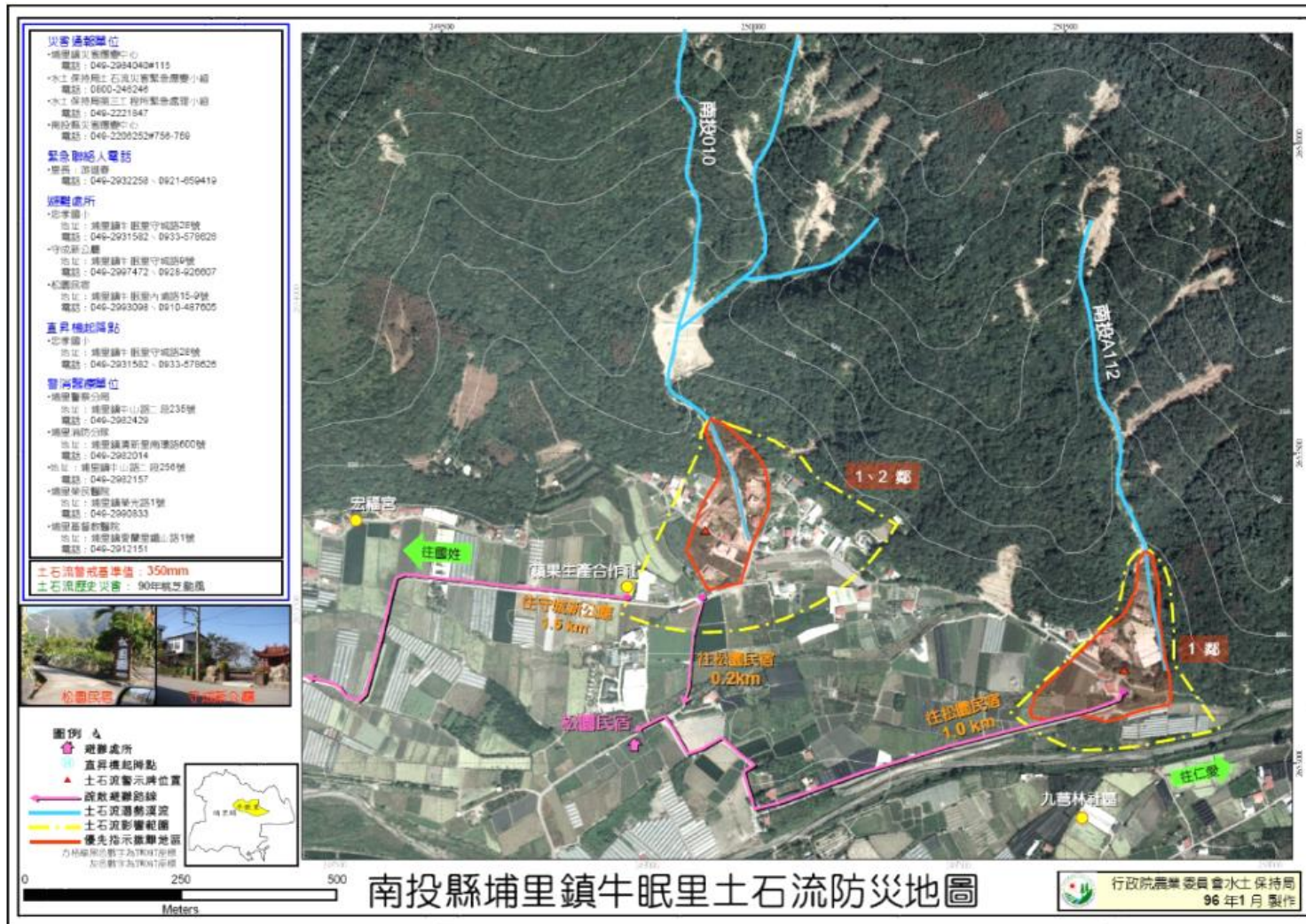




# Strengthening the private sector's DRR capacity—Disaster resilient community development

- ◆ Before the 9/21 earthquake (1998–2000)
  - Ministry of Interior's Civil Power Utilization Plan
- ◆ Public education period (2000–2002)  *Utilizing the experience of the Great Hanshin-Awaji Earthquake*
- Mainly the trial implementation of evacuation drills and disaster resilient community development in local areas (National Taiwan University, Chen Team, 921 Reconstruction Committee)
- ◆ Pilot plan promotion period (2006–2009)
  - The trial implementation of disaster resilient community development in local areas (Chang Jung Christian University, Shao team, disaster resilient community development three-year plan by the Ministry of Interior's Fire Agency )
- ◆ Full-scale promotion period (from 2010)  *Applying the lessons from the Morakot typhoon experience*
- Flood-resilient community development, mountain area disaster resilient community development, resilient community, etc.

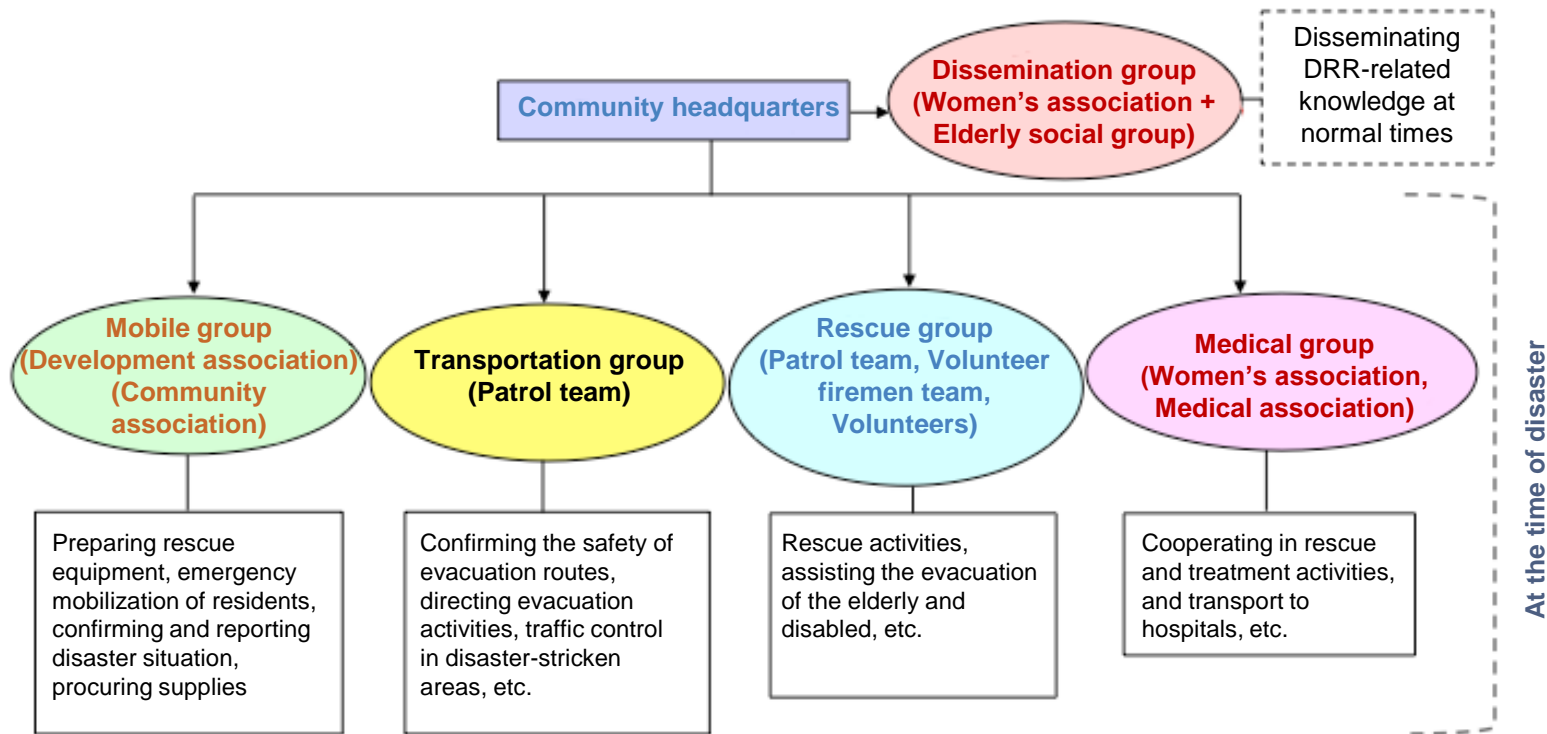
# Creating an evacuation map for use immediately after an earthquake





# Pilot plan: Jin-hwa Community, Tainan City

DRR structure in Jin-hwa Community, Tainan City



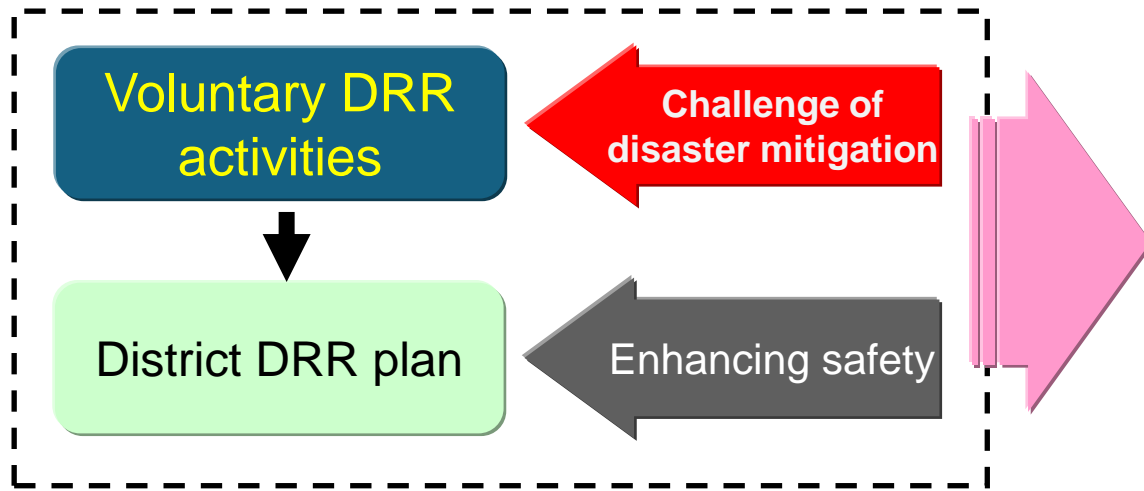
Only the dissemination group is active during normal times.  
( ) : Residents' organization within the community

# Full-scale promotion period: Flood-resilient community development

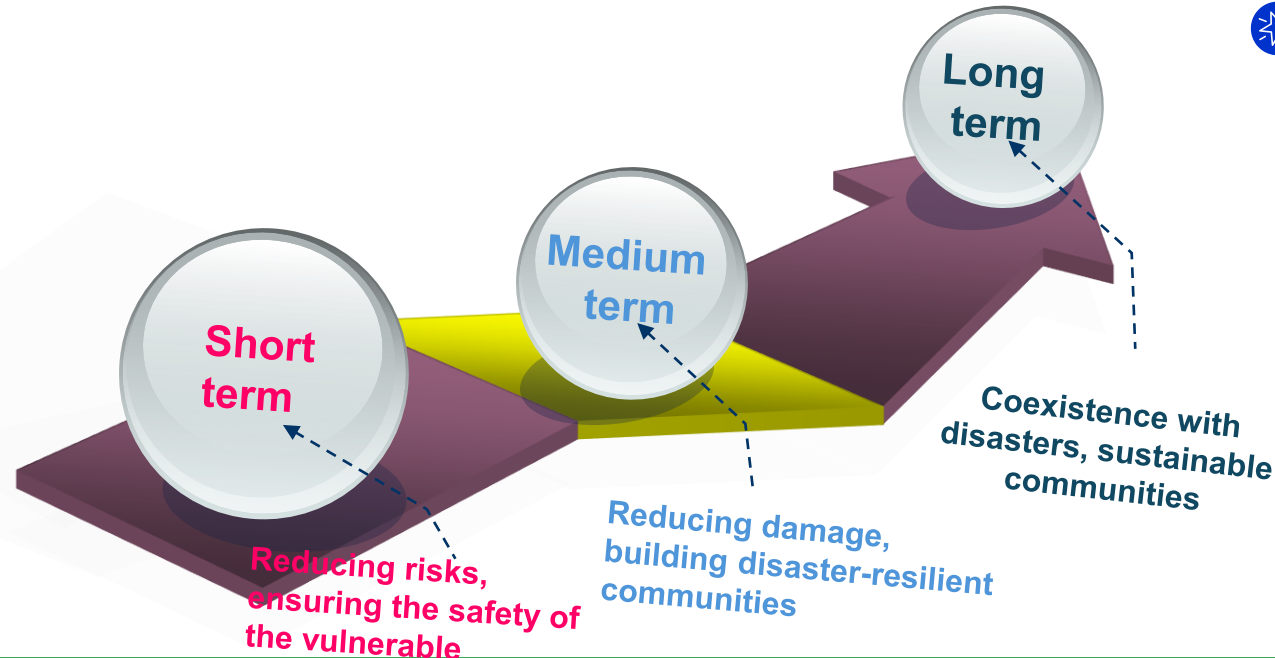
## Scenario-less DRR drills



# Formulating a district (community) DRR plan



- ☀️ Apply lessons from the past to reduce deaths and casualties
- ☀️ Prioritize the protection of vulnerable people to disasters
- 🌀 Evacuation routes and maps, district plans, promotion with flyers... (Quantity)
- 🌀 Discussion with local residents, risk communication, seeking understanding and awareness...(Quality)





# Recent threats: Responses to climate change

## ◆ National level

- Council for Economic Planning and Development: Climate Change Adaptation Strategy (2010)
- National Development Council: National Climate Change Adaptation Policy Platform (2012)
- Executive Yuan Disaster Prevention and Relief Committee: Recommendations for climate change resilient cities (2020)
- National Science and Technology Council: “Climate Change and Building a Resilient Taiwan” (2022)
- Creation of the Climate Change Agency (2023)

## ◆ Regional level

- Evaluation guidelines for flood resilient cities

## ◆ Private communities and businesses

- Promoting flood-resilient community development, building sustainable business management systems



# Recommendations by the Executive Yuan Disaster Prevention and Relief Committee

## Eight essentials for making cities resilient in Taiwan and UNDRR responses

### UNDRR's ten essentials for making cities resilient

**1** Build a complete DRR system

**4** Pursue community development and design with risk consideration

**5** Enhance social resilience

1. Organizational resilience

2. Understand risks and scenarios

3. Increase economic capacity to resist disasters

6. Strengthen the disaster response capacity of public and private sectors

**6** Improve the disaster response capacity of infrastructure

7. Strengthen awareness and social resilience

8. Increase infrastructure resilience

**2** Understand disaster risks and scenarios

4. Pursue resilient community design

5. Protect nature and ecologically sensitive areas

**7** Increase disaster response capacity

9. Ensure advance preparation and effective disaster response measures

10. Pursue better recovery through pre-disaster recovery planning

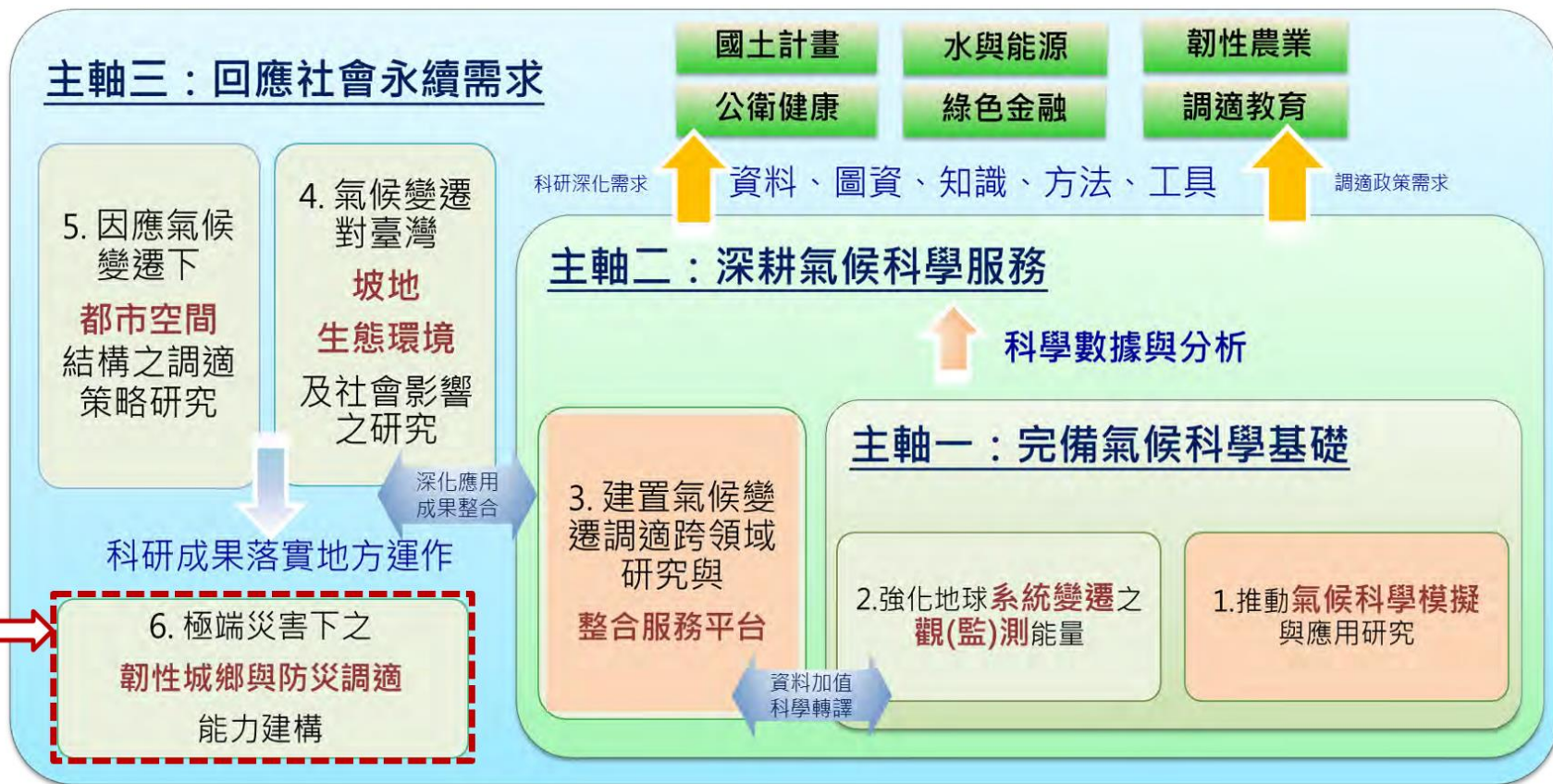
**3** Strengthen financial resilience

**8** Focus on and strengthen recovery capacity even at normal times

Source: Executive Yuan Disaster Prevention and Relief Committee (2020)

# National policy integration: Integrating research and practice

➤ **National Science and Technology Council: “Response to Climate Change and Building a Resilient Taiwan”** Medium-Term Outline Plan (2022–2025)



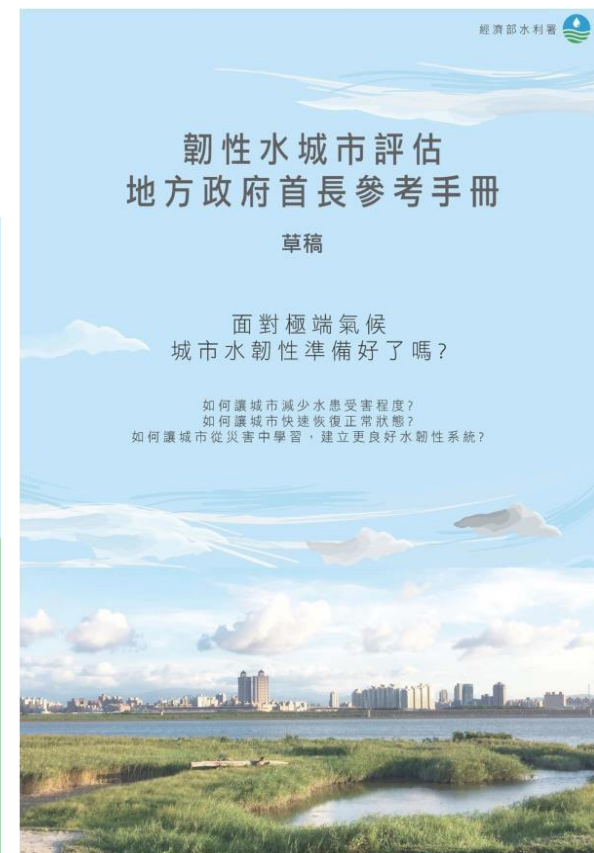
Source: National Science and Technology Council (2022)



# Regional governments: Evaluation guidelines for flood resilient cities

## Evaluation and adaptation guidelines for flood resilient cities (2017–2018)

- Investment in DRR resources, DRR awareness and capacity of residents, sustainable operation of infrastructure facilities, risk acceptance and recovery capacity



# Regional level: Promoting flood-resilient communities

7 chronological stages in promoting flood-resilient communities



Source: Flood Resilient Community Promotion Manual (2022) by Architecture and Building Research Institute, Ministry of the Interior; Shao Pei-Chun; et al.

# Future challenges: Major earthquakes and extreme weather

- ◆ Lessons from and memories of the 921 Earthquake have faded. We need to examine national DRR measures by applying scenario-based damage estimation methods.
- ◆ Promoting cooperation between specialized departments in national assistance: Alignment needs to be created between DRR measures and urban/national land planning.
- ◆ Improving the efforts of specialized departments and developing DRR specialists in regional administration: Regional governments need to revise their DRR plans through training, considering DRR capacity of local communities.
- ◆ Practicing self-care and mutual aid: Recognize how community resilience can be strengthened through voluntary DRR activities in the private sector.
- ◆ Build a mechanism to ensure a sustainable society as a countermeasure to extreme climate change based on the characteristics of an aging society.





**Thank you for your kind attention.**