

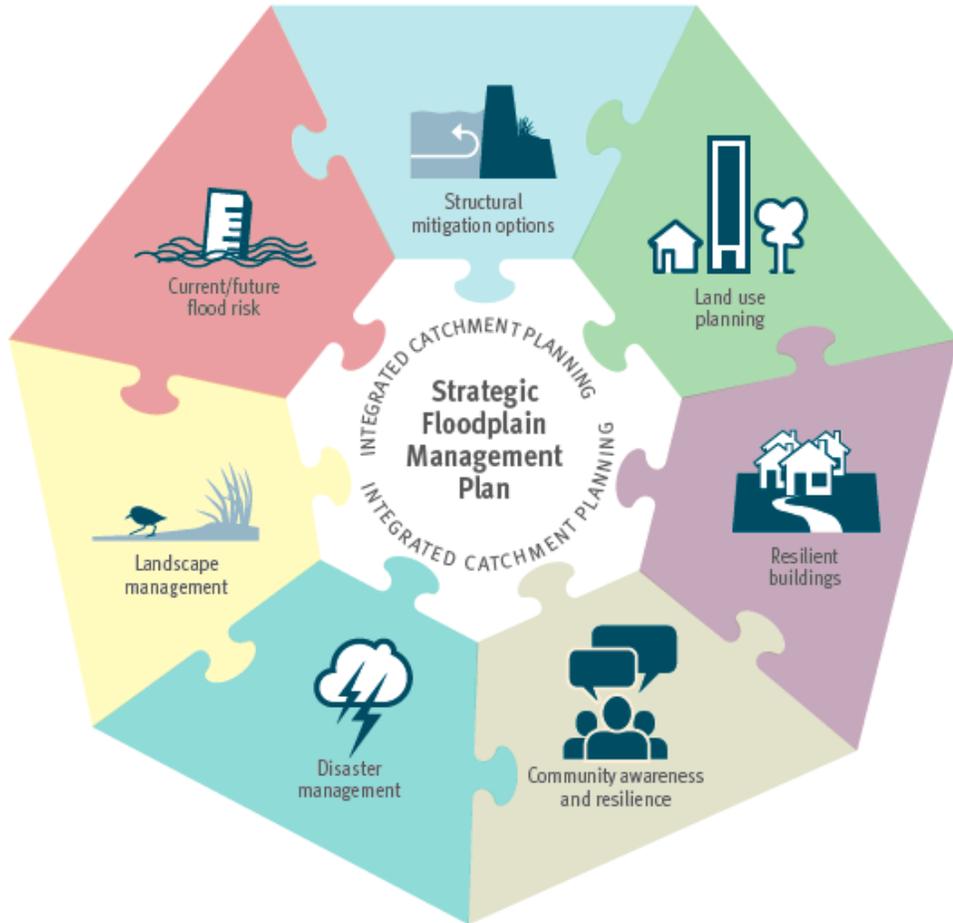


HỆ THỐNG GIÁM SÁT THIÊN TAI VIỆT NAM  
VIETNAM DESASTERS MONITORING SYSTEM (VNDMS)

# Integrated Disaster Risk Management Information System in Viet Nam

JUNE 2024

## INTEGRATED PLANNING



## DISASTER RISK MANAGEMENT OUTCOMES



- Land use planning
- Emergency Management
- Community engagement
- Structural/ Infrastructure
- Nature-based solutions and green infrastructure
- Future scenarios (CC)
- Land management
- Built form
- Insurance

## COMMUNICATE AND CONSULT



- Develop information to aid the understanding and strategic management of disaster risk.
- Provide this information to key end users and decision-makers in a format that suits their needs and is consistent with the level of disaster risks;
- Consult with local community and stakeholders to inform the development of flood risk management study and disaster risk management plan.
- Inform the community and key groups on the progress and outcomes of studies and on management decisions



**Fragmented tools in  
the Viet Nam Disaster And  
Dyke Management Authority  
(VDDMA)**

# Institutional arrangements for DRM

- The **Sendai Framework** for Disaster Risk Reduction 2015-2030
- The ASEAN Agreement on Disaster Management and Emergency Response (**AADMER**)
- APEC Emergency Preparedness Working Group (**EPWG**)

## Global Legal Basis



- The **Law on Disaster Prevention and Control 2020**
- Under law documents

## Legal Basis for DRM in Viet Nam

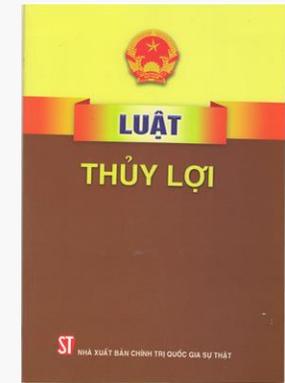
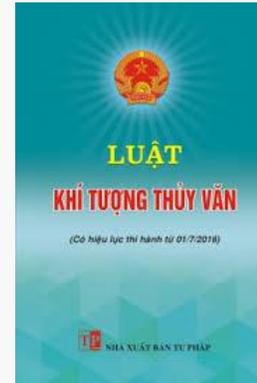


# Natural disaster prevention and control activities



## Legislative document system

is developed synchronously as the basis of the implementation of the natural disaster prevention and control nationwide



## Decrees

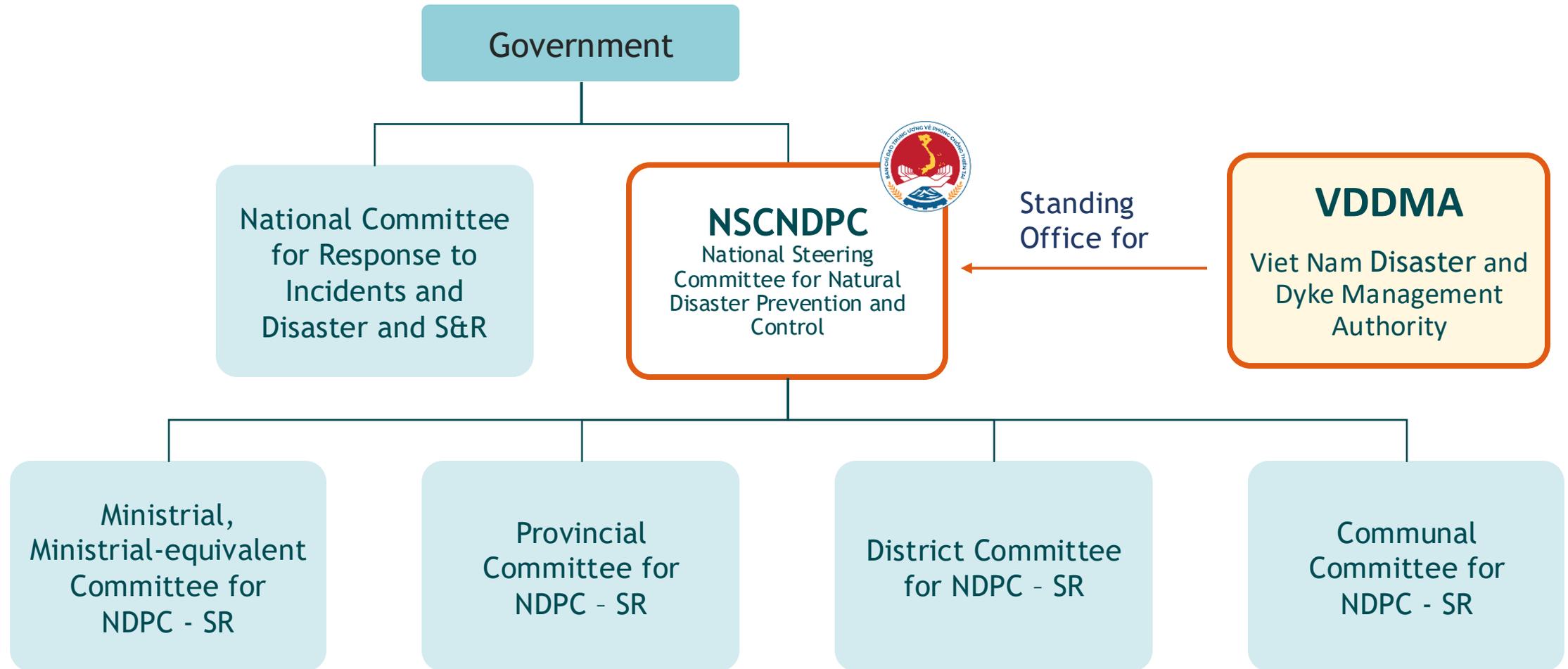
- **Decree 66/2021/ ND-CP** - Guiding some articles of Law on Natural disaster prevention and control
- **Decree 78/2021/ ND-CP** - Natural disaster prevention and control Fund
- **Decree 02/2017/ND-CP** - Support to production recovery
- **Decree 20/2021/ND-CP** - Social policy
- **Decision 18/ QĐ-TTg** - Disaster risk levels and warnings



## National plan

- National strategy on natural disaster prevention and control
- Plans for natural disaster prevention and control at national and local levels
- Response plans for different levels of natural disaster risks

# Vietnam DRM organizational structure



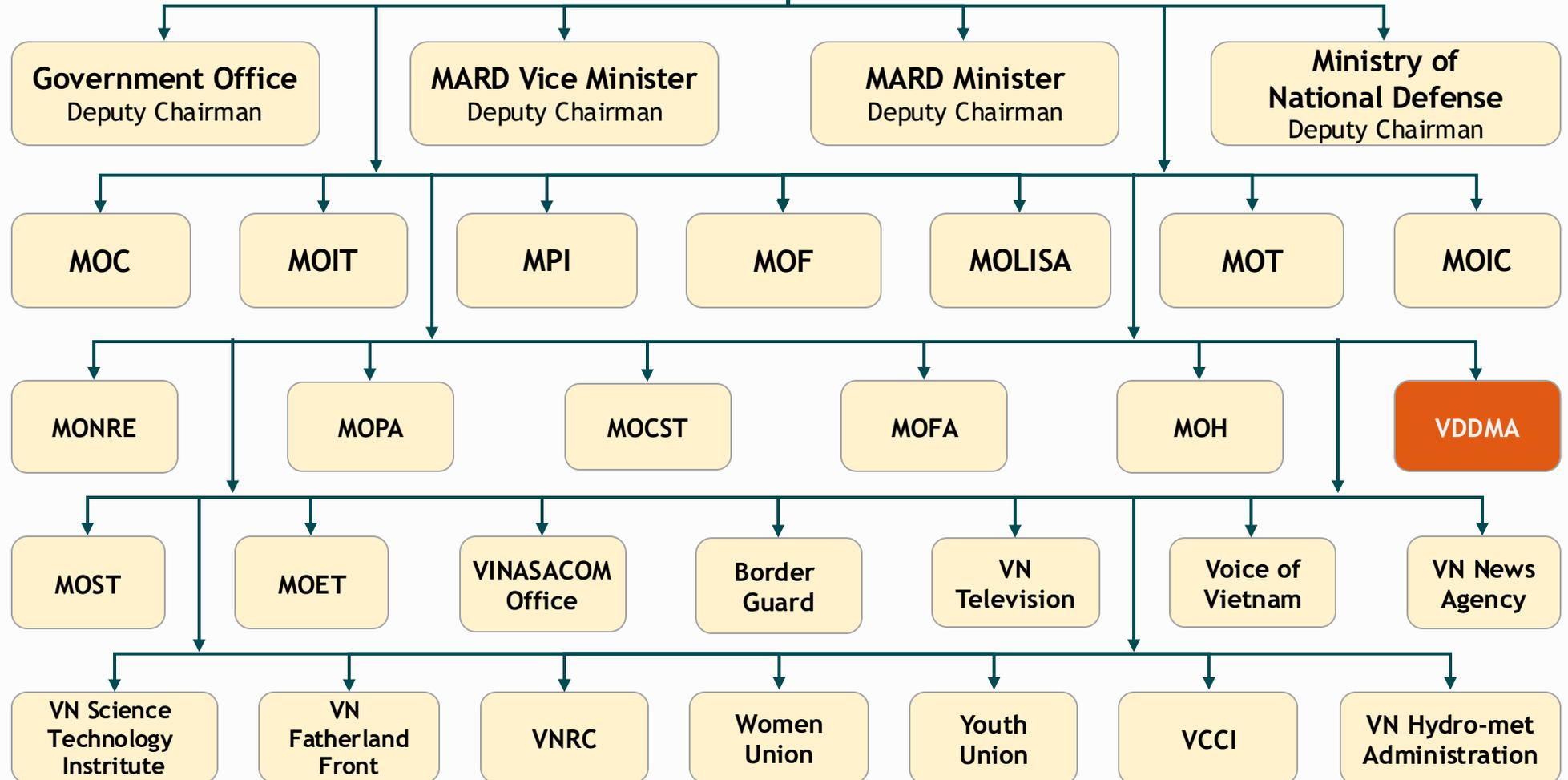


# Government

(Decision No. 169/QĐ- TTg  
March 1, 2023 on the  
enforcement of National  
Committee for Disaster  
Prevention and Control)

## Deputy Prime Minister - Chairman

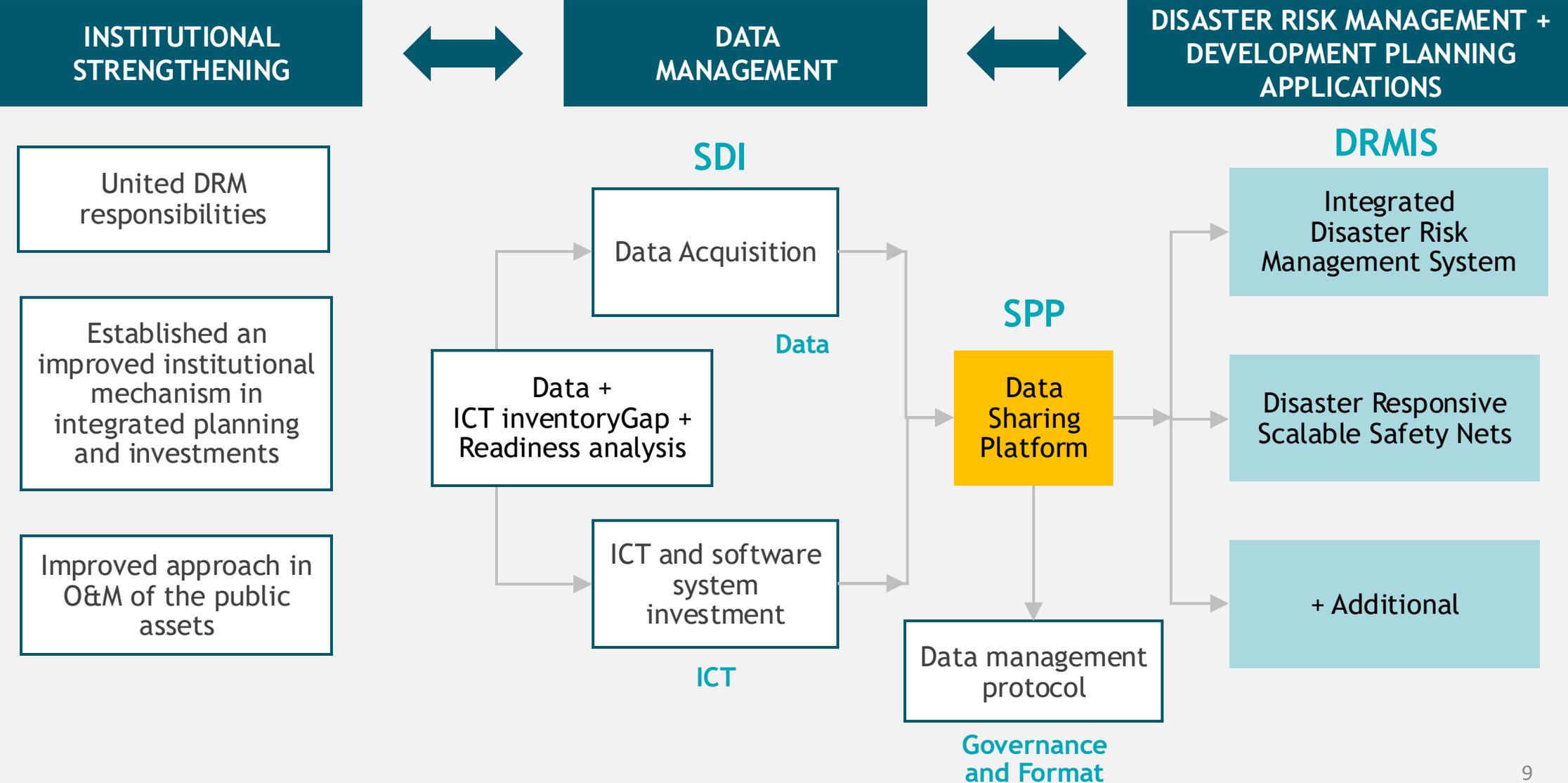
### National Steering Committee for Natural Disaster Prevention and Control



# Challenges in multi-sectoral coordination for DRM

 <b>Agency</b>	 <b>Responsibility</b>
<ol style="list-style-type: none"> <li data-bbox="690 339 746 396">1 National Steering Committee for Natural Disaster Prevention and Control (NSCNDPC) National Committee for Natural Disaster Response and Search and Rescue</li> </ol>	<p>Central government coordination bodies primarily responsible for emergency response to natural disasters</p>
<ol style="list-style-type: none"> <li data-bbox="690 489 746 546">2 Southern Institute of Water Resources Planning and Southern Institute of Water Resources and Research</li> </ol>	<p>Technical institutes for MARD that support development of flood management plans and analysis of flooding and other events</p>
<ol style="list-style-type: none"> <li data-bbox="690 618 746 675">3 Viet Nam Disaster and Dyke Management Authority (VDDMA)</li> </ol>	<p>Management of flood protection systems (dykes, large tidal sluice gates, hydraulic systems, and irrigation reservoirs)</p>
<ol style="list-style-type: none"> <li data-bbox="690 789 746 846">4 Ministry of Natural Resource and Environment and its Regional Hydromet Centers</li> </ol>	<p>Overseeing Land-Use Planning and Management (including wetland management), Hydrology and meteorology, weather and flood forecasting and early warning, water resources including ground-water management</p>
<ol style="list-style-type: none"> <li data-bbox="690 932 746 989">5 Ministry of Industry and Trade</li> </ol>	<p>Construction, operation and management of Hydropower facilities</p>
<ol style="list-style-type: none"> <li data-bbox="690 1018 746 1075">6 Ministry of Construction</li> </ol>	<p>Urban development and urban drainage</p>
<ol style="list-style-type: none"> <li data-bbox="690 1103 746 1160">7 Ministry of Transport</li> </ol>	<p>Roads, part of drainage/sewer system, waterway development</p>
<ol style="list-style-type: none"> <li data-bbox="690 1189 746 1246">8 Ministry of Planning and Investment</li> </ol>	<p>Planning and Investment (including resources for DRM related activities)</p>
<ol style="list-style-type: none"> <li data-bbox="690 1275 746 1332">9 Provinces and cities</li> </ol>	<p>Urban development and urban flood risk management</p>

# Concept for Integrated Planning Framework



# DRMIS design



## System Functions

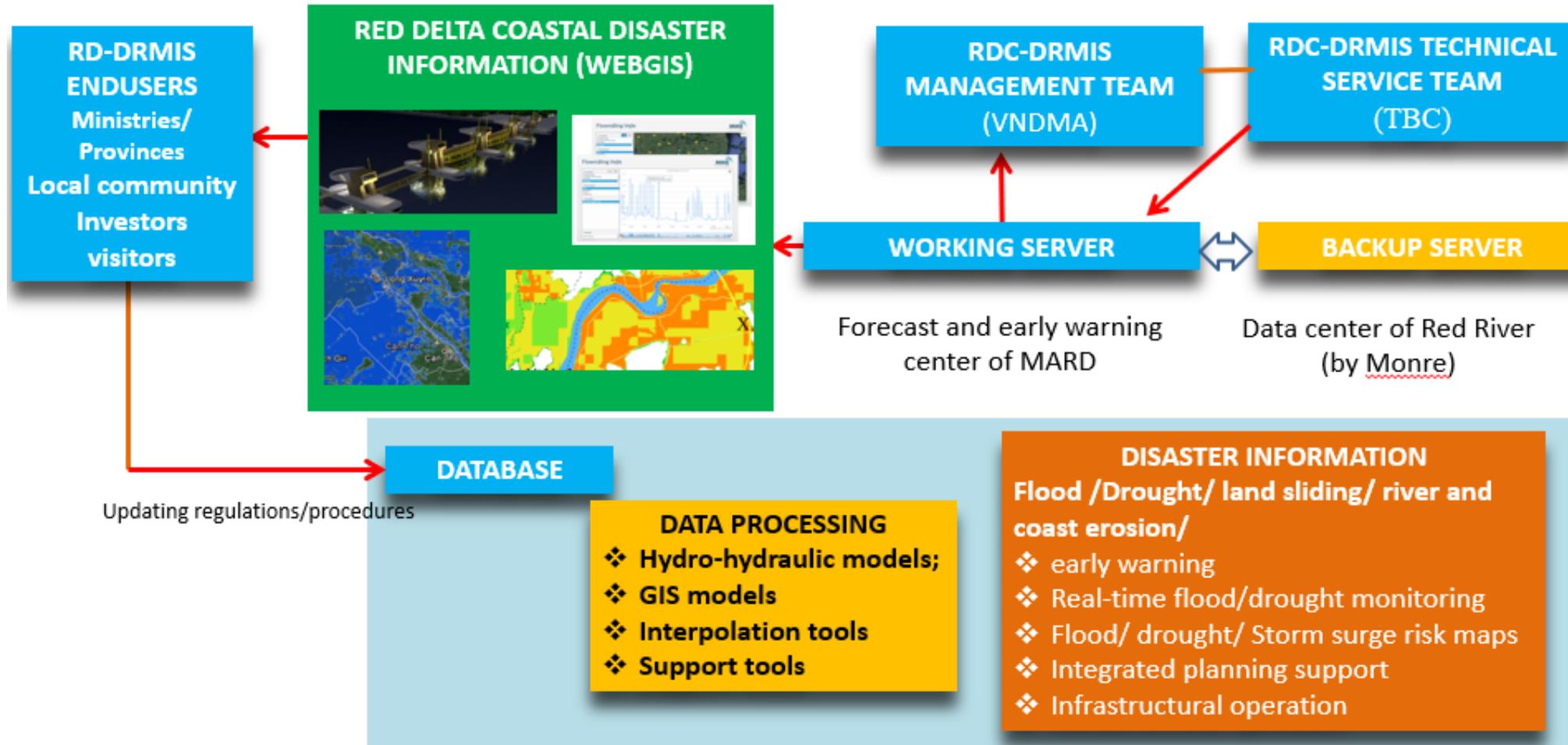
- Disaster forecast and early warning
- Flood drainage and control infrastructure operation (in combination with Navigation and environmental sanitation improvement)
- Disaster risk management planning
- Support of the resilient planning and investment (e.g. spatial and investment plans development and revision, monitoring of the plan implementation, etc.)



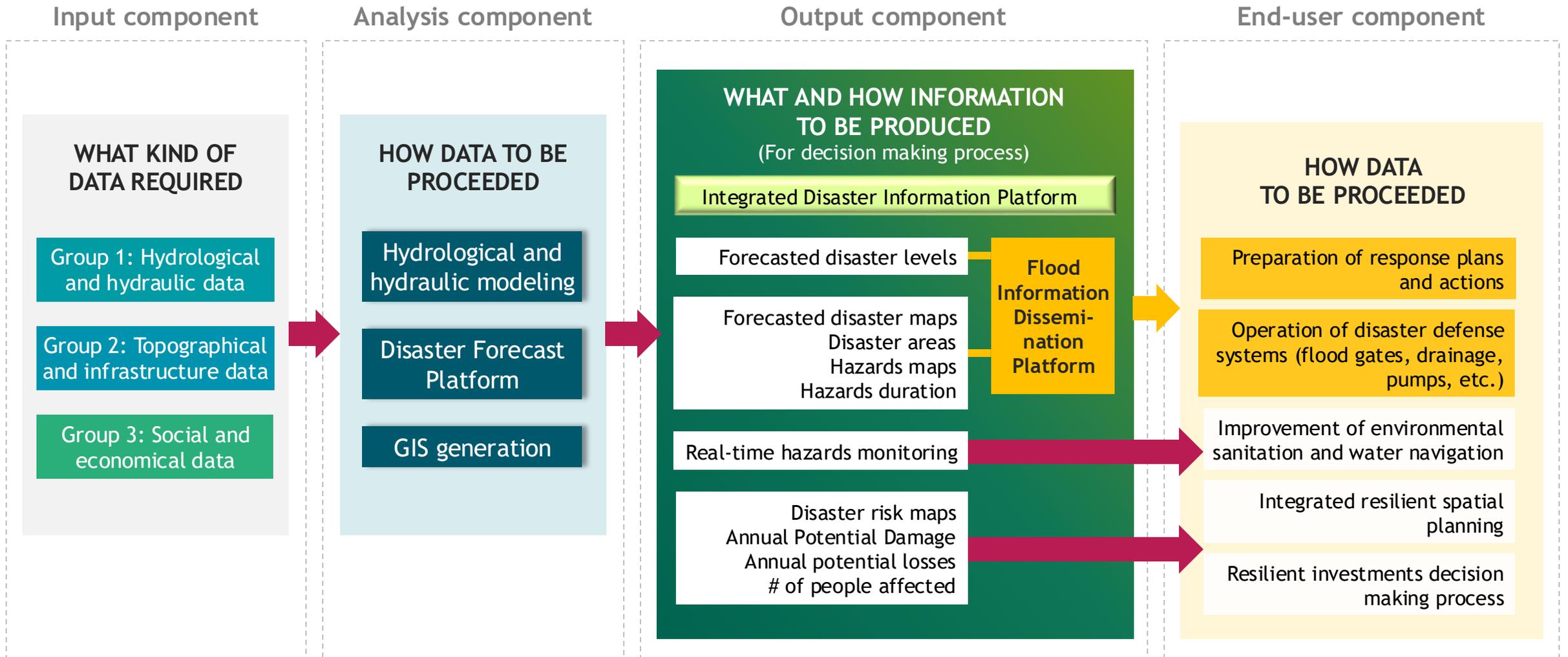
## System Design Principles

- Simple in system structure and operation
- Fit in the existing institutional arrangement and capacity
- High flexibility for future upgrades (open-source system)
- High security
- Low cost for establishment and operation

# How DRMIS can be operated



# What the DRMIS to be composed



# Requirements for System Establishing and Operating



## Pillar 1: Institutional policy and arrangement

This pillar is the master pillar that guides and leads the implementation of all other three pillars below. This pillar aims to establish enabling mechanisms for inter-agency coordination and, in the long run.



## Pillar 2: Technical skills and capacity

Refers to creating an awareness of capacity needs, identifying gaps in human resource supply, and developing competencies and skill sets for ensuring the effective production, maintenance, and utilization of spatial data. A weak 'People' pillar can limit the development and operation of DRMIS due to a lack of awareness or a shortage of skilled manpower to collect and analyze geospatial information and to maintain the Geoportal (or integrated data platform) under the 'ICT infrastructure' pillar



## Pillar 3: ICT hardware and software/infrastructure

Refers to any software, hardware, and IT-related infrastructure required to support DRMIS. A key component lies in the adequacy, functionalities and user interface of a Geoportal that combines GIS and spatially referenced tabular data. The Geoportal makes it possible for data sharing decrees and protocols to be actualized.

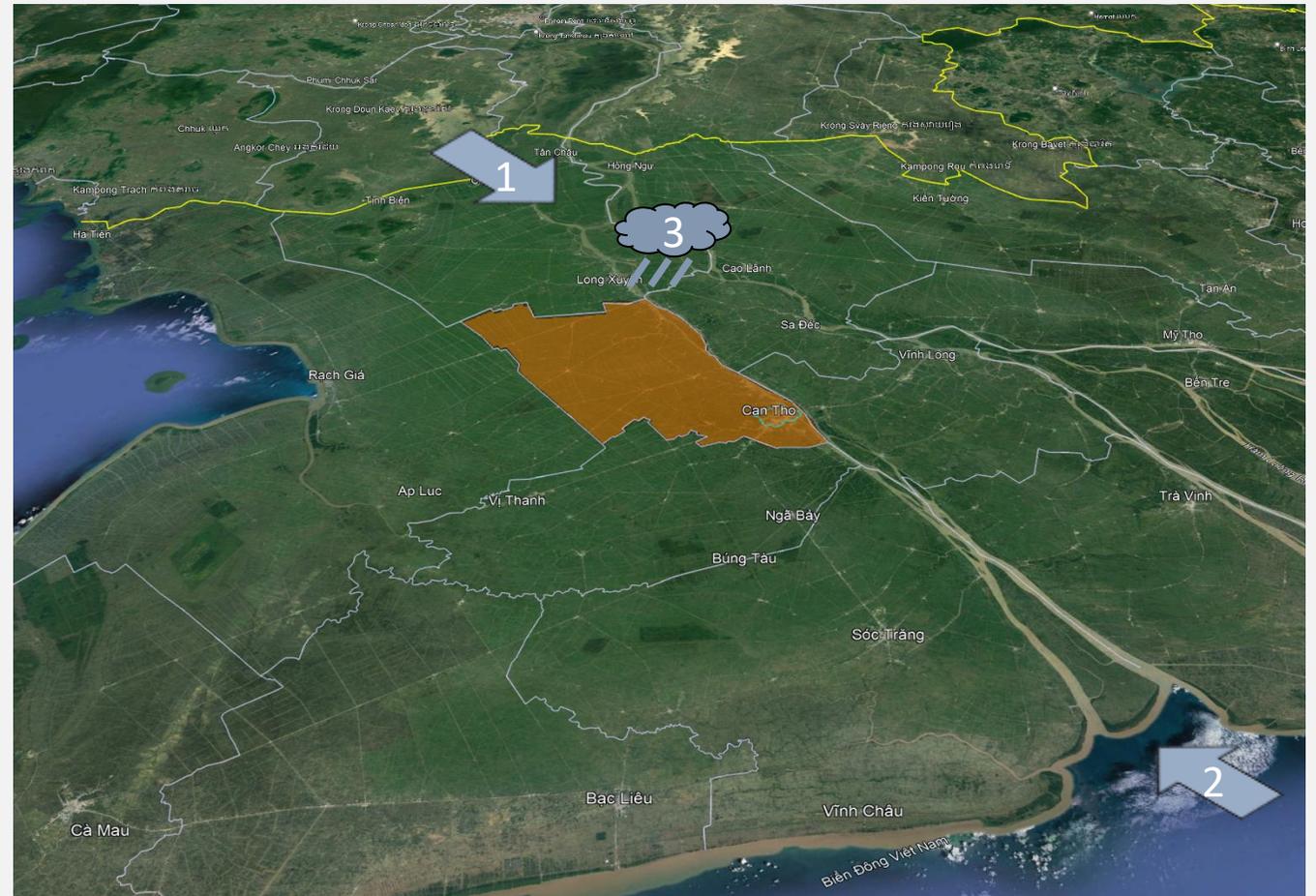


## Pillar 4: Data

Activities under this pillar assess the current state of data availability and quality, and related policies regarding formats, analysis, and sharing of geospatial information. This diagnostic also considers the business case for investment in data and the extent to which the use of geospatial information can add value to existing line departments' performance.

# Example in Can Tho

- Floods in Can Tho City due to:
  1. High river flows in the Hau River from upstream
  2. High tides in the East Sea
  3. Heavy rainfall over the city
- Can Tho is particularly vulnerable as it is low-lying and suffering from subsidence
- Climate change will increase tide levels and may cause higher river flows and more intense rainfall



# Can Tho Urban Development and Resilience Project (CTUDR)

## ➤ Flood Risk Management

Create Can Tho polder to “waterproof” the core city (including part of Binh Thuy & almost Ninh Kieu Districts) with surrounding embankments/tide walls

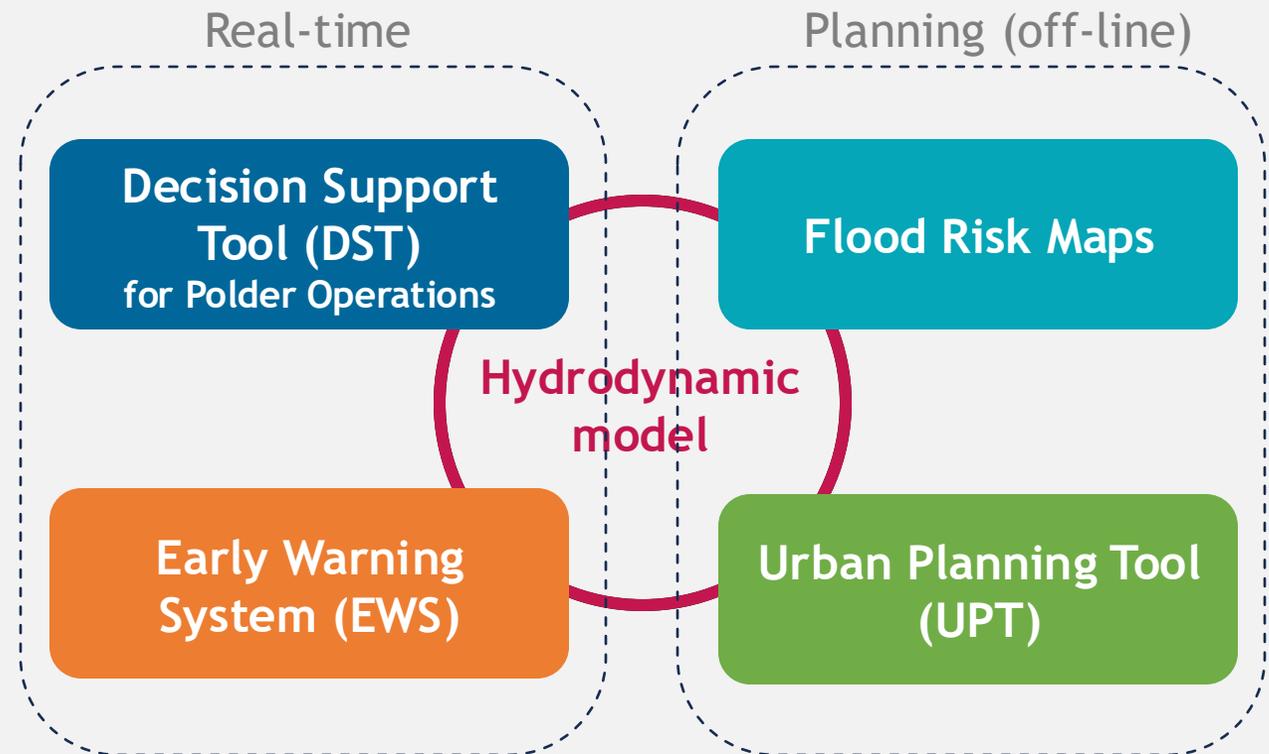
- New road cum embankment
- 12 new structures with gates sluices, 2 with navigation locks
- Pump stations at Dau Sau and Tham Thuong gates
- 2 smaller drainage pump stations in pipe system
- Drainage improvements
- SCADA system



# What is FRMIS and what does it do?

## FRMIS Components

- Hydrodynamic models (Core City, Larger City)
- DST - for modelling, polder infrastructure operations and flood forecasting
- Early Warning System (web pages)
- Flood Risk Maps
- Urban Planning Tool

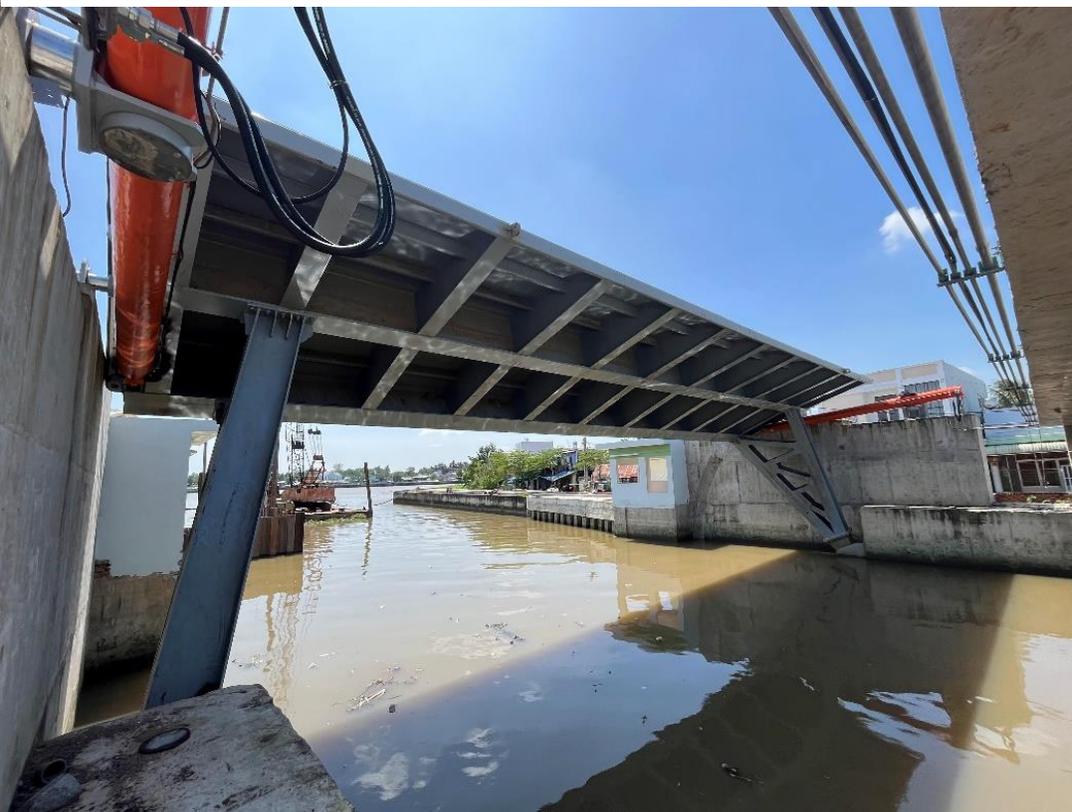




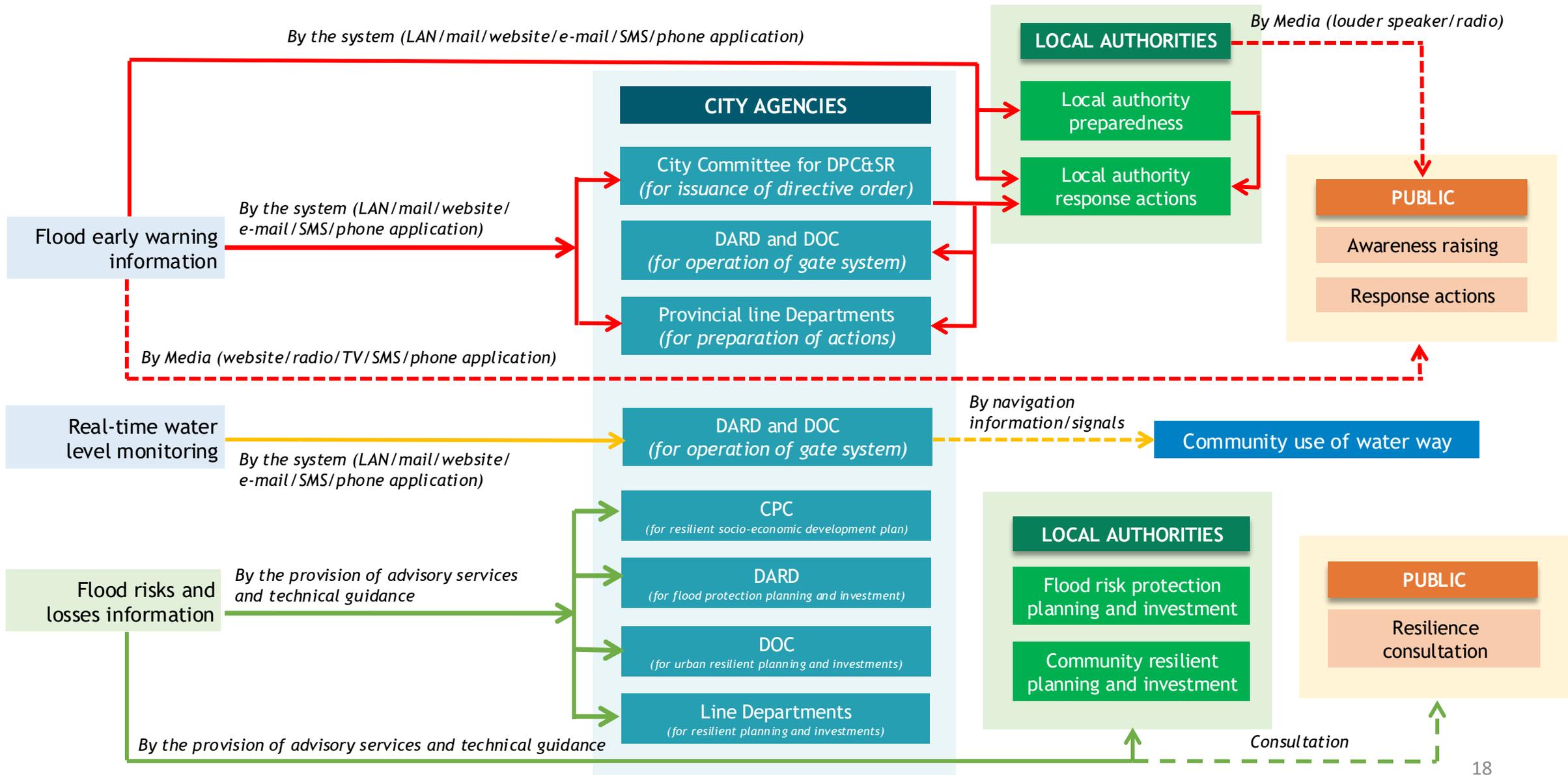
# What is FRMIS and what does it do?

FRMIS supports Can Tho City with:

- ✓ **Optimally manage the operation of the new gates and pumps in the core city** to 1) mitigate flooding during the monsoon season; 2) maintain a minimum water level for landscaping and inland navigation.
- ✓ **Easily access the latest flood information and forecasts** in the Can Tho City to support Early Warning.
- ✓ **Monitor water quality in the city's canals and rivers.**
- ✓ Sustainable urban development. **Integrate flood management in urban planning**, make improved investment and urban planning decisions.



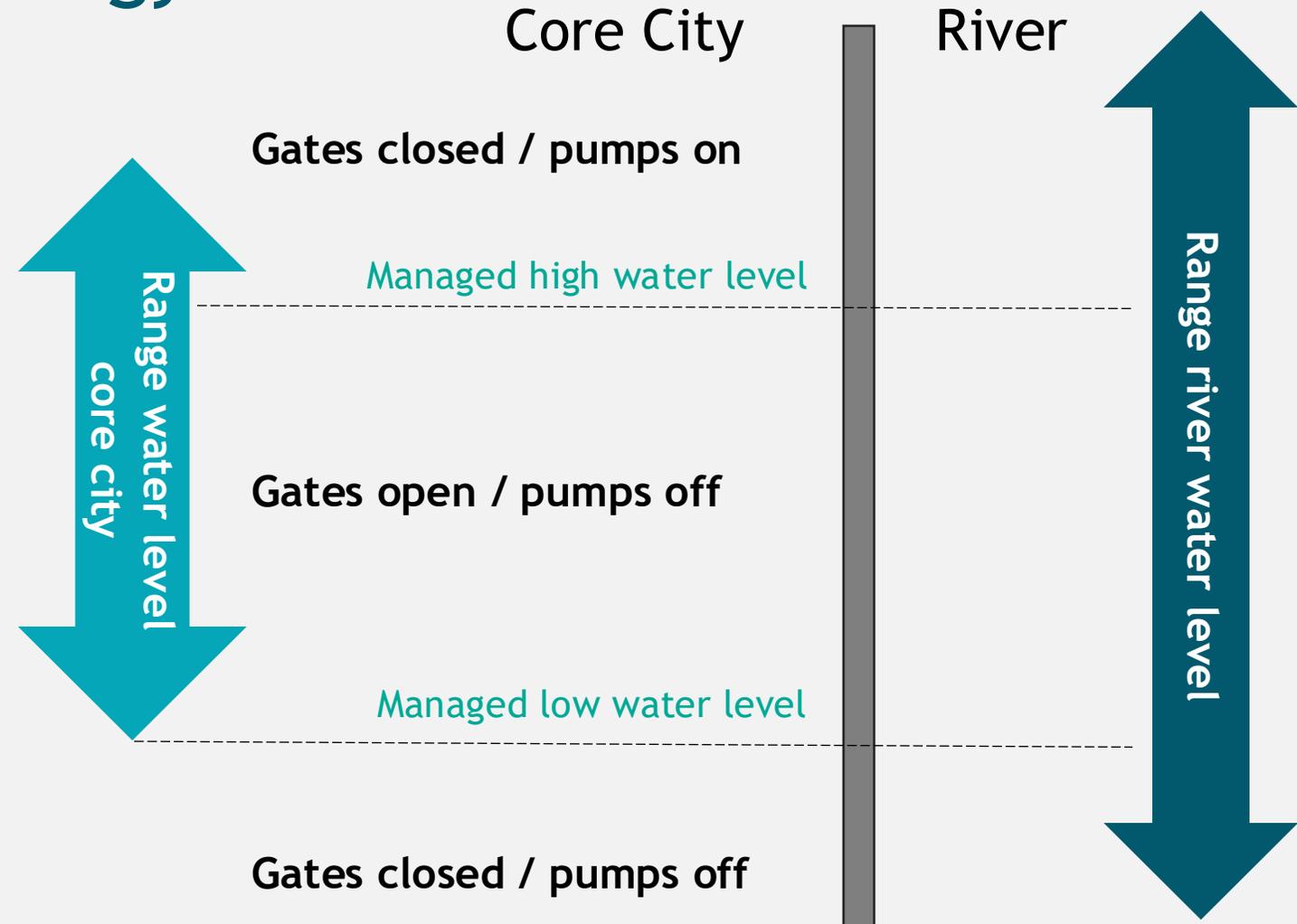
# How and to whom FRMIS provides flood information (End-user component)



# Overall operation strategy

## Core City

- **Managing water levels** the whole year
- **Prevent high tides** entering the core city and manage a water level to allow for flood storage in the channels in case of rainfall.
- **Maintain a minimum water level** in the core city to allow for inland navigation and landscaping/ environment



# Smart City connections

- FRMIS connects to Spatial Planning Platform and ISA:
- Spatial Planning Platform provides live access to city GIS layers, visible in Urban Planning Tool and used for model maintenance
- FRMIS provides:
  - To Spatial Planning Platform, flood risk maps (ad hoc update)
  - To ISA, daily flood inundation map based on measured data (model hindcast)

# FRMIS benefits

- 1 Provides the city with up-to-date and accurate data to manage the new infrastructure in the core city in the most optimal way
- 2 Provides advance warning of floods for the whole city to mitigate impacts
- 3 Supports sustainable long-term planning including impacts of future climate change
- 4 The developed models and data collected by FRMIS represent a valuable resource
- 5 If maintained, they can help the city to better manage flood risks and improve investment decisions

