

# Theoretical Understanding on Coping Capacity of Disaster Risk Governance System

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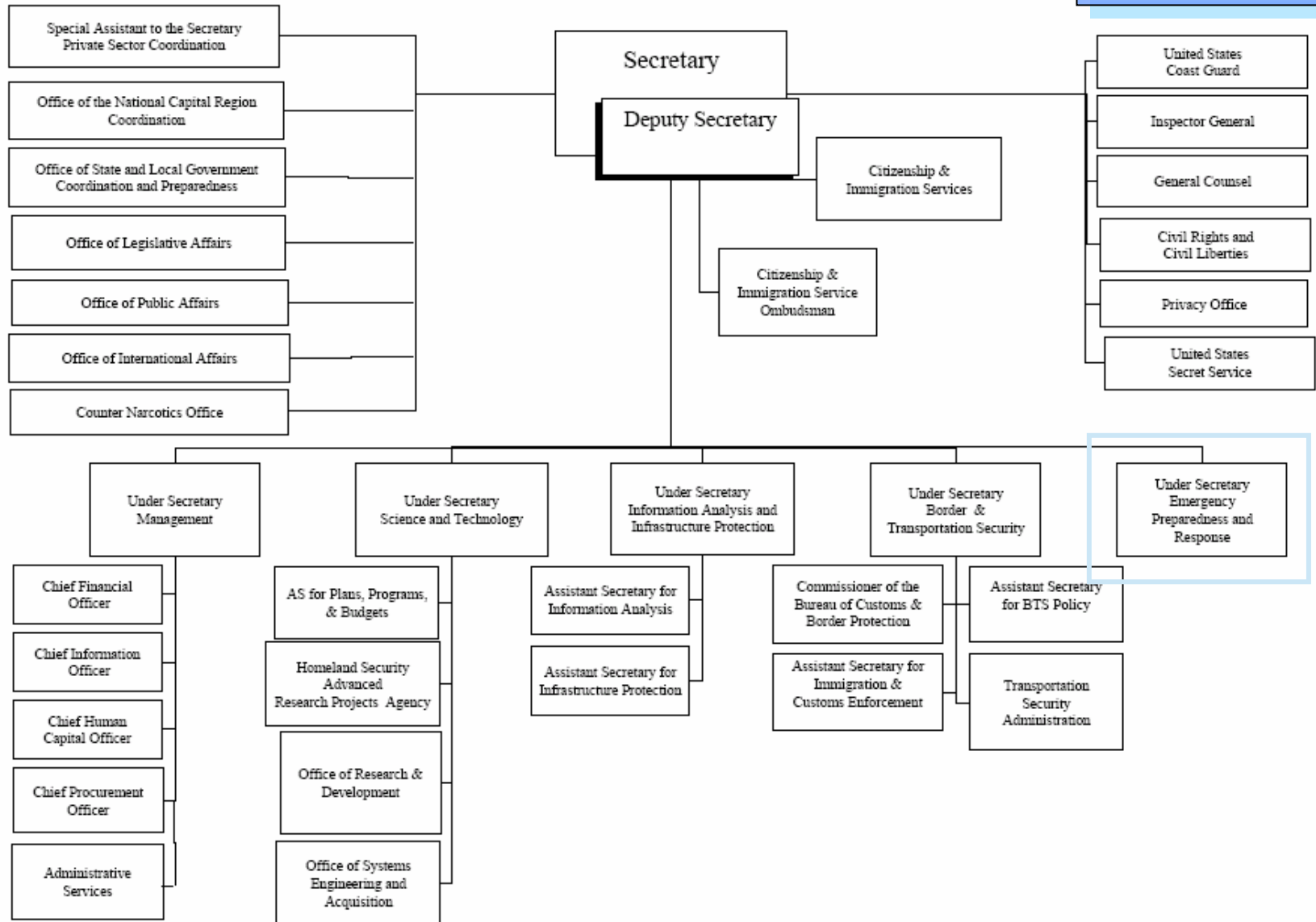
# Outlines

- Introduction
- Formulation of the problem
- Thematic reviews
- Theoretical understandings

# Introduction

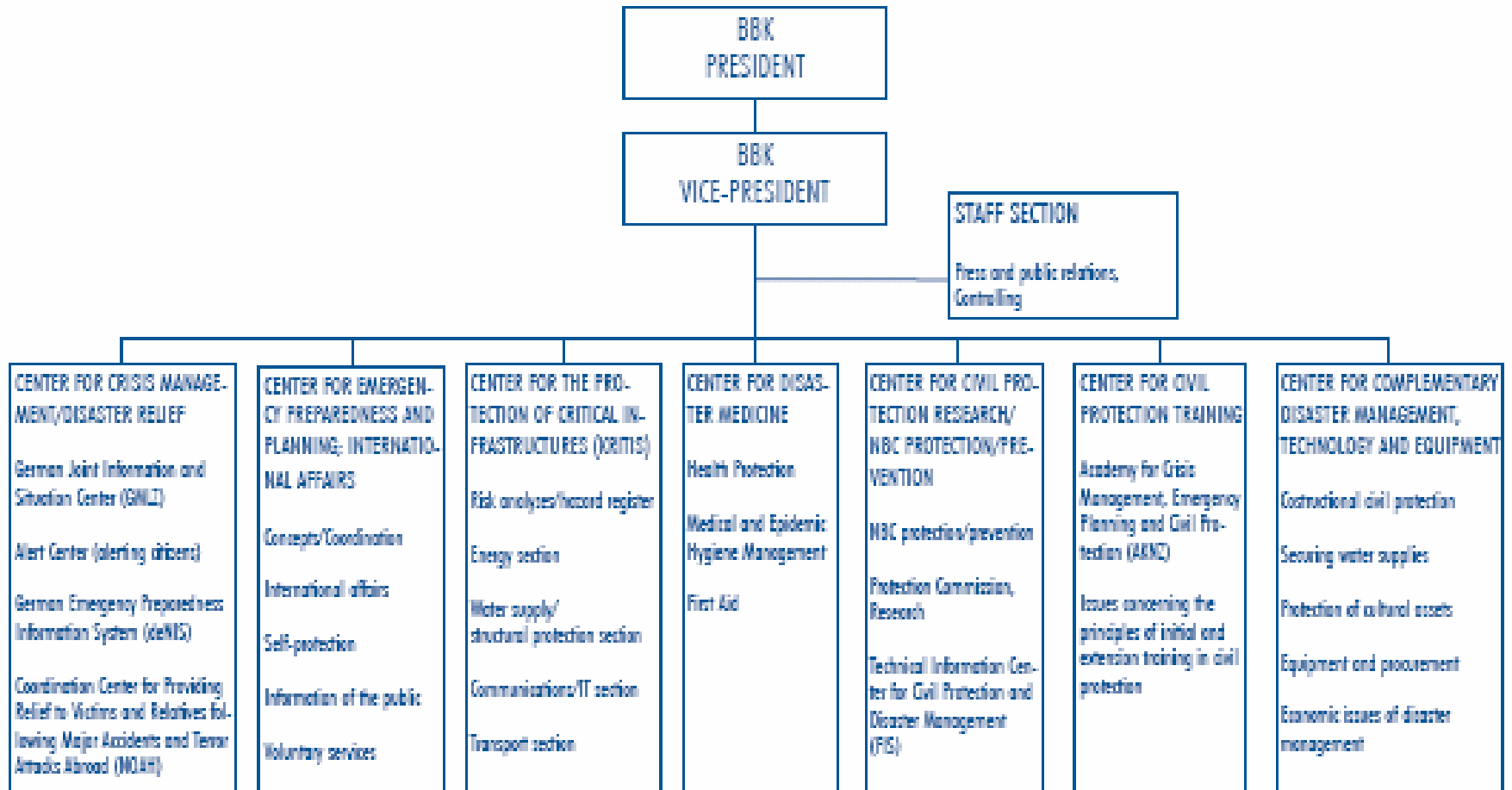
# Introduction

- Though Disaster risk management has entered a new era of IDRiM with Multi-stakeholders involved and multi-soft-measures employed
- It is still believed that Disaster Risk Governance is the essential part of IDRiM.
- Disaster risk governance moves to a higher stage with higher coping capacity and various modes.



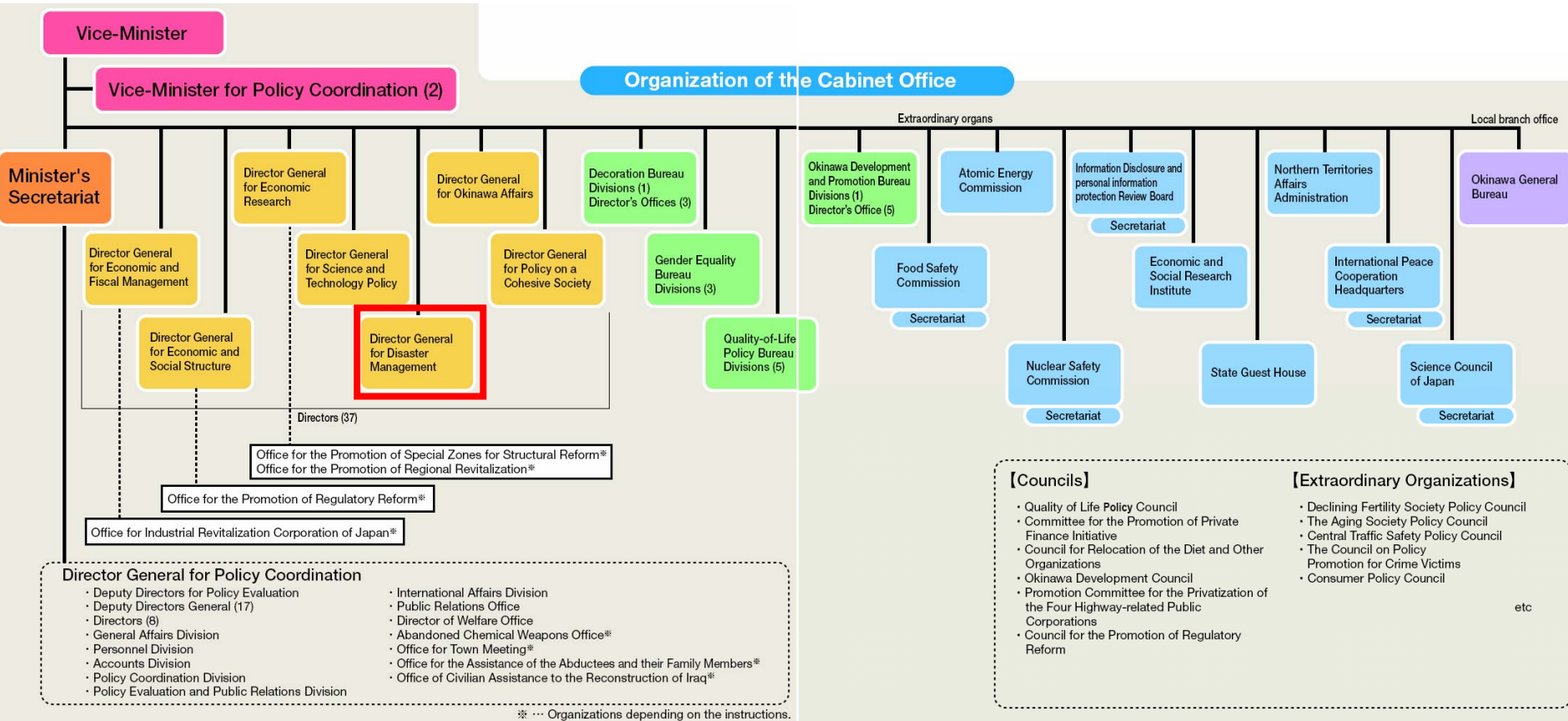
# Regional Oriented Mode

Germany



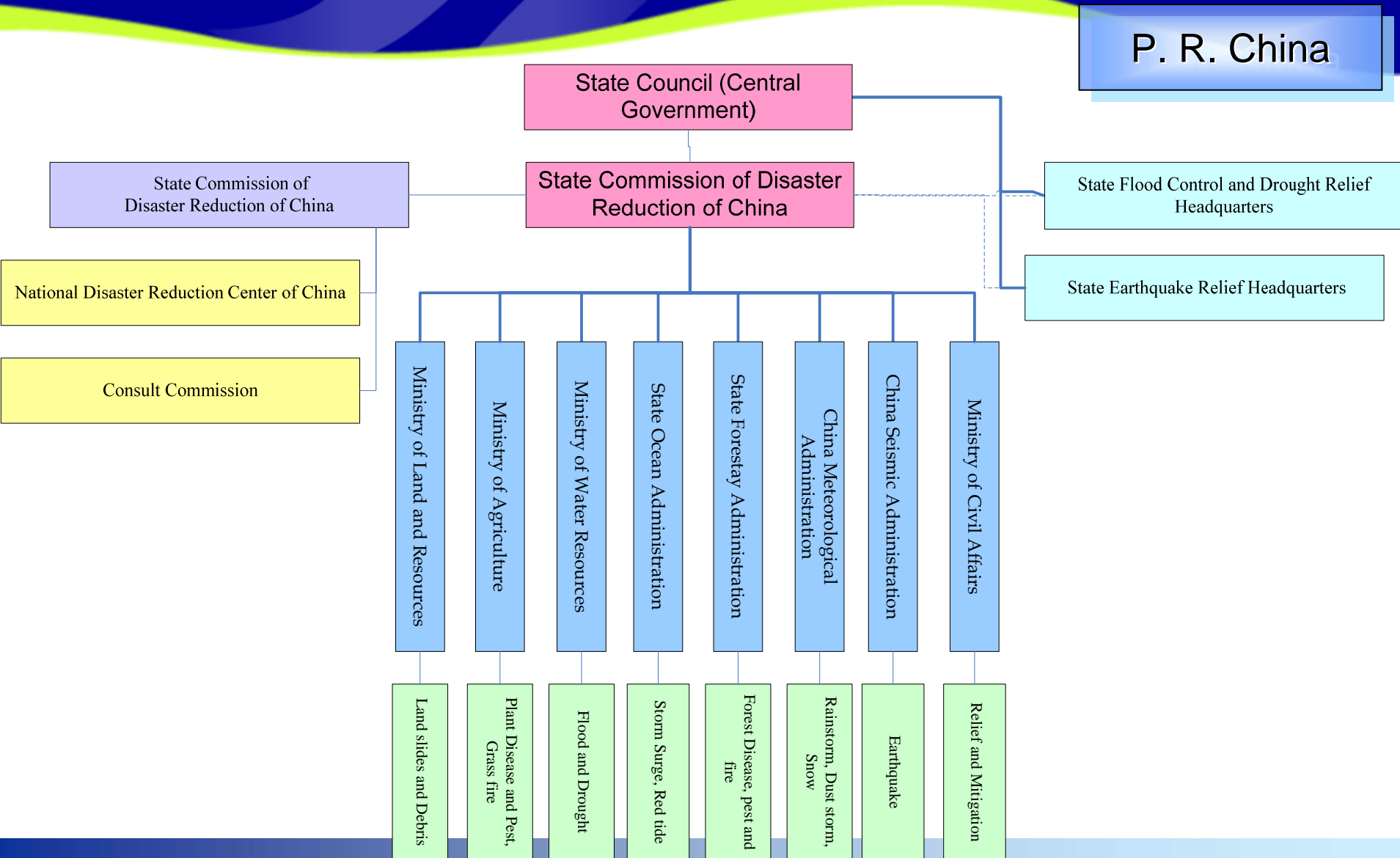
# Ministry Oriented Mode

Japan



# Combined Mode

## Natural Disaster Risk Governance System of China



# Problem Formulation

- Disaster risk research community has been concerning
  - Which disaster risk governance system has larger coping capacity?
  - How to enhance the coping capacity of disaster risk governance system?

# Problem Formulation

- If we know
  - Which style of disaster risk governance system has larger coping capacity
- Then we could
  - Make comparative studies between different regions
  - Optimize current disaster risk governance system for better coping capacity
  - Force our governors to perform better in disaster risk management

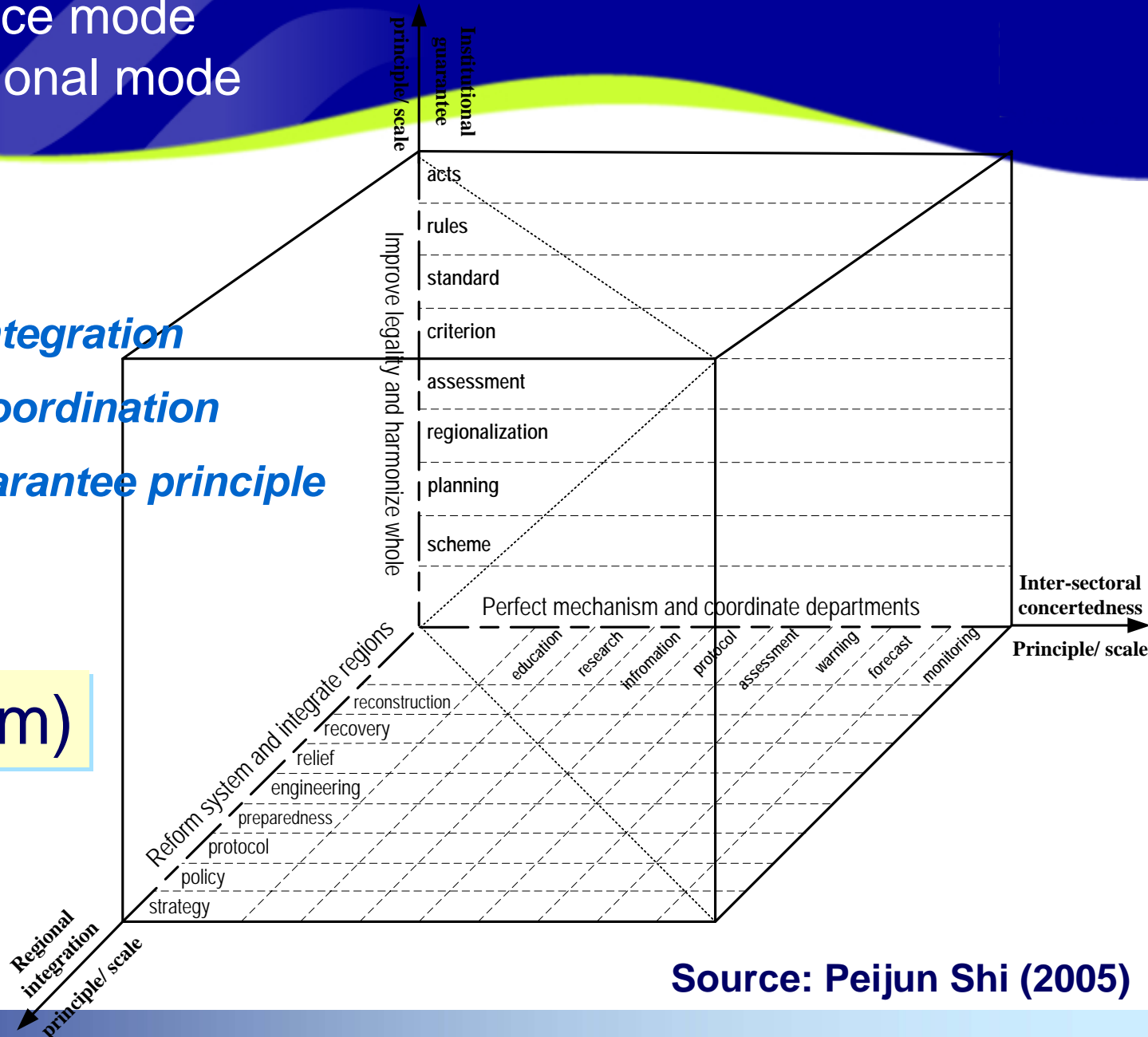
# Academic reviews

# Risk Governance mode

## --three dimensional mode

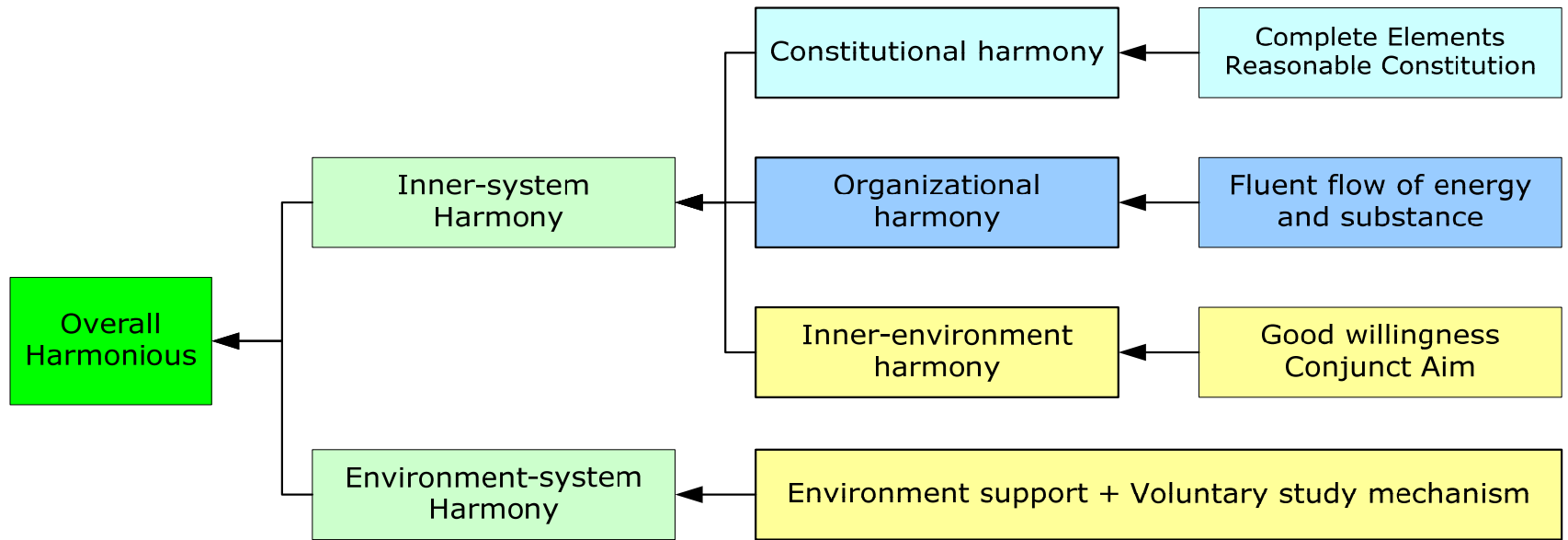
*Inter-regional integration*  
*Inter-sectoral coordination*  
*Institutional guarantee principle*

$$RGM=f(i,r,m)$$



Source: Peijun Shi (2005)

# Harmonious Management



**Inner-system harmonious and outer-system harmonious can help a system reach to its largest capacity**

**Source: Youmin Xi (2004)**

# Harmonious Management

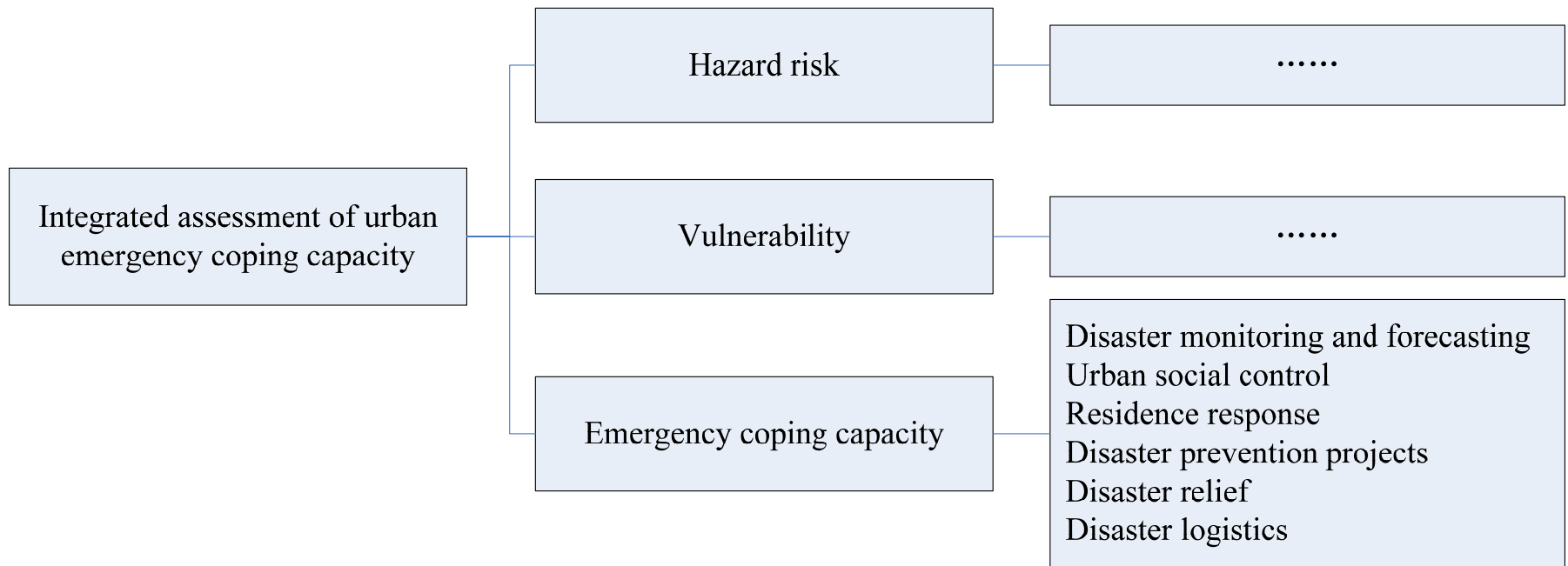
- The system's performance can be defined as

$$TP = \{p_i\} + I_h + E_h = \{p_i\} + C_h + O_h + Ie_h + E_h$$

- Where
  - $TP$  is the total performance of the system
  - $\{p_i\}$  is the sum of performance of element  $i$
  - $C_h$  stands for performance improvement induced by reasonable Coordination  $O_h$  stands for performance improvement induced by Effectiveness
  - $Ie_h$  stands for performance improvement induced by Unity
  - $E_h$  stands for performance improvement induced by Unity

Source: Youmin Xi (2004)

# Sketch of urban emergency coping capacity assessment



**Source: Shaoyu Wang (2004)**

# Emergency coping capacity conducted by FEMA and NEMA

## ■ Properties

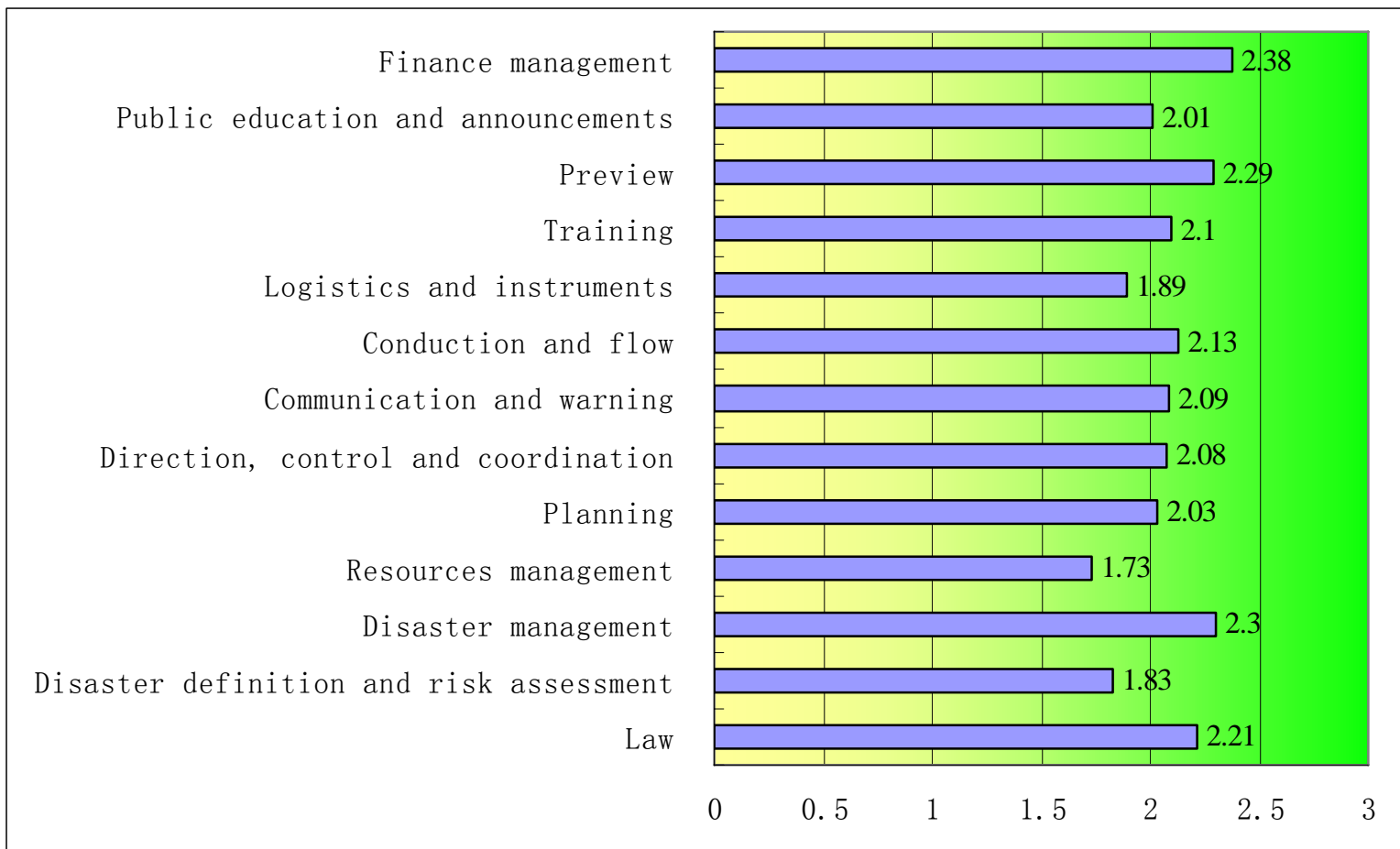
- Law
- Disaster definition and risk assessment
- Disaster management
- Resources management
- Planning
- Direction, control and coordination
- Communication and warning
- Conduction and flow
- Logistics and instruments
- Training
- Preview
- Public education and announcements
- Finance management

# Emergency coping capacity conducted by FEMA and NEMA

- Assessment method:
  - Grading
- Classification
  - 3: always meets requirements
  - 2: meets requirements
  - 1: needs improvements to meet requirements
  - N/A: not suitable for National emergency management
- Weight of index
  - All the same

# Emergency coping capacity conducted by FEMA and NEMA

## Result



# Theoretical Understandings

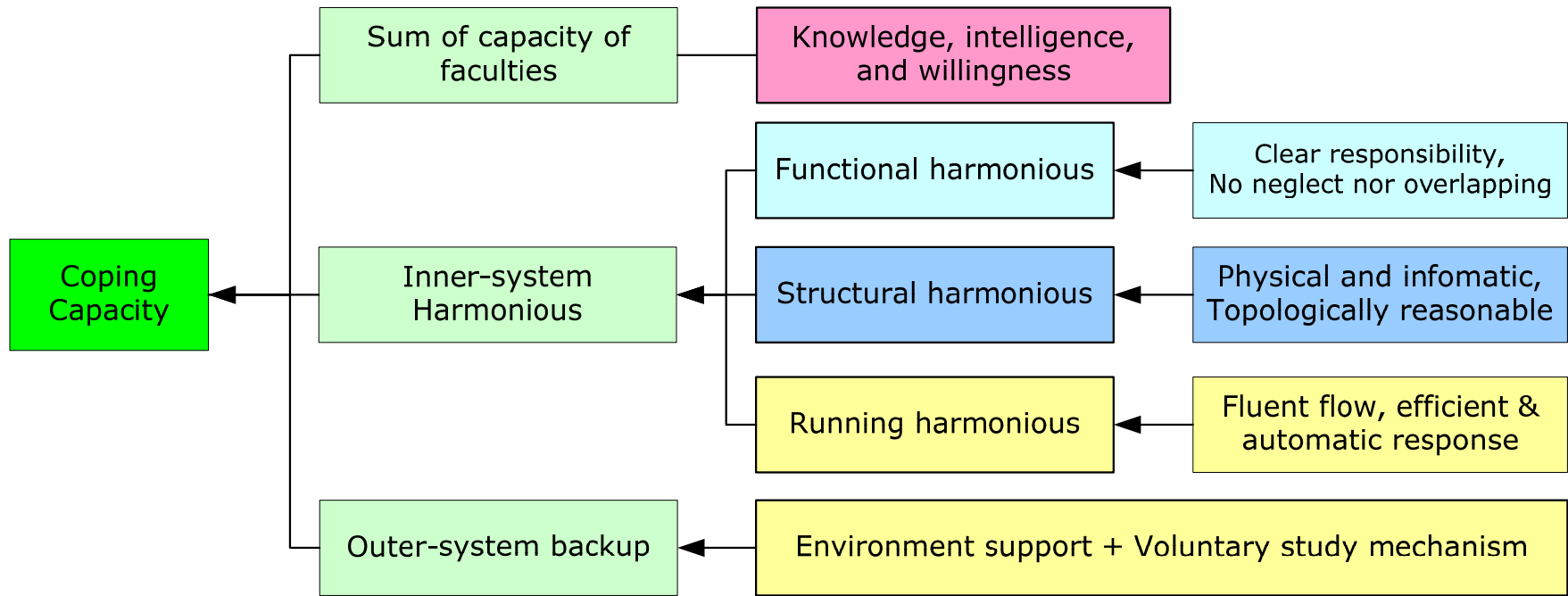
# Coping capacity of a system

- When assessing coping capacity, it should be regarded as a system. We shall apply methodologies of system theory.
- Then coping capacity can be regarded as the total performance of the system. According to Xi Youmin, it can be written as:

$$TP = f(\{p_i\}, x_1, x_2, \dots, x_n)$$

- Where  $x_i$  stands for the advantages and disadvantages induced by the integration of the system.

# Coping capacity of disaster risk governance system



# Coping capacity assessment model

- The system's performance can be defined as

$$CC = f(\{c_i\}, f, s, r, e)$$

- Where
  - CC is the coping capacity of disaster risk governance system
  - $\{c_i\}$  is the sum of coping capacity of faculty i.
  - f stands for performance improvement induced by clear definition of responsibility of administrations
  - s stands for performance improvement induced by reasonable structure
  - r stands for performance improvement induced by efficient and harmonious running
  - a stands for performance improvement induced by environment's backup

**Source: Youmin Xi (2004)**

# Questions

- The function  $f(x)$ :
  - A: plus?
  - B: multiple?
  - ... ?
- Is it possible to quantify each aspect? How to do it?

**Thanks for your attention!**

