NATIONAL DISASTER RESPONSE STRATEGIES FOR DROUGHTS OF CHINA

-from integrated risk governance perspectives

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Integrated Risk Governance Project/Future Earth

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Outline

- **Background**
- **Current Response Strategies**
- **Lessons Learned and Future Direction**
- **Summary and Takeaway Points**

What is Drought?
as a creeping phenomenon

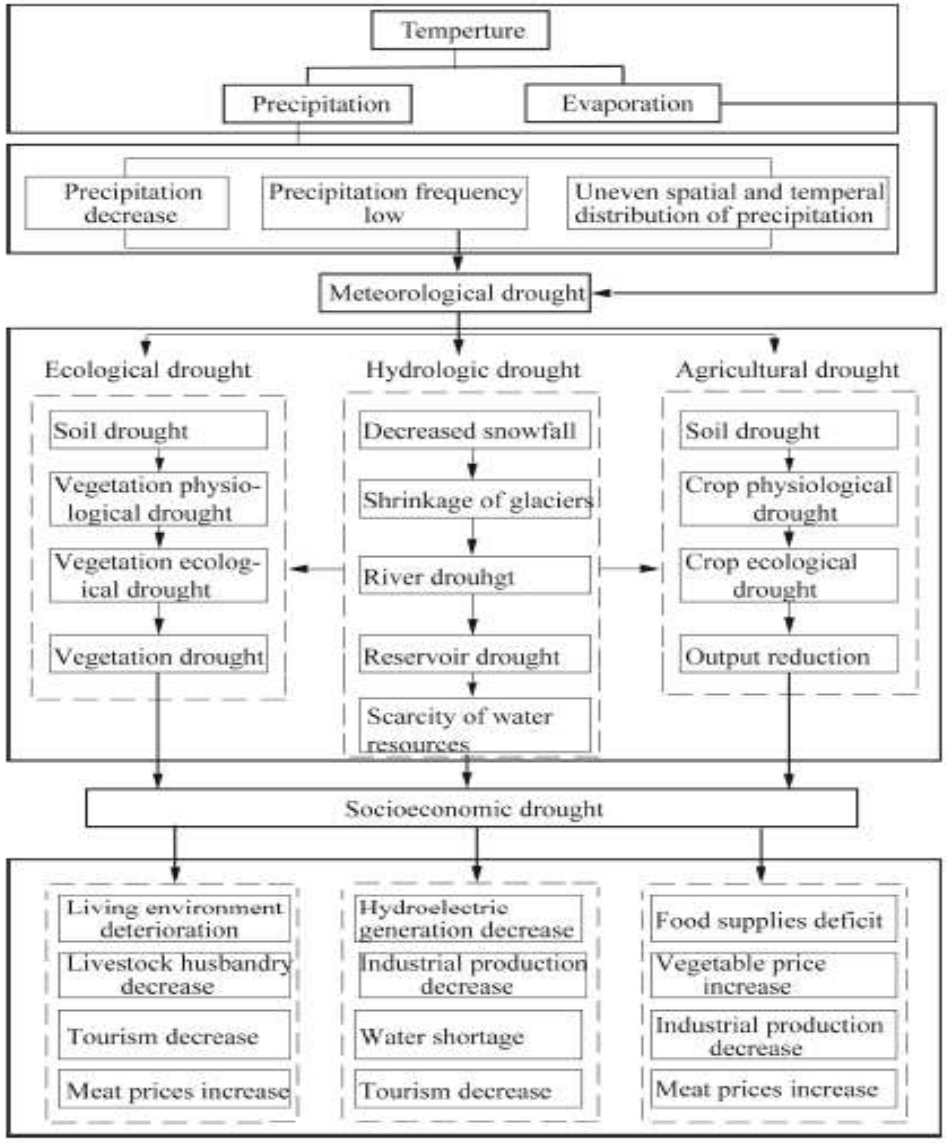
There cannot (and should not) be a universal definition of drought

- Wilhite and Glantz,1985

(*Understanding the drought phenomenon: the role of definitions)*

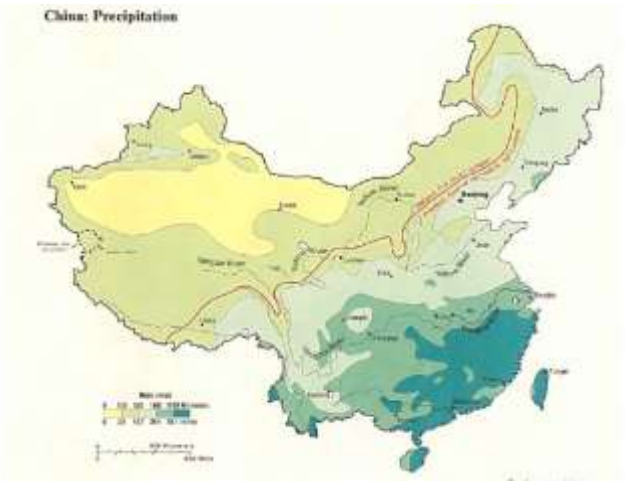
Meteorological Drought

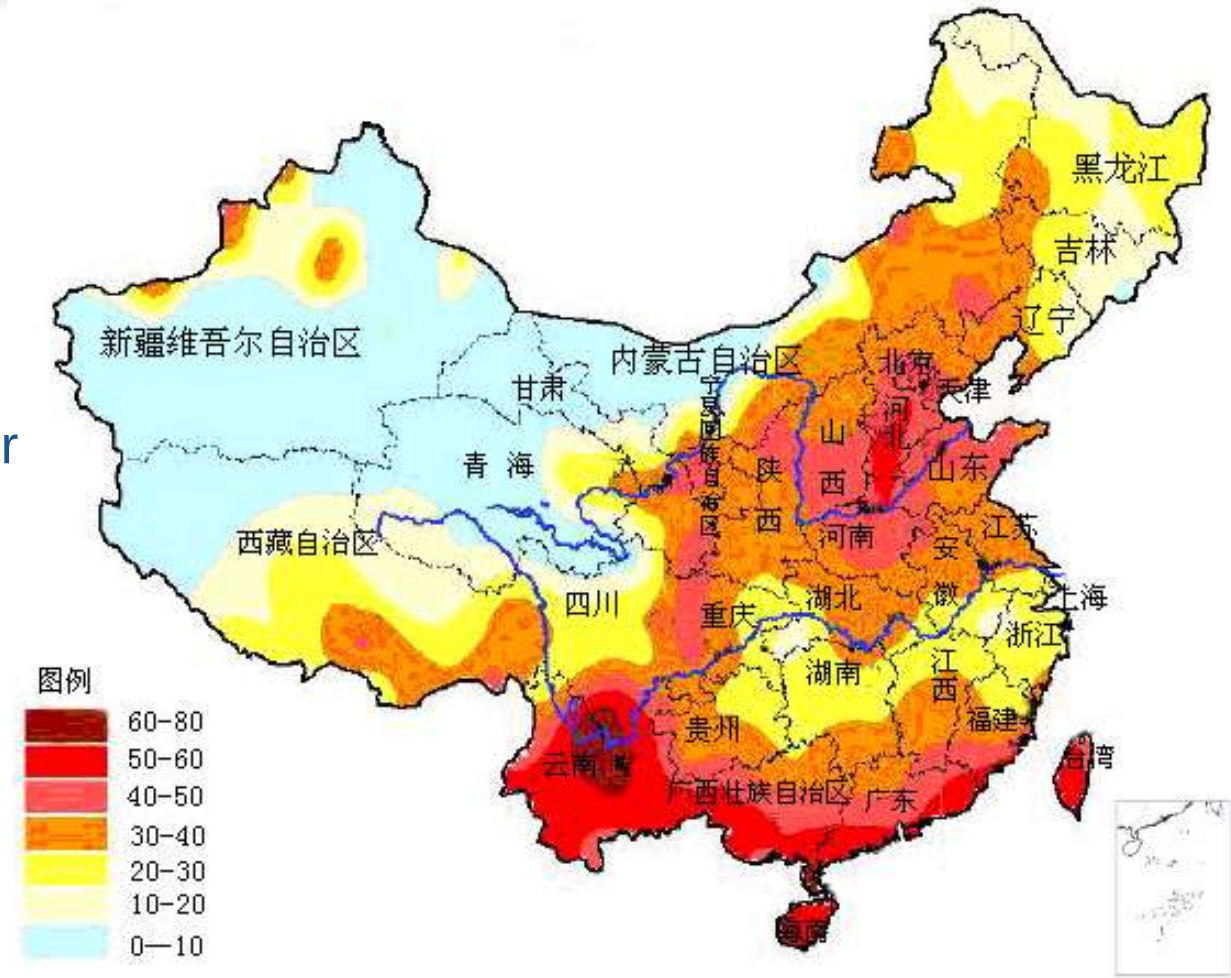
Ecological Droughts
Hydrological Droughts
Agricultural Droughts
Social-Economic Droughts



Drought in China

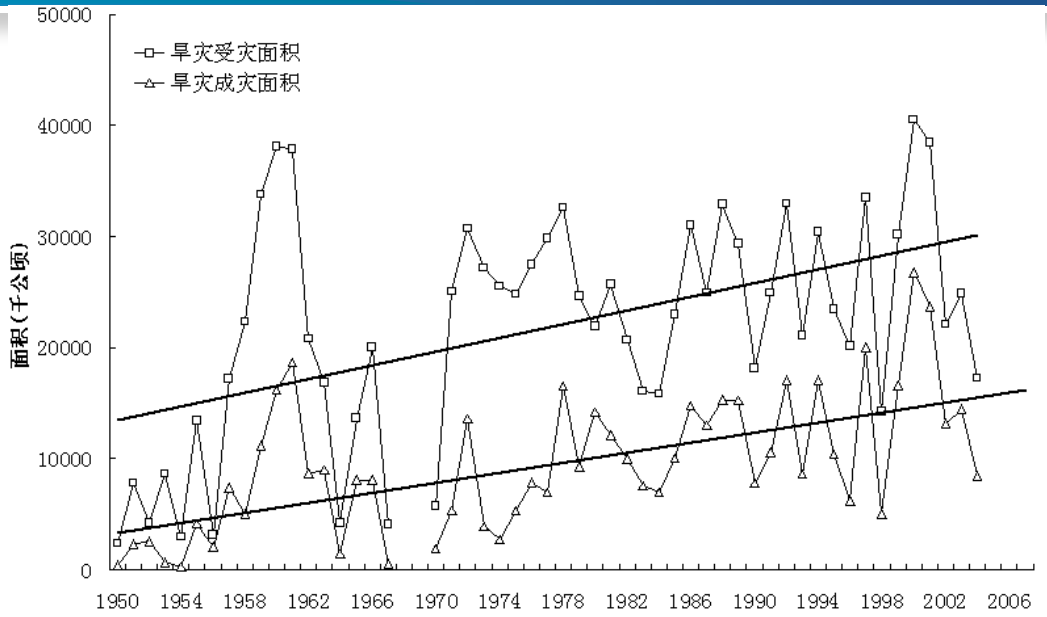
- With its ***vast territory***, dominated by ***Asia Monsoon*** and ***unevenly distributed river systems***, China suffers greatly from droughts in its long history (one major drought in every two years)



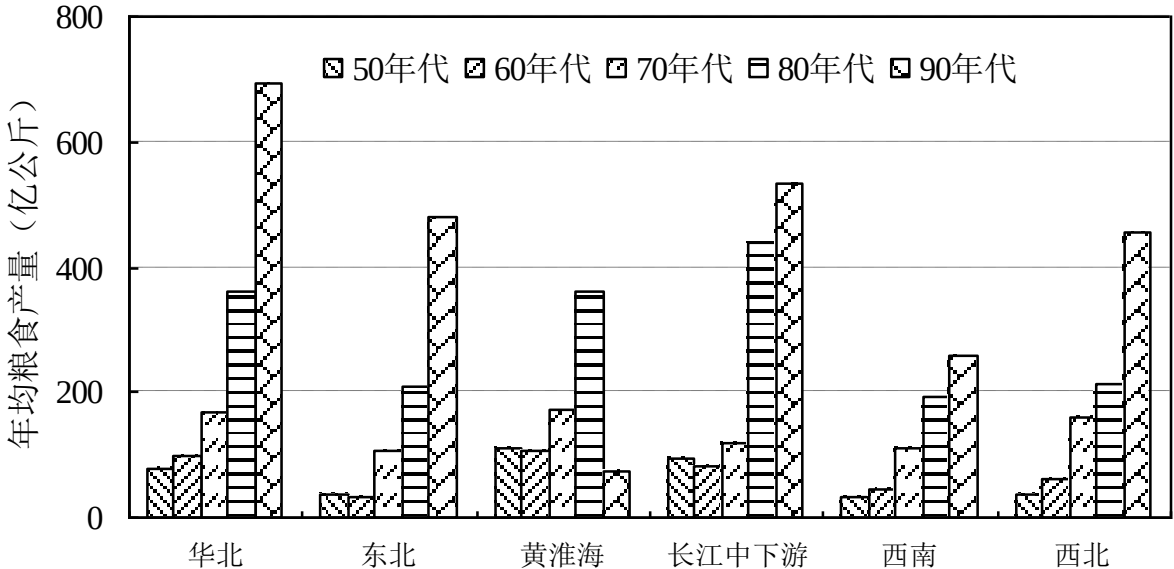


Frequency distribution of drought disasters In China 1950-2007年

Agricultural Loss



Headline News (2014):
Severe drought in 13 provinces costs direct loss of 21.27 billion RMB (2014.8.7) and affects more than 48million people as well as 4 million hectares of farmland.



Factors of Drought Risks in China

Risk = F(H, E, V) -Def. of UNISDR and IPCC-SREX

- Hazard
  - Meteorological and hydrological events
- Exposure
  - Population increase and economic development
- Vulnerability
  - Weak capacity in economic, scientific and technological, public awareness, etc.

National Strategies and Measures

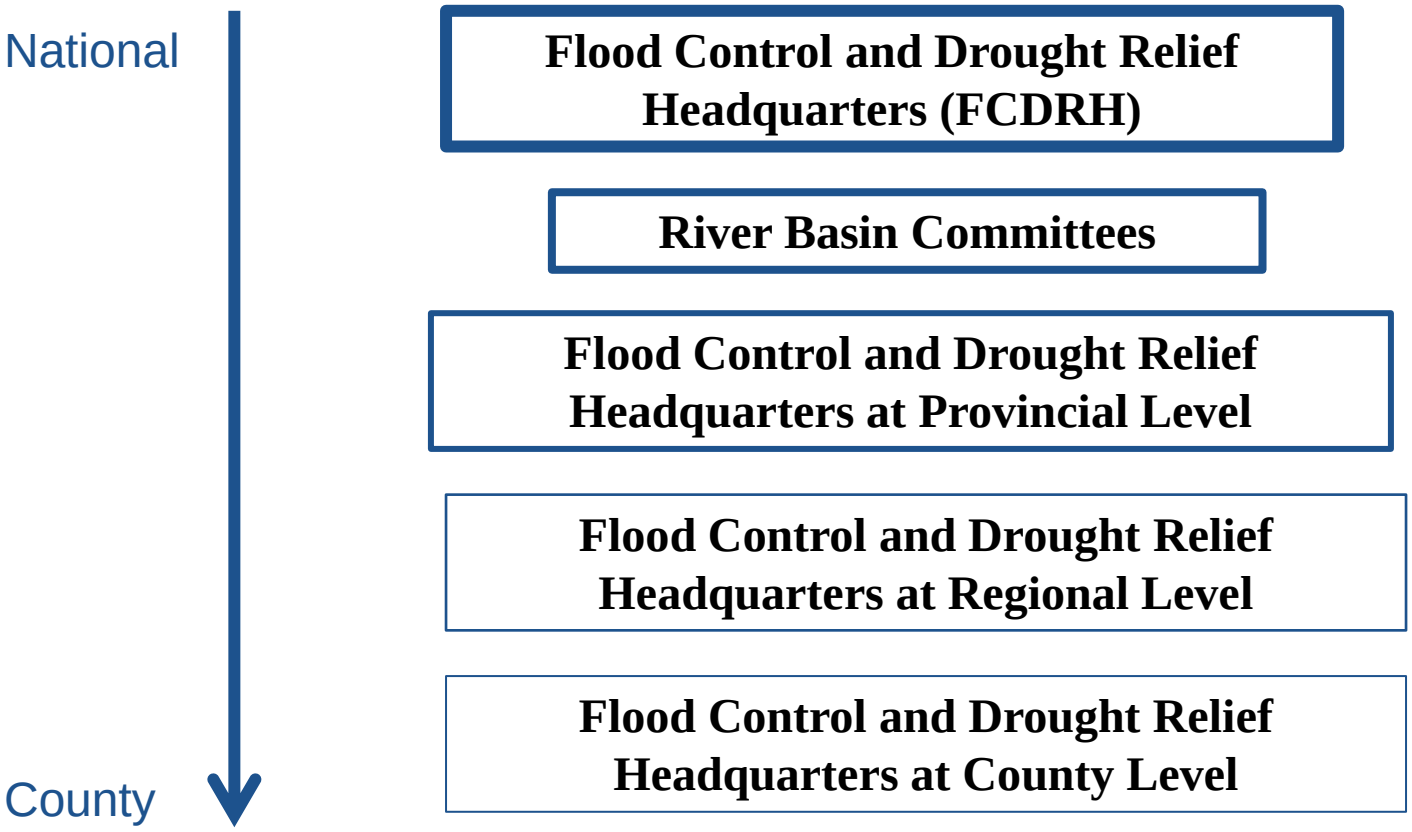
1. Developing legal framework to tackle drought and its impacts

Policy and regulations for drought disaster reduction since 2005

2006.1.11	The national emergency preplans for Flood Control and Drought Relief	State Council, P.R.C.
2007.11.1	Emergency Response Law of the People's Republic of China	Standing Committee of the National People's Congress, P.R.C.
2007.4.25	Hydrology Regulation of the People's Republic of China	State Council, P.R.C.
2007.7.5	Opinions on further strengthening meteorological disaster prevention work	General Office of State Council, P.R.C.
2008.12.17	Guidance on strengthening the construction of natural disaster relief emergency preplan system	Ministry of Civil Affairs, P.R.C.
2009.2.16	Technology points on forestry science and technology of disaster relief cope with droughts	Ministry of Agriculture, P.R.C.
2009.2.25	Drought Control Regulation of the People's Republic of China	State Council, P.R.C.

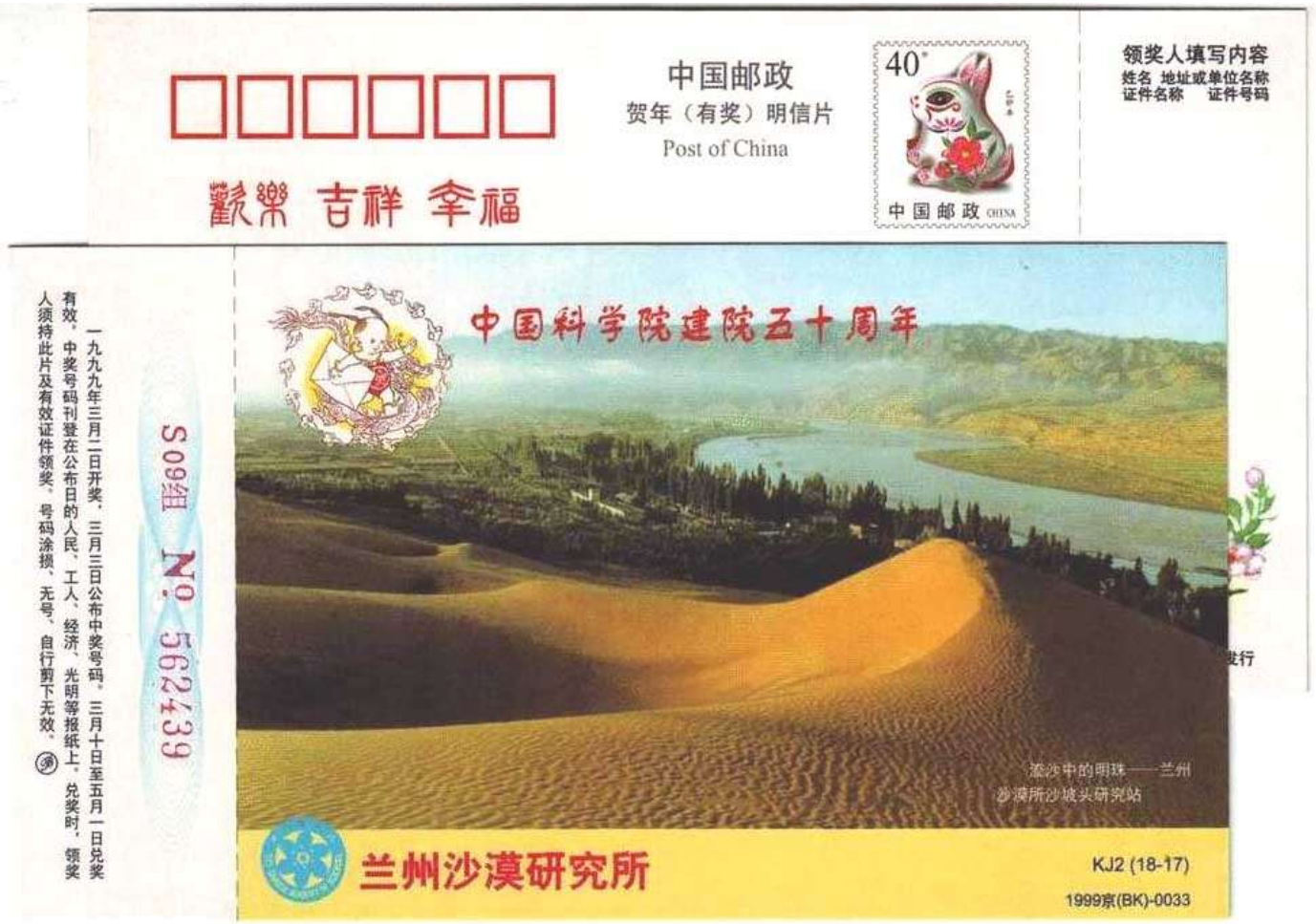
National Strategies and Measures

2. A top-down organization structure: Flood Control and Drought Relief Headquarters (FCDRH) was established in 1955 to implement drought relief activities according to the National Drought Relief Regulation of PRC



National Strategies and Measures

- **3. Incorporating Drought Management with Water Management and Ecological System Management with Engineering Solution**



Projects of water transfer and diversion, irrigation System and water storage from national to regional and community levels

National Strategies and Measures

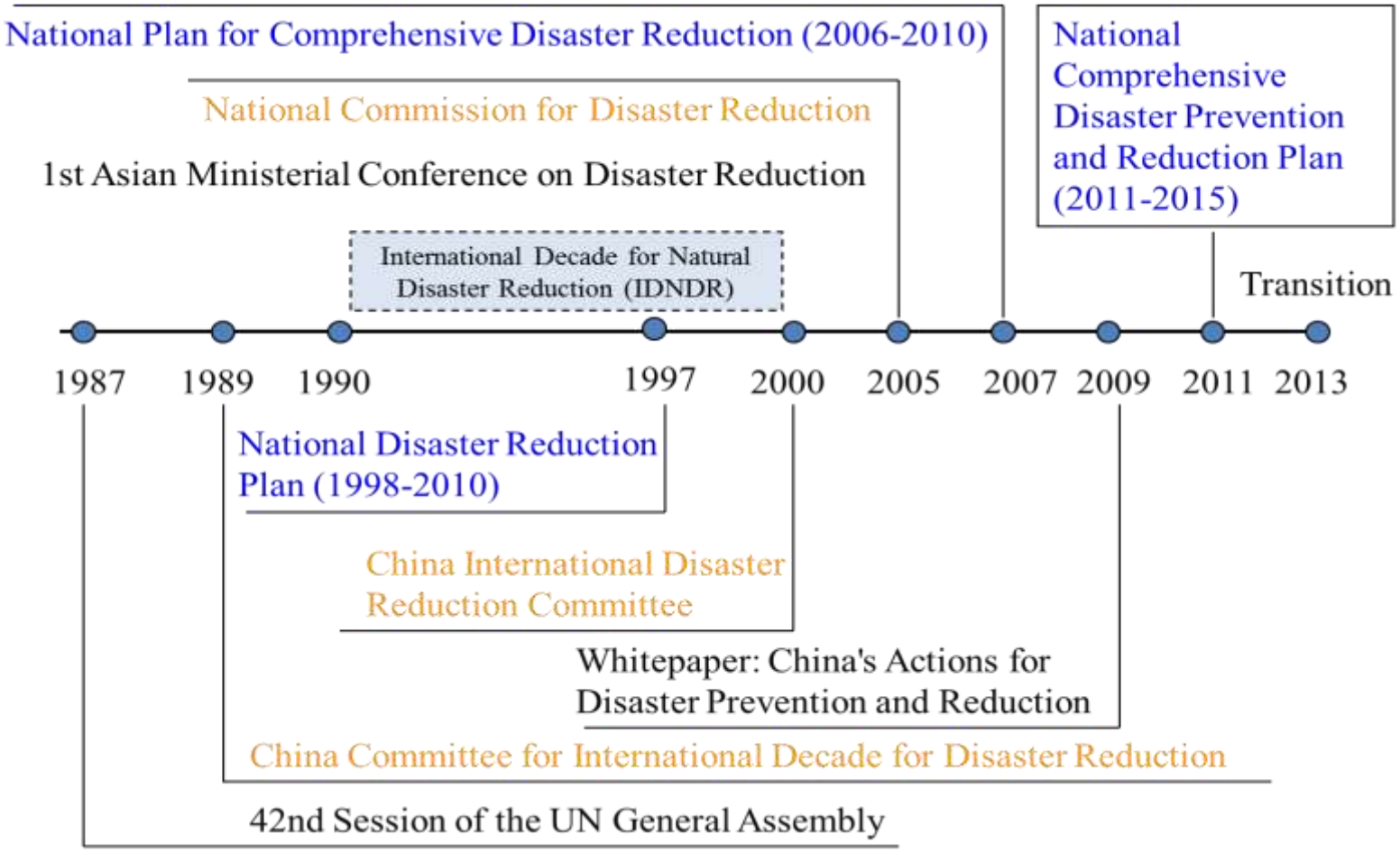
4. The role of science: mainly focusing on agricultural Drought and expending to pasture drought, urban drought and potable water deficiency

Types of agriculture	**Rain-fed agricultural area**	**Irrigated agricultural area**	
		Irrigated field	Paddy field
Appropriate indicators	Relative soil moisture	Relative soil moisture	Irrigation water deficiency ratio
	Percentage of precipitation anomalies	Irrigation water deficiency ratio	Consecutive days without water in rice field
	Consecutive days without rain		

Source: China Institute of Water Resources and Hydropower Research

New Trend:
From crisis management to risk management

1. Improving legislation and regulation



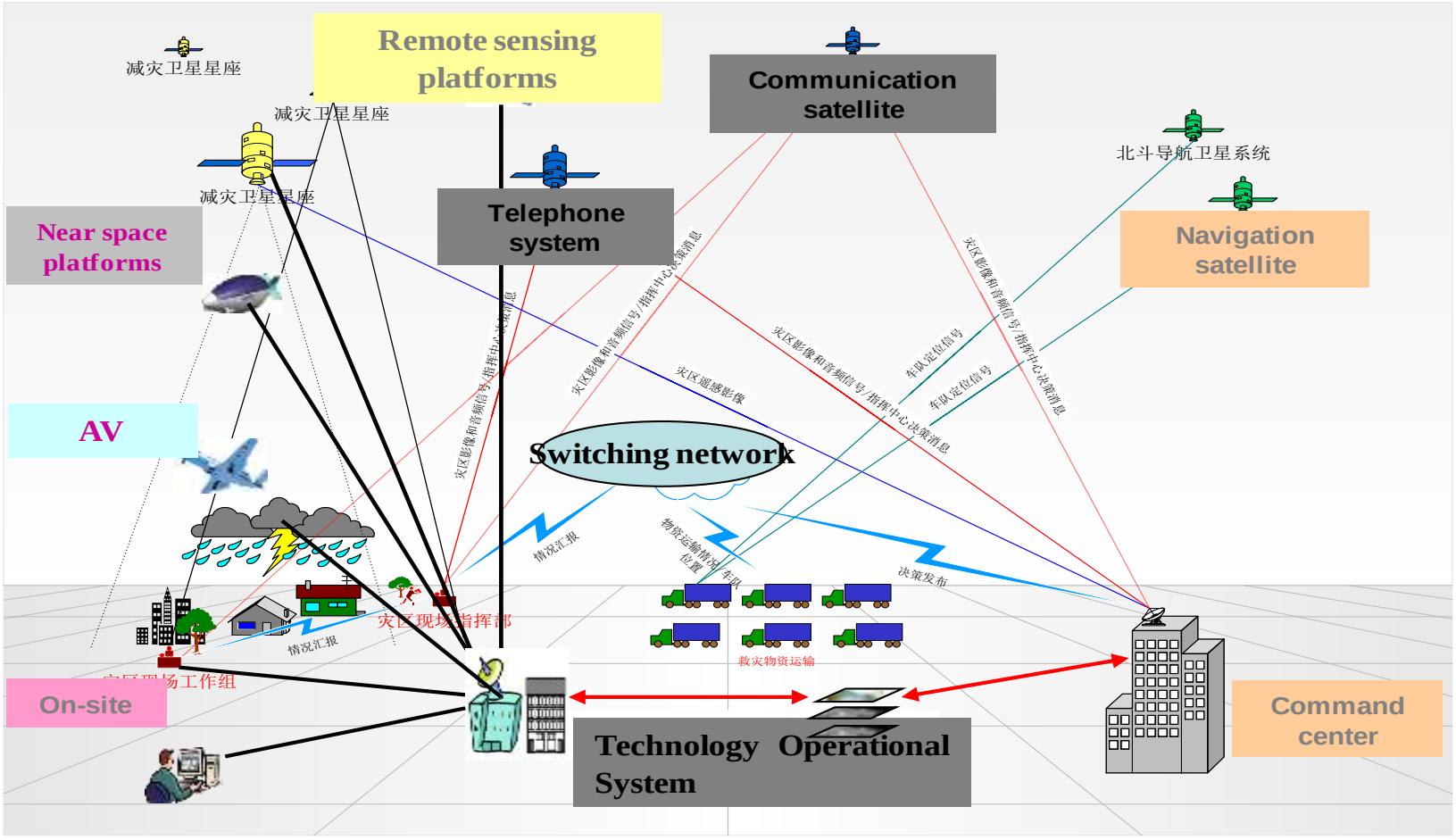
Progress in Integrated Risk Governance of China (1987-2013)

Comprehensive Disaster Relief System

2. A top-down organization framework to coordinate and organize drought disaster reduction and relief work.

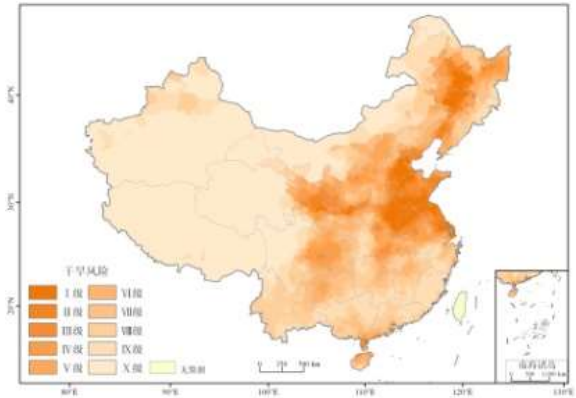
The Role of Sciences and ICT

3. National natural disaster monitoring and early-warning system and information sharing

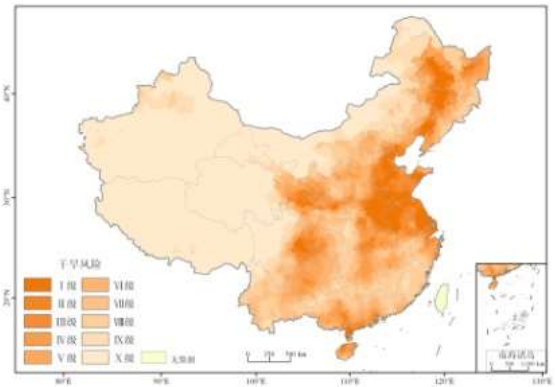


New Challenges

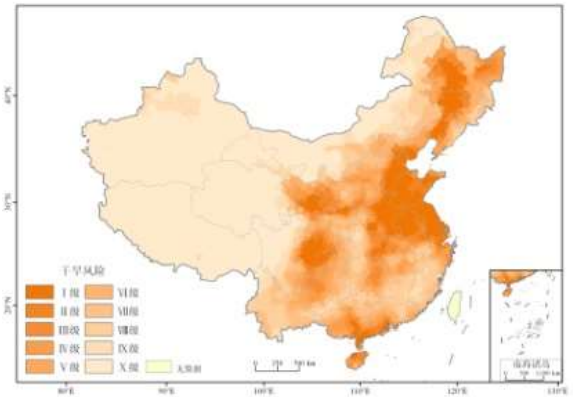
1.Climate change uncertainties lead to greater drought risks: trend, variations and extremes



(a) Near-term (1991-2020)



(b) Mid-term (2021-2050)



(c) Long-term (2051-2080)

Distribution of drought risk levels in China in the future in scenario SRES B2

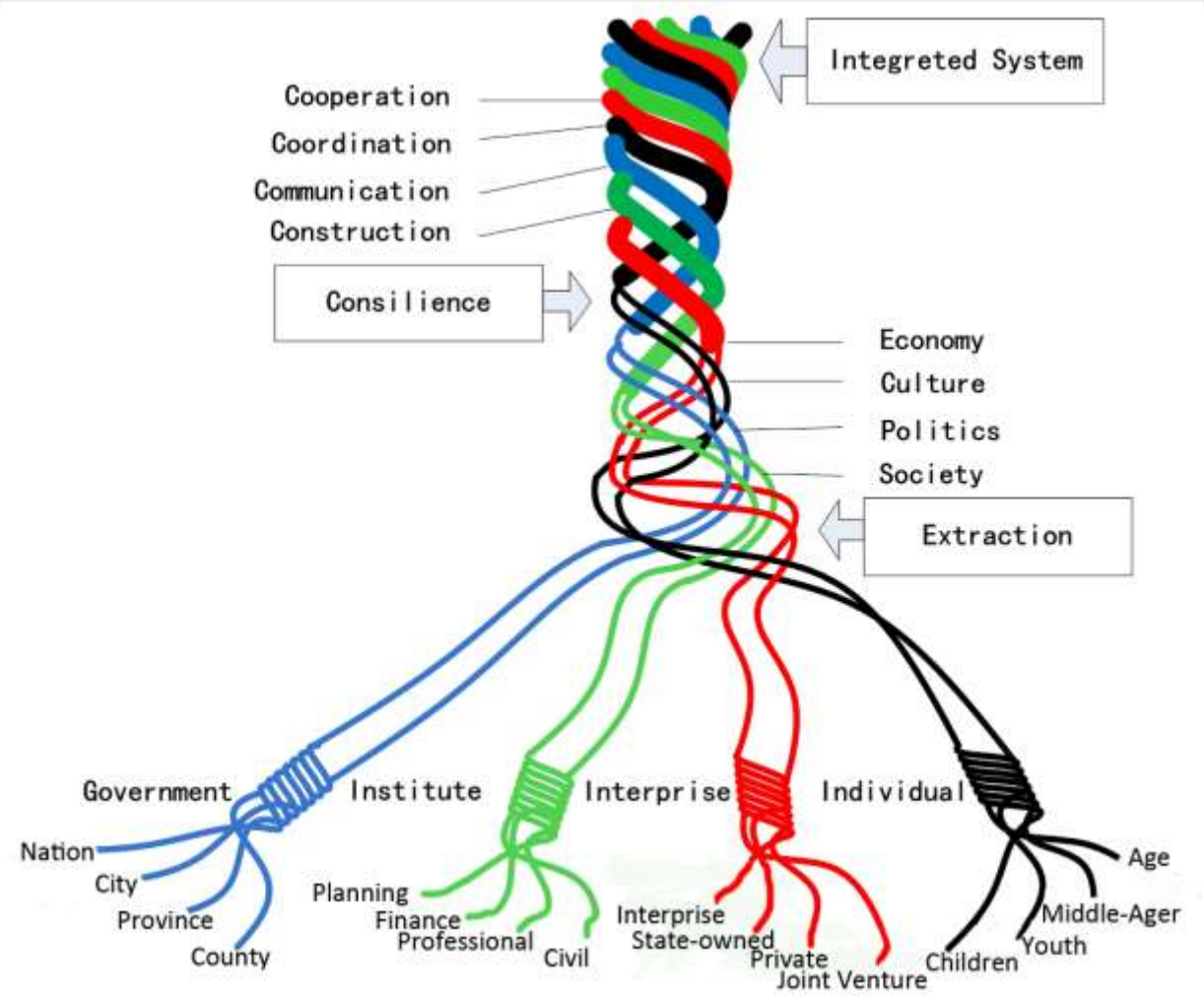
New Challenges

2. Fast social-economic development leads to new emerging drought risks and disaster chain effects

Urban Droughts

Ecological Droughts

Future Direction: New Governance Paradigm



Consilience model of large-scale disaster (LSD) governance (Shi et al 2011)

Table 1 Government Investment and Achievements for Various Desertification Prevention and Control Projects in China

Incorporating Drought Risk Governance into the Environmental Recovering Projects

Key Projects*	Government investment ($X10^8$ Yuan)	Major benefits of different projects
3NSDP 1978-2010	128	26.47 million ha of afforestation land
CCFP 2002-2010	2332	9.26 million ha of cropland was converted into forest land
NFPP 2000-2010	784	forest area increased by 14.00 million ha, timber production reduced by 220 million m^3
SSCP 2001-2010	412	6 million ha of cropland was returned to forest
GBGRP 2003-2010	203	518.66 million ha of grassland was protected with fence and 12.40 million ha of severe degraded grassland was reseeded

New Opportunities

- **Agricultural insurance and catastrophic bonds**

Technological innovation

Summary: Takeaway Points

- **Governments must play central role in governing drought risks**
- **Living with droughts: *Innovation and exploring the opportunities***
- **Better scientific toolbox to support decision makers: *From bridging to blending***
- **Human capital for dealing with an increasing complex world: *Knowledge Brokers***