

To Construct the Theory and Practice System of Integrated Disaster Risk Management

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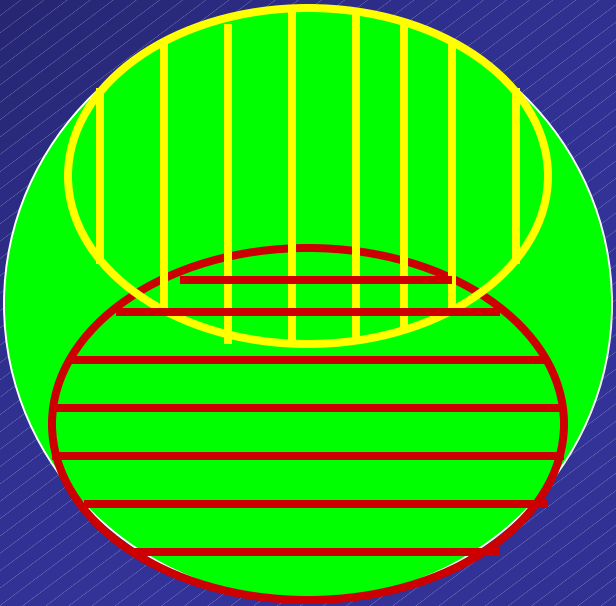
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1. How to understand disaster system?



Disaster System



E

Environment

H

Hazard

S

Social & Economic System

D

Disaster

(Shi Pei jun, 1991)

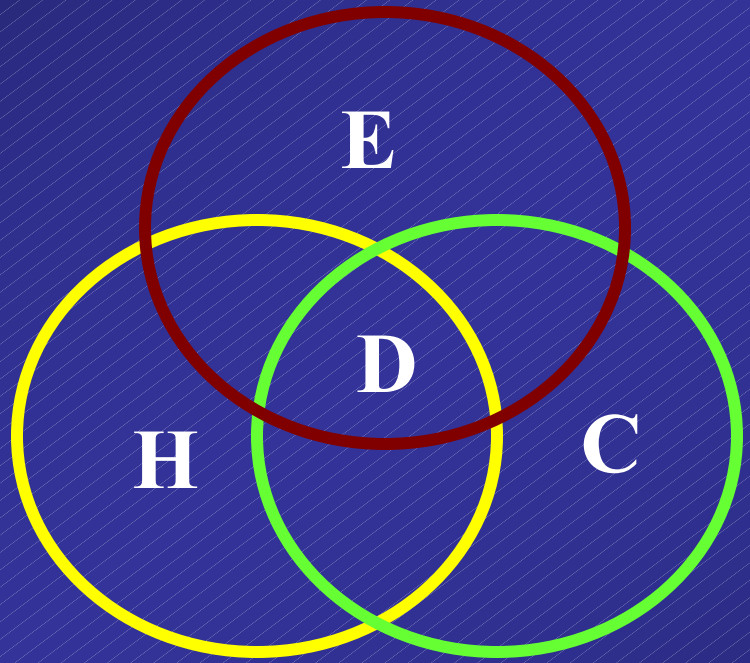
$$D = E \cap H \cap S$$



WCDR, Section 5.1: from Research to Action

How to understand the Disaster System?

Disaster System



(D. S. Mileti,
1999)

$$D = E \cap H \cap C$$



Multi-layer System



Life in community

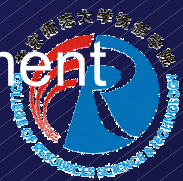
Landuse and Built Environment

Infrastructure

Social Schemes
Culture and Convention

Natural Environment

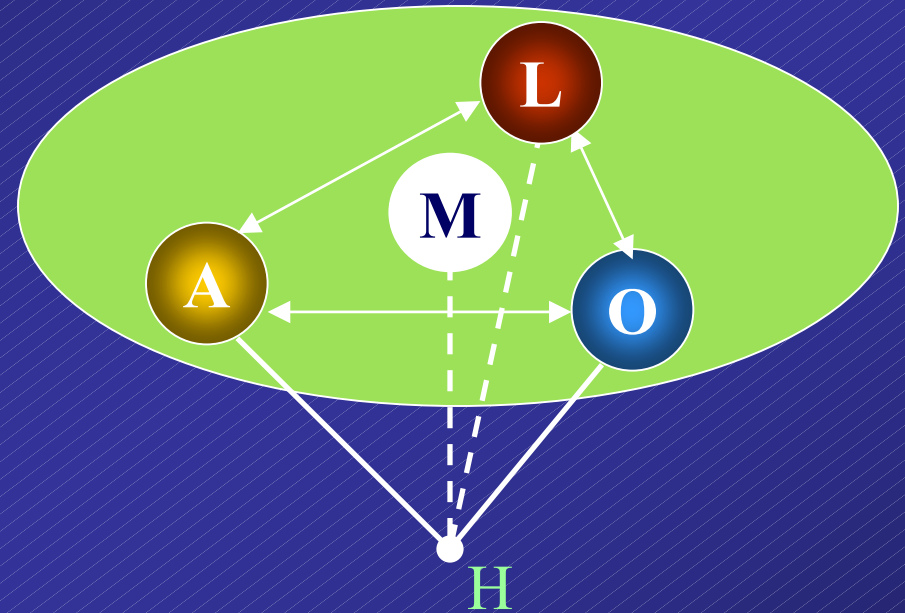
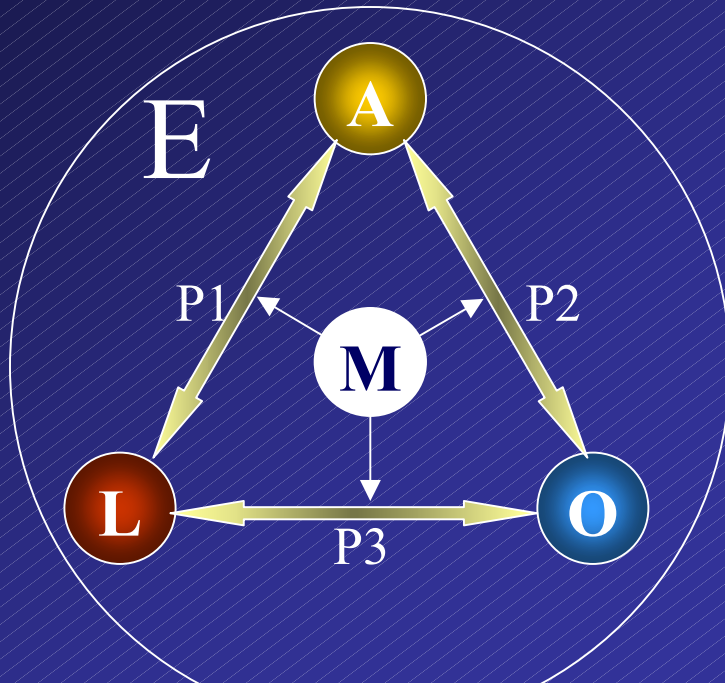
(Okada, 2003)



Understanding based on Ancient Chinese Philosophy



Sky, Earth, Human, and Harmony



E: Earth system **A:** Atmosphere

L: Land **O:** Ocean

M: Human **H:** Harmony

P1: Land-Atmosphere interaction

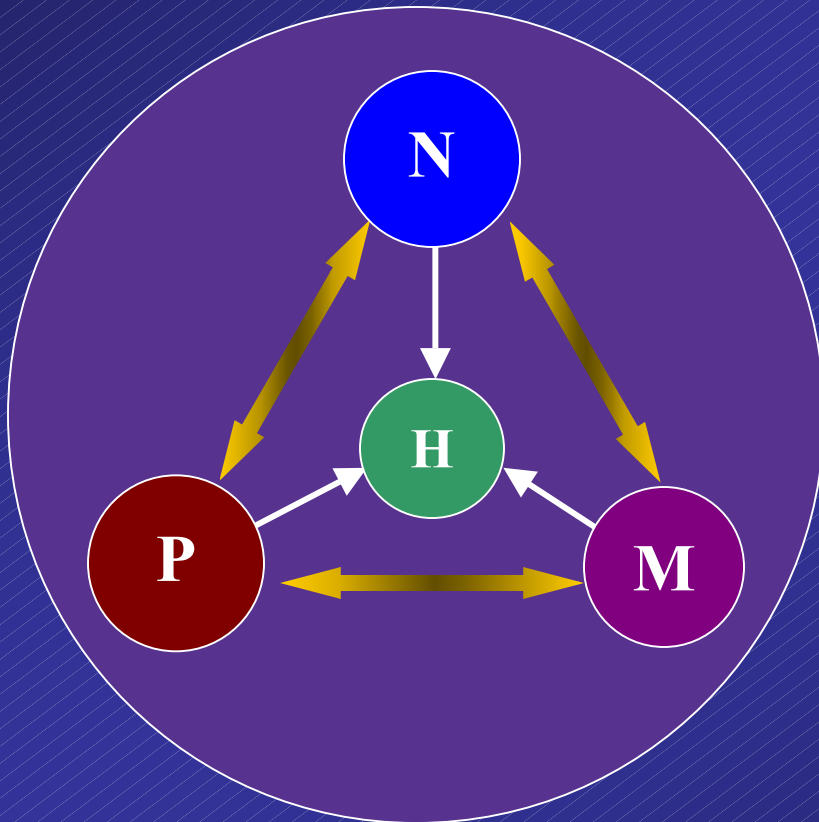
P2: Atmosphere-Ocean interaction

P3: Land-Ocean interaction

- **Harmony** is the fulcrum that balance the Human-Earth System

Sky, Earth, Human, and Harmony

- Seeking for the optimizing ways of the system by understanding the relationship between the sky, the earth, and human.



N: Natural Driving force

P: Pattern and Processes on the Earth surface

M: Human Beings

H: Harmony



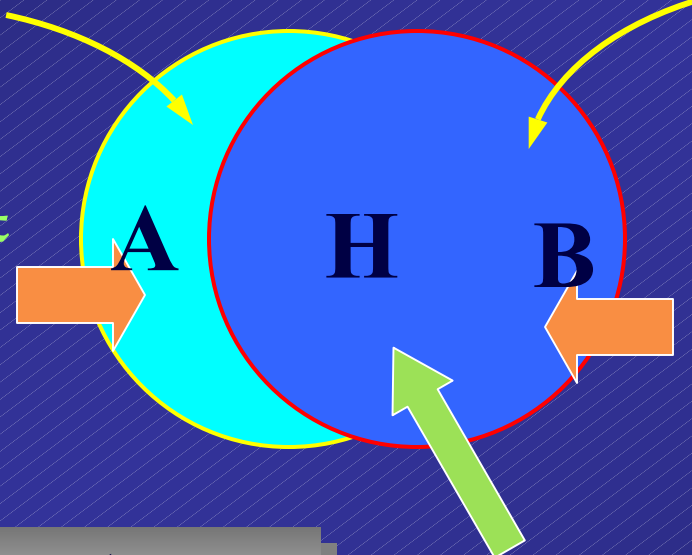
Syncretism of the nature and human

Planet Earth Natural Pattern
(Ocean, Land, Atmosphere)

World Political Map
(Countries & Districts)

A:
Biogeophysical &
Biogeochemical
Processes

B:
Vitageophysical &
Vitageochemical
Processes



A: Earth health system
B: Human health system
H: Bi-health system
($H=A \cap B$)

$H=A \cap B$
Biogeochemical Process
that both the earth and
human are healthy



Syncretism of the nature and human



- The larger the area of H is, the more sustainable human and the earth would be.
- This is the highest bourn in Human-Earth Relationship in Ancient Chinese Philosophy



2. “Structure-system” dynamics model
of
Integrated Disaster Risk Management
--from Theory to Practice



WCDR, Section 5.1: from Research to Action

The perspective for integrated disaster risk management



City as a Five Layered System

● Tower (Structure) System



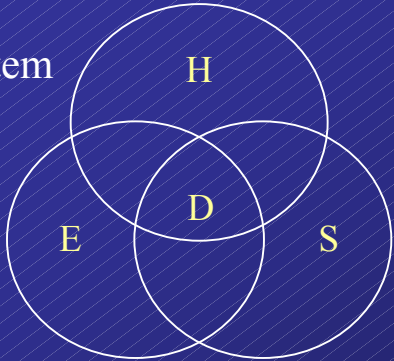
● Object Integrated



● Earth Surface Vita Dynamics / Earth Surface System Dynamics



● Disaster System

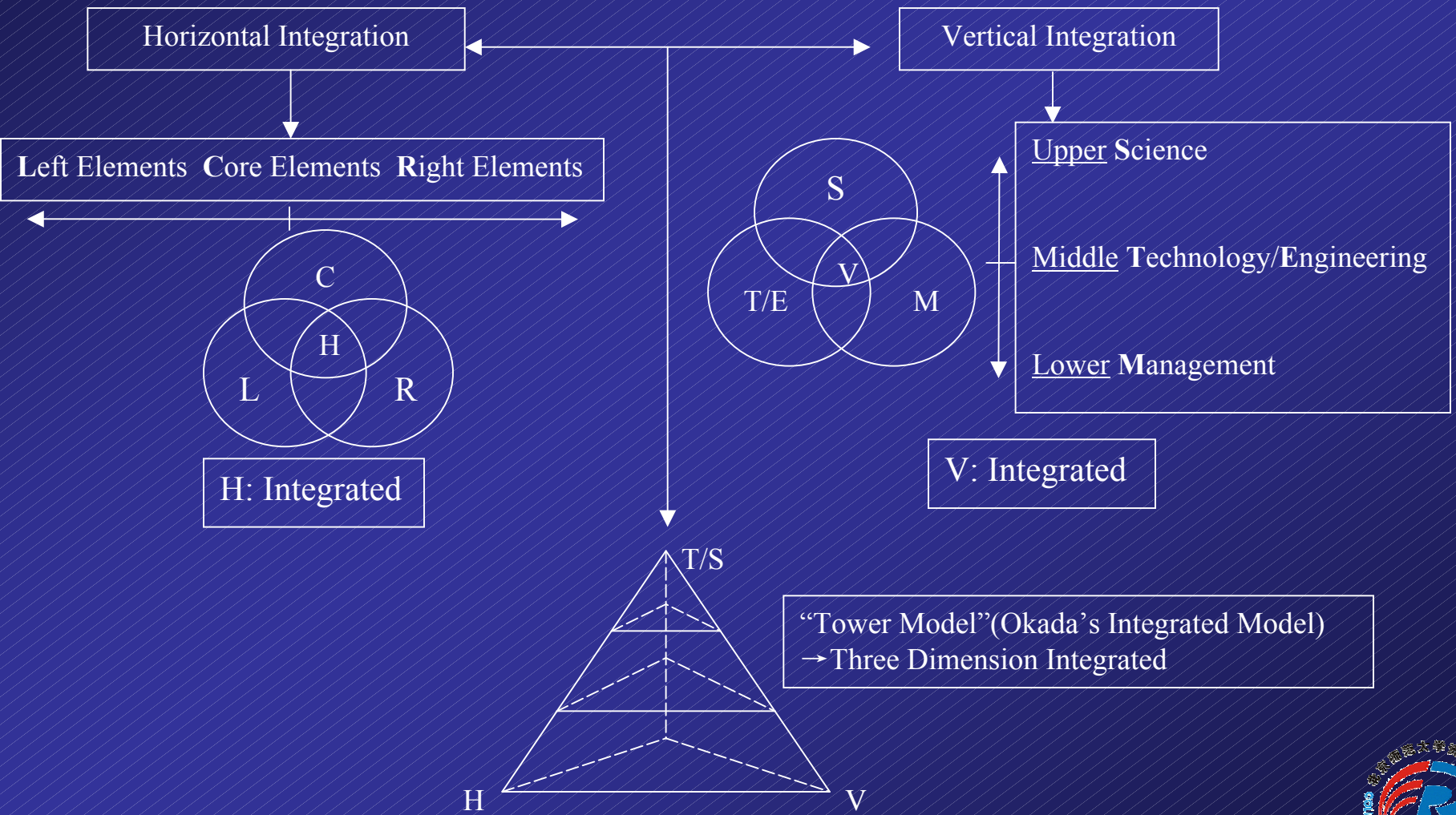


Disaster System
E: Environment
H: Hazard
S: Social & Economic System
D: Disaster

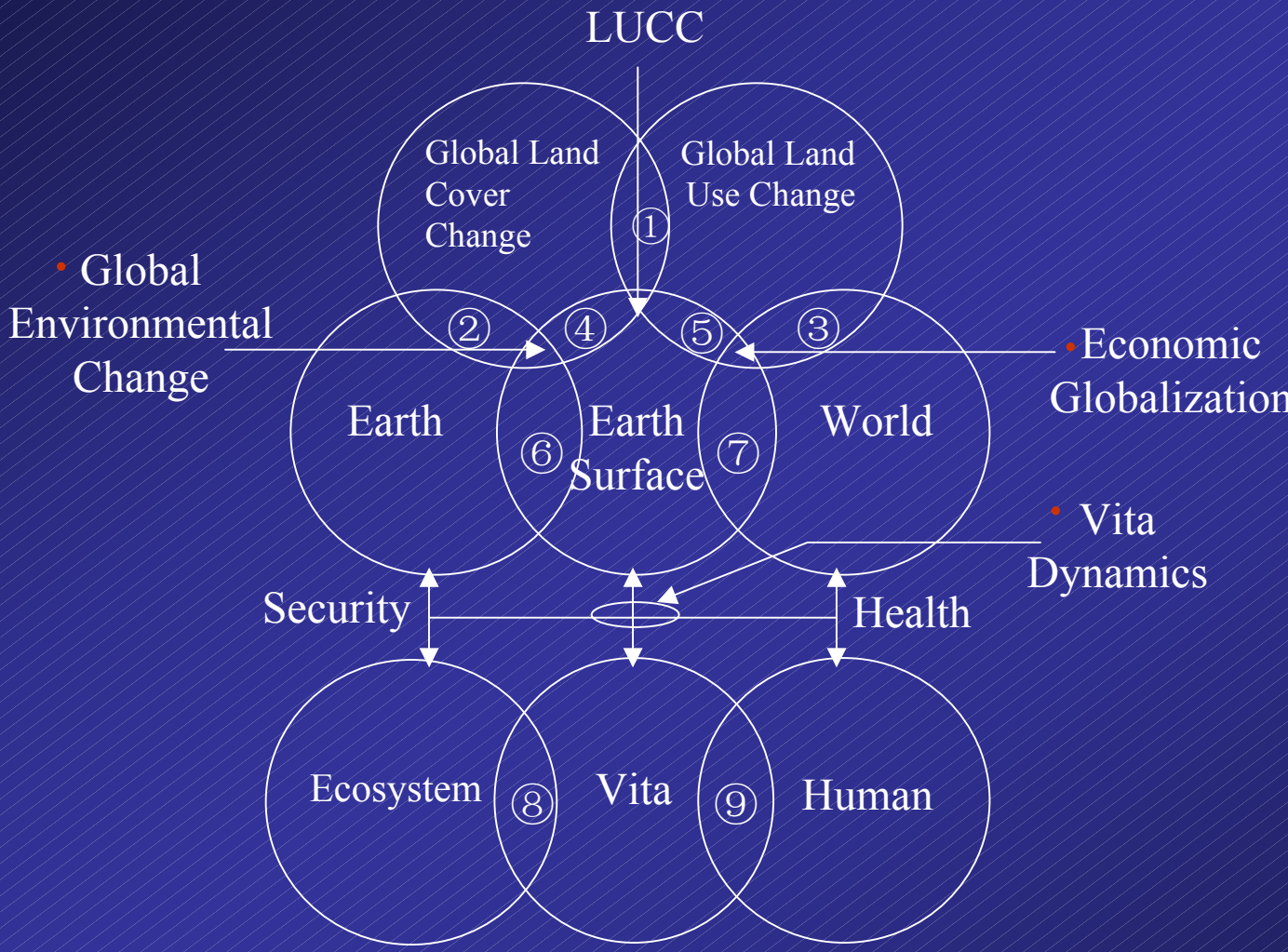


WCDR, Section 5.1: from Research to Action

Concept model of integrated disaster risk management



Structure-system dynamics model



- Core Problems
- ①—⑨ Key Fields:.
- ① Land System Dynamics;
- ② Physical Geography Processes;
- ③ Human Geography Processes;
- ④ Natural-Human Processes;
- ⑤ Human-Natural Processes;
- ⑥ Earth Nature Regionalization;
- ⑦ World Administration (Political) Regionalization;
- ⑧ Nature (Ecosystem) Vita Dynamics;
- ⑨ Human (Social System) Dynamics

Dynamics Model of Earth Surface (Natural-Human) Vita System
(Dynamic Model of "Structure-System" for Integrated Disaster Risk Management)



3. From Research to Action:
To construct Regional Practice System
of Integrated Disaster Risk Management



1). Form the regional integrated disaster risk management system

- ❑ From individual ministry to integrated ministry
— such as FEMA
- ❑ From individual database/information system to integrated risk information system
- ❑ From individual hazard response system to regional disaster response system



2) . To build the technology support system for action of disaster reduction

- ❑ Information sharing platform
- ❑ Warning sharing system
- ❑ Disaster reduction engineering system in high risk areas



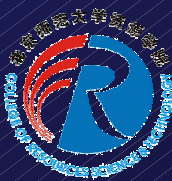
3). To build social and cultural support system of integrated disaster risk management

- ❑ Develop community disaster reduction system
- ❑ Strengthen stakeholders' disaster reduction skills
- ❑ Transmit community safety culture knowledge



4). To build IDRiM-Nexus of integrated disaster risk management

- ❑ Case stations
- ❑ Field campus
- ❑ Cooperation network system



Case stations in China Controlled by BNU

- ❑ Dongting Lake Basin (Flood and Drought)
- ❑ Shenzhen City Region (Typhoon, Red Tides)
- ❑ Tianjin Coastal Line Area (Sea Ice, Ocean Wave)
- ❑ Capital Rings (Dust-storm, Earthquake, Drought)
- ❑ Yunnan Lijiang District (Earthquake , Landslide)



WCDR, 18-22 January 2005, Kobe, Japan

Thank you for your attention!