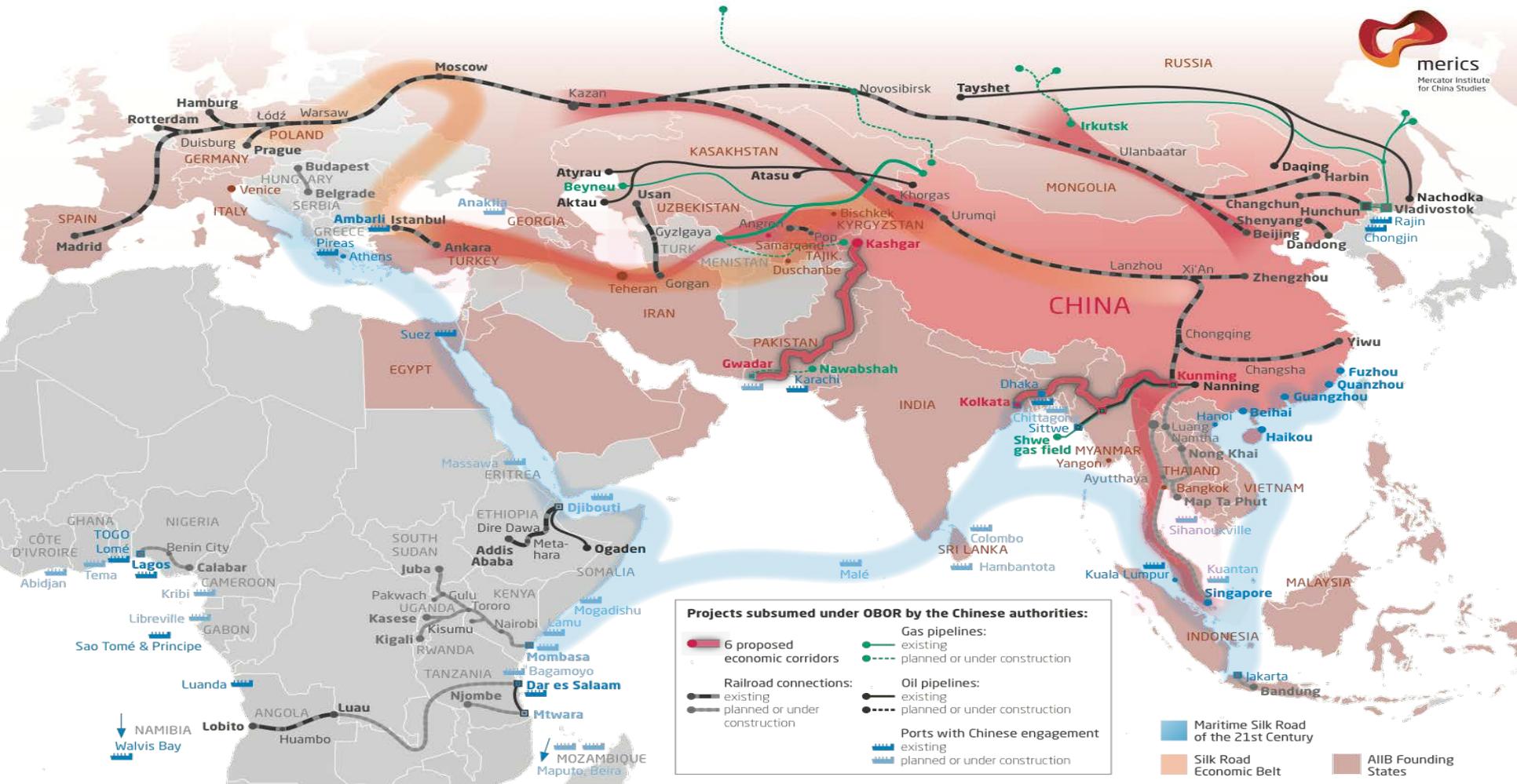


International Research Project of CAS:

Natural Hazards Mitigation and Risk Management for the Belt and Road Area

By: Prof. Peng CUI



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- 1. Significance**
- 2. Research Contents**
- 3. Vision and Promotion**
- 4. Cooperation and Road Map**

1. Significance



Silk Road Economic Belt and the 21st Century Maritime Silk Road (“the Belt and Road”)

Cover more than 70 countries and 4.4 billion peoples (63% of the world)

Background of Hazards in Mountain Region

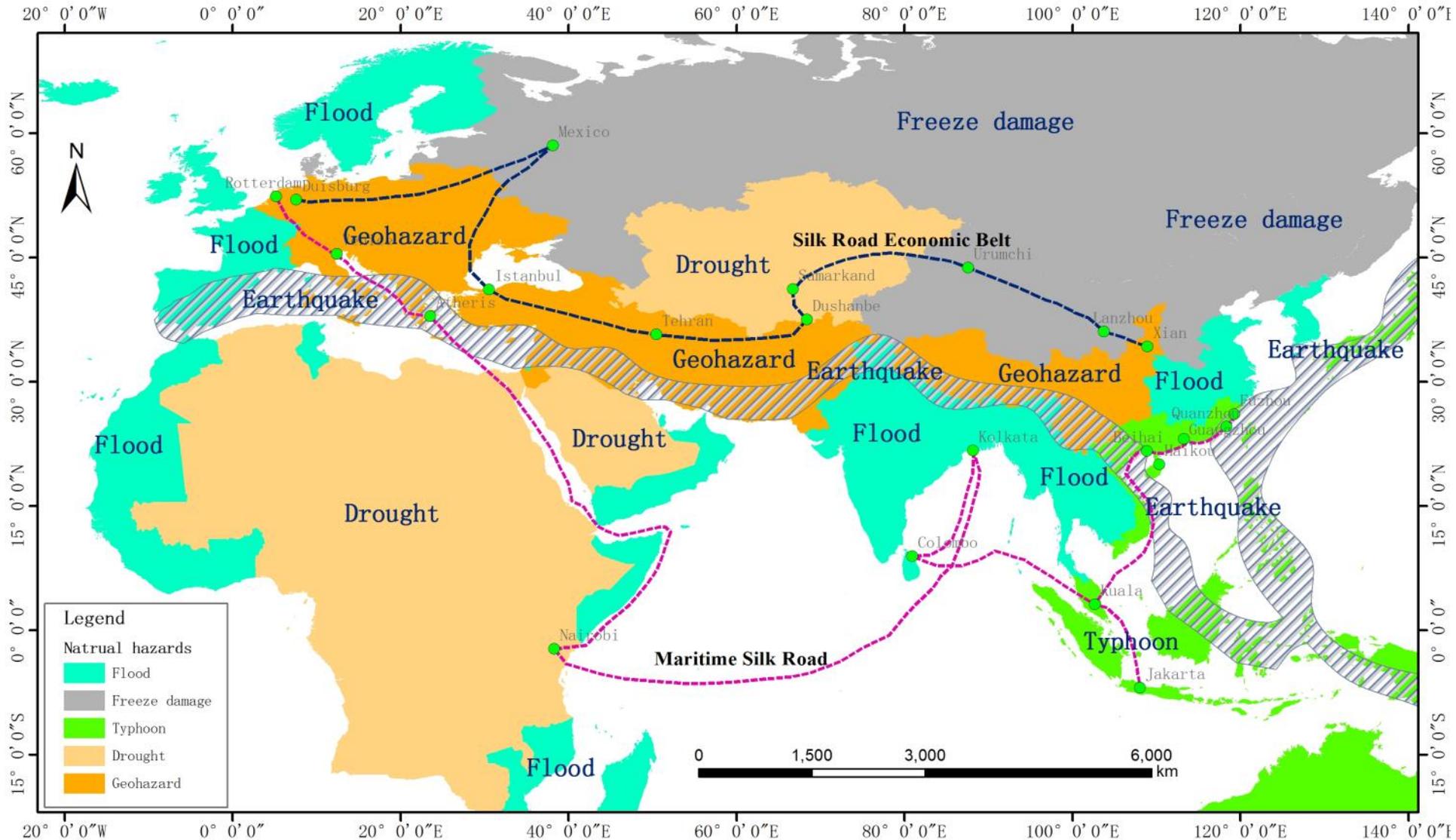
- ◆ Active tectonic movement in young mountains: frequent mega earthquakes and severe erosion generate **abundant solid mass** for formation of mountain hazards;
- ◆ High intensity rainfall and quick snow melting provide **plenty of water** for the formation of mountain hazards;
- ◆ Steep slope and high relative altitude is **conductive energy condition** to development of mountain hazards

Types of Natural Hazards in the Belt and Road Region

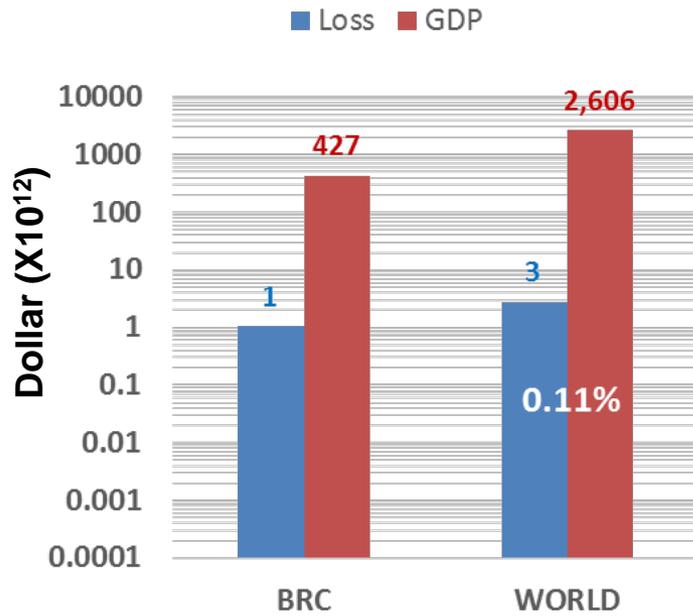
 Geophysical	 Hydrological	 Meteorological	 Climatological
Earthquake	Flood	Storm	Drought
Landslide	Debris Flow	Extreme temperature	Glacial lake outburst
Volcanic activity	Wave action	Fog	Wildfire

Earthquake, Tsunami, Flood, Landslide, Rock fall, Debris flow, Snow avalanche, Dammed lake, GLOF....

Distribution of Natural Hazards in the Belt and Road Region

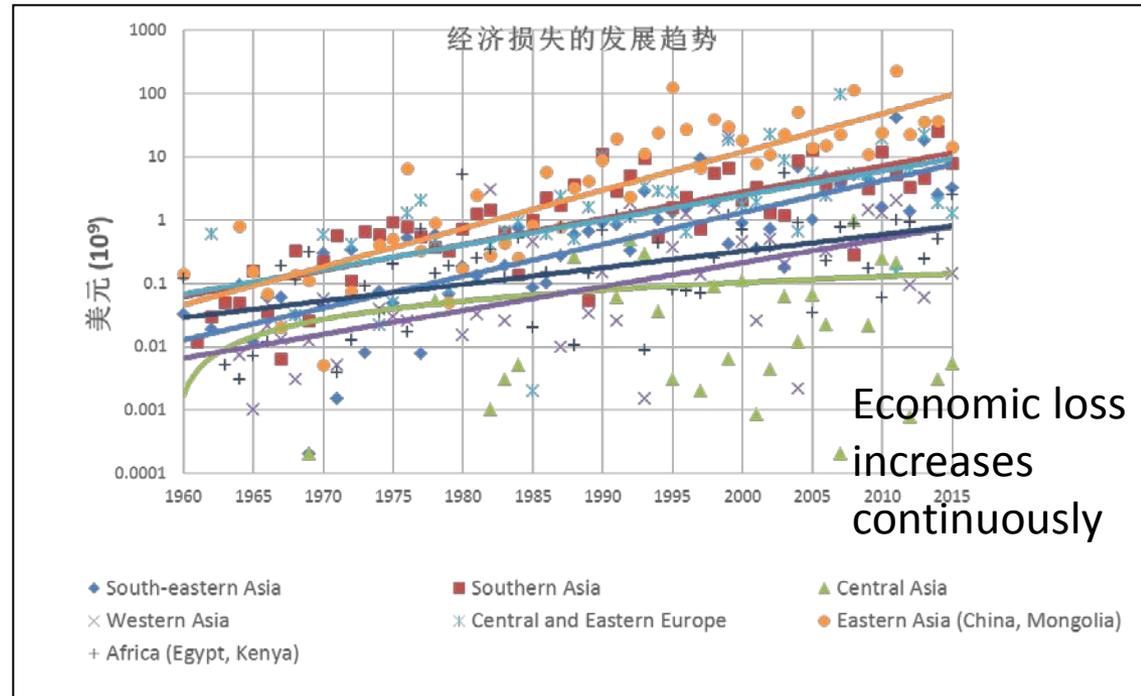


Economic Loss due to Natural Hazards, 1995-2015



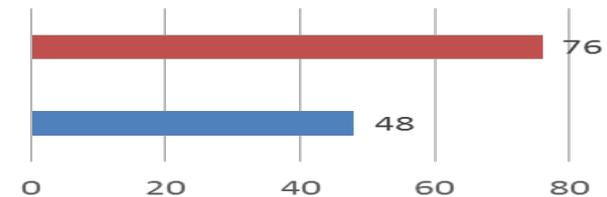
Economic loss/GPD

- Economic loss due to natural hazards in the “Belt and Road” is twice the world average
- Economic loss of East Asia, central and East Europe are the most



BRC (Belt and Road Countries)

Density of population
(No. per km²)

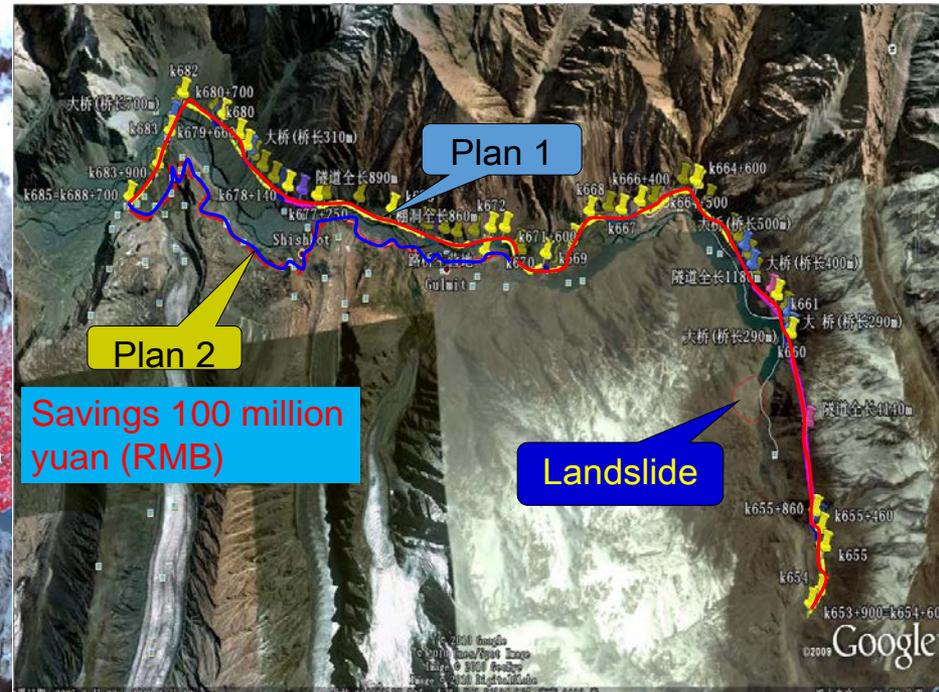
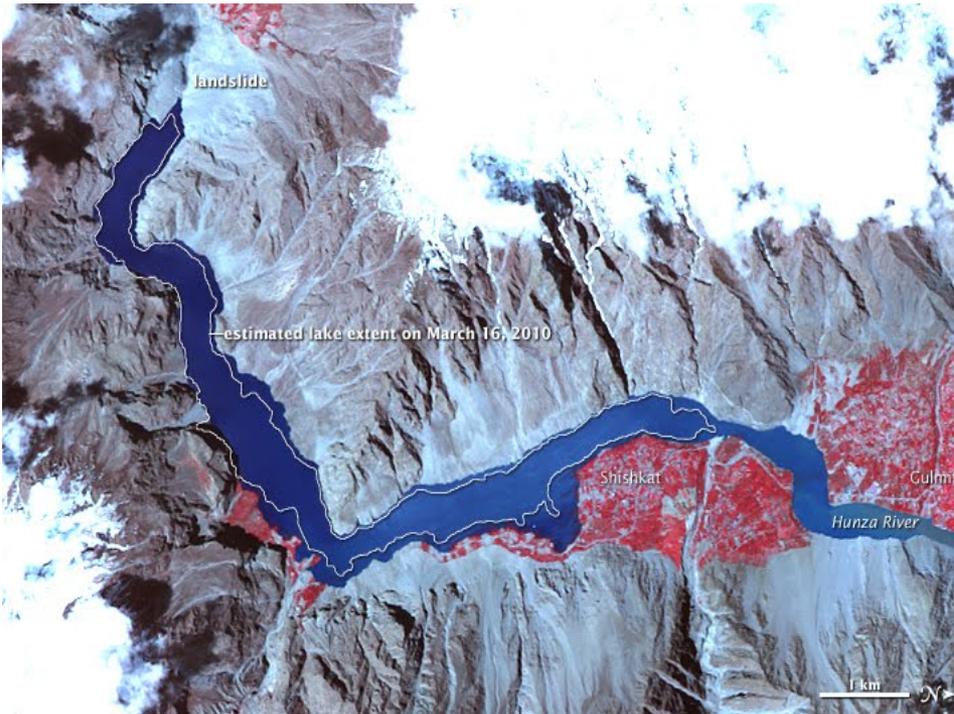


Many countries in the “Belt and Road” are developing countries. Natural hazards can give a great impact to the local society

Dammed Lake due to Landslide in Pakistan

Attadbad landslide, 2010

KKH rebuilding

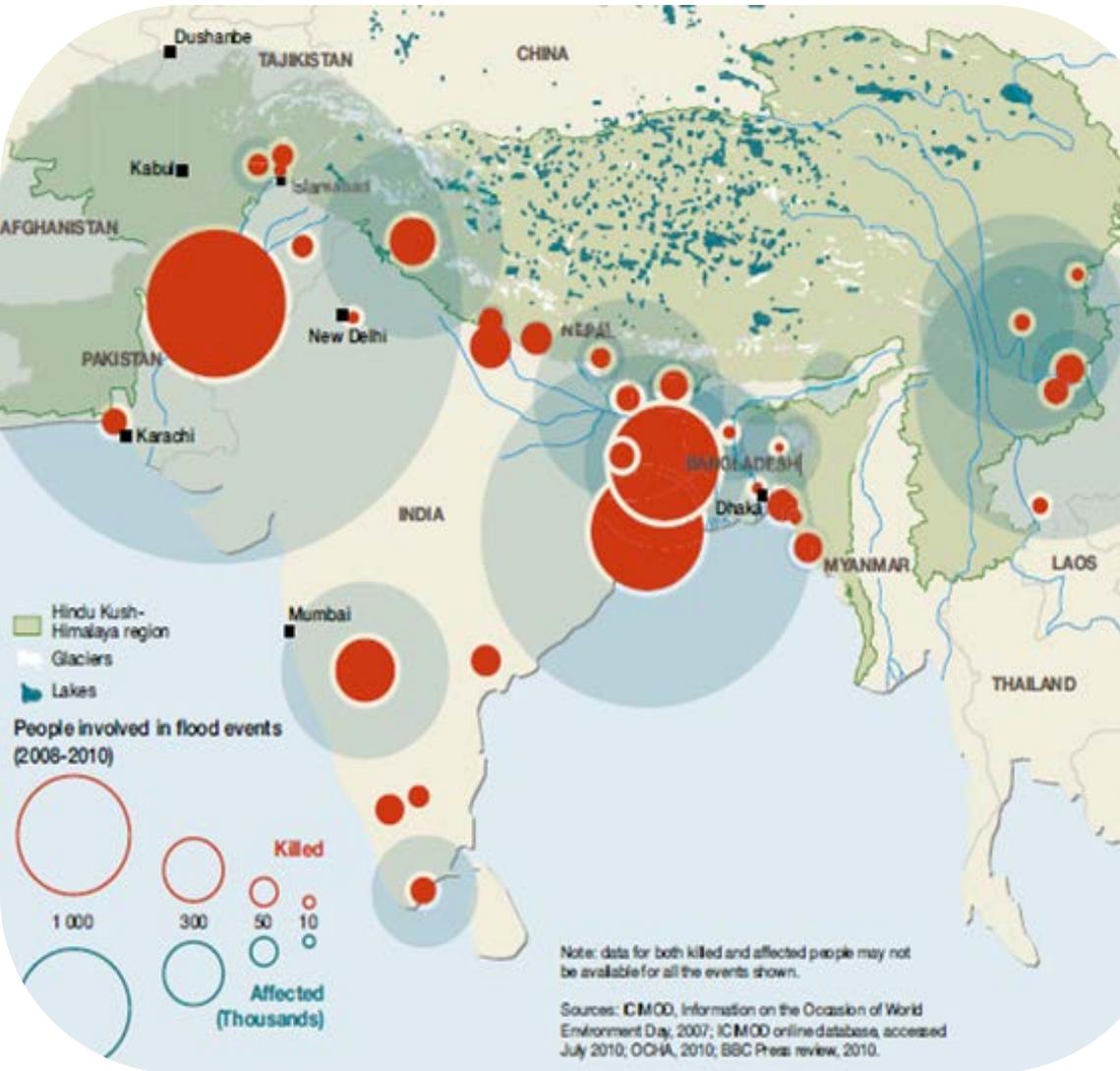


Savings 100 million yuan (RMB)



Transboundary Floods

- Shared Vulnerability across National Borders



Source: <http://100sd.wordpress.com>



Source: IndiaLookUp.in

Necessity and Urgency of this Project



Challenges :

- (1) Lack of background (natural hazards) data**
- (2) Unclear the new characteristics of hazards**
- (3) No scientific hazards risk assessment**
- (4) Hazards reduction technologies, standards, norms are not uniform**
- (5) Lack of information sharing and coordination mechanism**

2. Research Contents

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Research Contents

- ① Background survey technology and hazards database construction
- ② Dynamic evolution of the natural hazards and the development trend in future
- ③ Natural hazards monitoring and early warning (Sky-land integration)
- ④ Hazards risk assessment at different spatial and temporal scales
- ⑤ Key technologies of prevention and control of giant natural hazards for major projects
- ⑥ Active mitigation policy and effective multi country coordination mechanism
- ⑦ Hazards mitigation methods for less developed countries and regions

Natural Hazard Risk Reduction for the Belt and Road 2016-2020

Sendai Framework for Disaster Risk Reduction 2015 - 2030



Objective of our Project:

1. **Identification** and forecasting of natural hazards of BRCs.
2. The establishment of international **cooperation** mechanism;
3. To improve national hazards **resilience**
4. Hazard **risk assessment** and hazard mapping

Goals of SFDRR:

(d)...reduce disaster damage to critical infrastructure... developing their **resilience**...;

(e) ...increase the number of countries with national and local disaster **risk reduction** strategies...

(f) ...enhance international **cooperation** to developing countries

Goal-11:Sustainable city and communities

11.5.reduce the number of deaths and the number of people affected....caused by disasters, including water-related disasters.....

11.b: ...increase the number of cities and human settlements... towards ...**resilience** to disasters

2025 Vision: Key focal output:

4. Science-based **data**, tools and resources to support improved **resilience** of people, communities and economies, including disaster **risk reduction**

3. Promotion and Vision

Big Challenges:

- (1) Lack of background (natural hazards) data
- (2) Unclear the new characteristics of hazards
- (3) No scientific hazards risk assessment
- (4) Hazards reduction technologies, standards, norms are not uniform
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Research Contents

① Background technology and survey database construction and hazards

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Promotion

- ✓ Joint field investigation
- ✓ International Conference
- ✓ *Work groups*

- ✓ Rely on international platform (e.g., IRDR、Future Earth) to implement regional hazards reduction plan

- ✓ Incorporated into the framework of the *United Nations Program* for the reduction of 2015-2030 in Sendai

- ✓ The establishment of the union of scientific institutions along the "Belt and Road"

Xiangshan-Science Conference No. 560

Natural Hazards Reduction along the **Silk Road Economic Belt** and the Correlated Risks of Key Projects



May 11-12 of 2016, Beijing

Chaired by 6 Chinese academicians, and more than 40 experts from Chinese Universities/Research Institutes/Multinational corporations attended the conference

Working Meeting and Discussion with IRDR



June 20, 2016, Chengdu

**Attendance: IRDR-IPO, Miss Lucy Lu and Miss Xianlin Jin
Prof. Pasuto (CNR-Italy) and Prof. Peng Cui**

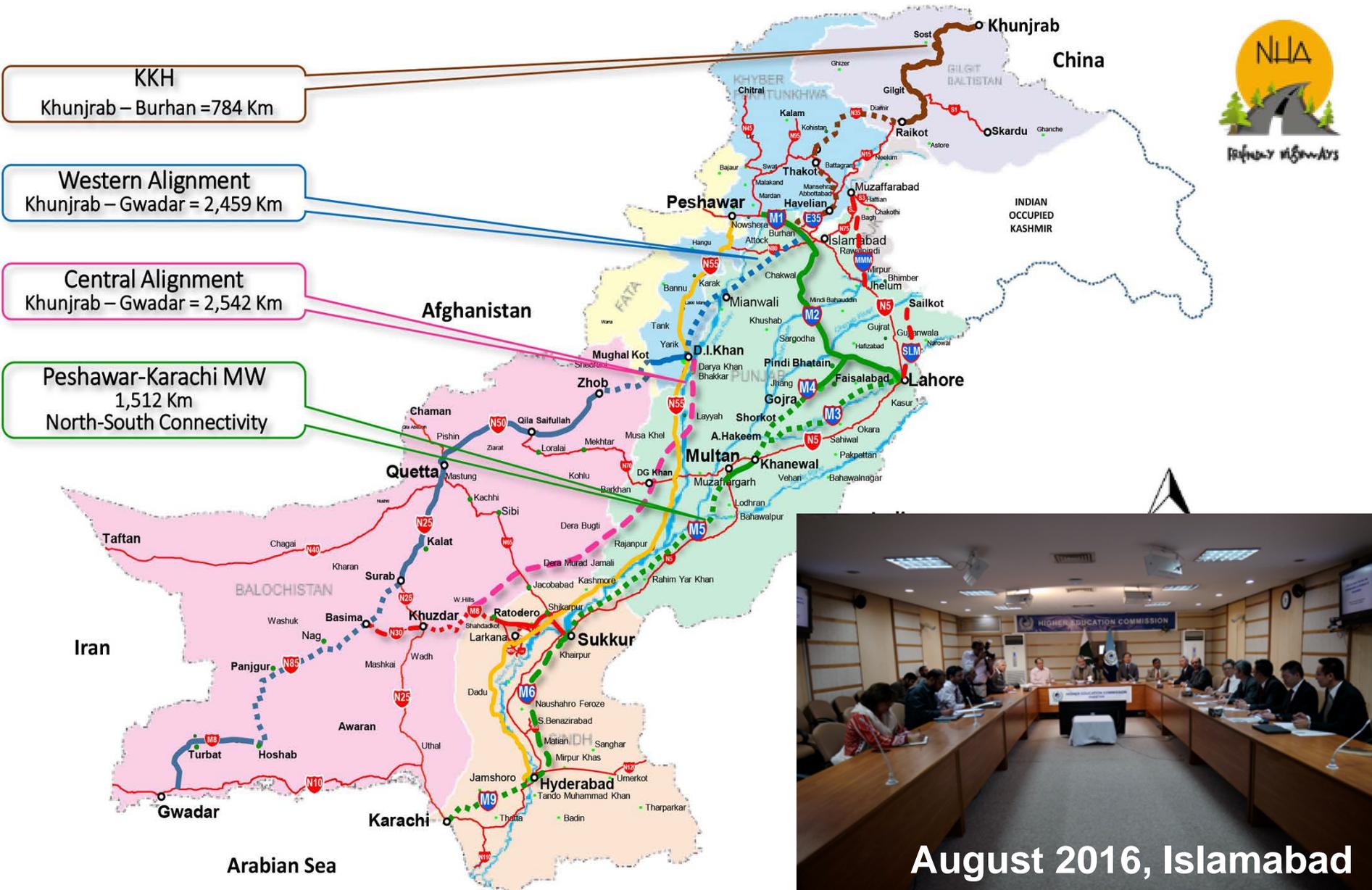
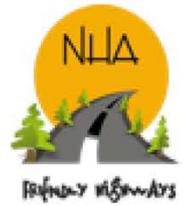
Chinese Academician Consultation Meeting

Natural Hazards Mitigation and Risk Management for the Belt and Road



Attendance: 7 Chinese academicians, and more than 20 professors from Chinese Universities/Research Institutes/Multinational corporations

Visiting Science and Technology Organizations of Pakistan



August 2016, Islamabad

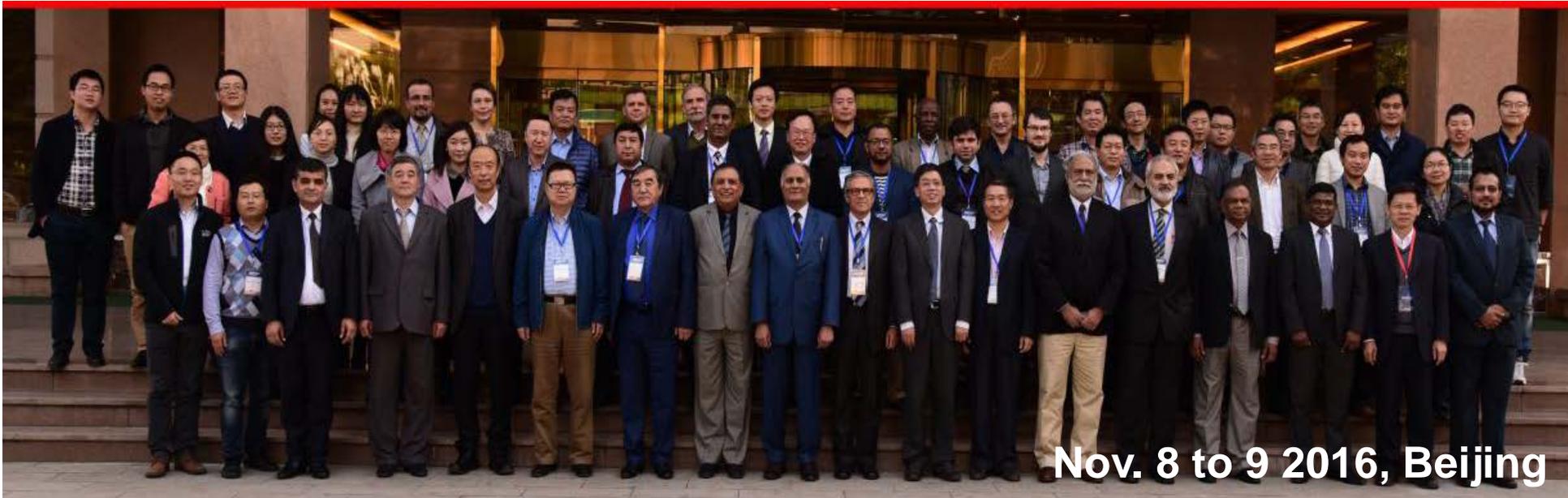
Project Kick-off Meeting



October 10 of 2016, Beijing

Chaired by **4 Chinese academicians**, and more than **50 experts** from Chinese Universities/Research Institutes of Chinese Academy of Sciences/Multinational corporations attended the conference

1st International Workshop of Hazard mitigation and Disaster Risk Reduction for One Belt One Road



Nov. 8 to 9 2016, Beijing



4. Cooperation and Roadmap



Roadmap

- Contact to international platform (e.g., IRDR, Future Earth);
- Organize an International Symposium on integrated hazards reduction

- Organize joint field investigation and International seminar on Geo-hazards reduction
- Contact to UNISDR

- International symposium on flood and earthquake disaster mitigation

- International symposium on storm surge and ocean hazards reduction

- International conference on natural hazards reduction

2016

2017

2018

2019

2020

5 year later

To promote the establishment of international key research project

Implementation of regional hazards risk research program

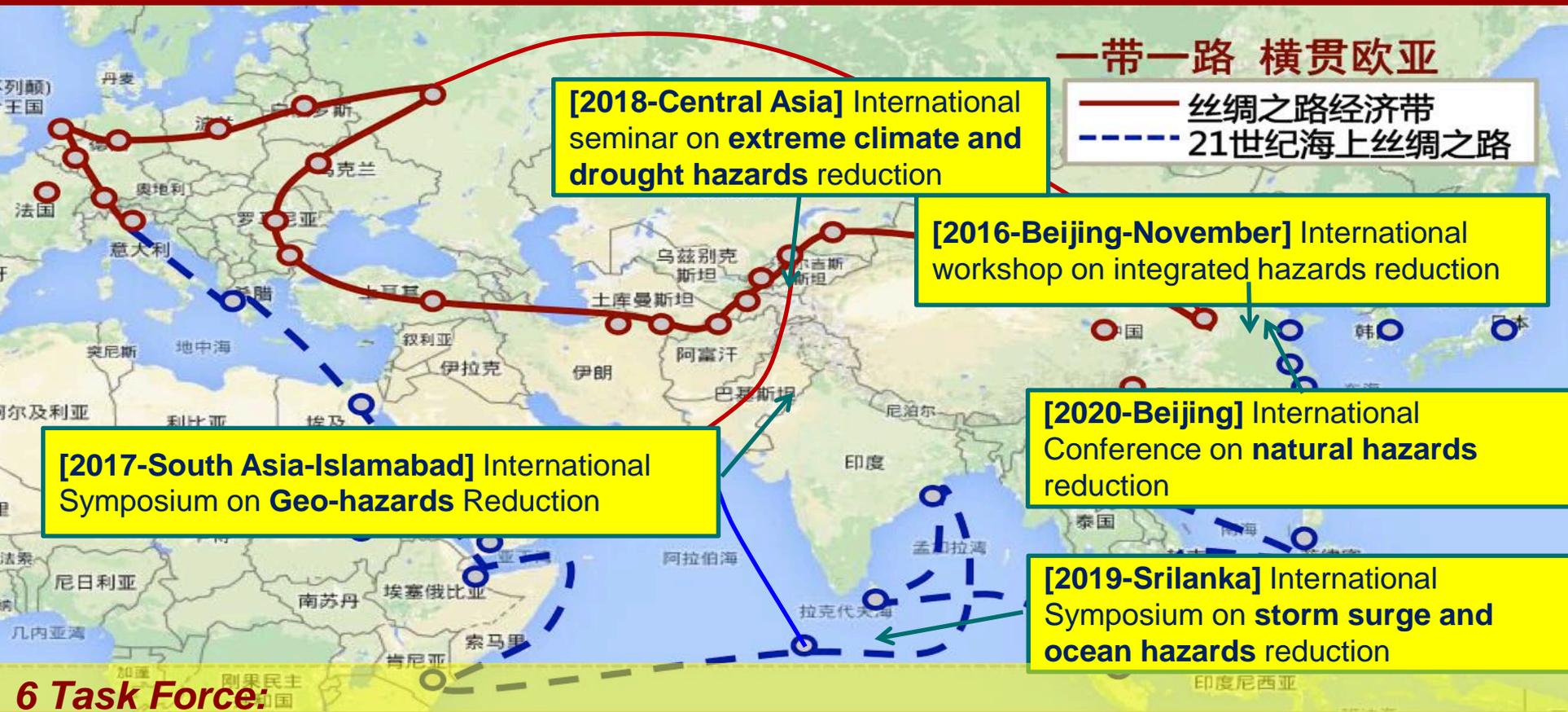
Incorporated into the framework of the United Nations Program for the reduction of 2015-2030 in Sendai

International research center for hazard mitigation and risk reduction

Union of scientific institutions in the disaster reduction along the "Belt and Road"

To make future research plan

Joint Field Investigation and International Conference



❖ **Group A: Earthquake**

❖ **Group B: Ocean and meteorology hazards**

❖ **Group C: Geo-hazards**

❖ **Group D: Drought and flood**

❖ **Group E: Hazards risk analysis and management**

❖ **Group F: Regional risk and mechanisms for joint hazards reduction**

Thanks for your attention!

