

DPRI International Forum  
Kyoto, 11-13 March 2013



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## **Disaster Risk Research**

**at United Nations University  
Institute for Environment and  
Human Security**

*Jakob Rhyner,  
Director UNU-EHS and Vice Rector in Europe*

UN-UNIVERSITY

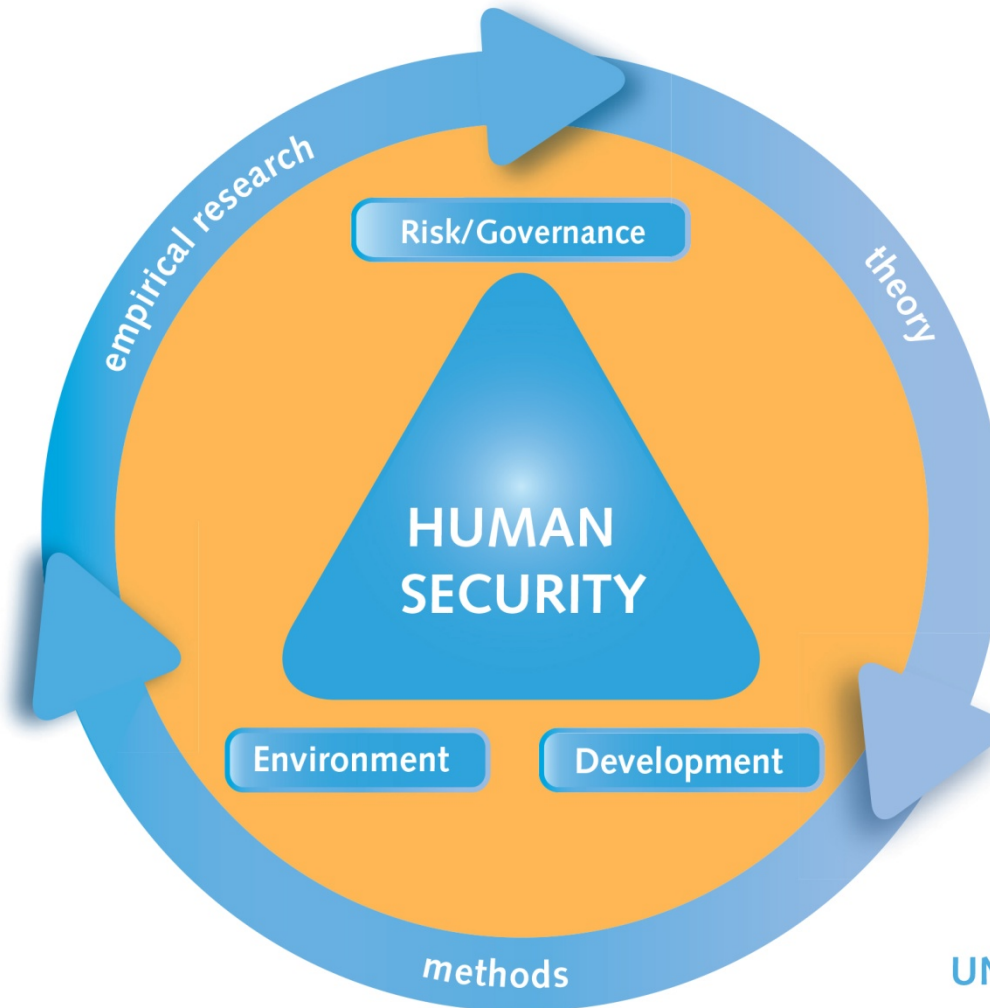
# Focus of UNU-EHS



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# Project „Loss & Damage“



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## Partners:

- CDKN
- Germanwatch
- MunichRe
- ICCCAD, Dhaka
- UNECA
- ACPC
- UNU-EHS

# Loss & Damage Programme

## 5 important points



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- 1. What causes it loss and damage ?** Climate change/variability impacts interacting with social vulnerability
- 2. Loss & Damage continuum:** Loss and damage impacts fall along a continuum, ranging from “events” associated with variability around current climatic norms (e.g. weather-related natural hazards) to “processes” associated with future anticipated changes in climatic norms in different parts of the world
- 3. Working Definition:** Loss and damage refers to negative effects of climate change/variability that people have not been able to cope with or adapt to
- 4. Its happening now:** Loss and damage is already a significant – and in some places growing – consequence of inadequate ability to adapt to changes in climate patterns across the world.
- 5. Mitigation can stem loss and damage:** But failure to mitigate GHG will drive loss & damage to as-yet unimaginable scenarios

- Existing coping/adaptation to biophysical impact is not enough to avoid loss and damage

- Measures have costs (economic, social, cultural, health, etc.) that are not regained

Adaptation happens but is not enough

Adaptation getting more costly

## Loss and damage occurs when...

Getting by, but losing ground

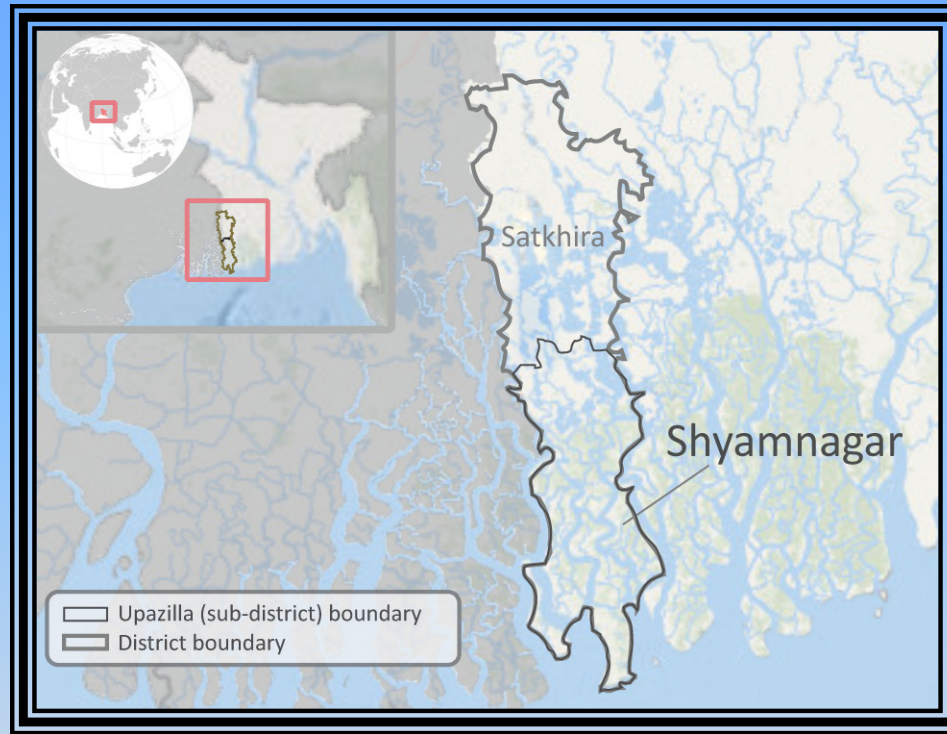
Adaptation is not happening

- Despite short-term merits, measures have negative effects in the longer term (erosive coping)

- No measures are adopted – or possible – at all

# Bangladesh

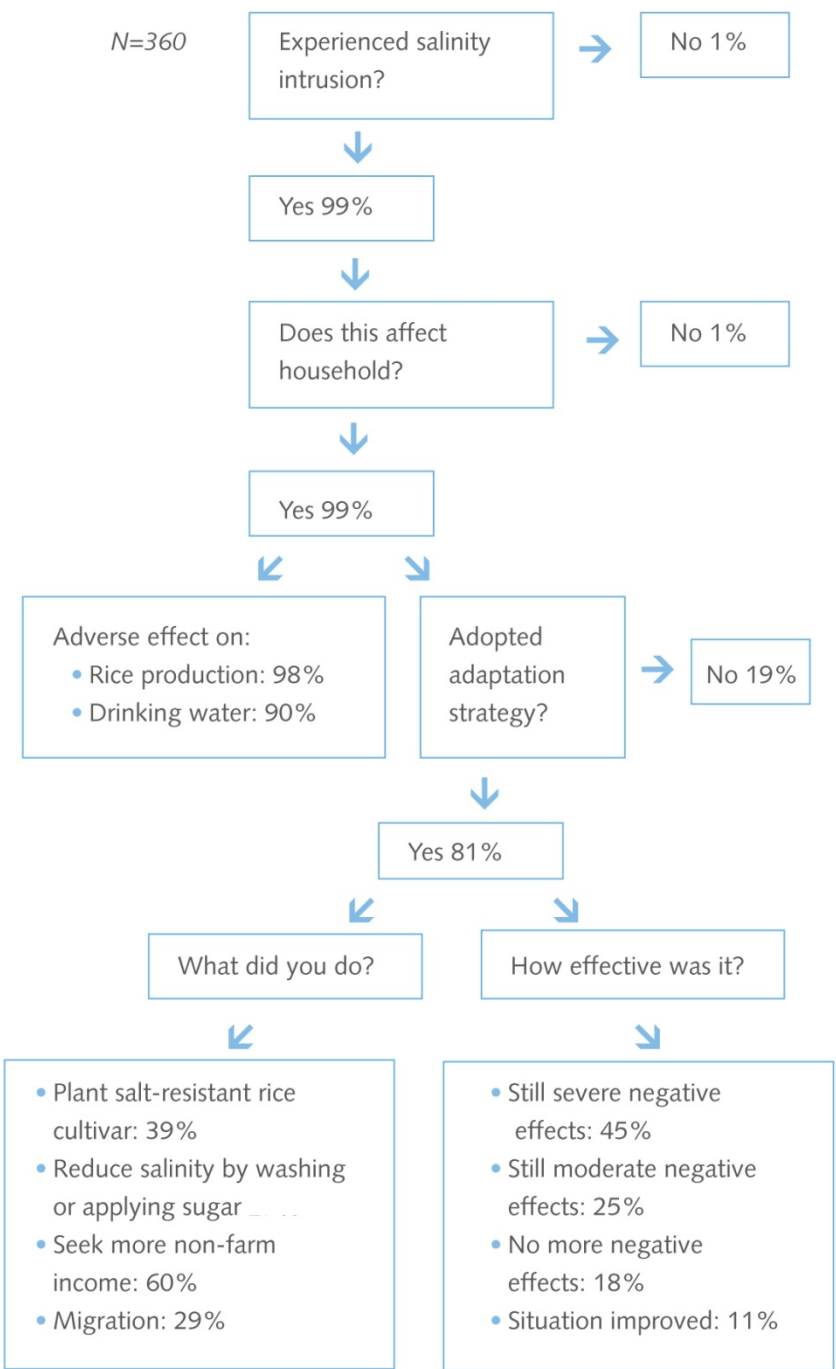
Golam Rabbani, BCAS



The limits of adaptation in Shyamnagar, Bangladesh:  
loss and damage associated with salinity intrusion

# Bangladesh

Golam Rabbani, BCAS



## • Climatic stressors

- Salinity intrusion, cyclone Aila (2009)

## • Impacts

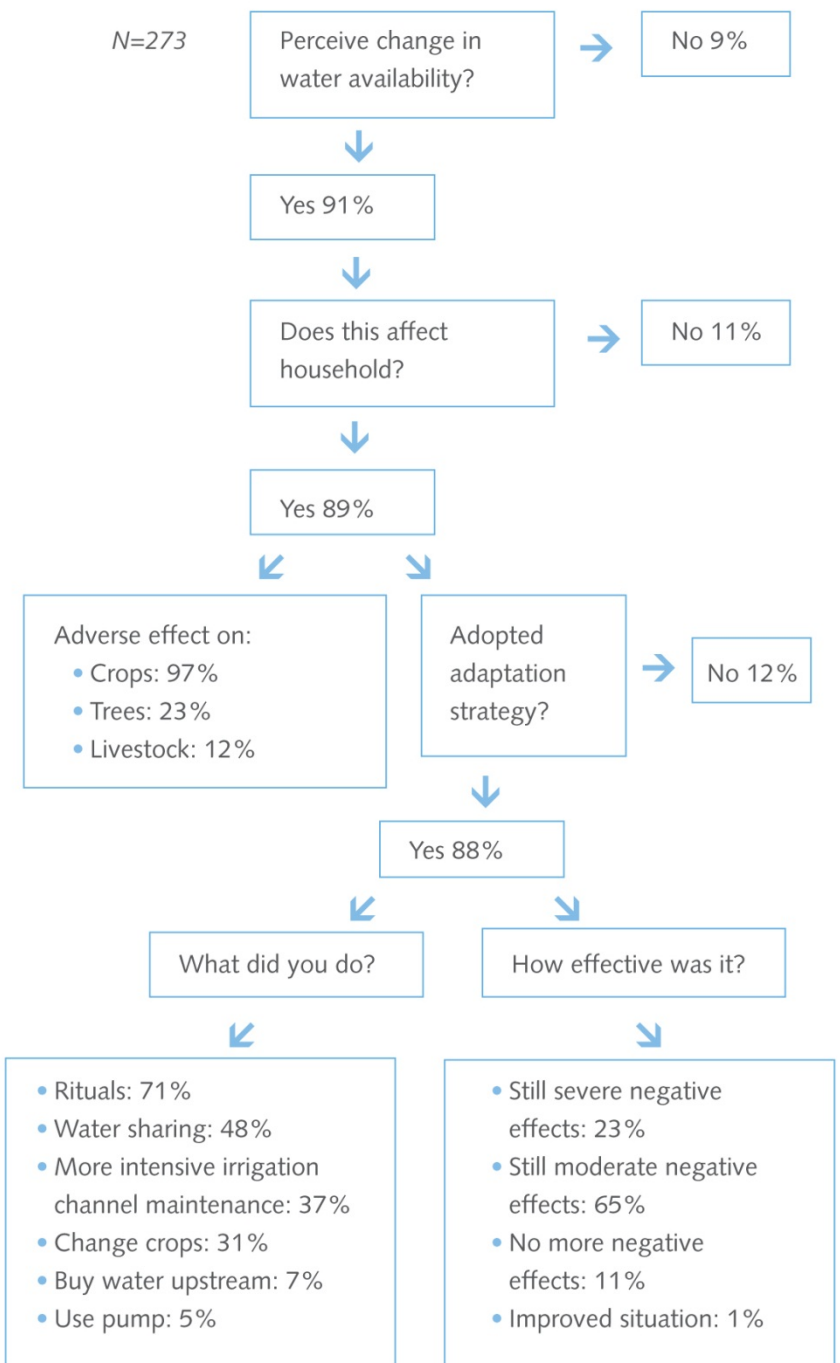
- Traditional rice varieties no longer grow well
- Health implications of salty drinking water

## • Adaptation

- Saline tolerant rice varieties
- Efforts to reduce salinity in fields
- Increased reliance on non-farm income

## • Loss & Damage

- Adaptations effective for gradual salinity increase, but could not prevent a 100% rice crop failure after cyclone Aila in 2009.
- Estimated loss to rice production in 4 study villages: \$1.9 Million



# Bhutan

Norbu Wangdi &  
Koen Kusters

## ■ Climatic stressors

- Monsoon rains: Less rain and later onset

## ■ Impact on livelihoods

- Reduced water availability for paddy cultivation: impact on food and income security

## ■ Adaptation

- Adjustments to irrigation practices and access to water, changes in crop mix, from two to one harvest a year, buying pumps

## ■ Loss and Damage

- For 87%, the measures are not enough and/or entail extra costs that could not be regained



# The Gambia

## Dr. Sidat Yaffa

N=373

Did drought affect household?

No 3%

Yes 97%

Adverse effect on:

- Crops: 99%
- Food price: 89%
- Livestock: 74%
- Trees: 40%

Did you use coping strategy?

No 7%

Yes 93%

What did you do?

How effective was it?

- Alternative income to buy food: 58%
- Sale of properties to buy food: 58%
- Rely on aid: 55%
- Rely on social networks: 57%
- Temp. displacement / migration: 23%

- Still severe effects: 41%
- Still moderate effects: 25%
- No more negative effects: 32%
- Improved situation: 3%

### • Climatic stressors

- Drought (2011)

### • Impacts

- Low crop yields for some, complete crop failure for others

### • Coping strategies

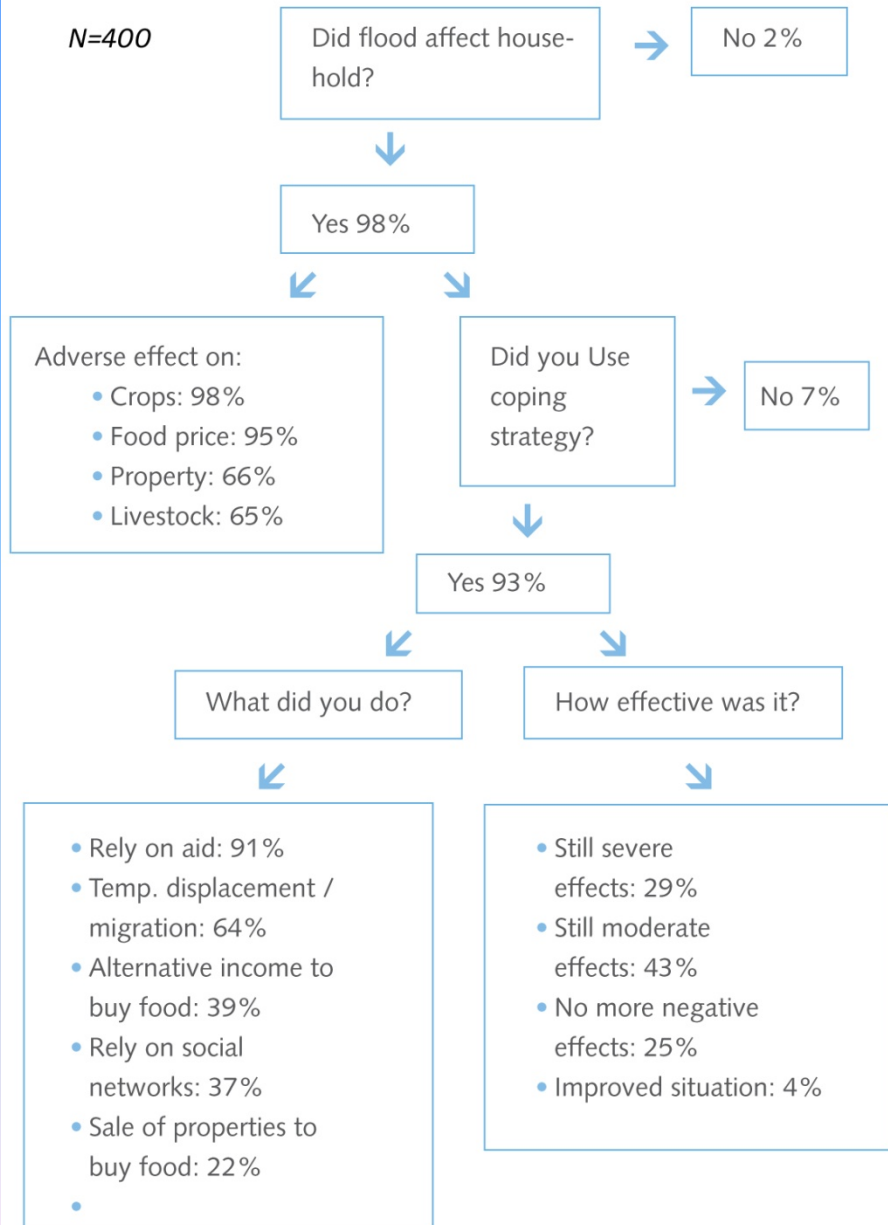
- Alternative sources of income to buy food, such as selling assets, and migration to urban centres
- Reliance on food aid and social networks

### • Loss and Damage

- For 63%, coping strategies were not enough to avoid food insecurity

# Kenya

## Denis Opiyo Opono



### • Climatic stressors

- Flood (2011)

### • Impacts

- Damage to crops
- Destruction of properties
- Death of livestock
- Health problems

### • Coping strategies

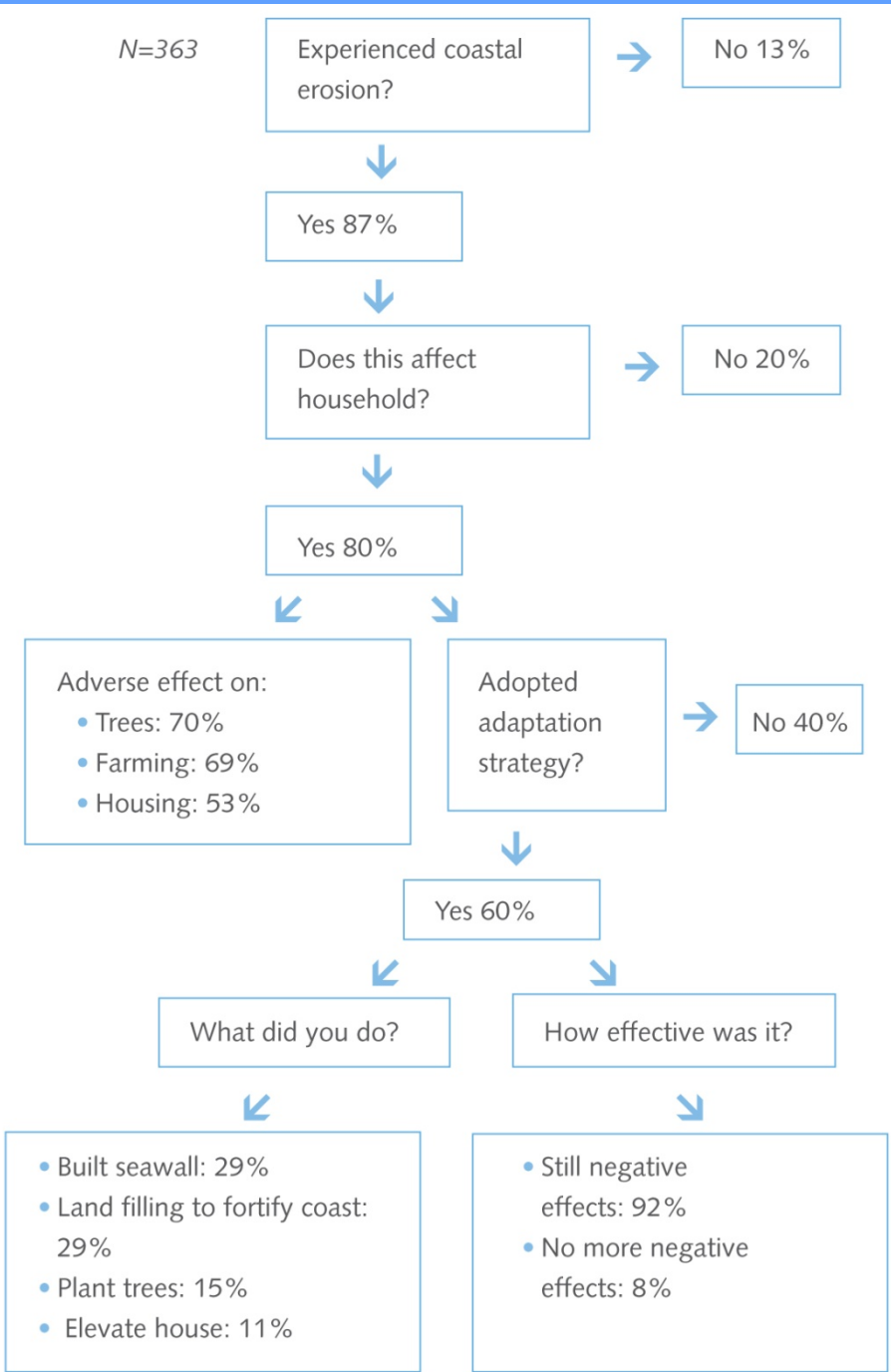
- Reliance on aid and social networks
- Look for alternative income to buy food

### • Loss & Damage

- For 72%, coping strategies were not enough to avoid adverse effects.
- Many coping strategies were found to be *erosive*: They affect long-term livelihood sustainability.

# Micronesia

## Simpson Abraham & Iris Monnereau



### • Climatic stressors

- Coastal erosion from sea level rise and storm surges

### • Impacts

- Damage to houses and infrastructure
- Crops and trees affected
- Loss of beaches

### • Adaptation

- Building seawalls, elevating or reinforcing houses, planting trees along the coastline and moving from the coast to upland areas

### • Loss and damage

- For 92%, the measures are not enough and/or entail extra costs
- 40% did not adopt any adaptation measures. Many lacked resources or just didn't know what to do.



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# Where the Rain Falls

## Partners:

- CARE International
- UNU-EHS

## Supported by:

- AXA
- MacArthur foundation

# Project Objectives & Scope

## OBJECTIVES

1. To understand how rainfall variability, food security and migration interact today
2. To understand how these factors might interact in coming decades as the impact of climate change begins to be felt more strongly
3. To work with communities to identify ways to manage rainfall variability, food and livelihood insecurity, and migration.



Focus group discussion, India.  
Source: Afifi, 2011

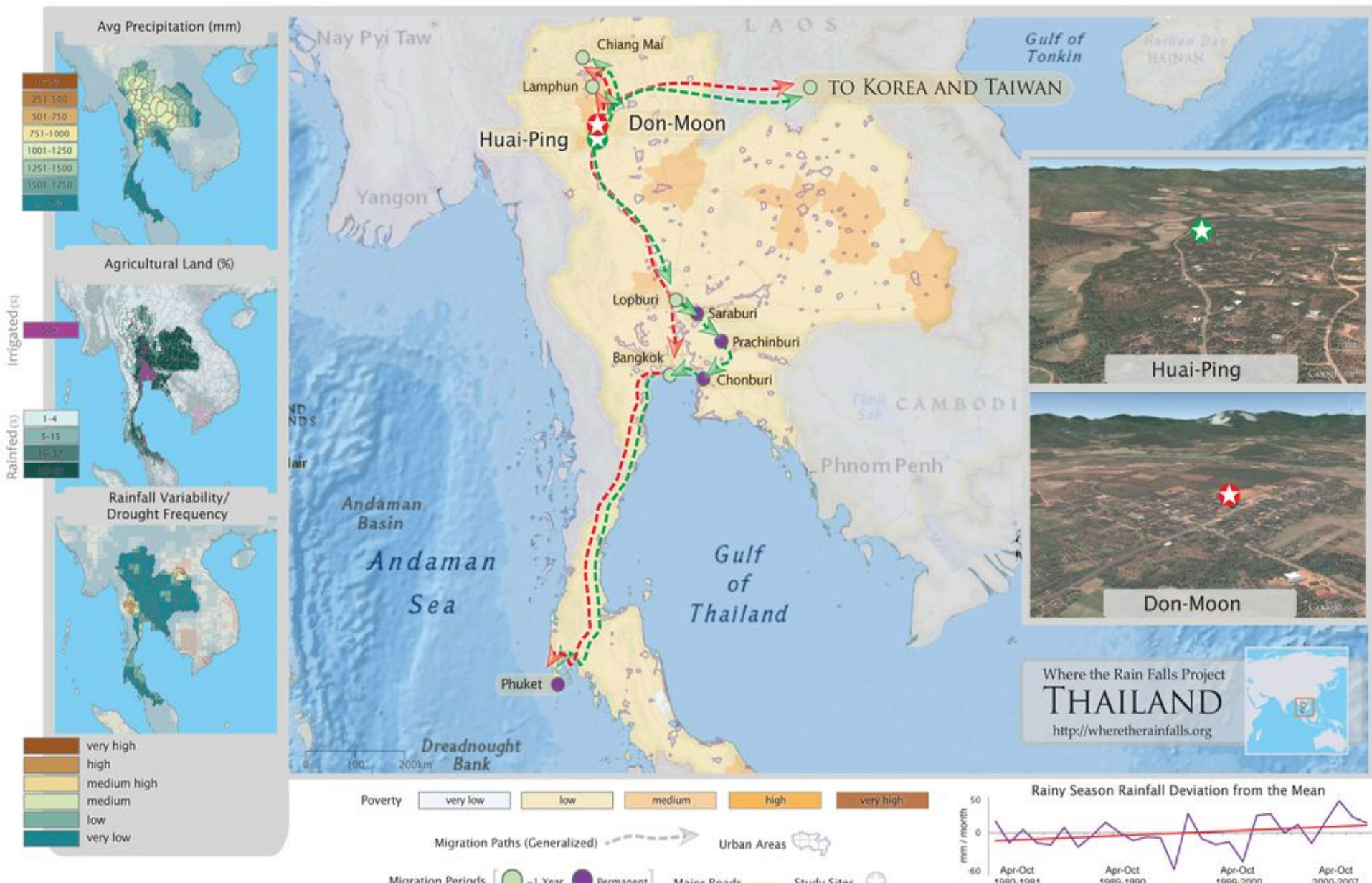
# Geographic Diversity: 8 Countries



8 case studies

Source: CARE France

# Thailand: Diverse livelihoods & access to assets & services make migration a matter of choice in Lamphun Province

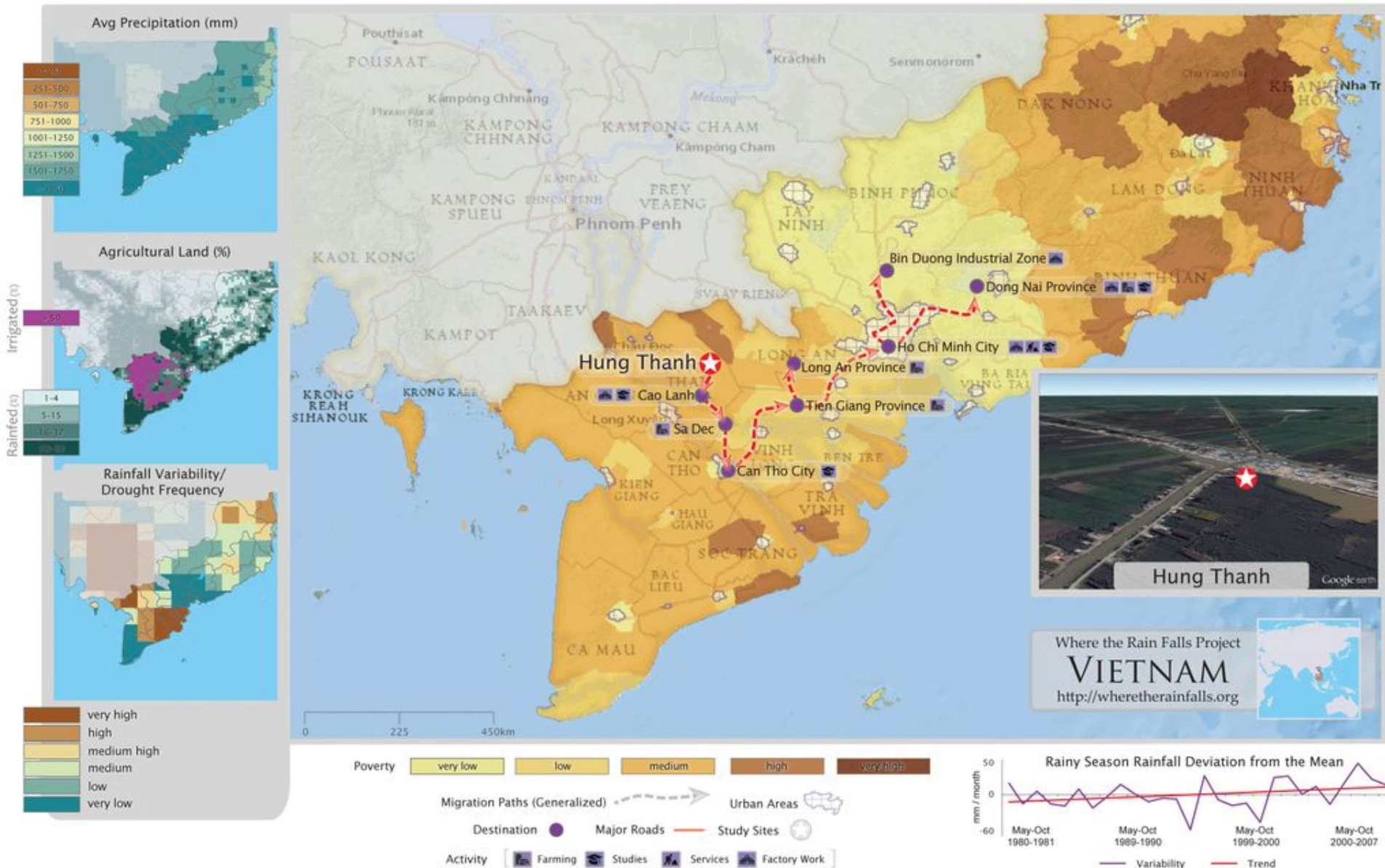




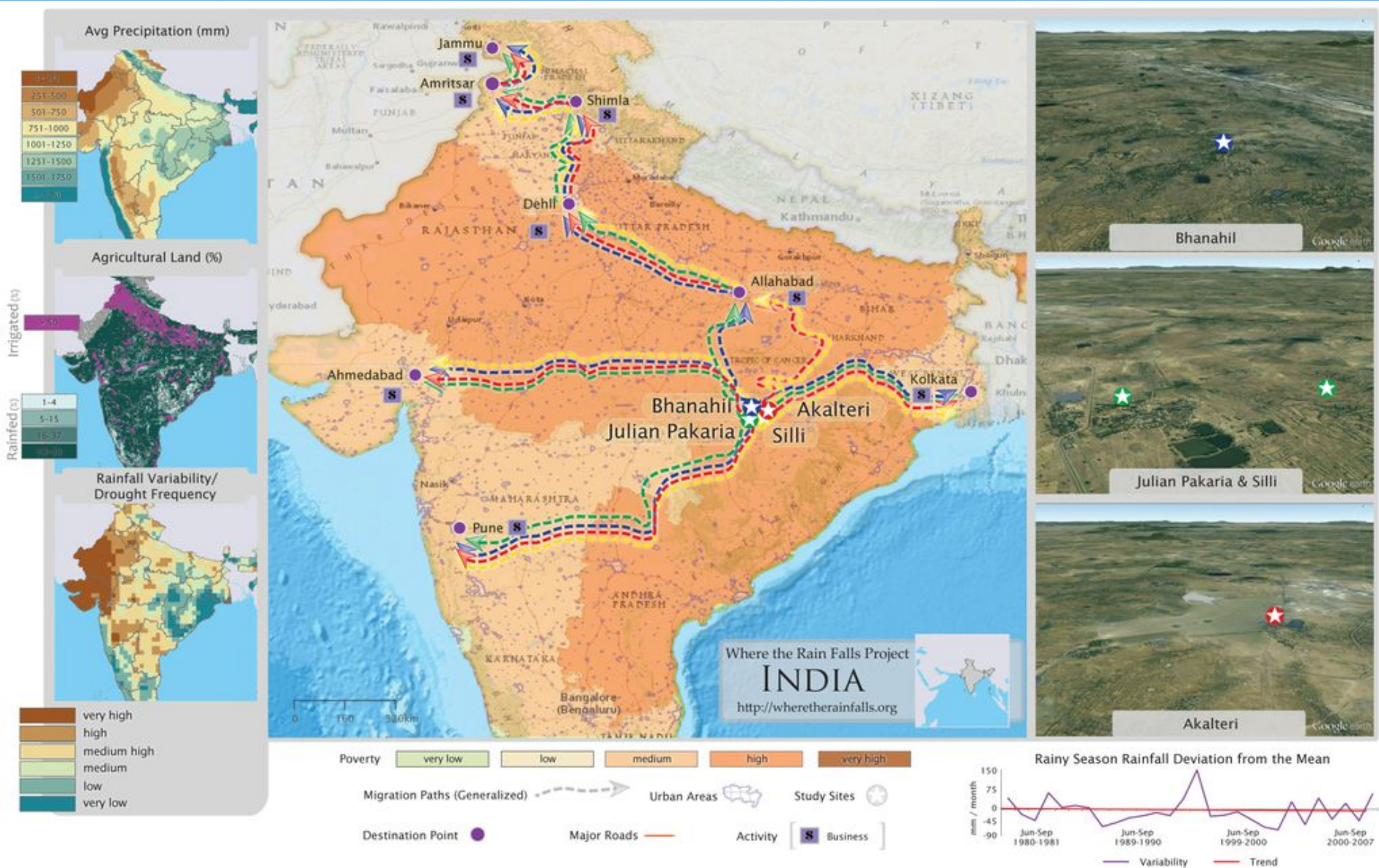
# Peru: Livelihood & migration strategies in Huancayo Province vary by elevation & proximity to urban centres



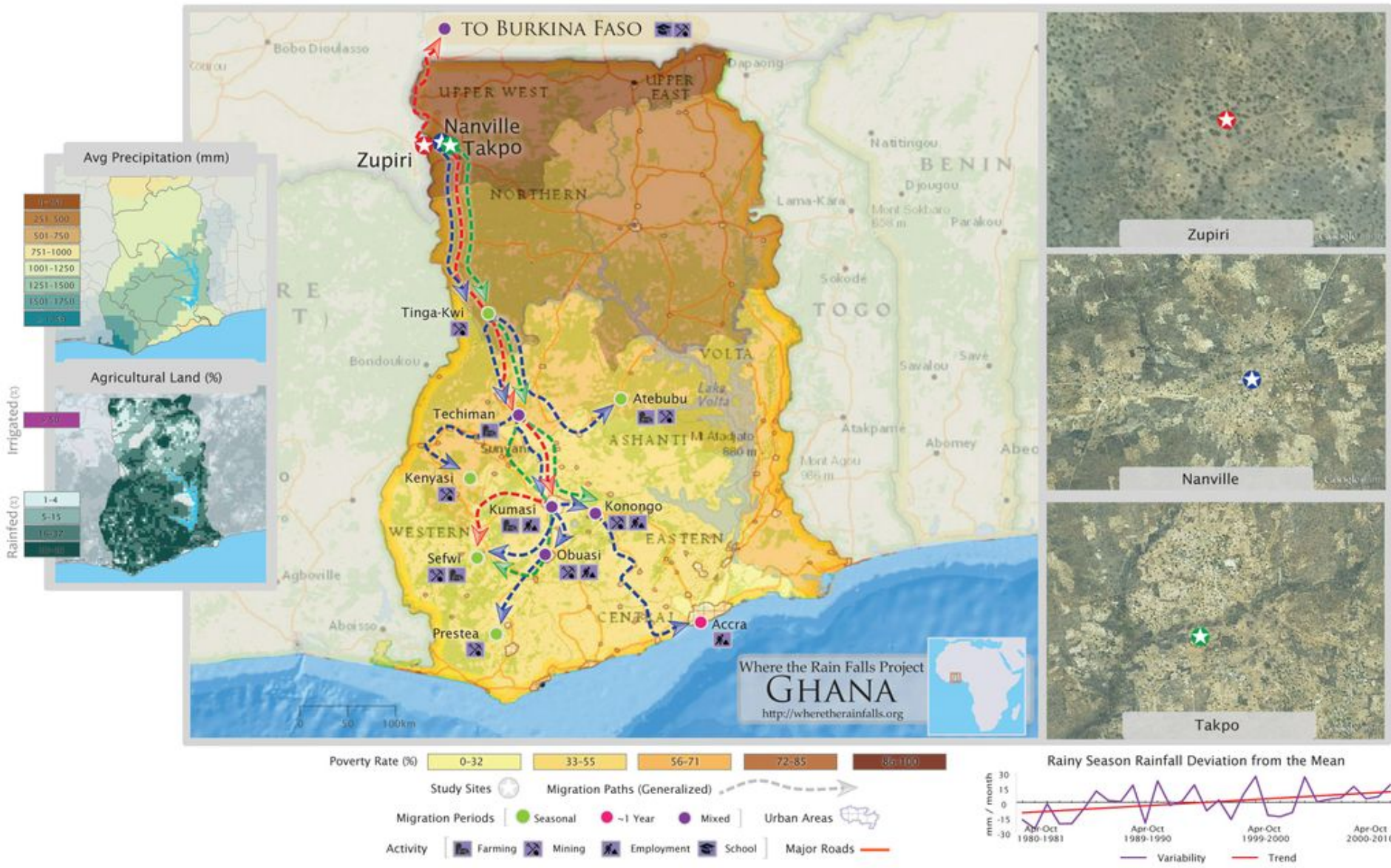
# Vietnam: Landless, low-skilled poor of Hung Thanh Commune have few options, despite a rising economic tide



# India: Poor households in Janjgir-Champa rely on seasonal migration for food security -- despite irrigation, industrialization & safety nets



# Ghana: High dependence on rain-fed agriculture in Nadowli District contributes to reliance on seasonal migration as a coping strategy



# World Risk Index

Co-funded by „Alliance Development Helps“



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## Risk and Vulnerability Index

### Exposure

Exposure to natural hazards

### Susceptibility

Likelihood to suffer damage in an emergency

### Coping Capacity

Capacity to reduce negative impacts in case of emergency

### Adaptive Capacity

Capacity for long-term adaptation and change

---- Core components of vulnerability ----

NATURAL HAZARDS  
SPHERE

SOCIETAL SPHERE

**Global Index / Indicators** with national scale resolution

**Local Indicators und criteria** with sub-national, local and household scale resolution

# Indicators selected



## 1. Exposure

### EXPOSED POPULATION IN REGARD TO

- A) Earthquakes
- B) Cyclones
- C) Floods
- D) Droughts
- E) Sea level rise

## 2. Susceptibility

### NUTRITION

- A) Percentage of undernourished population

### PUBLIC INFRASTRUCTURE

- B) Population without access to improved sanitation
- C) Population without access to clean water

### HOUSING CONDITIONS

Proportion of population in slums;  
proportion of semi-solid and fragile  
houses  
→ limited data availability

### POVERTY AND DEPENDENCIES

- D) Dependency ratio (proportion of under 15 – and above 65-year-olds in relation to the working population)
- E) Extreme poverty (population living on less than 1.25 USD (live PPPs) per day)

### ECONOMIC CAPACITY AND INCOME

- F) Gross Domestic Product per capita (Purchasing Power Parity)
- G) Gini-Index

## 3. Coping Capacity

### GOVERNMENT AND AUTHORITIES

- A) Corruption Perception Index
- B) Failed States Index

### DISASTER PREPAREDNESS AND EARLY WARNING

National disaster risk  
management policy according  
to the report of UN / ISDR

### MEDICAL SERVICES

- C) Number of physicians per 10,000 population
- D) The number of hospital beds per 10,000 population

### SOCIAL NETWORKS: NEIGHBORHOOD, FAMILY AND SELF-HELP

→ No data available

### ECONOMIC COVERAGE

- E) Insurance (except life insurance)

## 4. Adaptive Capacity

### EDUCATION AND RESEARCH

- A) Adult literacy rate
- B) Combined gross school enrolment (rate of school-aged children in primary, secondary and tertiary educational institutions)

### GENDER EQUITY

- C) Gender parity in education (in primary, secondary and tertiary educational institutions)
- D) Percentage of female representatives in the National Parliament

### ENVIRONMENTAL STATUS / ECOSYSTEM PROTECTION

- E) Water resources
- F) Protection of biodiversity and habitats
- G) Forest Management
- H) Agricultural Management

### ADAPTATION STRATEGIES

Volume of National Adaptation  
Programmes of Action to Climate  
Change, Climate Change Convention  
(available for 45 of the least developed  
countries)

### FINANCING

- I) Life expectancy at birth
- J) Private health expenditure
- K) Public health expenditure

# Hazard Exposure (annual pop. exposed)



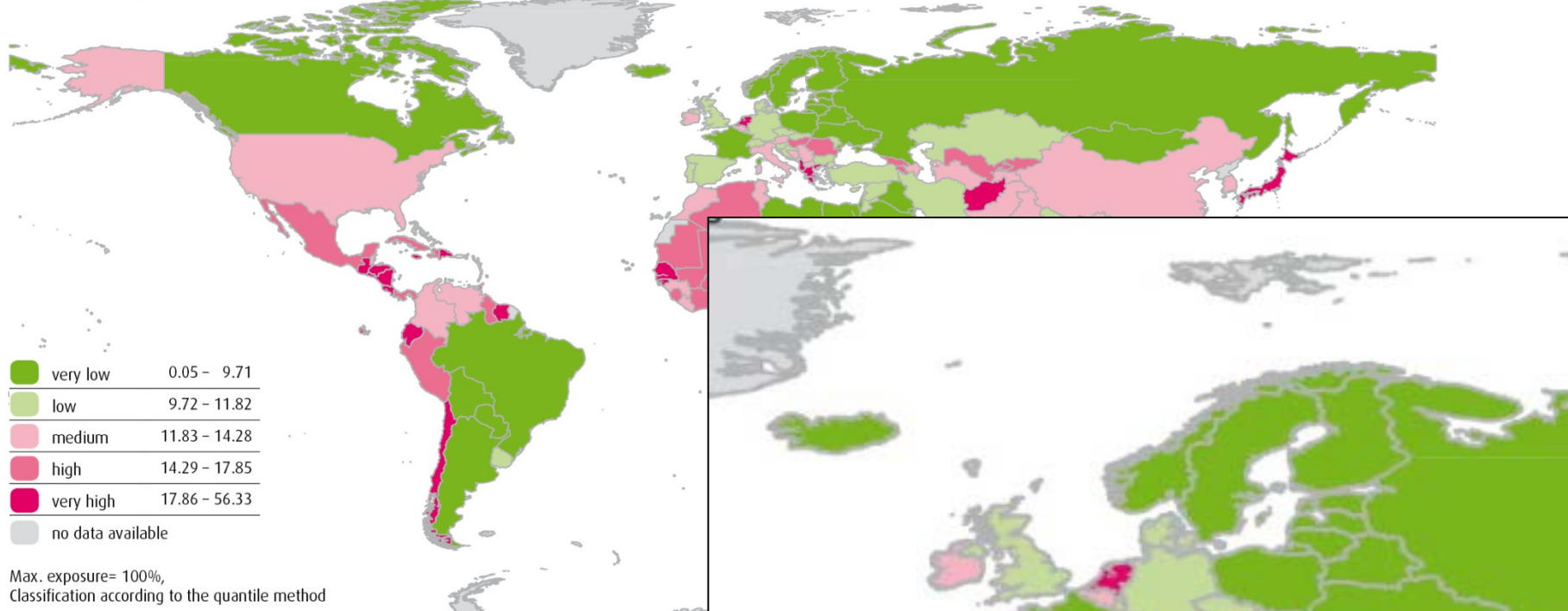
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## Exposure

Exposure of the population to natural hazards such as earthquakes, storms, floods, droughts and sea level rise.



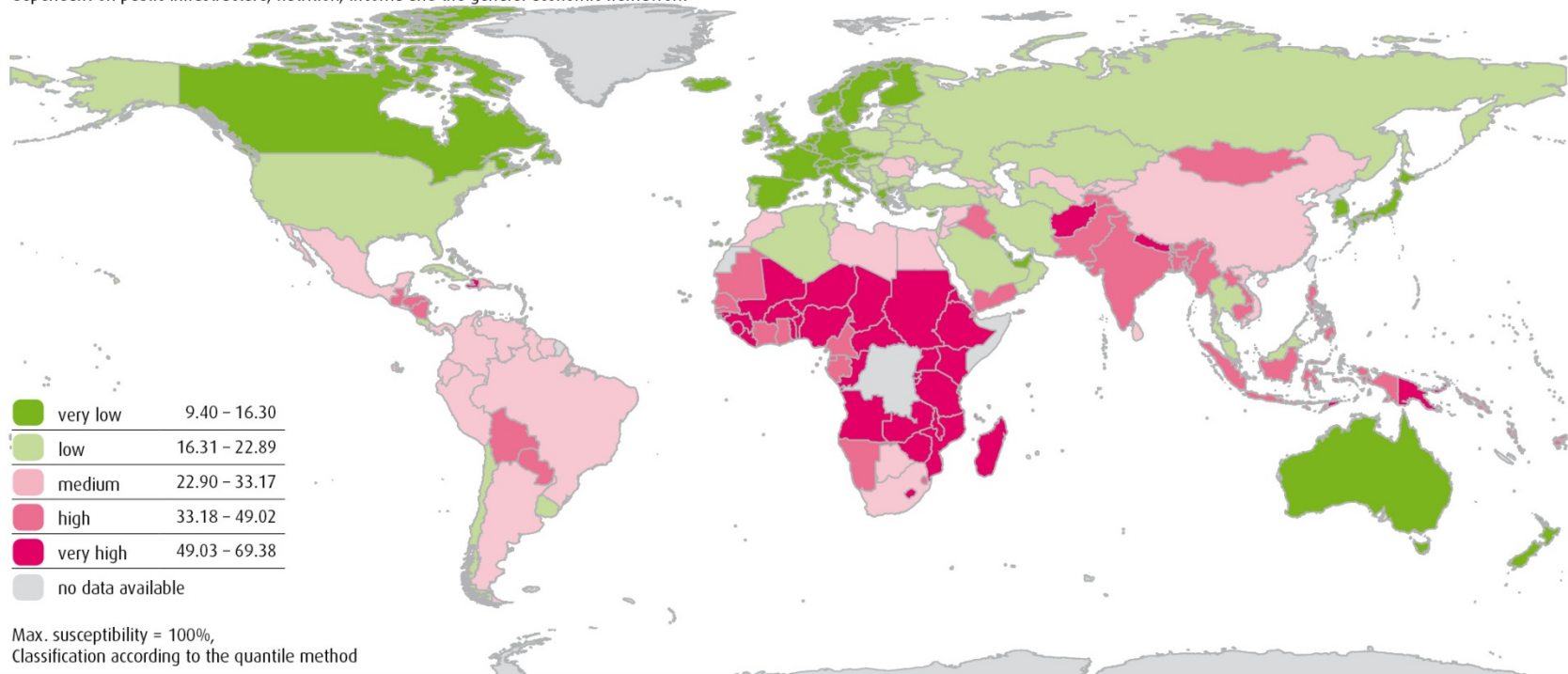
Data: UNU-EHS, based on the PREVIEW Global Risk Data Platform, Ceres, CIESIN and global databases; detailed information at [www.worldriskreport.org](http://www.worldriskreport.org)



# Susceptibility

## Susceptibility

dependent on public infrastructure, nutrition, income and the general economic framework





# Exposure, Susceptibility, Coping, Adaptation



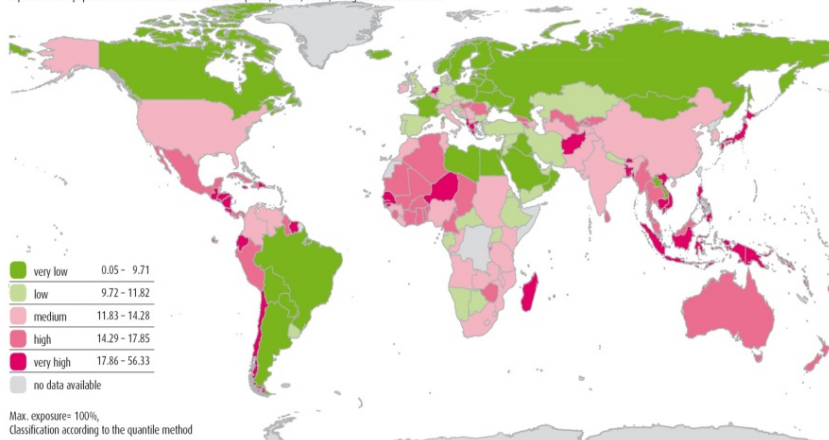
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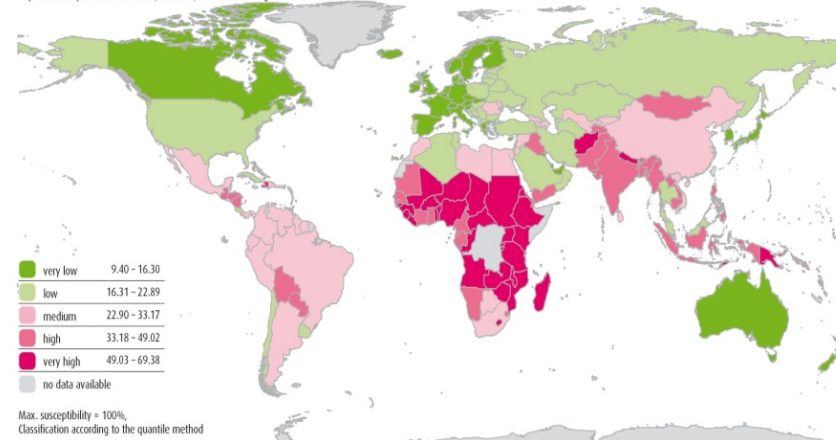
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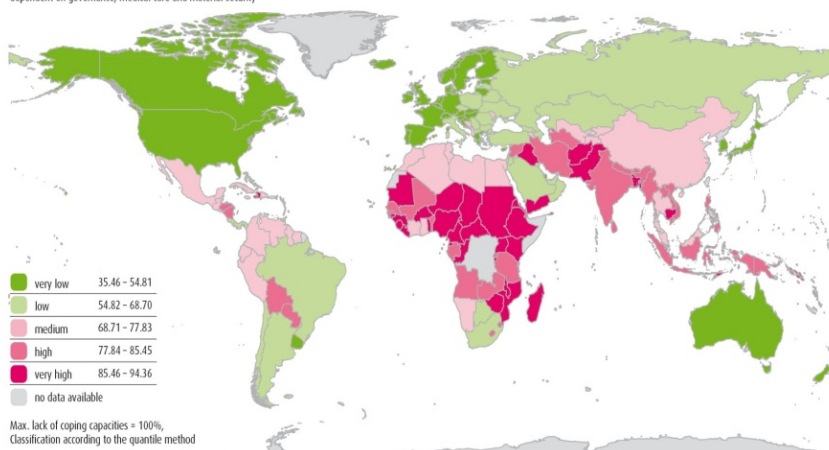
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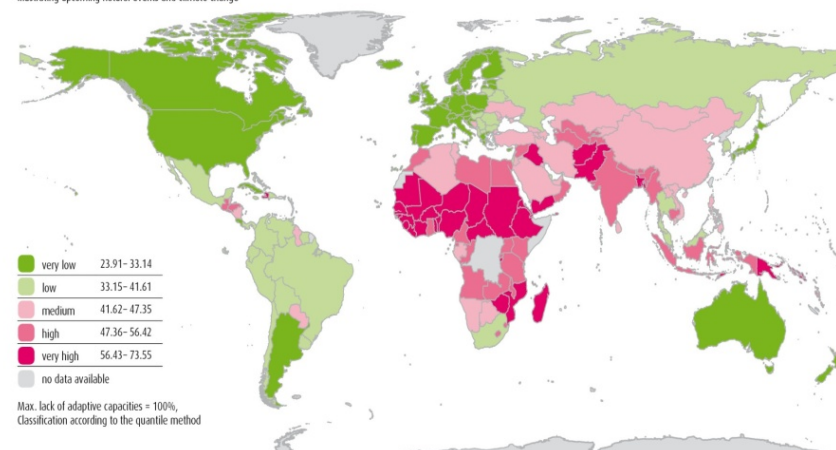
## Lack of coping capacities

dependent on governance, medical care and material security



## Lack of adaptive capacities

illustrating upcoming natural events and climate change



Data: UNU-EHS, based on the PEW Research Center, UNU-EHS, UNU-EHS and global indicators, Global Indicators of the World Development Report 2010

Data: UNU-EHS, based on the PEW Research Center, UNU-EHS, UNU-EHS and global indicators, Global Indicators of the World Development Report 2010



# A few conclusions

- Risks, loss and damage come in **different disguises** around the world
- Those associated with creeping processes are often particularly difficult for since
  - ...they are often associated with **large uncertainties**
  - ...there are often **no clear thresholds** for action
  - ...there is often not one dominant driver, but a **combination of drivers**
- Consequences of **social vulnerability** are still often underestimated, or not considered at all

# Joint Master between UNU and University of Bonn



BONN



## Master of Science (MSc):

### “Geography of Environmental Risks and Human Security”

- start: autumn 2013
- duration: 2 years
- number of students: max 24

# Joint Master: Curriculum



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Year 1		Year 2	
Fall	Spring	Fall	Spring
1. Introduction 14 CP	2. In-depth studies 24 CP		
3. Methods and skills 18 CP		4. Research project 6 CP	7. Master's thesis 30 CP
5. Linking Concepts 18 CP			
	6. Internship 10 CP		

# THANK YOU FOR YOUR ATTENTION!



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[www.ehs.unu.edu](http://www.ehs.unu.edu)

For the World Risk Index: [www.worldriskreport.org](http://www.worldriskreport.org)

For UNU projects in Africa: <http://www.vie.unu.edu/project/map/priority-africa>

Case Station /Field Campus  
(CASiFiCA) Scheme  
implemented in Kumamoto,  
granted by MEXT

Norio Okada

Director and Prof. of IRESC, Kumamoto University,  
Kumamoto, Japan

March 13, 2013

Panel on Education

@DPRI International Forum, Uji Campus, Kyoto University

1. Kumamoto Univ. (*Eng. and Natural Science*)

4 Univ. Partnership Project (MEXT-granted)

4. Kumamoto Gakuen Univ. (*social care*)

2. Kumamoto Health Science Univ. (*Medicine & Health*)

3. Kumamoto Pref. Univ. (*social science*)

# Kumamoto CASiFiCA

- Four Kumamoto-located university partnership
  - Kumamoto University
  - Kumamoto Prefecture University
  - Kumamoto Gakuen University
  - Kumamoto Health Science University
- Supported by MEXT, Japan
- Community-based disaster education
- Five years starting this November.



# Case Station/ Field Campus

Prioritize Actions

**Advocates**  
**Change Agents**

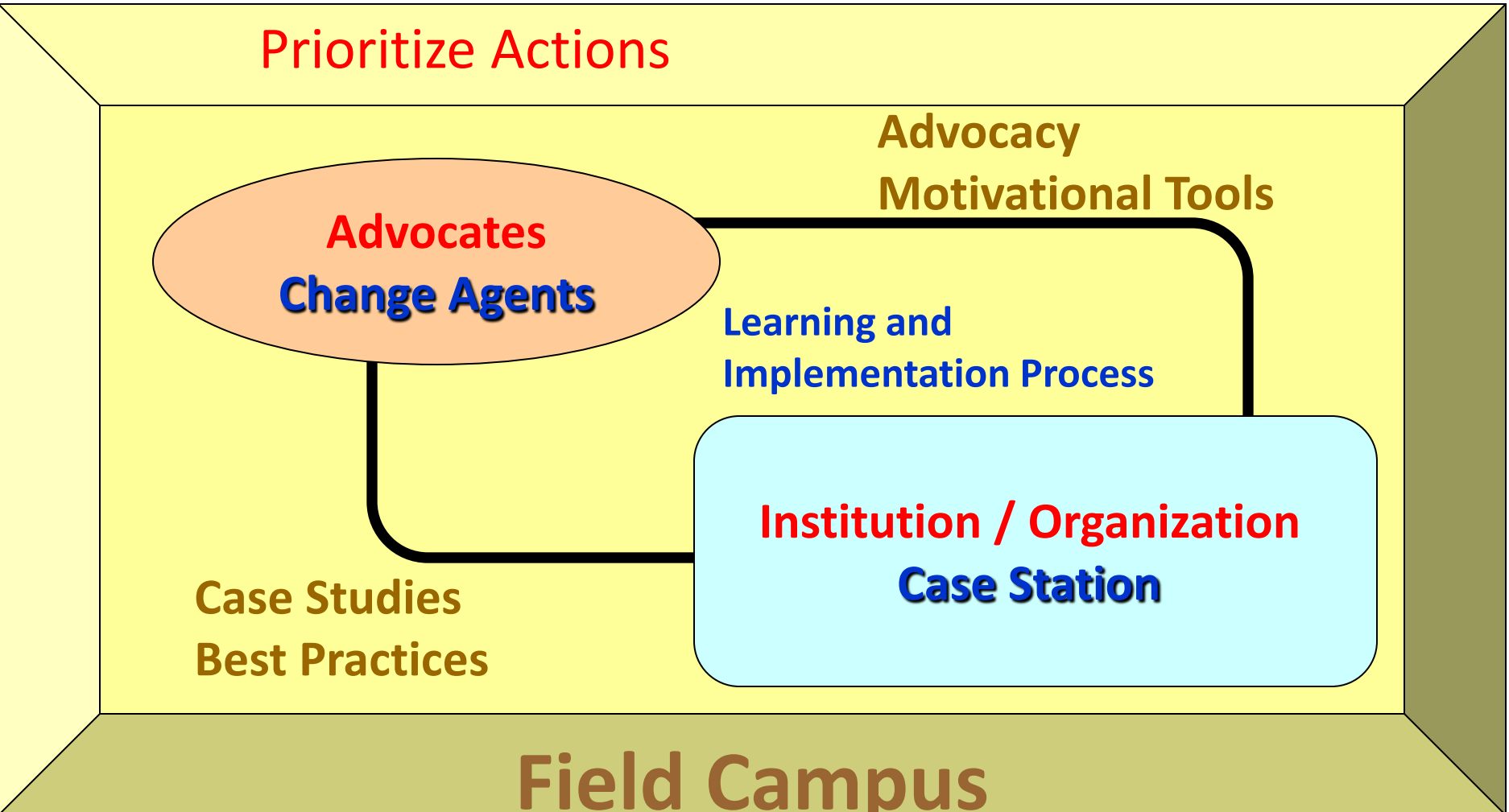
Advocacy  
Motivational Tools


Learning and  
Implementation Process

Case Studies  
Best Practices

**Institution / Organization**  
**Case Station**

Field Campus



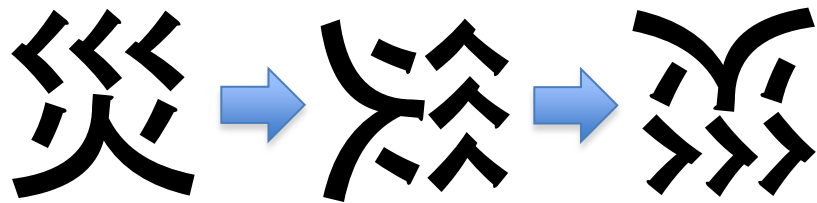


**Introduction to  
International Research Institute of  
Disaster Science (IRIDeS)  
Tohoku University**

**東北大学 災害科学国際研究所**

International Research Institute of  
Disaster Science(IRIDeS), TOHOKU University

- Origin:
  - IRIS (plural)
  - Violet (Color of Iris)
    - Nobility and desire
  - Logo: reversing Chinese Character for disaster



- A proverb: “Disaster turns into blessings”



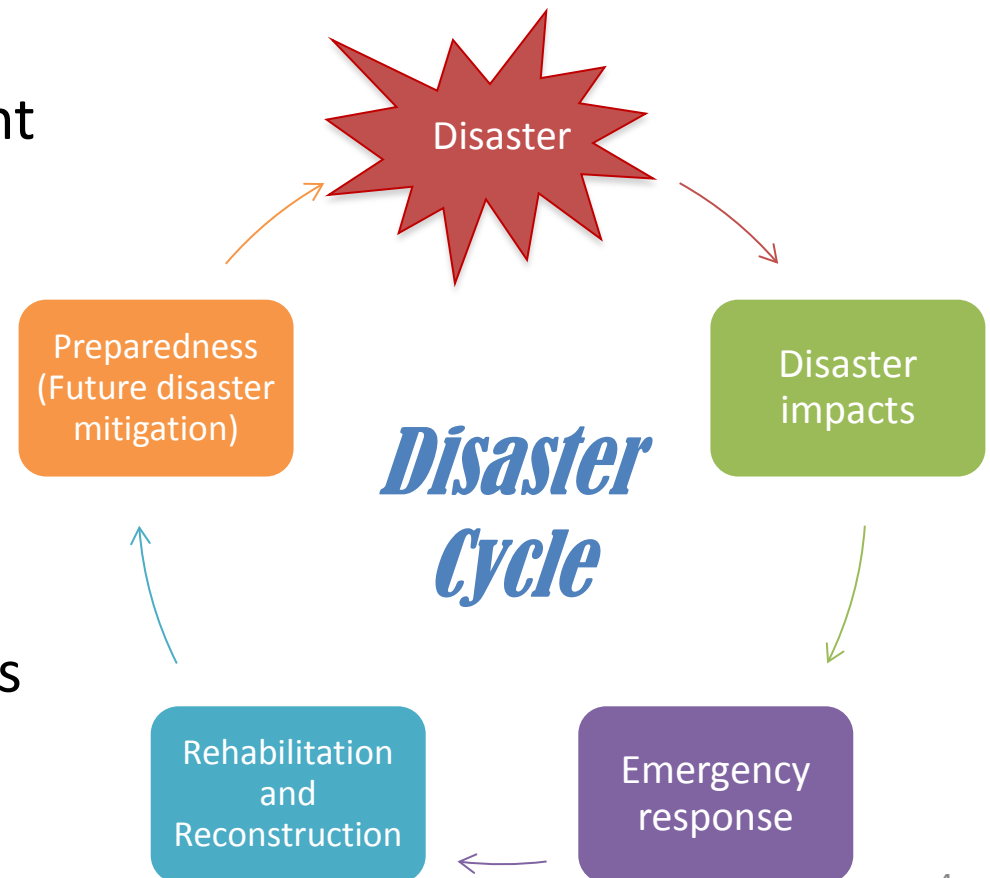


- IRIDeS overview:
  - IRIDeS: International Research Institute of Disaster Science
  - Founded in Tohoku University
    - Tohoku U. : one of a few universities worldwide to experience a historic mega-disaster
    - Established on April 1, 2012
  - 7 departments, 37 areas of specialization
  - Approximately 80 researchers
  - Annual budget: JPY 800 million (\$10 million); secured for the first 10 years

- Mission

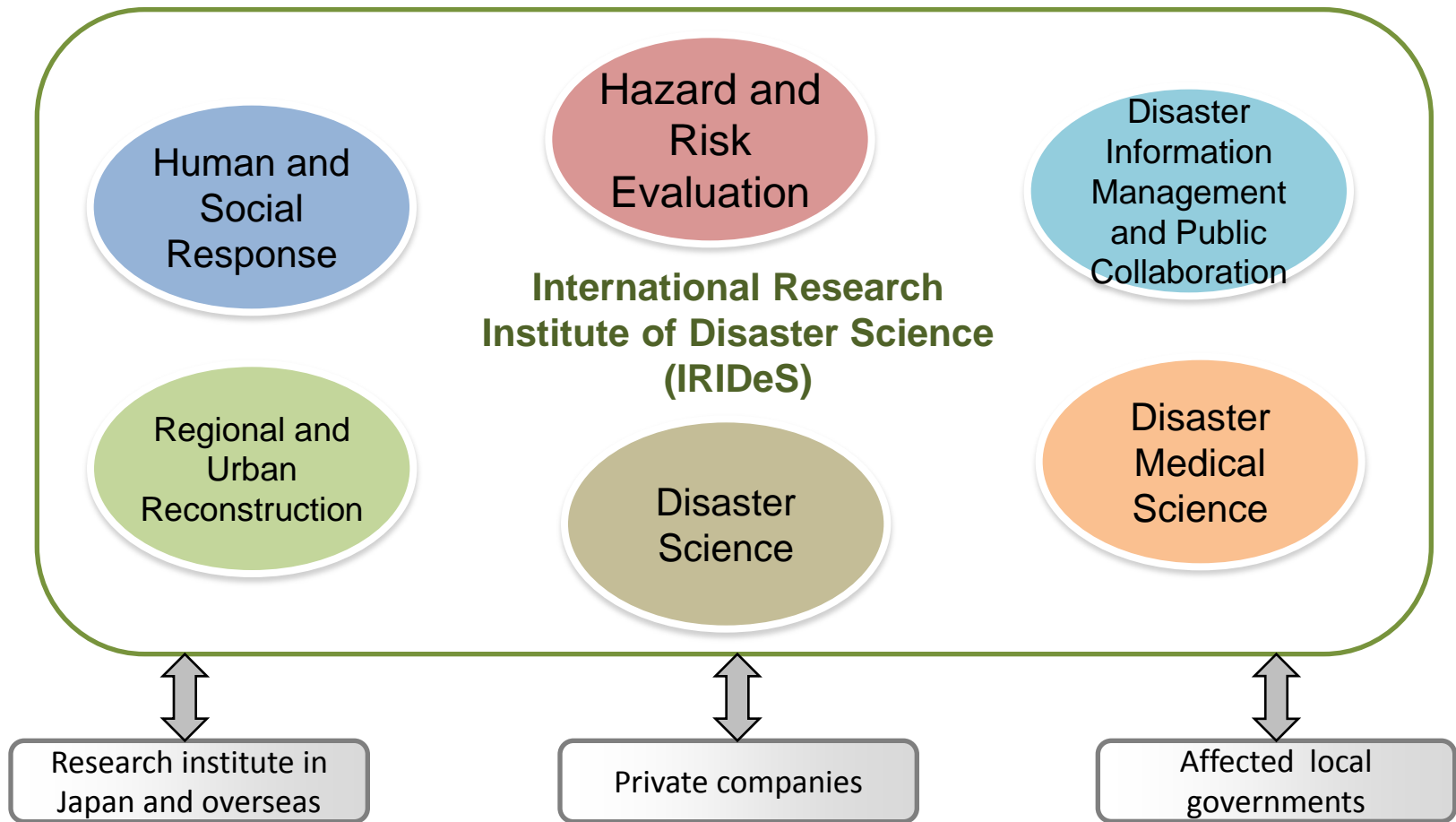
- Establish “practical” disaster management studies

- Identify and theorize disaster-related phenomenon in each stage of disaster cycle
- Establish an area of disaster management study that supports building societies more resilient to disasters
- Internationally-driven research/ educational activities



- Institutional structure

- 7 departments, extensive collaboration beyond IRIDeS



# Uniqueness (1): Multi-interdisciplinary structure

Research area		Tohoku Univ. IRIDeS	Univ. of Tokyo E Institute	Kyoto Univ. D Institute	Niigata Univ. R Institute	Fukushima Univ. S Institute	D Institute
Hazard and Risk Evaluation  Disaster Science	Earthquake, Tsunami	Hazard and Risk	研究所全体 (4部門, 4研究センター, 3マネジメントセンター)	地震・火山研究グループ 大気・水研究グループ	環境変動科学部門 複合災害科学部門 地域安全科学部門		地震・火山研究ユニット 兵庫県耐震工学研究センター
	Volcanic						
	Wind and Rain	Natural Disaster Science	地盤研究グループ 大気・水研究グループ	水・土砂防災研究ユニット			
	Snow Storm			雪氷防災研究センター			
Human & Social Response		Human and Social Response		総合防災研究グループ	地域安全科学部門	研究所全体 (11研究会)	災害リスク研究ユニット
Regional & Urban Reconstruction	Regional safety	Regional and Urban Reconstruction					
	Radiation Decontamination						
	Robotics						
Medical Relief		Disaster Medical Science			地域安全科学部門		
Public Cooperation		Information management		総合防災研究グループ		研究所全体 (11研究会)	災害リスク研究ユニット
International Collaboration		Yes	Yes	Yes			

\* Multi-interdisciplinary also includes research on different types/areas of hazards, low frequency high risk disasters

- Uniqueness (2): A history professor leading the institute

“My area of specialty is History, and am hoping to identify past [ancient] earthquake and tsunami evidences from locally existing literatures and stories. These then can inform to natural sciences, to run simulations for example, to estimate disaster size and impacts. We also aim to emphasize humanities and social sciences to seek for more resiliency in disasters.”



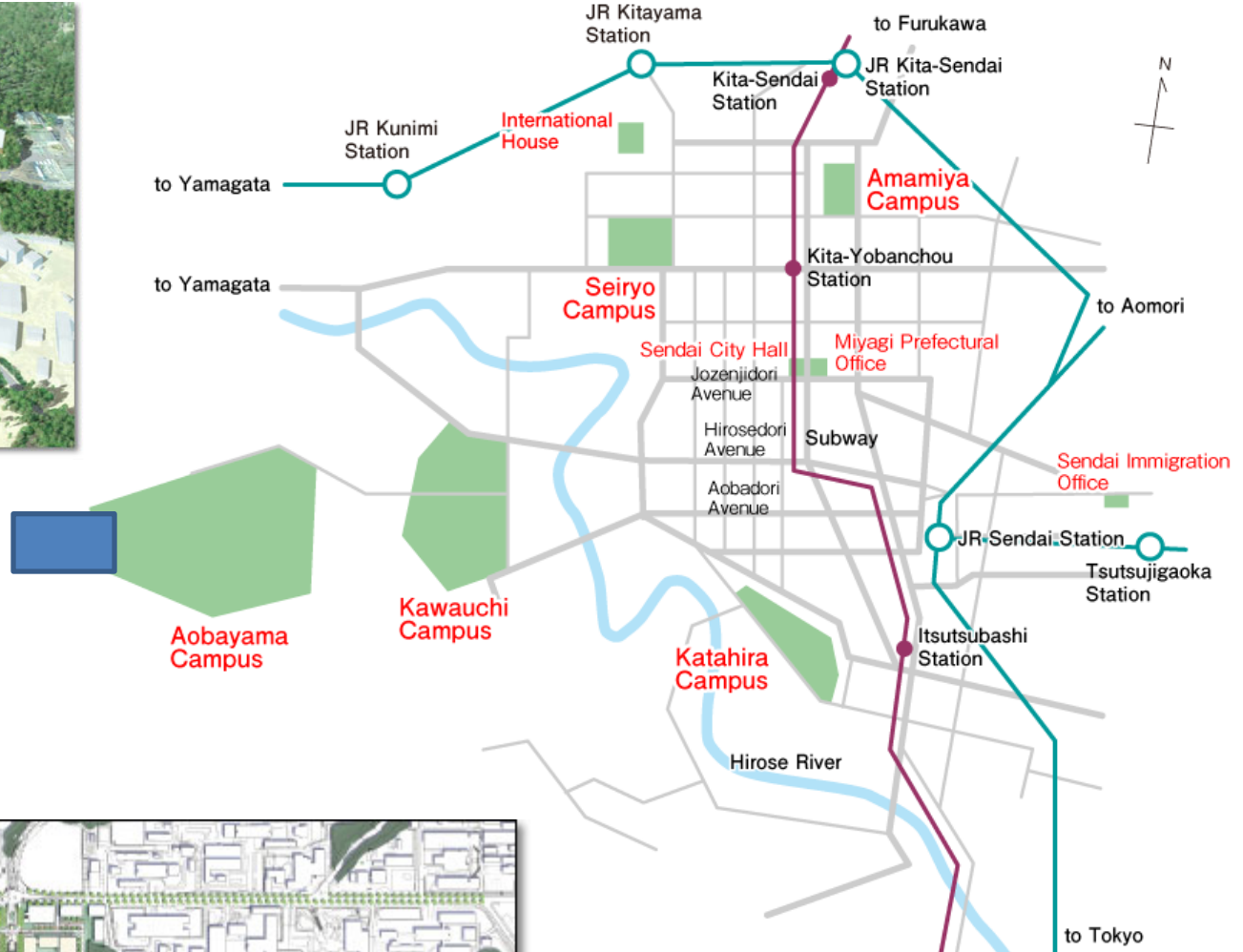
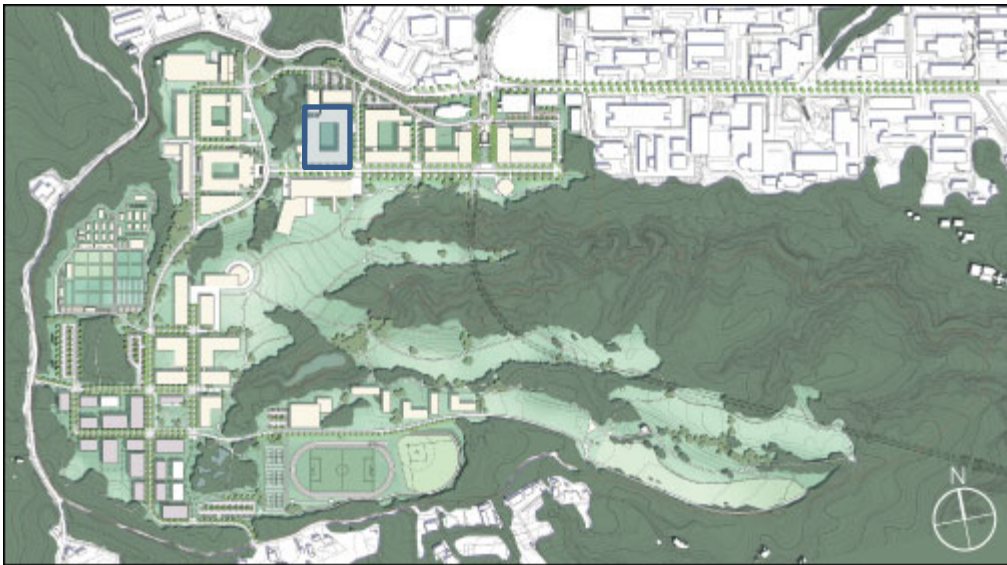
—Director, professor Arata Hirakawa

(Source: Kahoku Newspaper, March 23, 2012; Picture: Nikkei Newspaper, October 14, 2012)



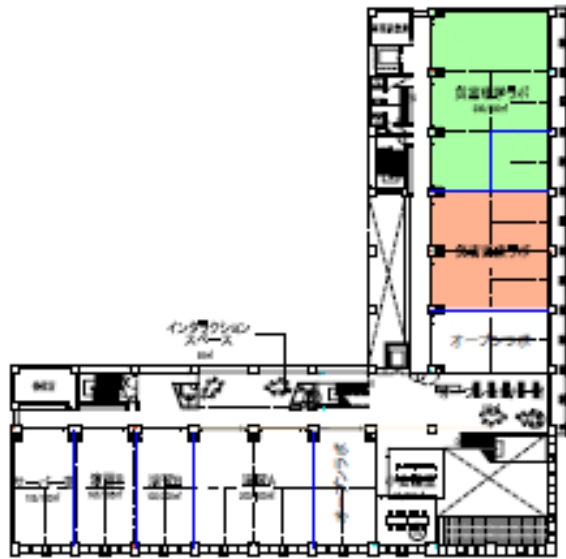


## AOBAYAMA NEW CAMPUS

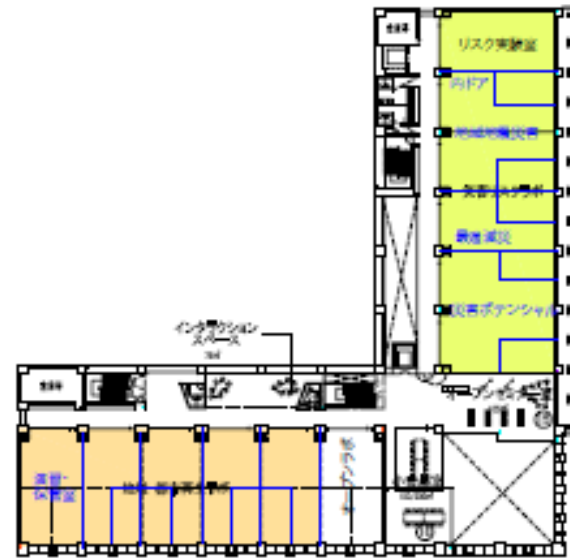


- Permanent space for the institution is under construction

部門別レイアウトB-1案



2階



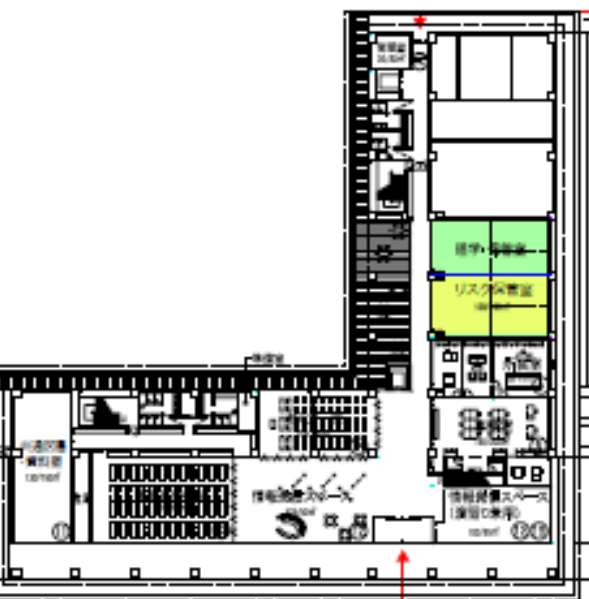
4階

凡例：スペース別

- 専任スペース
- 研究所共通スペース
- 部門ごと共通スペース

凡例：部門別

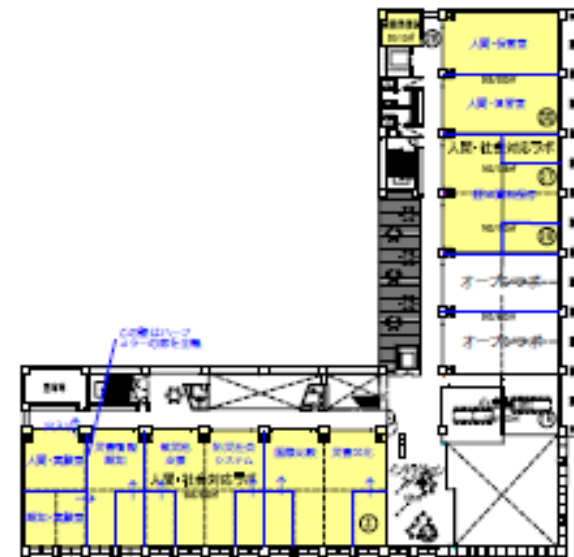
- 災害理学
- 災害リスク
- 人間・社会対応
- 地域・都市衛生
- 災害医療
- 情報管理・社会連携
- 専用講座



1階



3階



5階

# Current Activities

- Project-based research activities
  - Research with domestic and international universities
    - 17 projects granted for type A (leading institutions need located in Tohoku region); US \$5million
    - 39 projects granted for type B (leading institutions located in non-Tohoku and Tohoku regions); US \$2million
    - Grants will be provided every fiscal years, up to 10 years



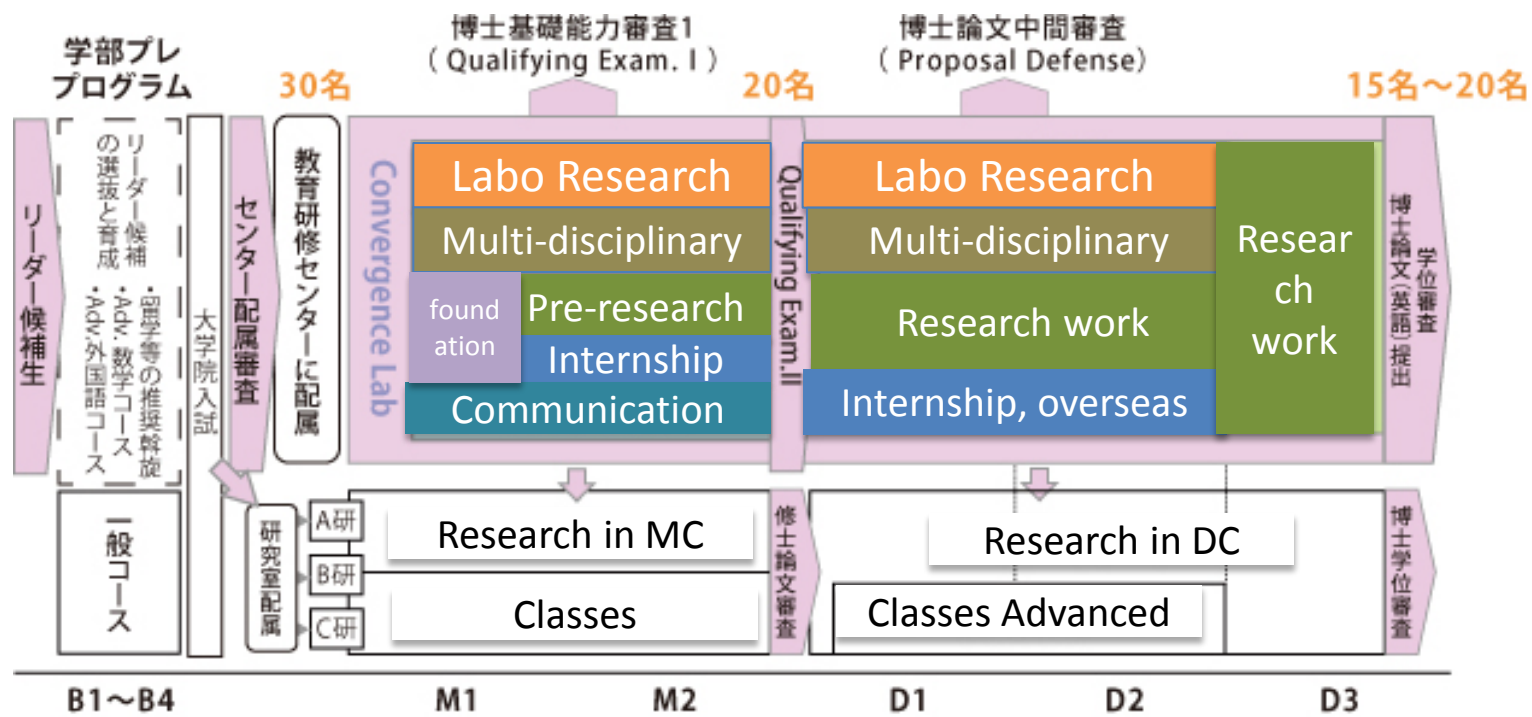


- Archival project [**Michinoku Shinroku Den**]
  - Collect and archive disaster information
    - Data will be collected in Tohoku
    - Collecting different events' data, including historic ones
    - All types of data will be archived for future needs
  - Establish global standard on archival science
  - Will be practical
    - System to link with government and industry
    - Linking with education
  - Create new jobs around this system

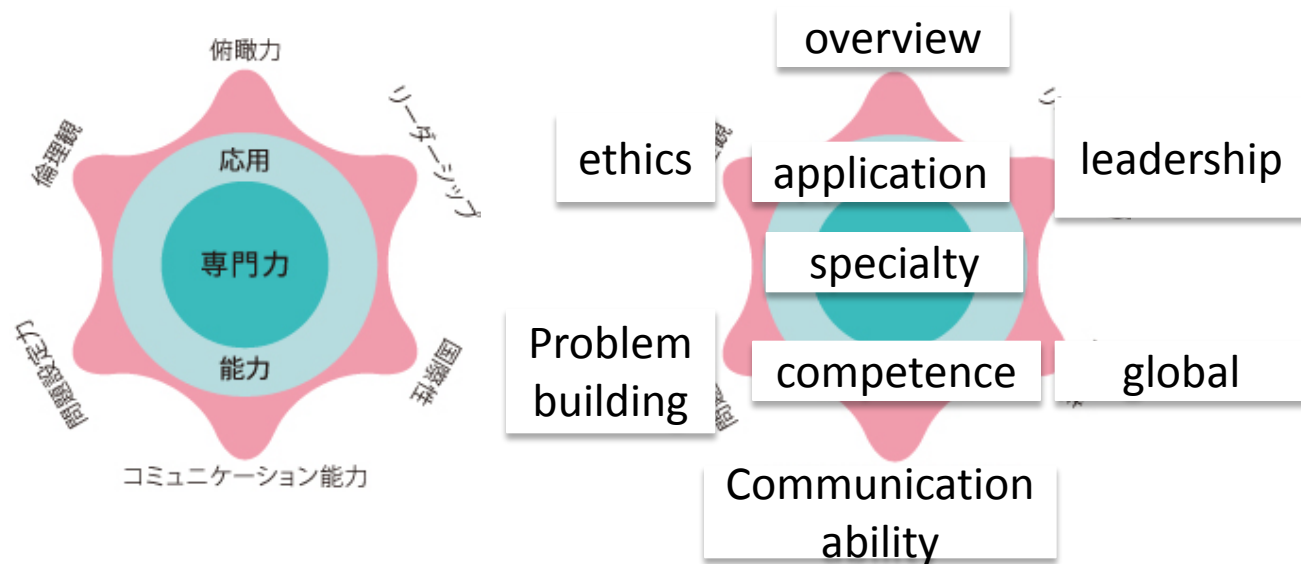
- Inter-graduate School Doctoral Degree Program on Science for Global Safety
- 2012-2018 supported by MEXT



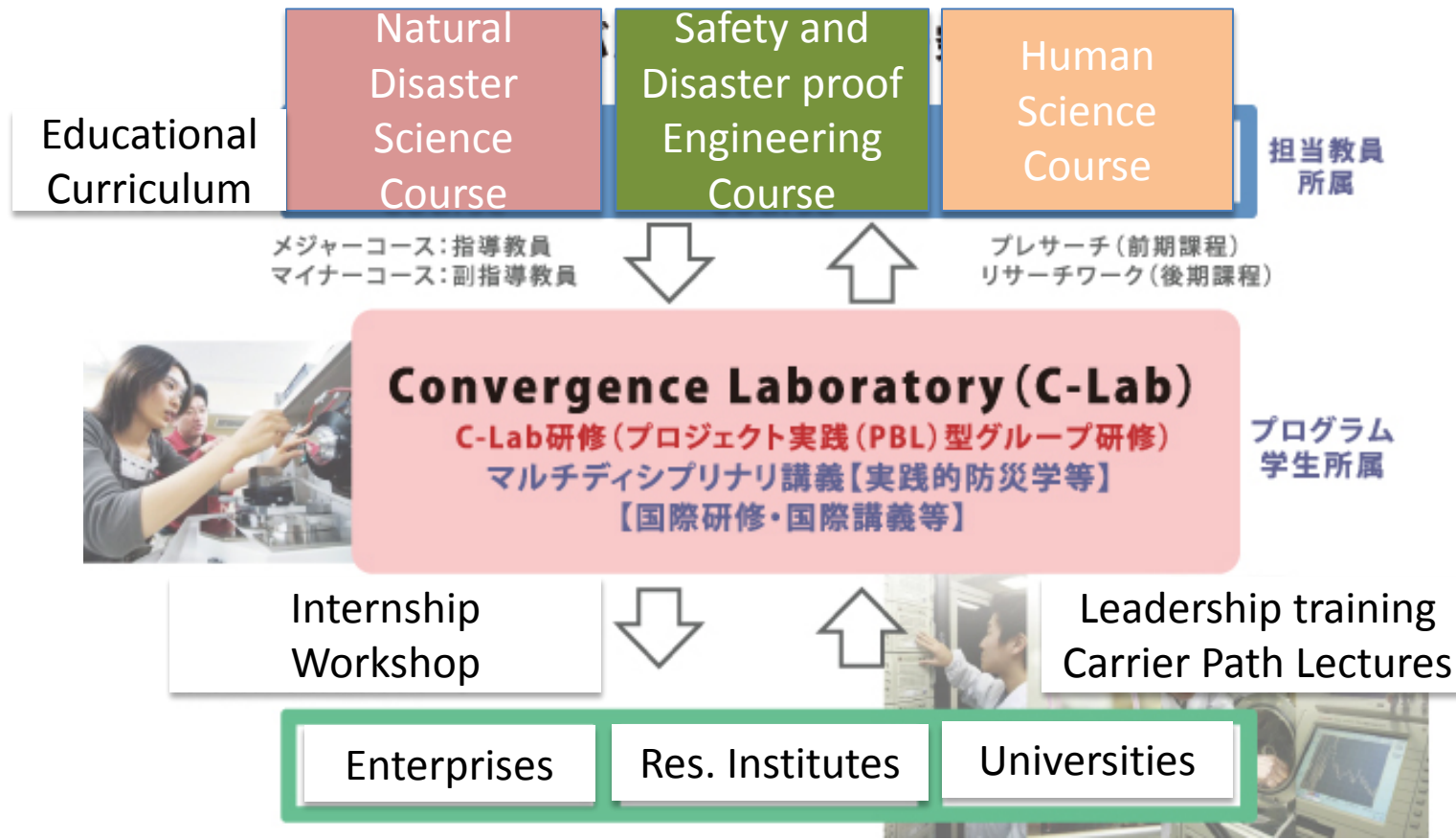
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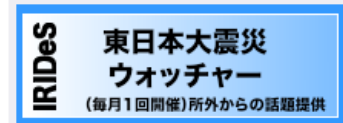
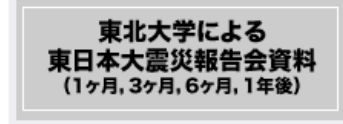
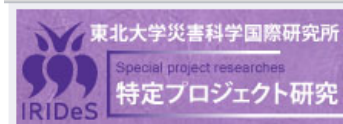


# Thank you!

URLs:

<http://irides.tohoku.ac.jp/eng/index.html>

<http://irides.tohoku.ac.jp/index.html>



## **Education in Safety and Security Areas:**

Creating an ambience on Sustainability, Safety, Security in  
Education

Communications for Sustainability >> *Sustainability Citizenry*

Salil K Sen, PhD

Applied Researcher, the Practice of Sustainability and  
Adjunct Assistant Professor

Centre of Excellence on Hazardous Substance Management,  
Chulalongkorn University, Bangkok, Thailand

## Propositions:

- Issues to address: Linking Safety, Security with Communications for Sustainability
  
- *Perspectives from literature: three lenses (policy, operations, communications)*
  
- Hypothesis: The Communications for Sustainability creates pathway to bridge the vulnerability - - resilience continuum
- Business value of communications for sustainability:
  - > Integrates Energy <-> Water <-> Waste
  - > Creates competitiveness, differentiation within the threshold

# Challenges on Sustainability, Safety, Security

- > Quality of Habitats: Health: air, water, land quality
- > 2030, it will be necessary to spend \$57 trillion on infrastructure (roads, bridges, ports (McKinsey, 2013)

## Shifts: Citizenry to Sustainability Citizenry

- > water-waste-energy sustainability citizenry offers:

technology based

attitude driven solutions

leading to

- > judicious use of water [>>> Communications lens]
- > timely conversion of waste to energy [>>> Operations/Services lens]
- > empathy towards waste among citizens and [>>> Policy lens]
- > legal framework that discourages inappropriate use of water-waste-energy.

# Perspectives from literature: Sustainability content 'weaved' into Communications: three lenses

## **Policy-makers:**

- *The Practice of Sustainability is beyond-compliance stewardship (Sharma & Henriques, 2005)*
- *Incorporating Sustainability practices creates value, gains credibility beyond national boundaries*
- *Firms adept in integrating heterogeneous / hitherto extrinsic attributes such as sustainability into intrinsic / deterministic parameters such as competitiveness would weather the test of time (Fubini, Price, Zollo, 2007; Hitt, Harrison & Ireland, 2001;*

## **Service providers/producers/SMEs**

- *Sustainability driven firms take responsibility for environmental & social impacts caused by its operations on carrying capacity of ecosystems*
- *Sustainability paradigms are to be addressed to remain competitive, as depletion of clean air, water, eco-systems, non-renewable sources of energy are rampant (Pew, 2007; Darnall et al 2008)*
- *Sustainability creates comprehensive wealth, which is present value of the flow of aggregate future consumption (Arrow, Dasgupta, Goulder, Mumford, Oleson, 2012)*
- *Ecosystem impacts are trans-boundary*

## **Communications for Sustainability**

- *Subliminal threshold (Kanuk & Shiffman, 1980)*
- *Above just noticeable difference (j n d)*
- *Economic Value Added (Stern & Stewart, 1990)*
- *Ecology Value Added (Sen, 2007)*

## **Symposium keywords: Communication challenge**

### **Policy-level governance**

- *Disaster losses, vulnerability – resilience continuum (Briceno)*
- *Environmental quality sensors (Forester, 2013)*
- *River restoration (Jung)*
- *Gather – integrate – communicate (Beroza)*
- *Numbers going the wrong way (Kovacs)*
- *Missed opportunities for early action (Collins)*
- *Multi-layering spiral lift effect (Mishra)...*

### **Service providers/producers/SMEs value added**

- *Strong Motion Generation Area (Aochi)*
- *Micro-tremors (Matsushima)*
- *Liquefaction induced settlement (Wilson)*
- *Simulated typhoon tracks (Ishikawa)*
- *Prepared-ness plan (Nakashima)...*

### **Communications for Sustainability, curriculum development**

- *Now-casting (Iwabuchi)*
- *Small strain matters (Elliott)*
- *Innovations, applications, governance, education (Tatano)*

Embedded opportunities:  
*integrating water – energy - waste*

Develop water – energy - waste *baselines* for a habitat (say ASEAN)

Concept of economic and ecology *hinterland*.

- Decouple market share, cost of capital, equity beta (Economic Value Added) from water – energy – waste (Ecology Value Added).

Waste is a common denominator that curbs air, water, land

Water – Energy – Waste integration has *embedded* opportunities:

- (i) Economic Value Added (iii) Ecology Value Added (iii) Societal Value Added
- (ii) Communicate the opportunities to create pathway along the *vulnerability – resilience* continuum

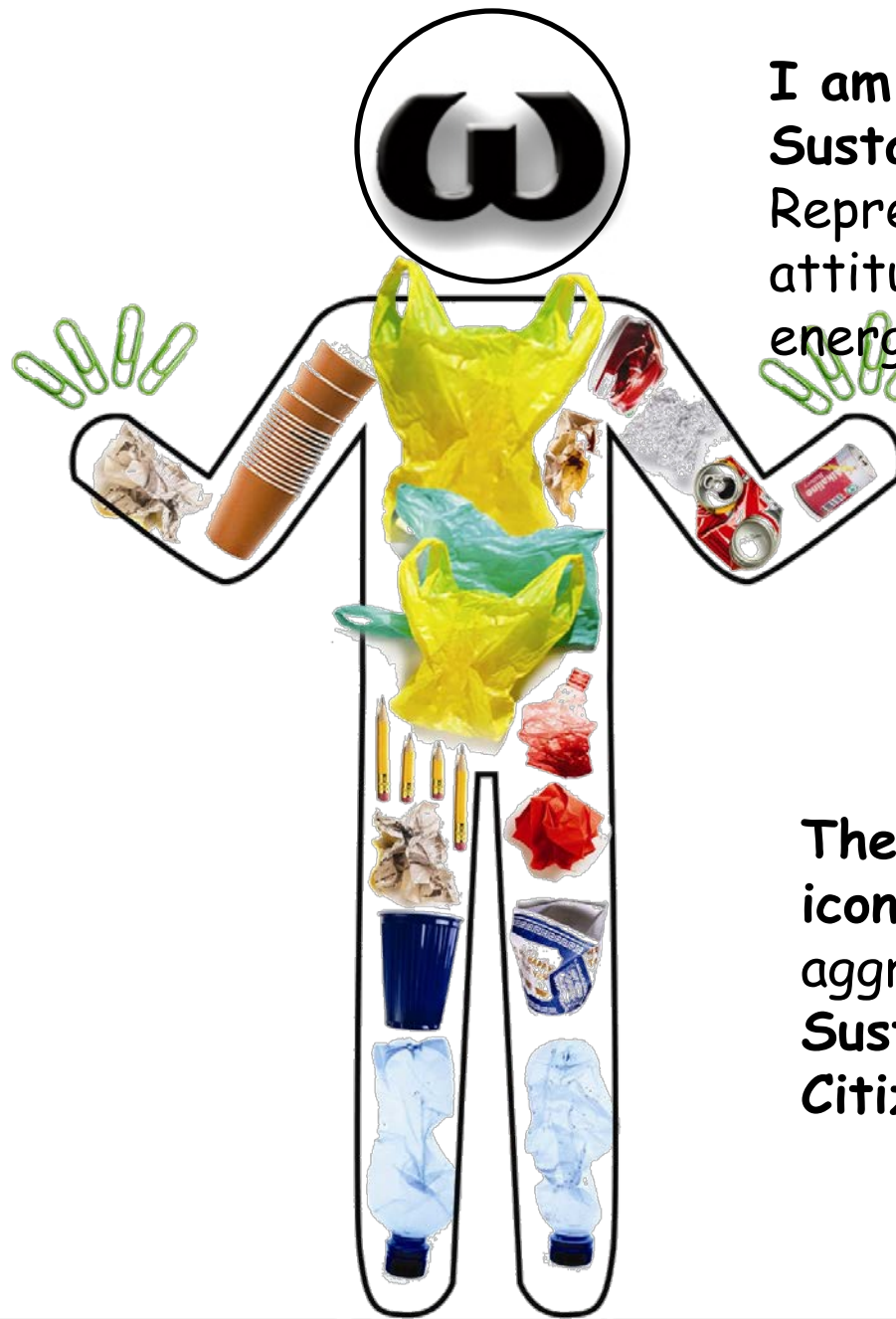
# Communications for Sustainability

Focus shifts  
from

- > Recycle to **Recyclability**
- > Reuse to **Reusability**
- > Redesign to **Redesign-ability**

Complements  
tech focal  
areas:

- > disaster-preparedness
- > **attitude** shift: reactive to proactive
- > **timeliness** to deal with **waste**



I am the  
**Sustainability icon:**  
Represents **Your**  
attitude to water,  
energy and waste

**The Sustainability  
icon:**  
aggregates to  
**Sustainability  
Citizenry**





# *Survey questionnaire for Communications for Sustainability curriculum needs (excerpts)*

## **Part A: Sustainability needs:**

### **1. Management of Wastes and Hazardous Substances**

1.1 Safety in usage of hazardous substances :

***This is relevant in our Institution: EXTENSIVELY 5 4 3 2 1 LEAST***  
***Country specific topic(s)***

1.2 Container & packaging recycling:

***This is relevant in our Institution: EXTENSIVELY 5 4 3 2 1 LEAST***  
***Country specific topic(s)***

1.3 Food waste & mass consumption:

***This is relevant in our Institution: EXTENSIVELY 5 4 3 2 1 LEAST***  
***Country specific topic(s)***

1.4 Sustainable finance

# Sustainability citizenry: Land use

Run off water from open dump polluting surface streams and underlying groundwater



Open Dump projects contaminate land by wastes

Survey results: (preliminary) Key-issue	Communications Objective	Sustainability value creation	Inter-connected-ness
Innovations	multi-dimensional <i>diagnostics</i> skills	Linking economic value with ecology	<i>dynamic metabolism</i> of Industry, agriculture, services
Impacts	Recalibrating growth adjusted to the carrying capacity of the planet	Reuse, redesign, recycle	Life Cycle Analysis
Policies	Corporate Social Responsibility	Beyond compliance stewardship	Economic Value Added coupled with Ecology Value Added
Quality of growth	Competitiveness & Sustainability	Sustainable Consumption and Production	Internalizing extrinsic attributes (water - energy - waste)
Extreme-weather related issues	Environment and Infrastructure	Sustainable Transportation, Green buildings	Resilience
Environment and Energy	Linking society, community climate concerns with project	Sustainable procurement, green buildings, renewable energy and waste to energy	Eco-efficiency and Energy footprint

ASEAN integration through *Sustainability Citizenry*



Next steps: Communications for Sustainability to create *Sustainable Differentiation*



# Sustainability issues: Waste management

Waste to Energy: Sustainability Citizenry



# Sustainability citizenry: Transportation management



Investment per journey?

Cost of journey in different modes?

Emissions per journey in different modes?

## Challenges on Sustainability, Safety, Security:

> air pollution (23% of total CO2 emissions related to energy)



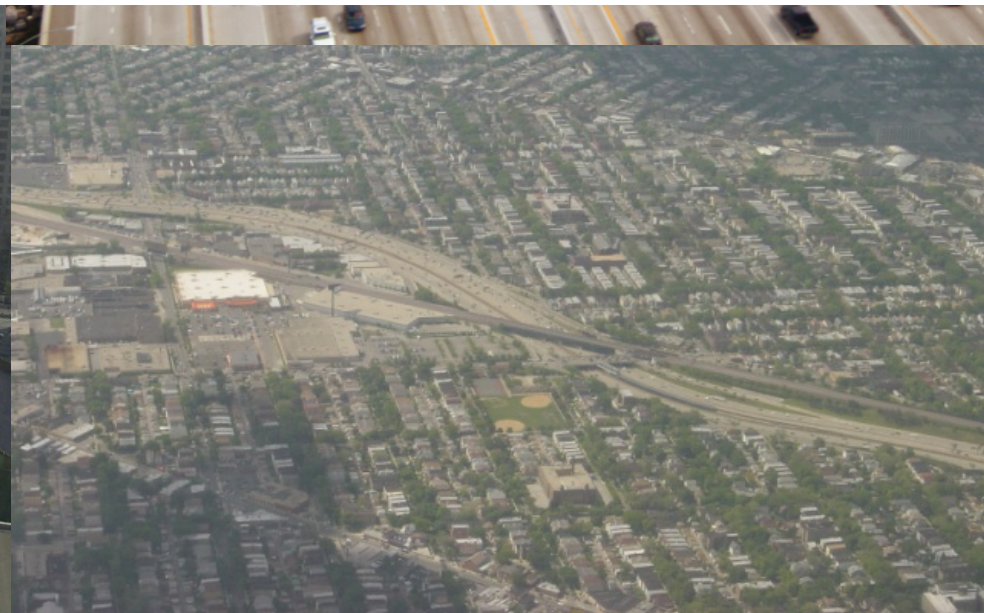
## Pathways, solutions, curriculum development:

>> Communications for Sustainability >> *Sustainability Citizenry*





Well being: 10-25% of urban areas are taken by road transportation infrastructure



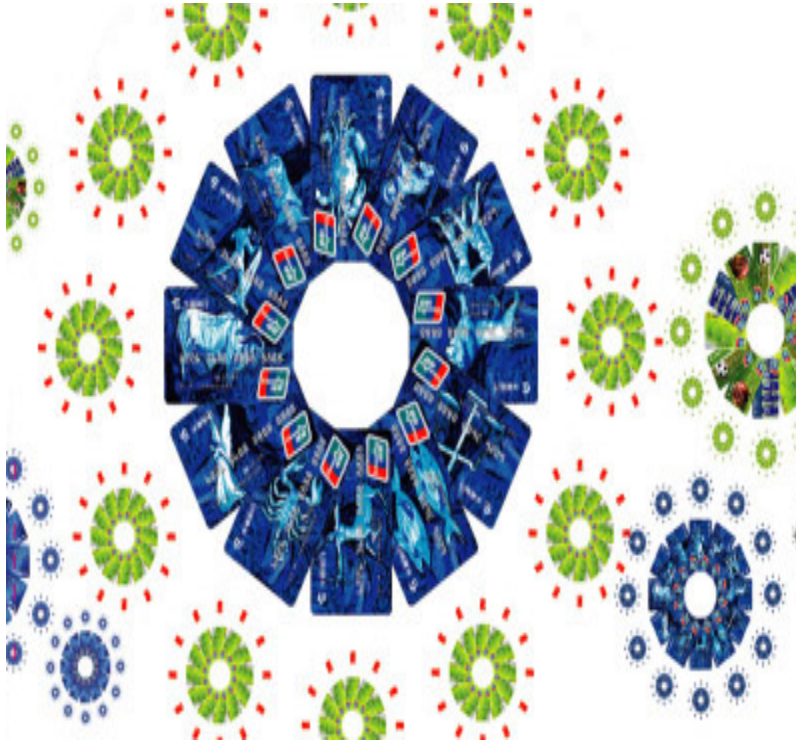




Consumption driven communications:

Example: P&G China

China: The Great Wall:  
*linked with Health Security*



## Financial tsunamis

- Huaxia Credit Card Center with Deutsche Bank

*Credit Culture*

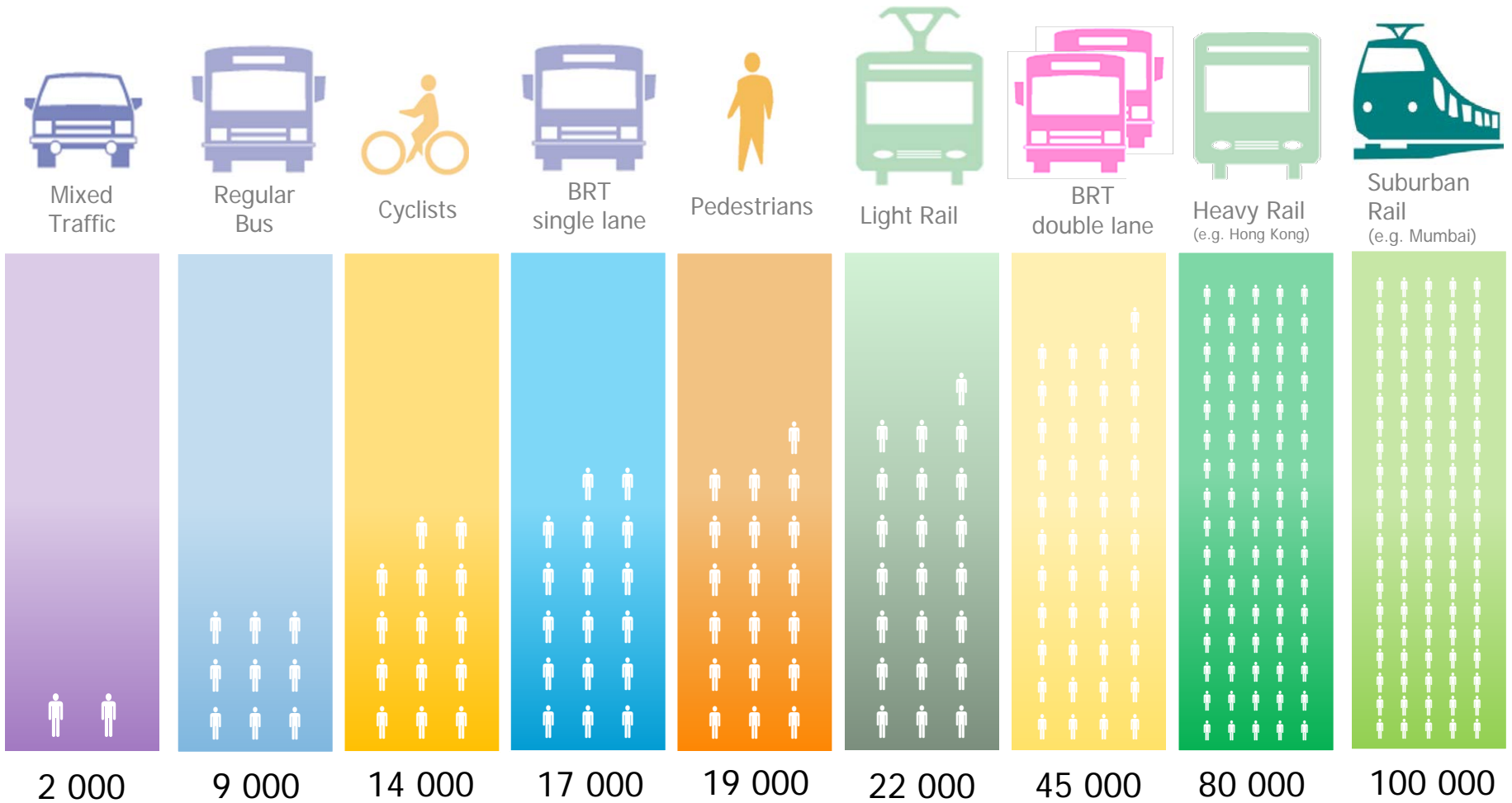
**Credit card 'boom and bust' cycles** in Hong Kong SAR in 2002, S Korea in 2003 and Taiwan in 2006

**HSBC India 2007:** 40 percent assets in Asia: *focus: two fold: skimming: wealthy customers*  
*Mass market: feel good to be with HSBC*

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# Communications for Sustainability: Corridor Capacity

(flow per hour, 3.5 m wide transit corridor in a crowded city)



Source: Botma & Papendrecht, TU Delft 1991 and own figures

# Future research: Communications for Sustainability creating Competitiveness

## Country/Regional level

Create / promote / collaborate for trans-boundary water – energy – waste collaborations

## Public sector Institutions

Dynamically assess the natural, environmental and societal footprint

## Private MNEs

Develop new & innovative products & services that are ecology/consumer friendly

## SMEs

Benchmark vendors sustainability initiatives on water – energy – waste

## Water

1: Value capital by appropriate shadow values

2: Trans-boundary resource, create value by collaboration, clusters

3: Environmental capital

## Waste (generic)

1: Human health capital

2: Renew / reuse / recycle potential

3: Beyond product/service life cycle, waste can extend value chain

## Energy

1: Waste to Energy, role of water in energy

Thank you !  
Discussions



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# International Forum on Research Institute for Disaster Risk Reduction Theme: Education

Presented by:

Nafy Aidara

Division of Physical & Natural Sciences

The University of the Gambia (UTG)



# Outline

- The Gambian Context
- Disaster History
- The University of The Gambia (UTG)
- Role of UTG
- Empowering local communities
- Capacity Building

# The Gambia

11,295 square kilometers.



1.7 million inhabitants Annual growth rate of 2.7% per cent





# The Gambian Context

- A Sudano–Sahelian climate: short rainy season from June to October.
- The mean annual rainfall varies from 900 mm in the South West to about 500 mm in the North East.
- Temperatures vary from 14° C to 40° C with means ranging from 25°C to 28° C, and generally could be higher in the eastern part of the country.

# Disaster History

- In 2011 The Gambia was affected by drought due to late, unevenly distributed and erratic rainfall during the rainy season with an overall deficit of 10% below normal and 37% below 2010 levels.
- Between 2002 and 2006 there were 65 flood related disasters and 45 incidents of fire in the western region only which mostly are highly populated and urbanized.

# Disaster History

- Severe floods in 1999 and 2003. It affected 13.1 per cent of the population.
- 1978 epidemic: the largest human loss in terms of people killed (200 people killed).
- 1980 drought: the largest human loss in terms of affected people (500,000 people affected).



# The University of The Gambia

- UTG is established in 1999, it is the only one.
- Total enrolment of approximately 4000 students spread over five schools: Law, Arts & Sciences, Business and Public Administration, Medicine and Allied Health Sciences.
- A new Science Technology and Innovation Park is launched. It will be the hub of the DRR center.
- Partner with universities to develop a regional center for research, training and building capacity and Competencies.

# Role of UTG

- UTG: First vice-chair of the National platform for DRR & CCA.
- Its role is to take the lead in conducting training and research in DRR & CCA in The Gambia.
- Develop modules and certificate /Diploma programs and even degree programs to train future professionals for better preparation in all aspects of Disaster.
- Update of course material, access to latest resources on DM/ DRR/ CCA, training of faculty.

# Empowering Local communities

- Local populations often lack the knowledge and awareness on the consequences that some of the traditional practices have on long-term development.
  - For example, in the case of logging and destruction of the mangroves, the practice is related to short-term economic gain that leaves no space to think about consequences on the ecosystems and on livelihoods.

# Empowering Local communities

- Concepts and measures of flood risk are not generally well understood by the population.
- Rainfall shortage within the last decades has narrowed the perception of potential flood risk.
- As a consequence many houses were built on flood prone areas along rivers during drought periods.

# Capacity Building

- Research and development through the cooperation of universities and research institutions will help to create high-level capacities, for example,
  - in the field of remote sensing and use of satellite technology for early warning systems,
- Mapping of disaster impacts and others;
- Peer learning, exchange of information and knowledge between government officials, professionals, and citizens will become an important instrument;



# GRATITUDE





*Using games in participatory  
community disaster risk  
management*

***Katsuya YAMORI***

***(Disaster Prevention Research Institute,  
Kyoto University, Japan)***



**“CROSSROAD: KOBE”**

# “CROSSROAD Game”

-- A citizenry-centered & participatory disaster risk management



**Gaming-type disaster education procedure**



## 高齢者や障害者 災害時どう支援 呉で施設職員ら研修

芸子地震から五年を迎えるのを前に、呉市内の社会福祉施設職員や民生児童委員ら約百五十人が二十六日、呉市総合体育館で研修会を開き、高齢者や障害者ら要援護者の災害時の支援について理解を深めた。

呉市社会福祉協議会などの主催。参加者は同協議会職員の協力で、京都大防災研究所が開発した災害時の対応をシミュレーションするカードゲーム「クロスロード」を五人ずつのグループで体験した。



「クロスロード」を体験し、要援護者の災害時支援について考える参加者

障害者の家族の立場で、どを担当する民生児童委員阪井和子さん(66)は「住民ぐるみで対策を考えたい。ゲームを地域に持ち帰り、勉強会をした」と話していた。

(増田咲子)

「大地震から二十四時間。半壊の自宅や避難所の方が安全だが、多岐の中でうまくやるか心配。避難所に行くことなどの問いに賛否を答え、意見を出し合った。

一昨年、甚大な台風被害を及ぼした平野町

蘭玉アート



- Over 200,000 copies published
- Big media coverage (TV news, papers, magazines, etc.)
- more than 100,000 participants



Crossroad  
worldwide

# “CROSSROAD Game”

- Original version, “Kobe-Version”: all episodes are based on actual events (real stories) in the 1995 Kobe Earthquake
- Obtained from a series of focus-group interviews with those who experienced the disaster (more than 200 hours with more than 150 interviewees)
- Interviewees: survivors, volunteers, and local government officers working at the frontline

[Kobe1015]

You Are...  
City employee..

Although your house is half-collapsed after the earthquake, none of your family was injured fortunately. Public transportation system is stopped and it may take about 2-3 hours to the office.

Do you come to work ?

Yes (To come to work)

OR

No (To stay home)

Episode Card Sample

**You Are...**  
City employee

The city hall has almost totally collapsed. However, maps and documents which are necessary for disaster response are in the collapsed office.

Do you dare to enter the office in the area off-limits?

Yes (To enter)

OR

No (Not to enter)

**You Are...**  
Senior  
Administrative Officer

A lot of non-organized volunteers appear at the city hall. But there is no staff for receiving nor organizing them now.

Do you accept them?

Yes (To accept them)

OR

No (Not to accept them)

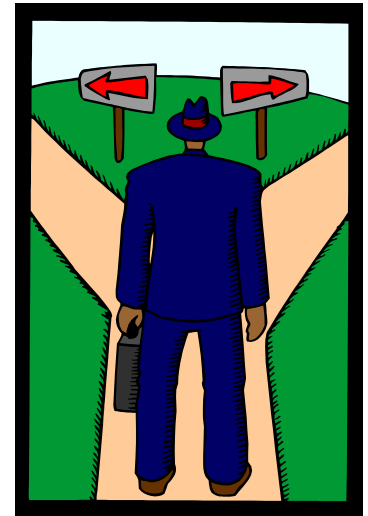
【Kobe1030】

【Kobe1029】



# “CROSSROAD Game”

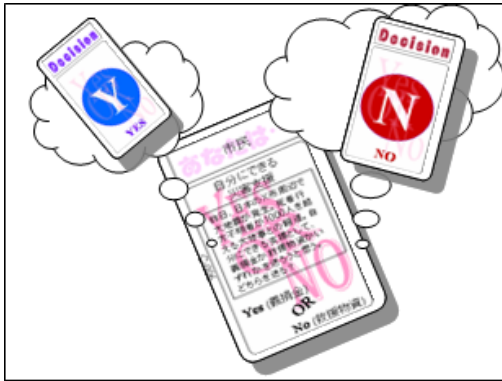
- Episodes: describing real experiences of interviewees in a form of severe dilemmatic either-or decision between two conflicting choices, which we call “Crossroad Format,”
- More than 10 different new versions published in the same Crossroad Format, such as “Everyday-preparedness-Version,” “School-safety-Version,” “Flood/tsunami-Version,” “Social-work-Version,” etc.



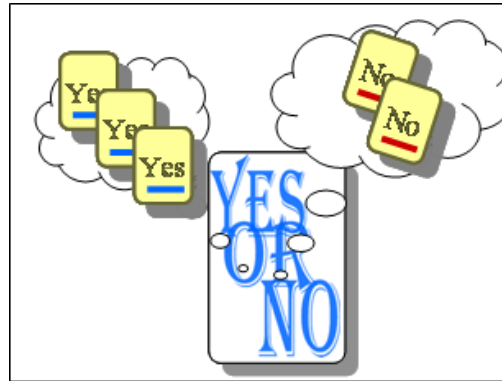
# Basic procedure of “Crossroad: Kobe”

## Procedure

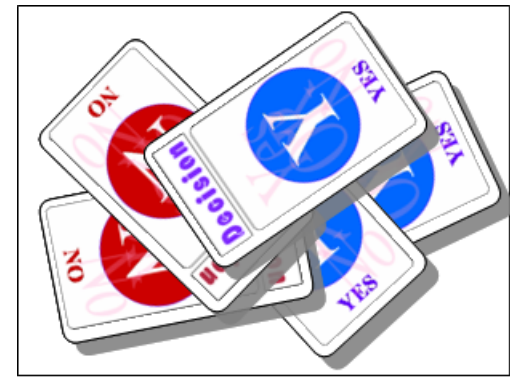
**1 Read episode and Make your choice - Yes or NO?**



**2 Disclose your choice by Yes or No card**



**3 Find out group result — Majority or minority?**



**4 Get game points based on the results**  
--- Majority : 1 normal point (a blue chip)  
--- Single Minority: 1 special point (a gold chip)

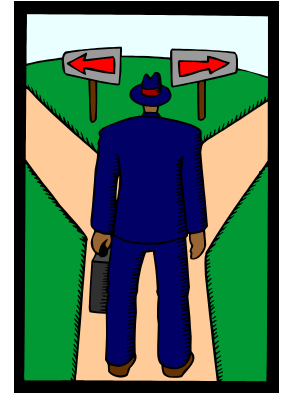
**5 Exchange views --- persuading others and/or persuaded by others, Also, writing down the reasons, grounds, and conditions for YES or NO attitude on the note**

**6 Learn basic info and listen to disaster veterans' talk**

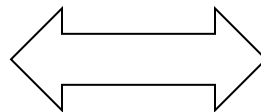
# “Crossroad”: Sample item

---from “Tsunami Version”---

- Suppose ...you live in a village at the seacoast
- You know that experts estimate tsunami will hit the village within just 15 minutes after the earthquake. You feel sudden and strong tremor just now. You quickly begin evacuating to a higher elevation, but an elderly woman in the neighborhood comes to your mind. She lives alone and you take care of her as a community worker. Do you go to see her before you evacuate?



**YES**  
**(To go)**



**NO**  
**(Not to go)**

## “Cross-note”: opinion summary (sample)

### ◆YES (to go)

- Just a responsibility or an obligation of neighbors
- Hard to leave her, considering everyday friendship
- Quite natural to help each other by neighbors
- Only IF her house is located on the way to evacuation site
- Only IF it is sure that she is at home

### ◆NO (not to go)

- Tsunami evacuation is very urgent. Securing one's own life must be a priority
- I wish I could, but 15 minutes is not just enough to take care of others
- Better to leave the woman to people living next door neighbors
- The woman might not be at home
- Difficult to take her out if she is trapped in the collapsed house

- **No single universally correct solution assumed,**
- **All “Depends” in Crossroad Game**
- **Exactly the case in evacuation behaviors in the 3.11 Tohoku Earthquake and Tsunami:**
  - **car ride for evacuation: OK or NG?**
  - **evacuating to the secondary place from the place where evacuate first: OK or NG?**
  - **re-entry into risky area to rescue people left behind: OK or NG?**
  - **evacuating up to the 3rd floor: OK or NG?**
  - **evacuating to an officially designated evacuation site: OK or NG?**

• **Very easy to find conflicting episodes and survey data inconsistent, incompatible, and contradictory to each other--- big diversity, case by case, very different from place to place**

• **Important to know the diversity, conflict, and dilemma / no single universally correct solution assumed**

• **More Important to know how diversely people feel, think, and behave**

• **Need to find in advance what can be done to resolve the dilemma, by Crossroad, particularly, through group discussion**

**•The importance of motivating local people to find a socially “viable” solution by their own capacity, rather than simply accepting a universally “correct” solution, prescribed in advance by outsiders, such as disaster experts, local government officers**

- Need to develop an interactive tool, device, and arena, to promote this co-learning process --> “Crossroad Game”
- “Lesson”, to be expressed, Not in the form of a simple proposition style, such as “Do X in tsunami” or “Do X when Y”
- But, in the form which includes conflict, contradiction, dilemma, compromise, and negotiation, to reflect big “diversity” in a reality of evacuation behaviors, and to promote co-learning by a diverse stakeholders



**•For example, in this case, helpful for local people to know and discuss the following things concretely, with the assistance of disaster experts and government officials, before tsunami comes:**

**•How quick and big the tsunami will be in their own community**

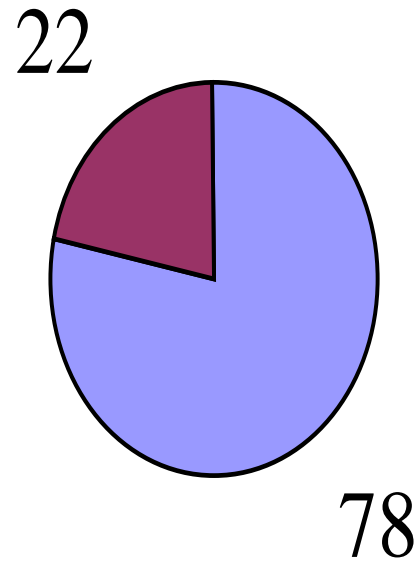
**•What trigger: quake itself, warning from wireless, mobile, TV/radio, from neighbor?**

**•where to evacuate --- safe enough? any alternatives?**

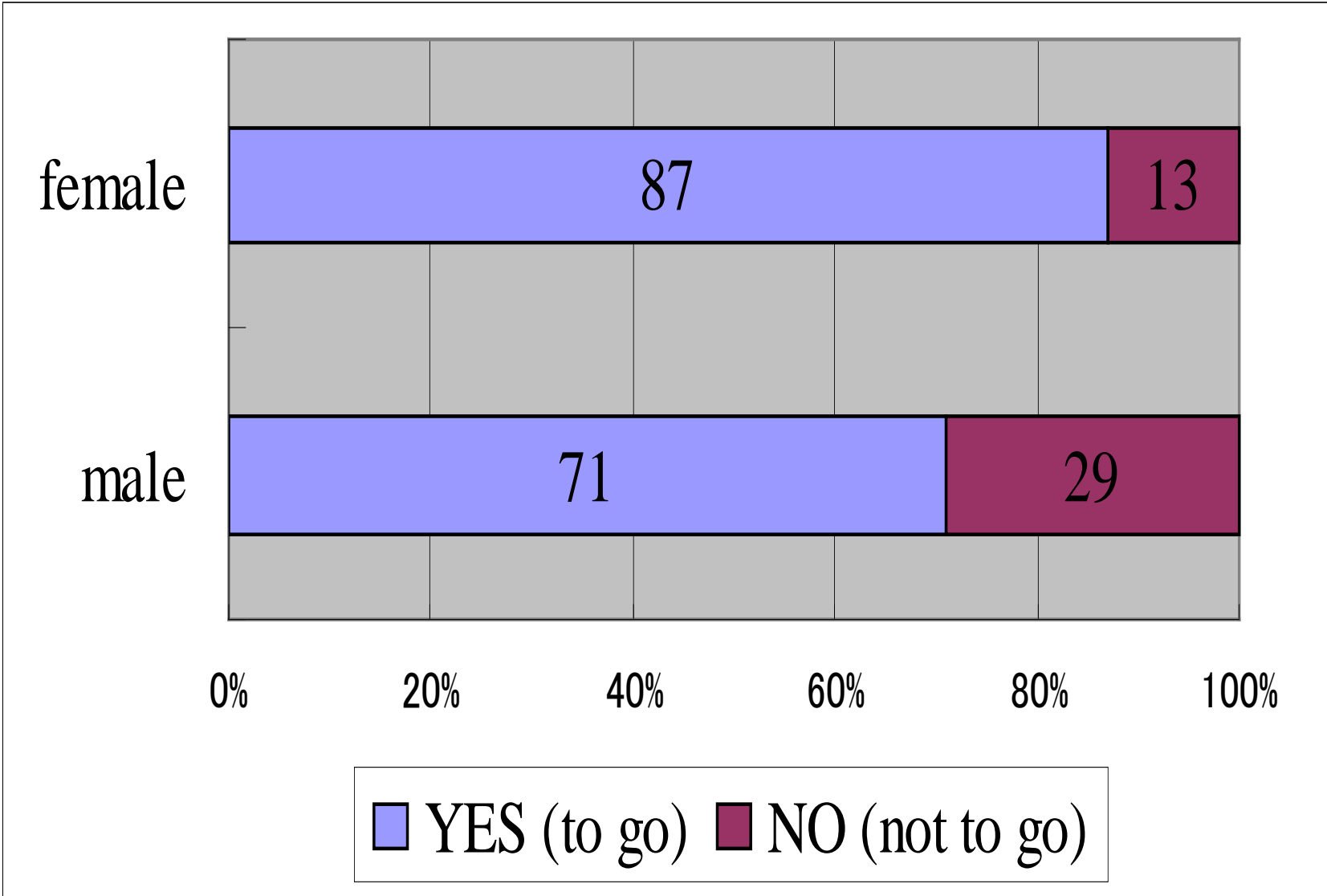
**•how to evacuate --- car, bike, walking?  
possibility of traffic jam?**

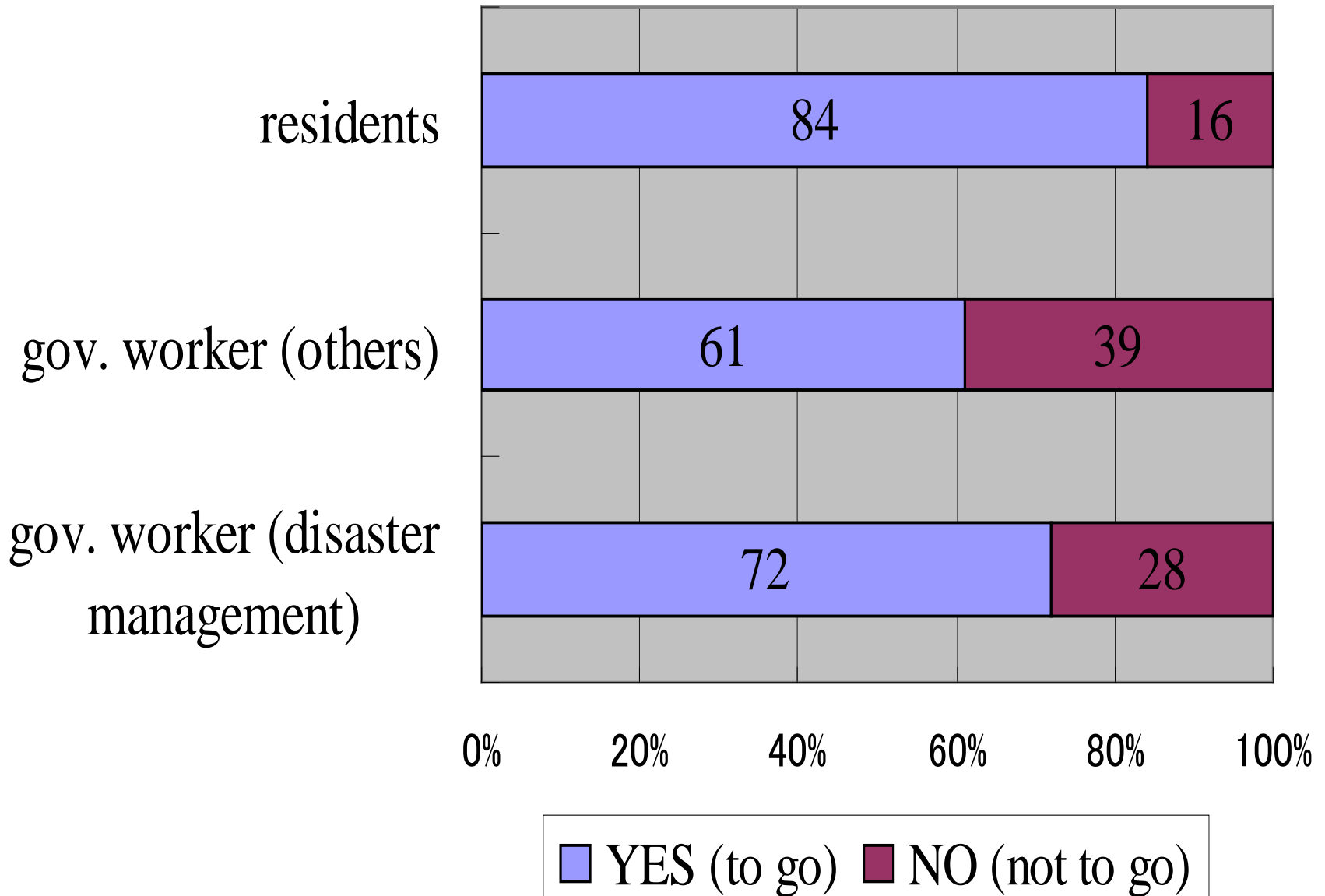
**•who needs special care & help, where such people live, and who can help them**

**Crossroad: players interaction fist,  
but also, capable to know an overall public  
voice by recording players' choice data**



■ YES (to go) ■ NO (not to go)







# 「津波てんでんこ」の意味



- 津波による大被害に見舞われてきた三陸沿岸に伝わる言い伝え
- Traditional legend handed down in local communities in the Tohoku Pacific coastal area, tsunami prone area
- 津波襲来ときは、身内といえど他人を省みず、高所への避難をいそぐべし。それだけが、一族郎党共倒れを防ぐ法
- Act (Evacuate to higher place) Just for yourself without taking care of anyone else, even one's parents and children
- Only way to escape from total/complete destruction



北



興津

郷分

浦分

小室の浜

小室

不老が谷

三崎山



記号の意味

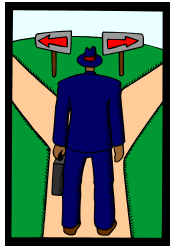
避難場所  
 小学校・中学校  
 郵便局  
 神社

500m

細い道路までは表示していません。

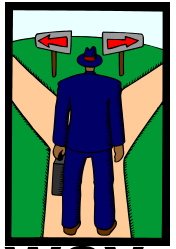


# What CORSSROAD realizes(1/3)



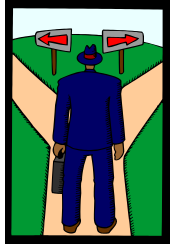
- 1. Collaborative and participative learning rather than individual and passive learning**
- 2. Considering critical issues under soft, relaxed and even amusing atmosphere**
- 3. Creating one's own view rather than just accepting expert's and/or disaster veteran's opinions**
- 4. Thinking deeper by trying to refine one's opinion to persuade others or not to be persuaded by others**

# What CORSSROAD realizes(2/3)



- 5. Mutual information sharing rather than one-way information flow**
- 6. Rethinking one's idea by facing the diversity of views and thoughts in free discussion with other participants**
- 7. Making consensus by collaborative thinking rather than unidirectional persuasion of a particular participant**
- 8. "Lesson", not in a simple proposition, such as "Do X in tsunami" or "Do X when Y," but in the form including conflict, contradiction, dilemma, compromise, and negotiation, to reflect "diversity" in a reality of evacuation, and to promote co-learning by a diverse stakeholders**

# What CORSSROAD realizes (3/3)



8. **Repeatable & continuing**; new and different findings when played with different members, even if you play the same episode repeatedly
9. **Dissemination power**; Identifying and formulating potentially-shared risk-related issues and concerns in a different community and/or in a different topic, with the same format (i.e. Crossroad format), to create new items (a different version) of Crossroad
10. **Active participatory learning**: Through this process, former players (passive learners) to become game facilitators and game co-creators (active investigators)

# For details

- Yamori, K. 2007. Disaster risk sense in Japan and gaming approach to risk communication. International Journal of Mass Emergencies and Disasters, 25, 101-131.
- Yamori, K. 2008 Narrative mode of thought in disaster damage reduction: A crossroad of narrative and gaming approach. In Sugiman, T., Gergen, K., Wagner, W., and Yamada, Y. (eds.) Meaning in action: Constructions, narratives and representations. p.241-252. Tokyo: Springer-Verlag.
- Yamori, K. 2010. Using games in community disaster prevention exercises. Group Decision and Negotiation, (Online, 19 January 2011), pp. 1-13
- Yamori, K. 2011 The roles and tasks of implementation science on disaster prevention and reduction knowledge and technology: From efficient application to collaborative generation. Journal of Integrated Disaster Risk Management, 1.

# An example: CROSSROAD gaming

You Are...  
City employee...

Although your house is half-collapsed after the earthquake, none of your family was injured fortunately. Public transportation system is stopped and it may take about 2-3 hours to the office.

Do you come to work?

Yes (To come to work)

OR

No (To stay home)

You Are...  
Citizen...

Some say that it is important to build a good relationship with the neighborhood as mutual help is necessary in face of disasters. Others say retrofitting housing is more important.

Do you put community above retrofitting?

Yes (Community first)

OR

No (Retrofitting first)

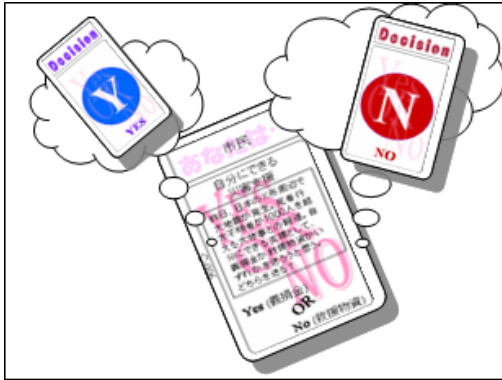
【Kobe1015】

【general2013】

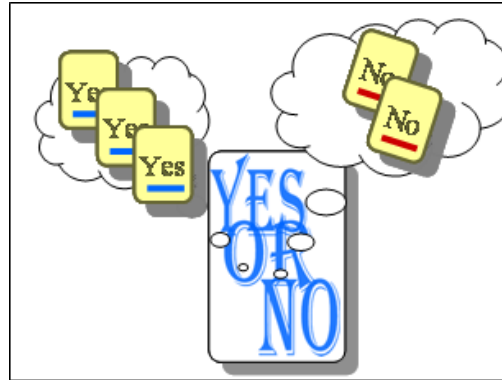
# Basic procedure of “Crossroad: Kobe”

## Procedure

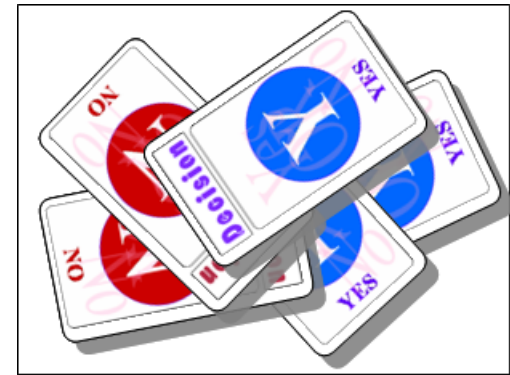
**1 Read episode and Make your choice - Yes or NO?**



**2 Disclose your choice by Yes or No card**



**3 Find out group result — Majority or minority?**



**4 Get game points based on the results**  
--- Majority : 1 normal point (a blue chip)  
--- Single Minority: 1 special point (a gold chip)

**5 Exchange views --- persuading others and/or persuaded by others, Also, writing down the reasons, grounds, and conditions for YES or NO attitude on the note**

**6 Learn basic info and listen to disaster veterans' talk**

# What is achieved by CROSSROAD

- Communicative survey is a research in which both a researcher and local people try to find a locally “viable solution,” not a universally “correct solution,” in a collaborative and participatory manner.
- Thus, communicative survey requires a new method/tool, different from a conventional one, to promote this type of research.
- A game type of disaster education tool, Crossroad, could be a possibility.
- CROSSROAD is a communicative tool, which regards a society
  - NOT as a world in which a unique correct solution is identified by privileged persons, such as a professional scientist, an influential politician, or an talented administrative government officer, for example,
  - BUT as a debatable, conflicting, and dilemmatic world, and thus, a world where multiple “viable solutions” can coexist.
- CROSSROAD makes full use of OTHERs (game participants) as functionally equivalent to the unpredicted, unknown, unfamiliar, and unexpected future risk, since only OTHERs can discover “blind sides” of a current “viable solutions.”