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Risk Assessment for Community Resilience in Viet Nam

Submitted by: UNDP

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Workshop on Improving Global Supply Chain Resilience: Advancing the Seven APEC Principles in Your Organization
Christchurch, New Zealand
26-28 March 2014

Risk assessment for community resilience in Vietnam

Hazard assessment mapping: Comprehensive and sectoral approach

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APEC Workshop on Improving Global Supply Chain Resilience
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2 – Hazard mapping Approaches, Procedures, Results

- Integrated/Comprehensive risk assessment
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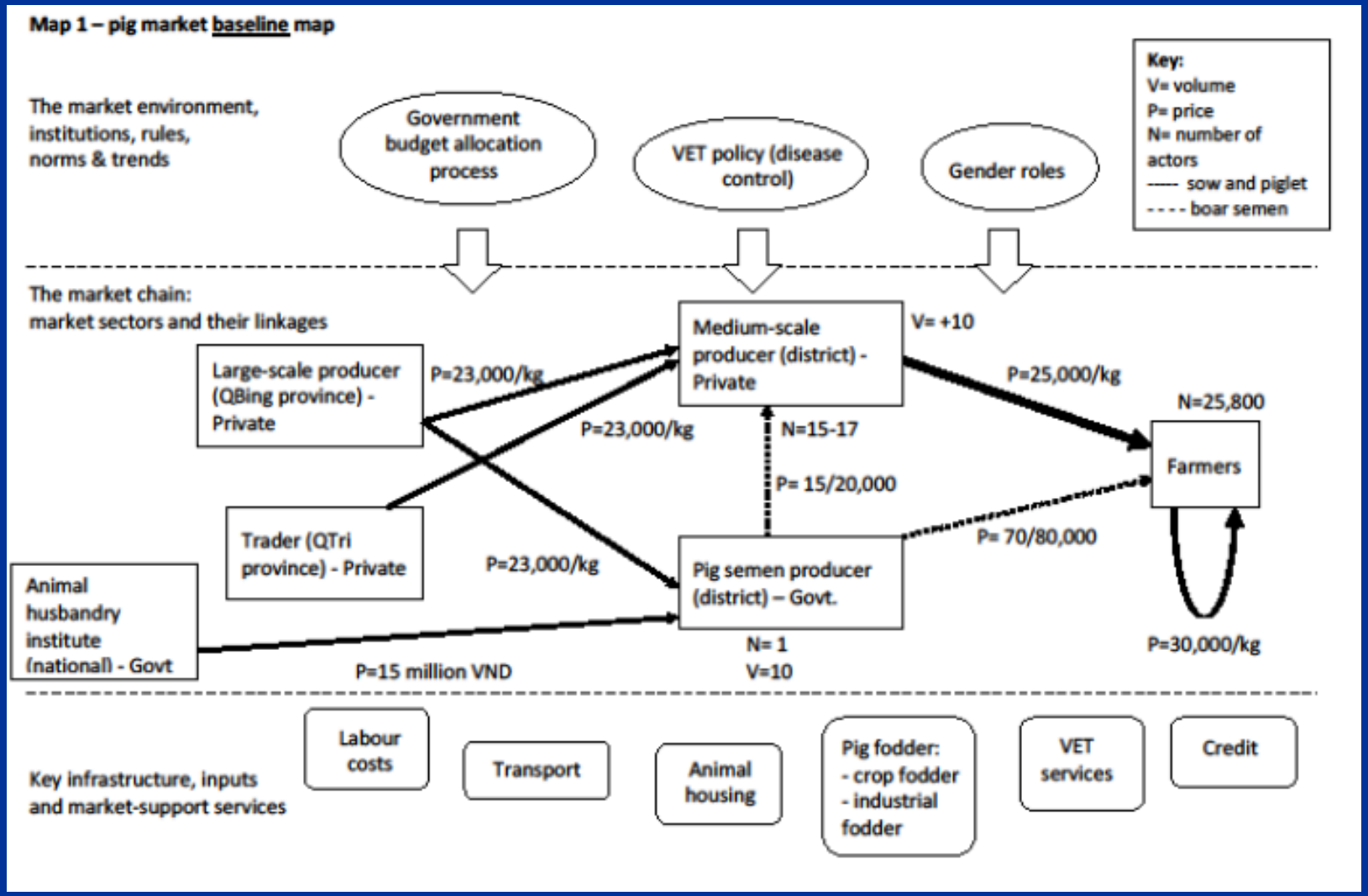
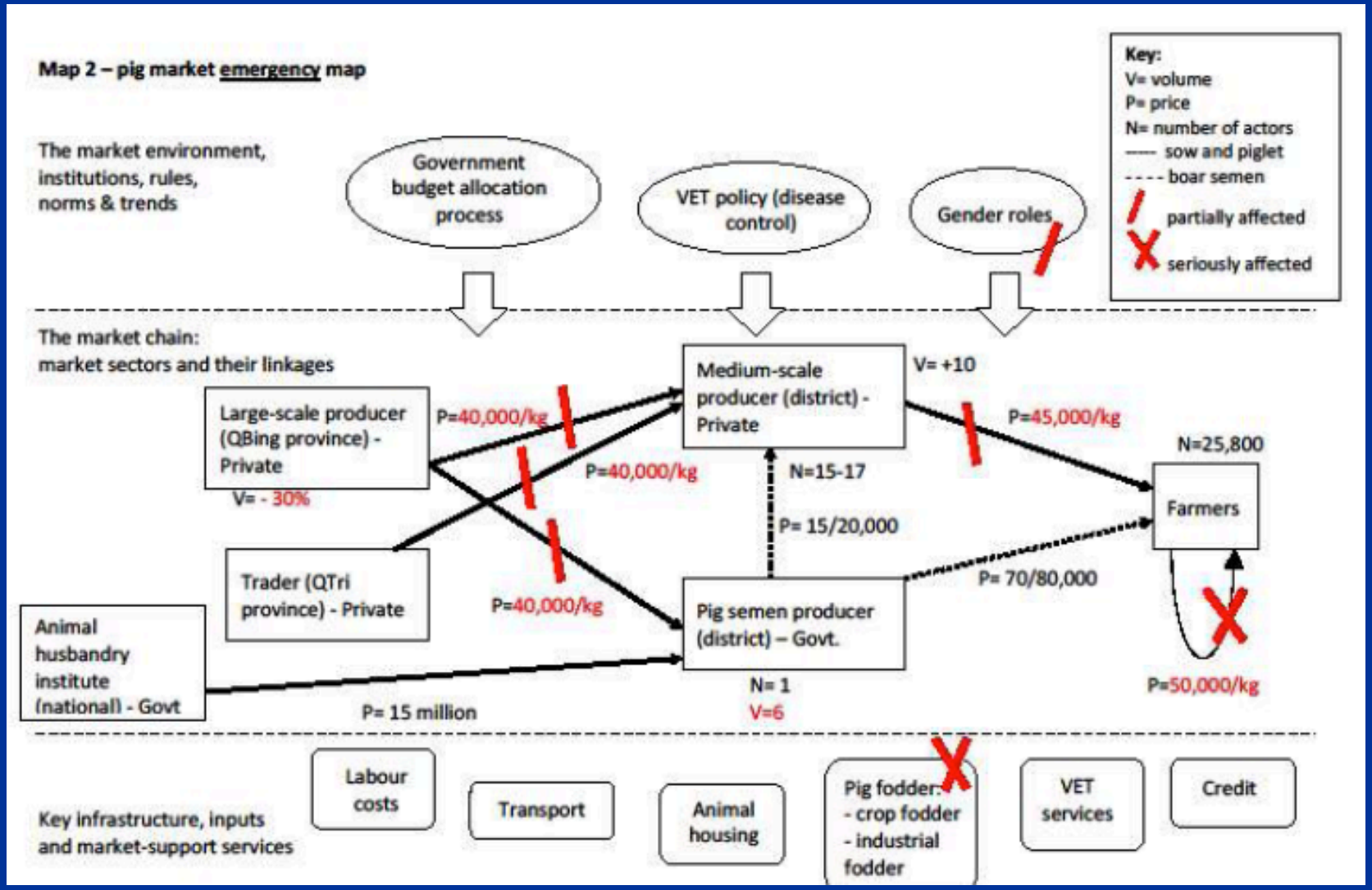
CONTEXT



Pig Market Emergency Market Mapping in Le Thuy District, Quang Binh, BEFORE consecutive floods in Oct 2010. UNDP/DMC/Oxfam (2010)

CONTEXT



Pig Market Emergency Market Mapping in Le Thuy District, Quang Binh, AFTER consecutive floods in Oct 2010. UNDP/DMC/Oxfam (2010)

CONTEXT

Average of 6-8 typhoons. Extreme rainfalls and floodings likely increase, especially risk of flashfloods/landslides

High cost of annual loss:

- *Annually 445 human casualties.*
- *Average annual GDP (PPP) losses of USD 1.8 b (in PPP) ~ 1.2 % GDP*

Increasing infrastructure exposures to CC as Government emphasis on structural measures

- *Transportation infra. often damaged , e.g. 2001-2005, extreme events cost VND 2,571 b.*
- *Over 10,600km of 6-9m high river dykes ; 2,600km of 3.5-5m high sea dykes*
- *If 1m SLR, 11,000 km of roads submerged. Total domestic highways inundation 695 km (Mekong Delta alone 495 km), without measures taken*

RATIONAL

- Detect hazards & CC and disaster risks;
- Understand traditional coping strategies & response mechanisms
- Identify options and logic to responses and adapt to impacts with consciousness of time, resources,
- Long-term than corrective actions
- A systematic, objective, rigorous methodology
- Viable and practical for decision making

HAZARD Mapping and Risk Assesment

- Case 1 - Integrated/Comprehensive

  Identify ~ 6,000/11,100 communes at most risks to natural hazards in 63 provinces for Government Program on CBDRM until 2020

- *Case 2 – Sectoral/Sub-regional*

  Practical assessment to underpin the policy and decision-making framework for climate resilient infrastructure development in Northern Vietnam

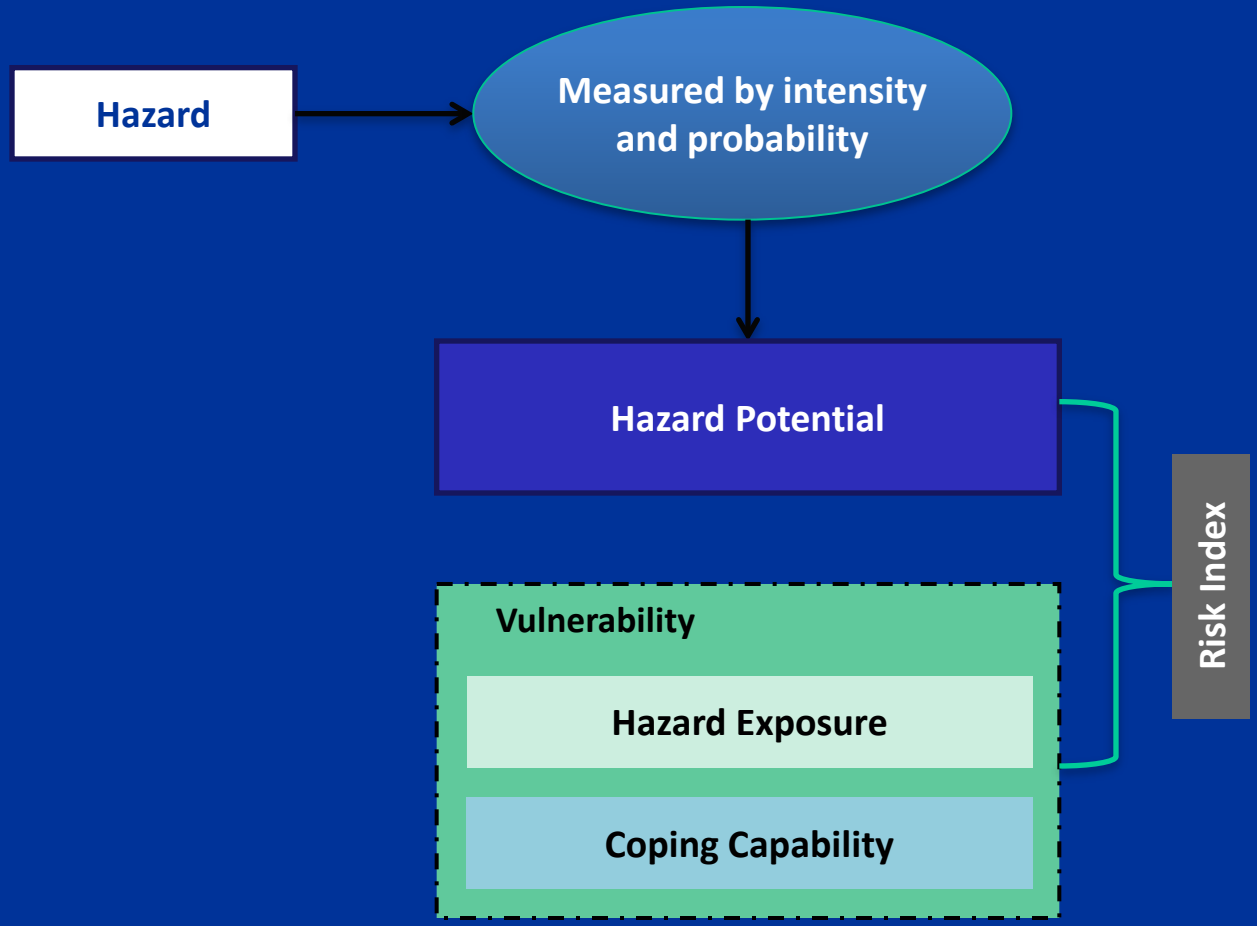
Concepts

IPCC 1995, 2001, 2007

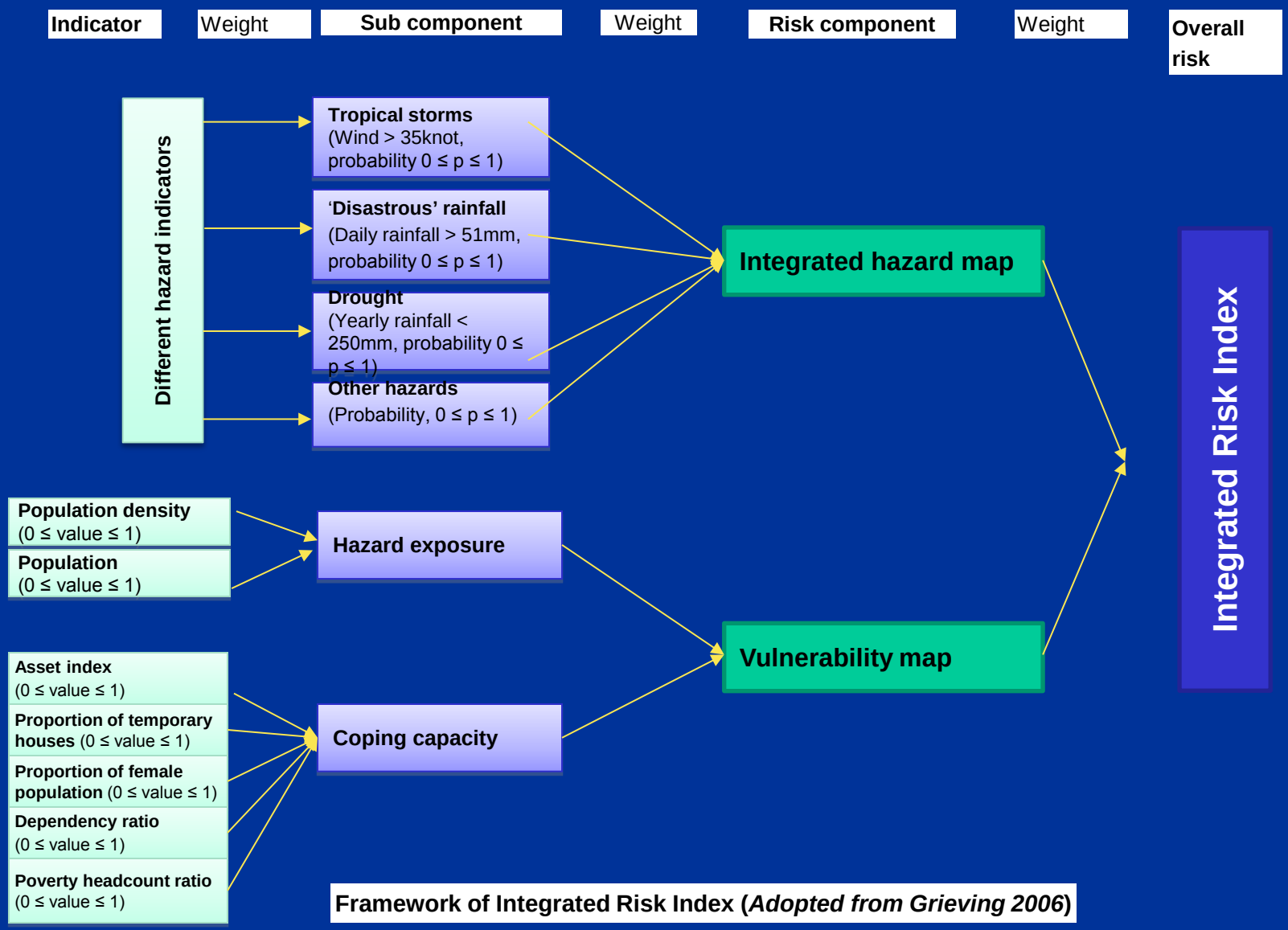
Disaster Risk is f (vulnerability, hazards, exposures)

Methodology

Natural Disaster Risk Index suggested by Greiving (2006)



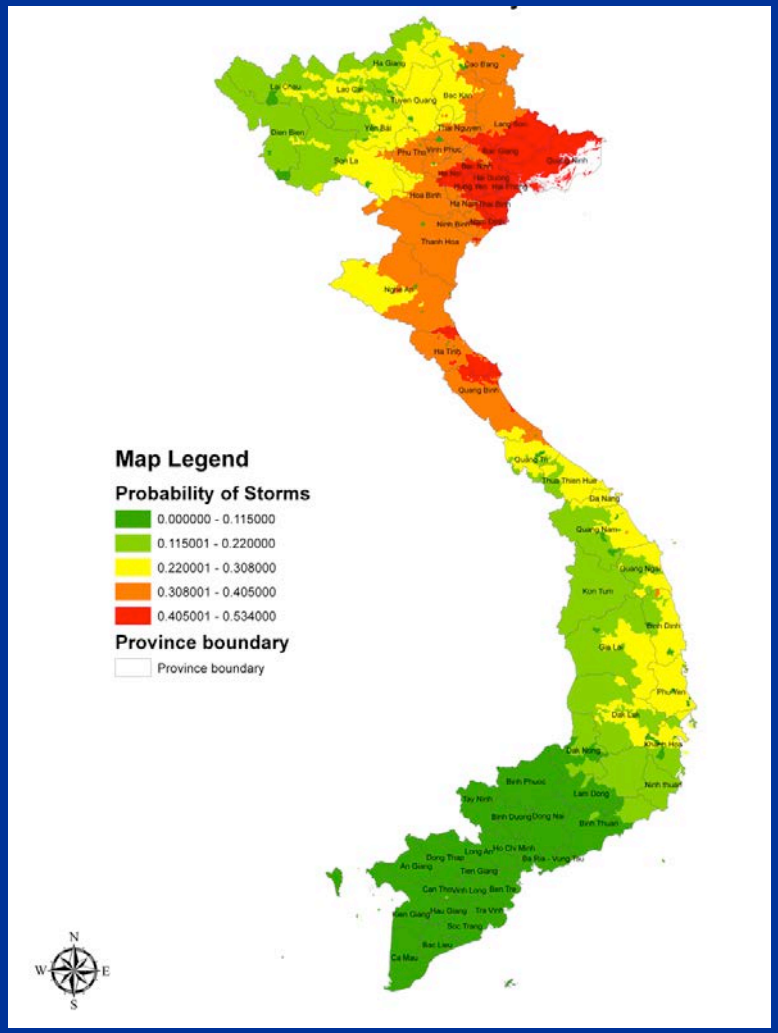
CASE 1-Select 6000 high disaster risk communes



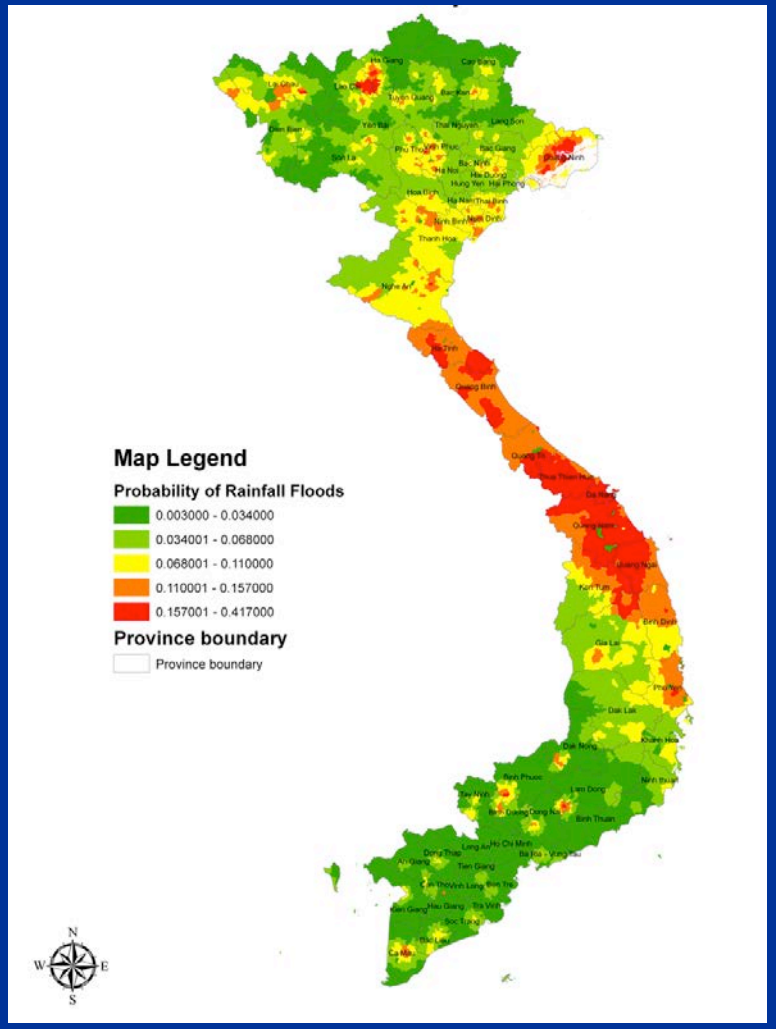
Framework of Integrated Risk Index (*Adopted from Grieving 2006*)

Results

Probability of Storm



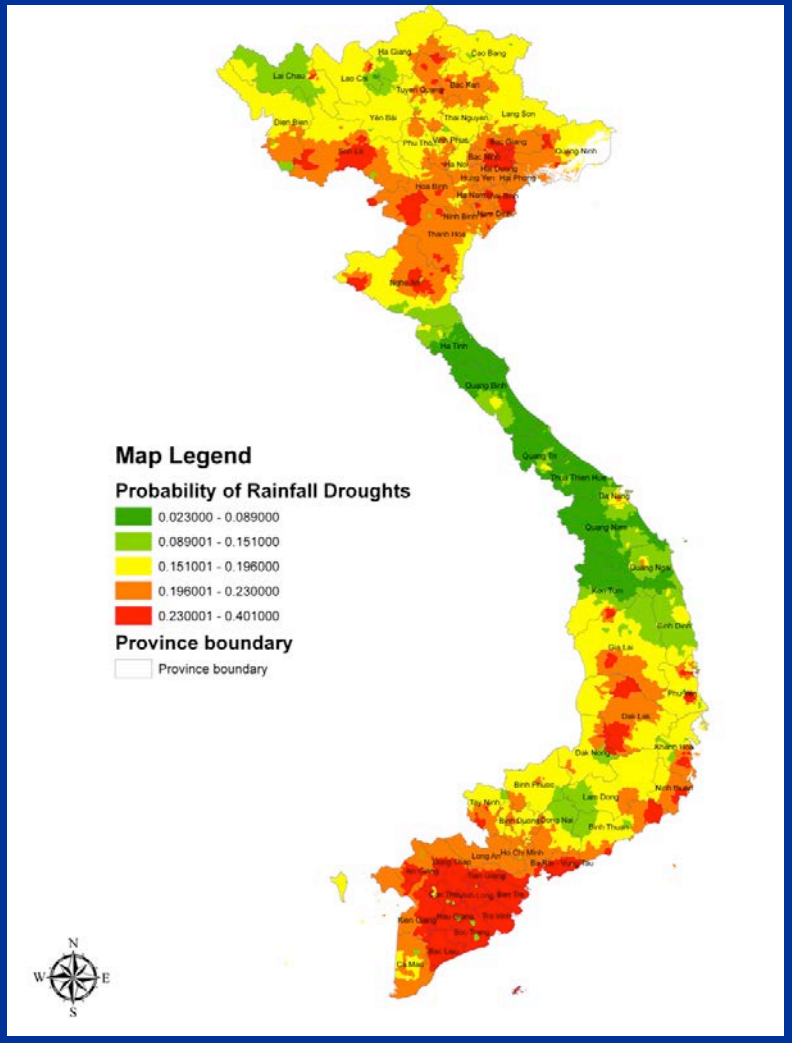
Probability of Rainfall Flood



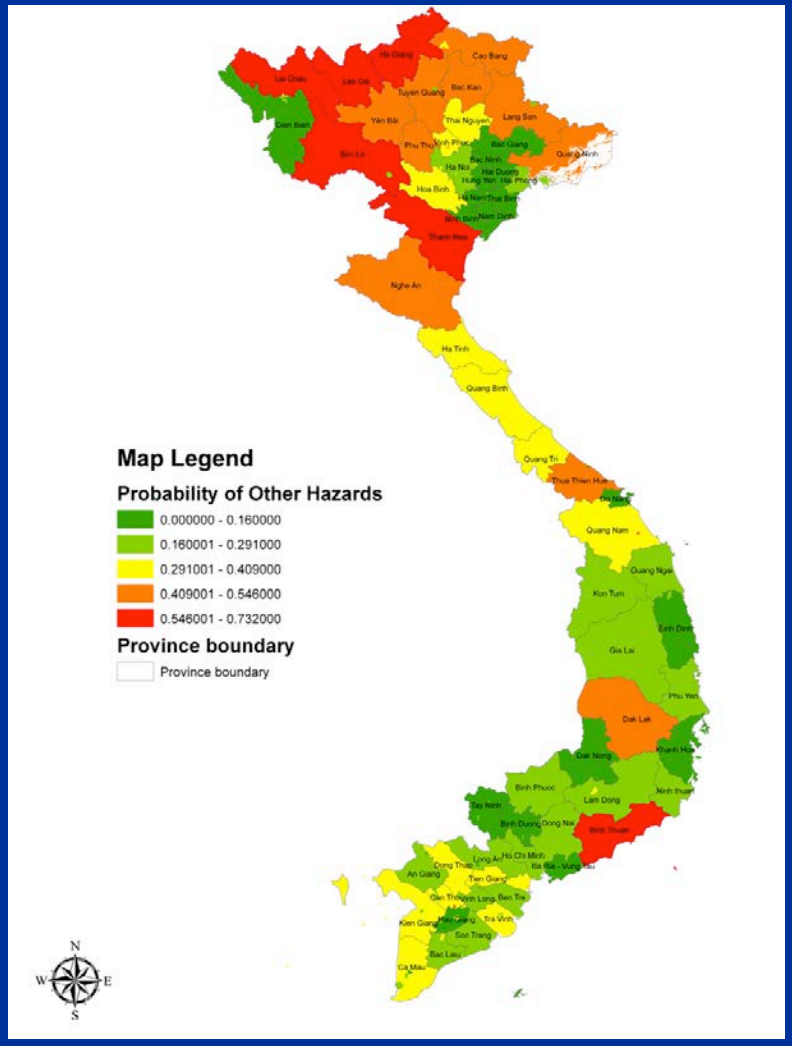
NB: the map represent the available data only, not the administrative illustration

Results

Probability of Rainfall Drought



Probability of other Hazards



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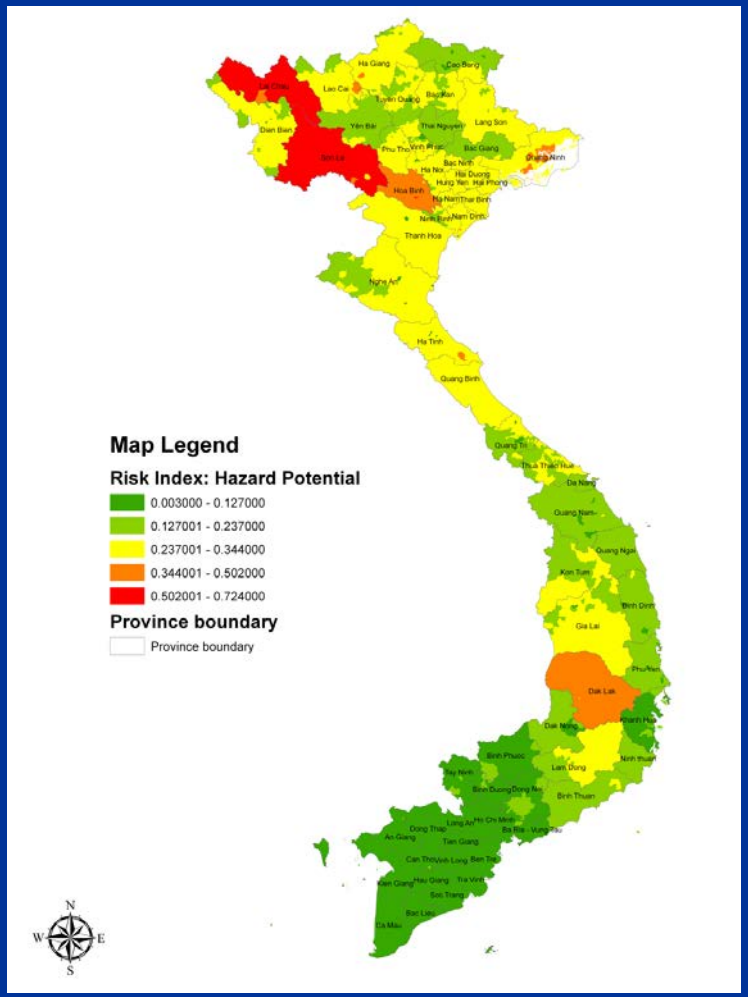
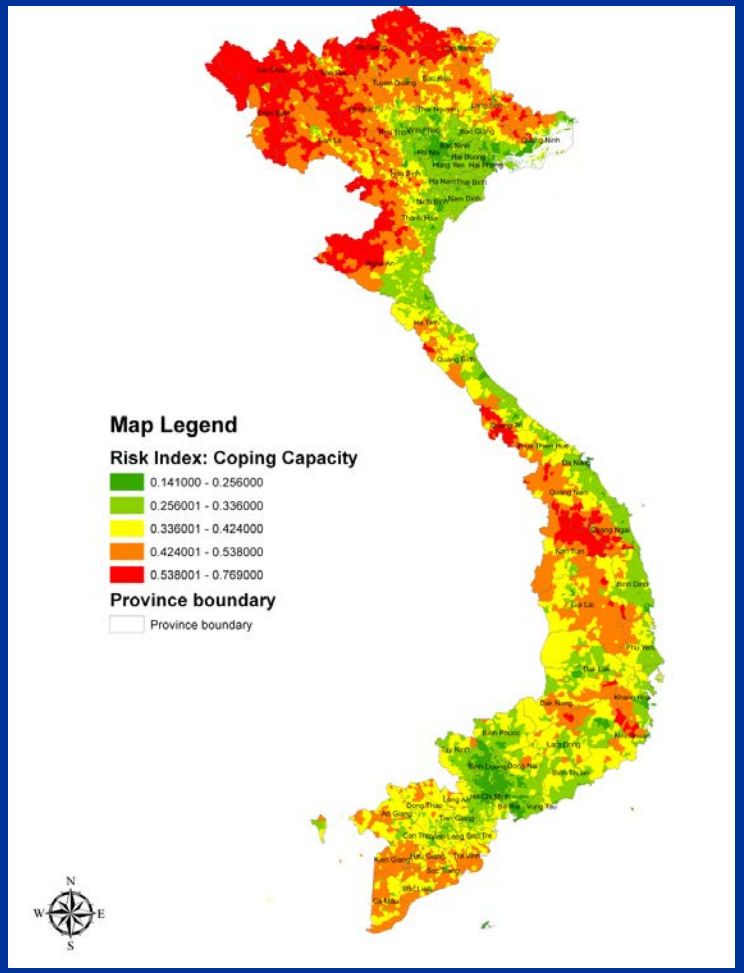
Results

Hazard potential



Coping Capacity



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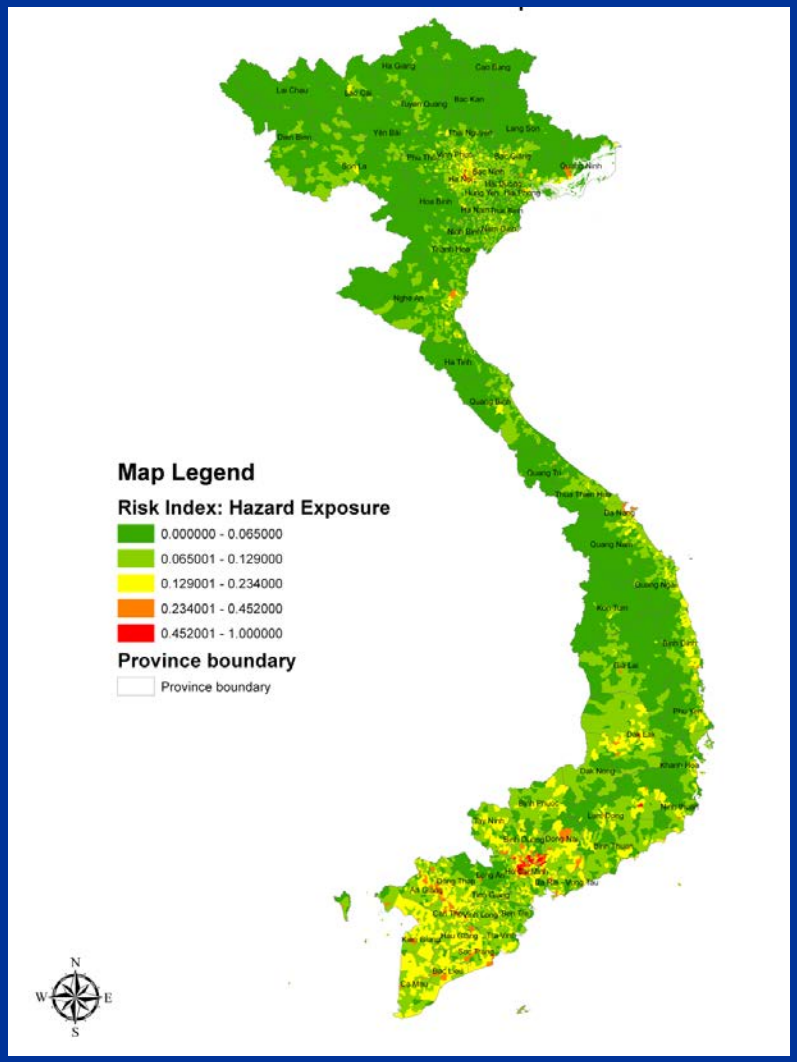
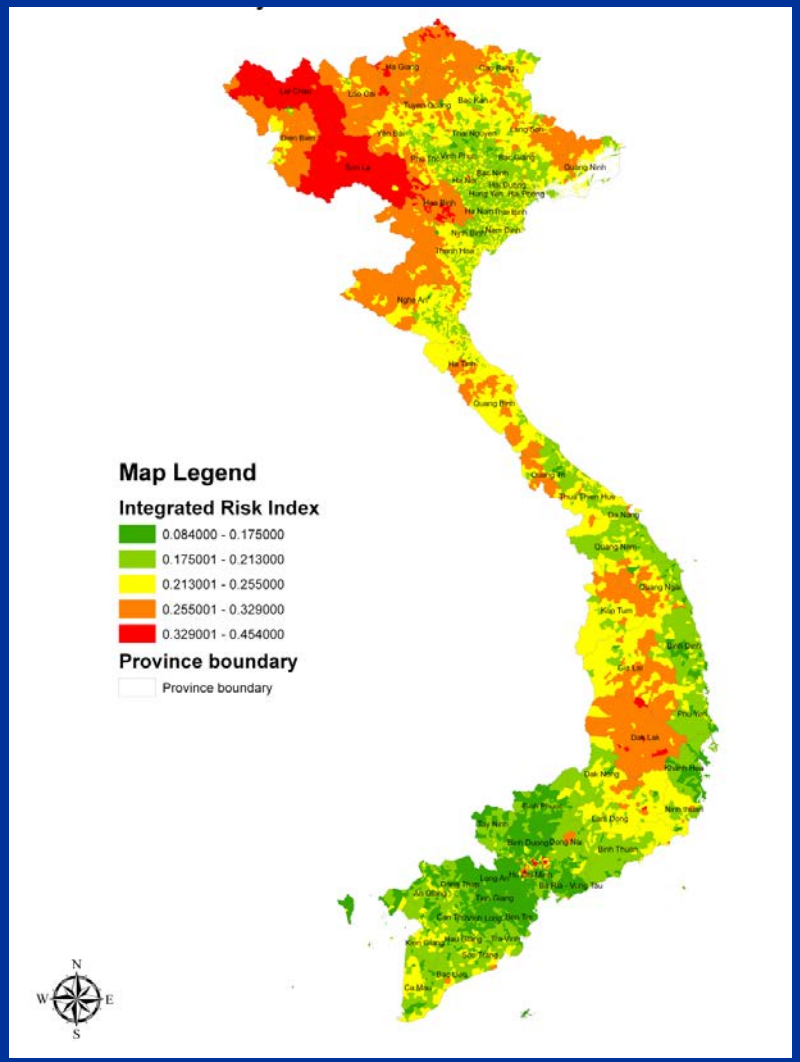
Results

Hazard Exposure



Integrated Risk Index



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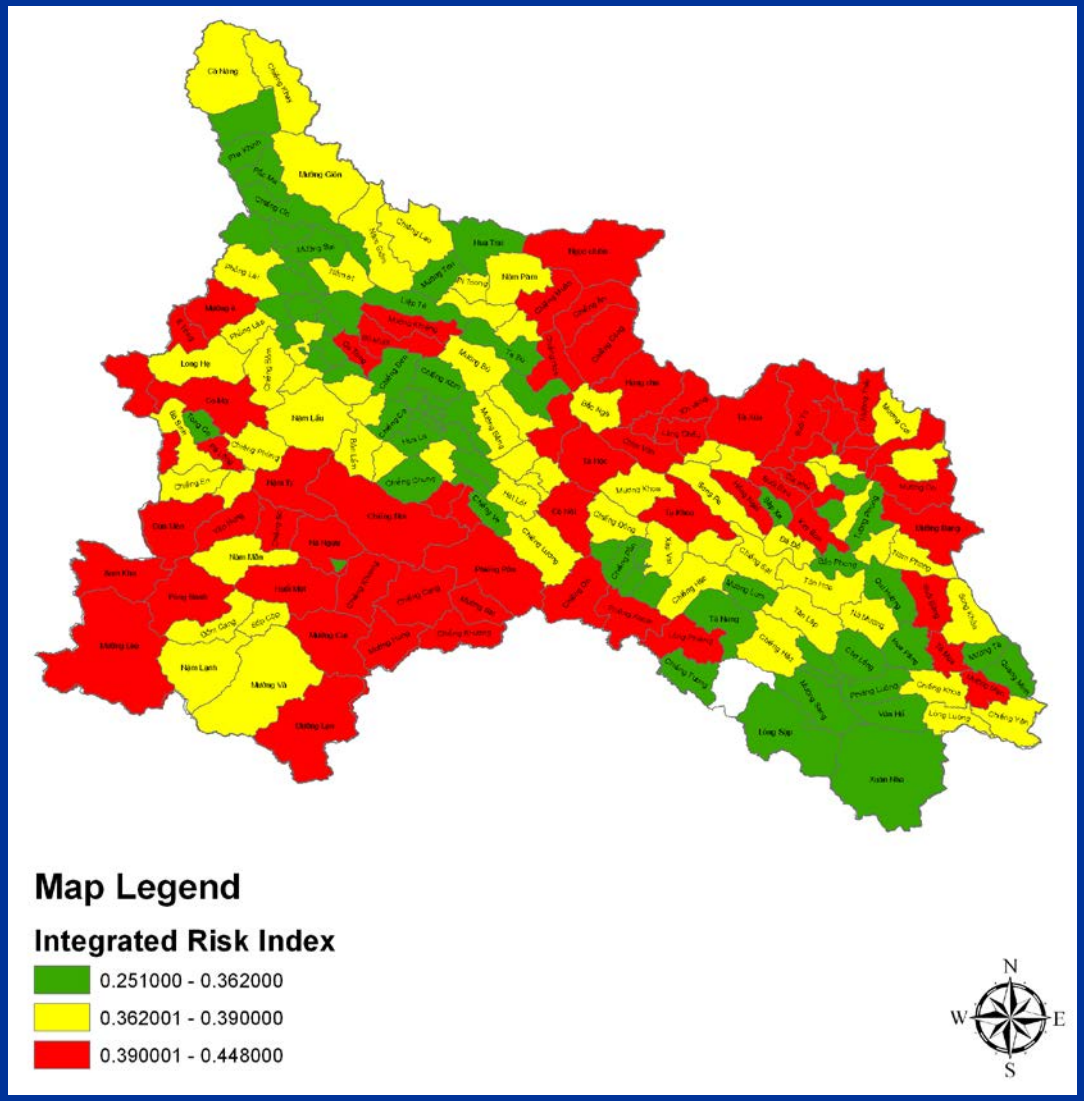
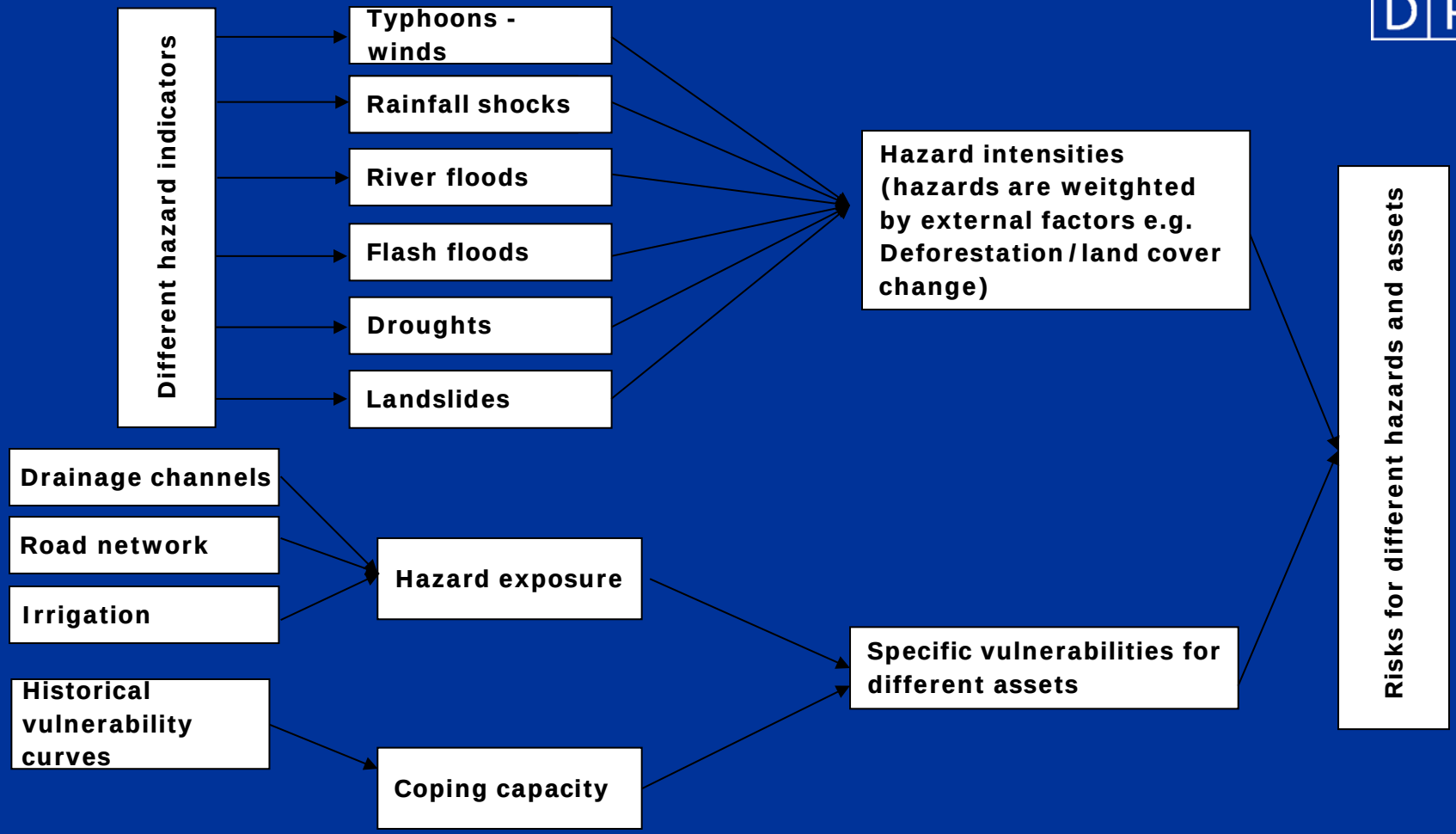
Results – Disaster Risk Index in Son La (North Upland)



Case 2 - Climate risk assessment of rural infrastructures in Northern Vietnam



Climate risk and vulnerability of rural infrastrucures in Northern Vietnam

PROCEDURE – On-going

1 - Hazard assessment and mapping

- *Focus on landslides, flashfloods, droughts and strong winds,*
- *Considering earthquakes and cyclones if avail*
- *Collect historical hazard: Spatial extent affected by hazards; Duration of impact; estimate intensity and frequency distribution of all hazard*
- *Identify hazards need to be specifically modeled e.g. flashfloods and droughts*

Expected outputs

- *GIS maps and tables detailing historical events;*
- *GIS-based maps for individual hazards,*
- *Detailing climatological means, model-based estimates, and expected return periods?*

PROCEDURE – on-going

2 - Exposure assessment:

- *Exposure data related to roads, irrigation systems; consider some other socio-economic assets (project focus)*
- *Collect asset exposure and socio-economic data including attribute data*
- *Collect info. future plan developments of the infrastructures,*
- *Develop exposure information in GIS form in pilot provinces.*
- *Verify data through site visits and/or other secondary*

3 - Vulnerability assessment

- *Spatially and statistically combine the hazard and exposure data*
- *Identify those areas most vulnerable to existing hazards.*
- *Can be repeated for future modeled hazards if same format/content*

Some reflections

- The assessment framework has potential to apply in practices
- Hazard mapping is only initial step for solutions/options.
- The complementary results of “sector” versus “multi-sectoral” assessment
- Often disaster risks are the concerns of many sector, but in practices, often it fall under one-single sector
- Hazard mapping should equally mindful of who are protected behinds the infrastructure and their adaptive capacities (e.g. company business contingency plan; farmers’ migration in flood seasons; etc.),
- Opportunity for build-back-better than corrective investments – e.g. extreme design figures and built codes

Thank you very much!