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3rd Asia-Pacific Climate Change Adaptation Forum

Panel 2.2: Capacity building for local adaptation planning

Assessing vulnerability and building capacity for adaptation: The case study of the Mekong delta

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Outline

- Introduction
- Vulnerability in the Mekong delta
- Field survey of perceptions
- Concluding remarks
 - Dual approach for adaptation
 - Capacity building

Introduction

- The Mekong delta in Vietnam is expected to face challenges from various forms of climate change such impacts as sea level rise, storm surge, flooding, etc.
- A growing population, which currently stands at 18.7 million (**22% of Vietnam's POP**) people lives in the Mekong Delta.
 - The most significant barriers to implementing adaptation measures are the lack of recognition among policy makers, insufficient data and scientific basis for taking adaptation decisions, and the lack of sufficient financial and human resources.
- This study conducts vulnerability assessment and perception survey about natural disasters in the Mekong delta.
 - **Scientific analysis vs. perception of local communities**
- It also discusses some roles of stakeholders for planning and implementing adaptation.

Vulnerability and resilience

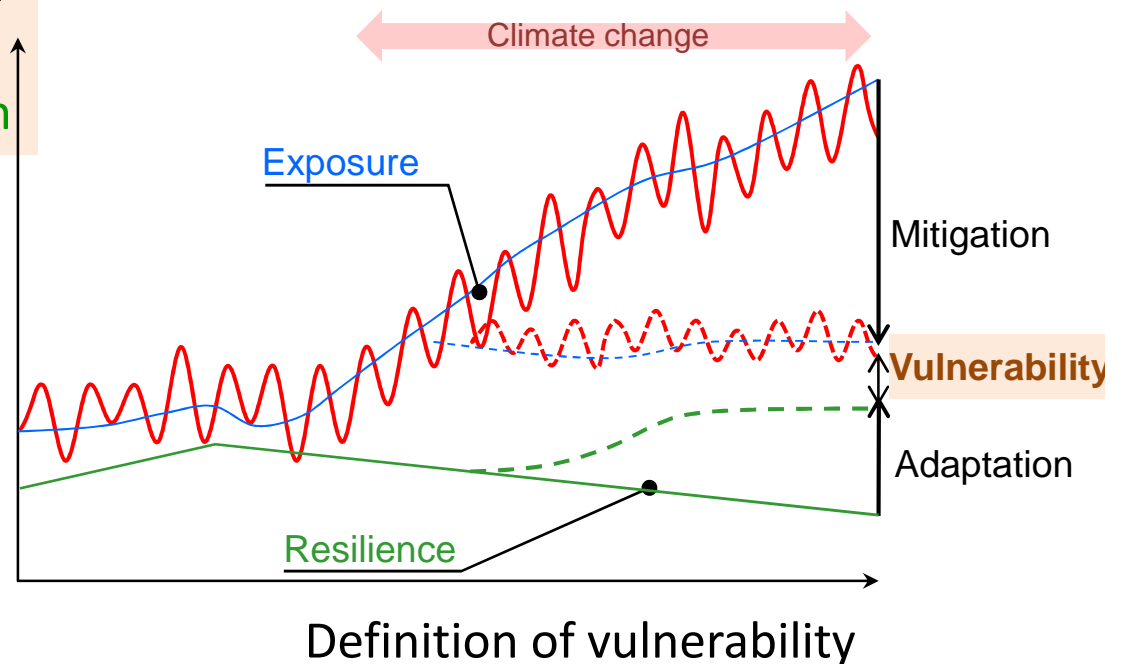
- Vulnerability

- Vulnerability is a function of exposure to climate factors and the resilience (sensitivity and adaptive capacity) to that change.

$$\text{Vulnerability} \equiv \frac{\text{Exposure}}{\text{Resilience}}$$

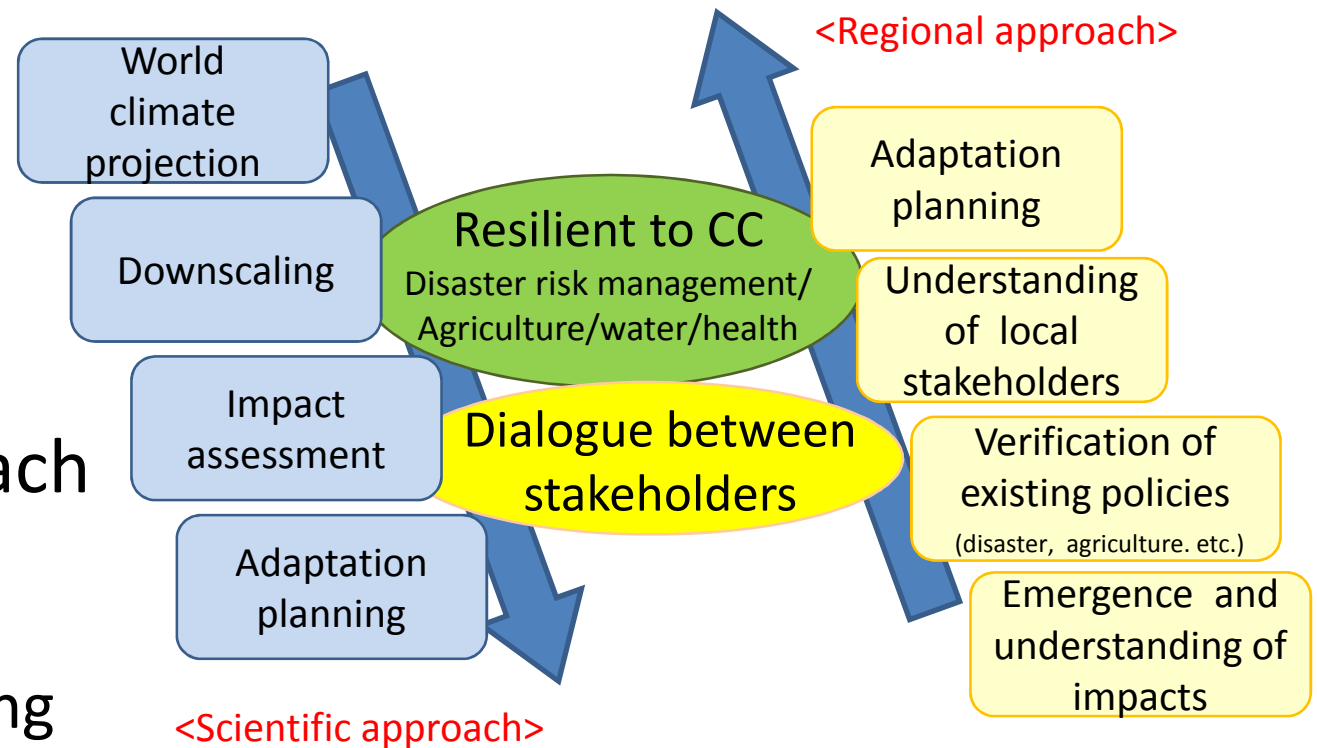
- ◆ Decrease the exposure=>Mitigation
- ◆ Given the exposure=>Adaptation
- ◆ Increase the resilience=>Adaptation

- Vulnerability assessment for climate change is one of the primary steps to **prioritize and verify the adaptation strategies.**



Dual approach for adaptation

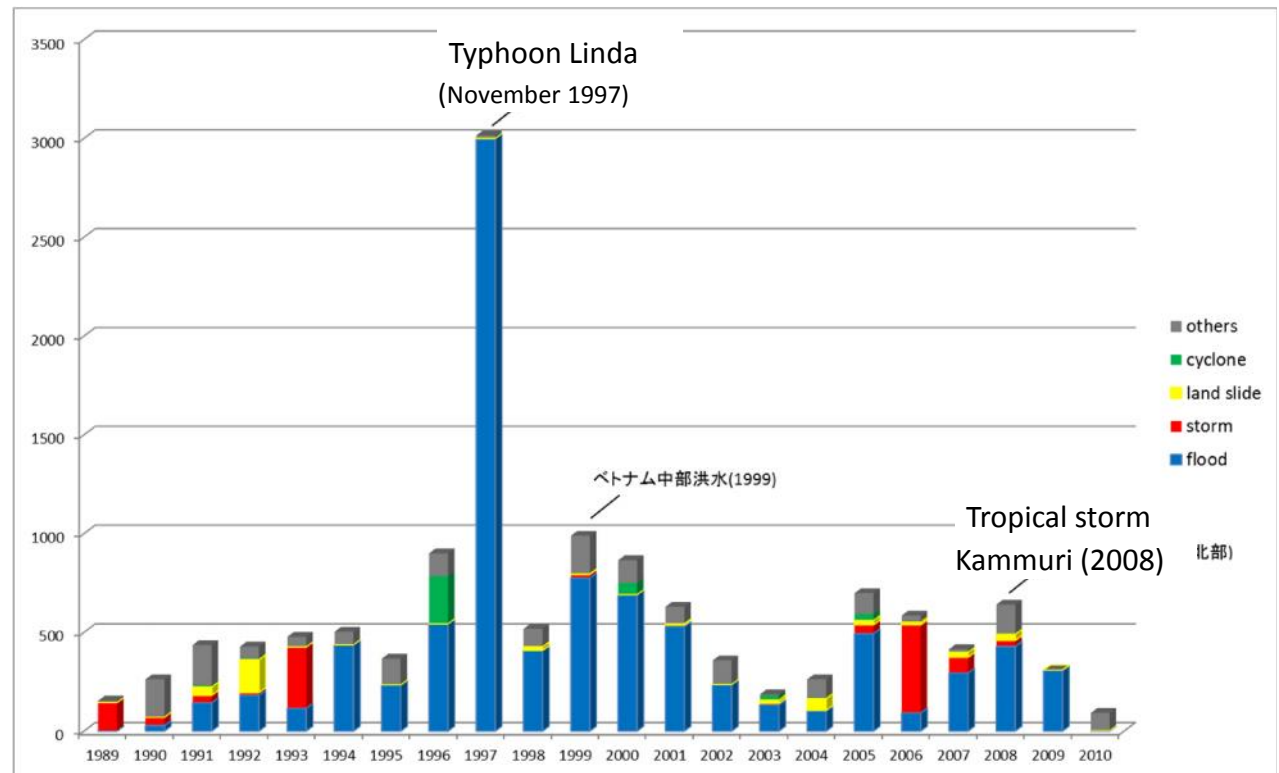
- Scientific approach
 - Projection, downscaling
 - Impact and vulnerability assessment
 - Adaptation planning
- Regional approach
 - Findings of impacts
 - Capacity building
 - Adaptation planning



Dual approach

Statistics(1)

- Flooding is 70% of dead/missing due to natural disasters in Vietnam
 - Total dead/missing is 9,941(1989-2010)
 - The Mekong delta is 35% of dead/missing in Vietnam

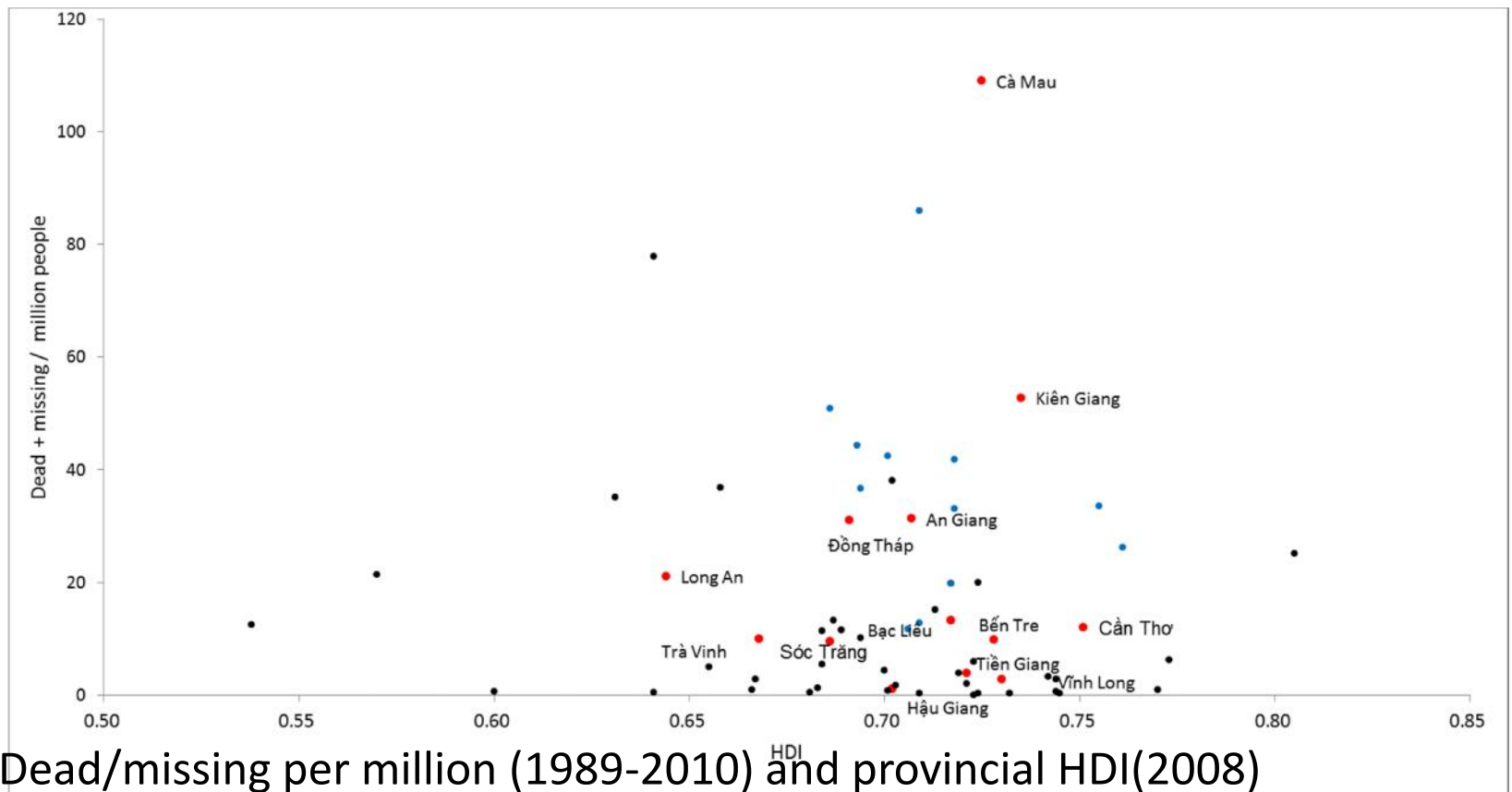


Dead/missing due to disasters in Vietnam(1989-2010)

Source) Desinventar

Statistics(2)

- No strong correlation between dead/missing of natural disasters and human development index (HDI), GDP, and etc.
 - Resilience (or adaptive capacity) cannot be quantified



Blue: Middle coast provinces, Red: Mekong's 13 provinces

Source) Desinventar, UNDP(2011)

Methodology for vulnerability assessment

- Integrated assessment

$$V_i = \sum w_i \cdot Z_{ij}$$

The higher the indicator is,
the more vulnerable

$$Z_{ij} = \frac{X_{ij} - X_i^{Min}}{X_i^{Max} - X_i^{Min}}$$

The higher the indicator is,
the less vulnerable

$$Z_{ij} = 1 - \frac{X_{ij} - X_i^{Min}}{X_i^{Max} - X_i^{Min}}$$

- Z_{ij} Standardized indicator of type i of region j
- X_{ij} Unstandardized indicator of type i of region j
- X_i^{Max} Maximum value of the indicator over region j
- X_i^{Min} Minimum value of the indicator over region j
- V_j Vulnerability over region j
- w_i Weight of each indicator

- Physical vul.: SLR, natural disasters
- Social vul: population, poverty

Inputs for VA

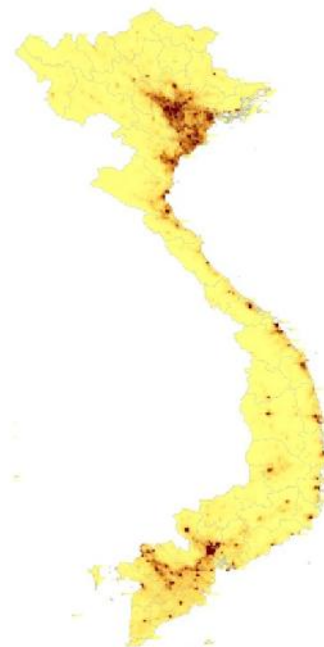
- SLR and population density in 2100 are originally estimated/downscaled
 - Numerical simulation on SLR(Nobuoka, 2013)
 - Population projection in 5km mesh downscaling (Kinoshita, 2013)



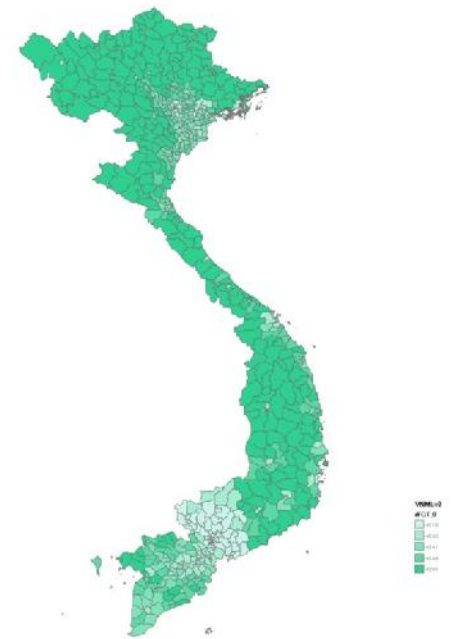
Natural disasters (1989-2010): Desinventar



SLR48cm(A1B) in 2100:
Our study



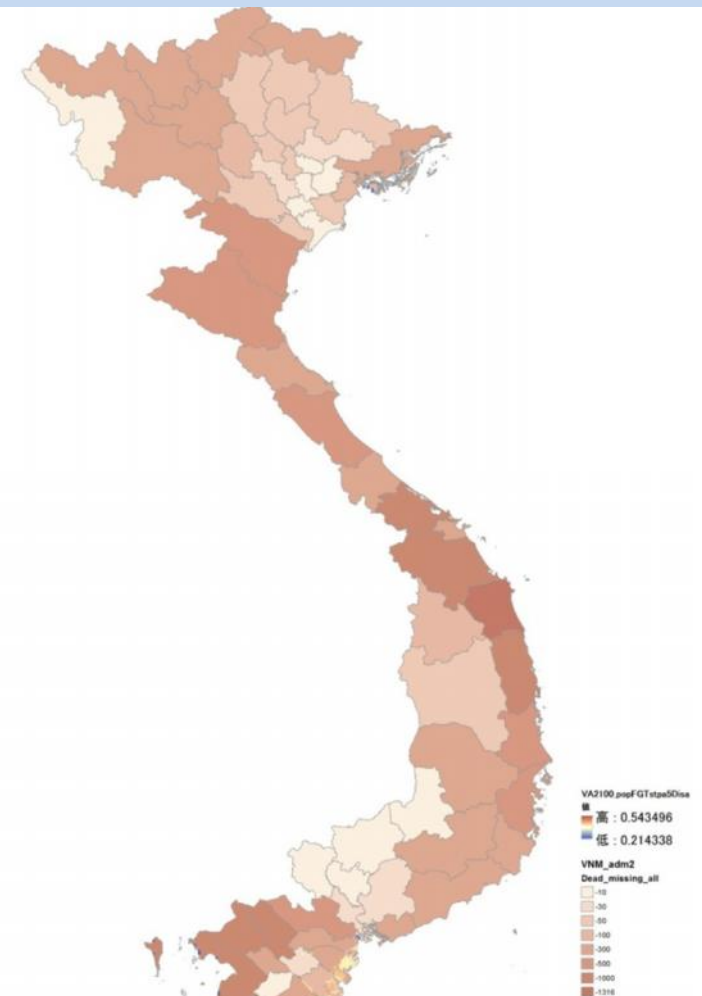
Population in 2100:
Our study



Poverty (headcount index): CIESIN

Vulnerability in the Vietnam

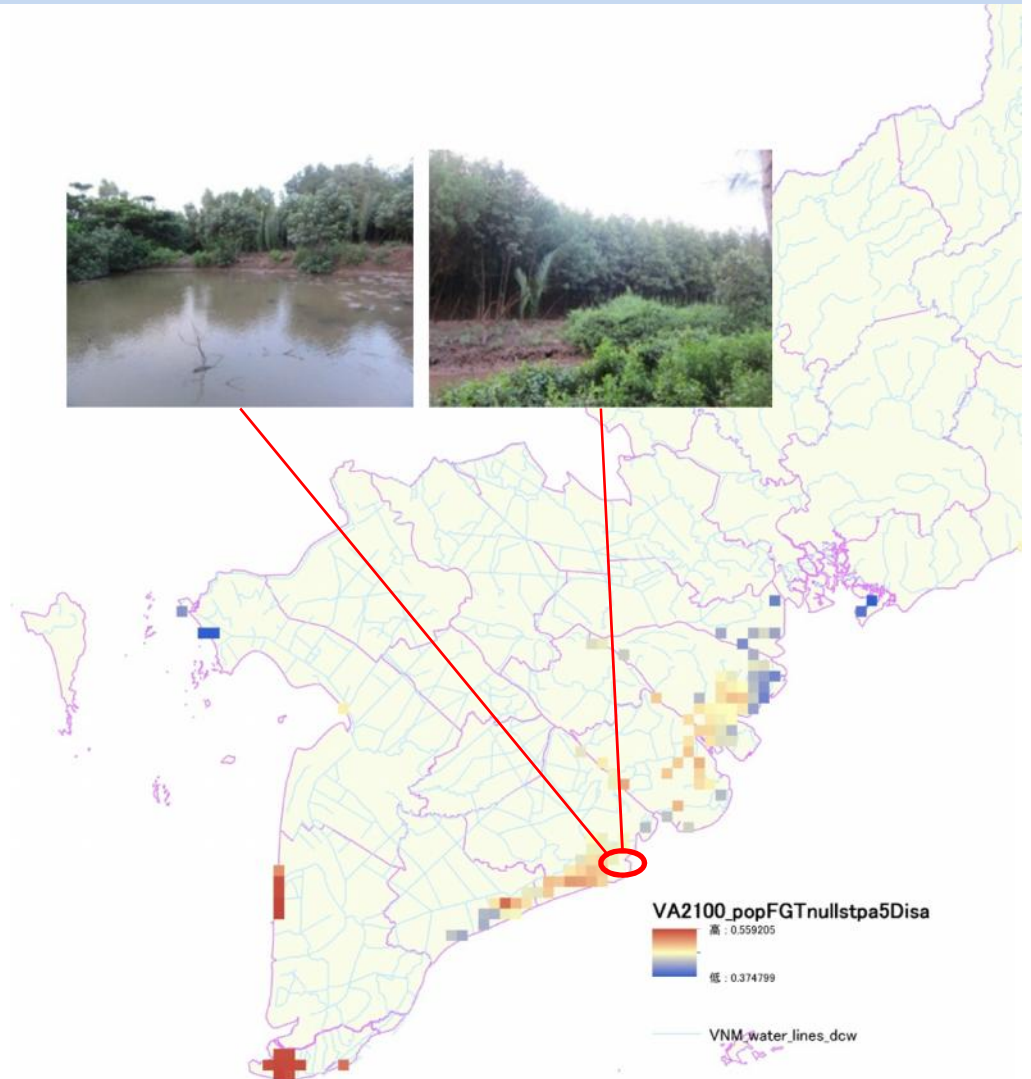
- The vulnerable areas due to physical and social conditions are identified
 - Social vulnerabilities
 - Population
 - Vietnam:
87M(2010)=>103M(2050)=>82M(2100)
 - Mekong:
18.7M(2010, 22%) =>25M(2050, 25%)
=>24M(2100, 29%)
 - Poverty
 - Resilience is not considered
 - No strong correlation between damage of natural disasters and HDI...



Vulnerability assessment in Vietnam
2100 pop.+ poverty + SLR(stpa5) +disaster
history

Vulnerability in the Mekong delta

- The vulnerable areas due to SLR and social conditions are identified
 - Ca Mau, Soc Trang, Bac Lieu

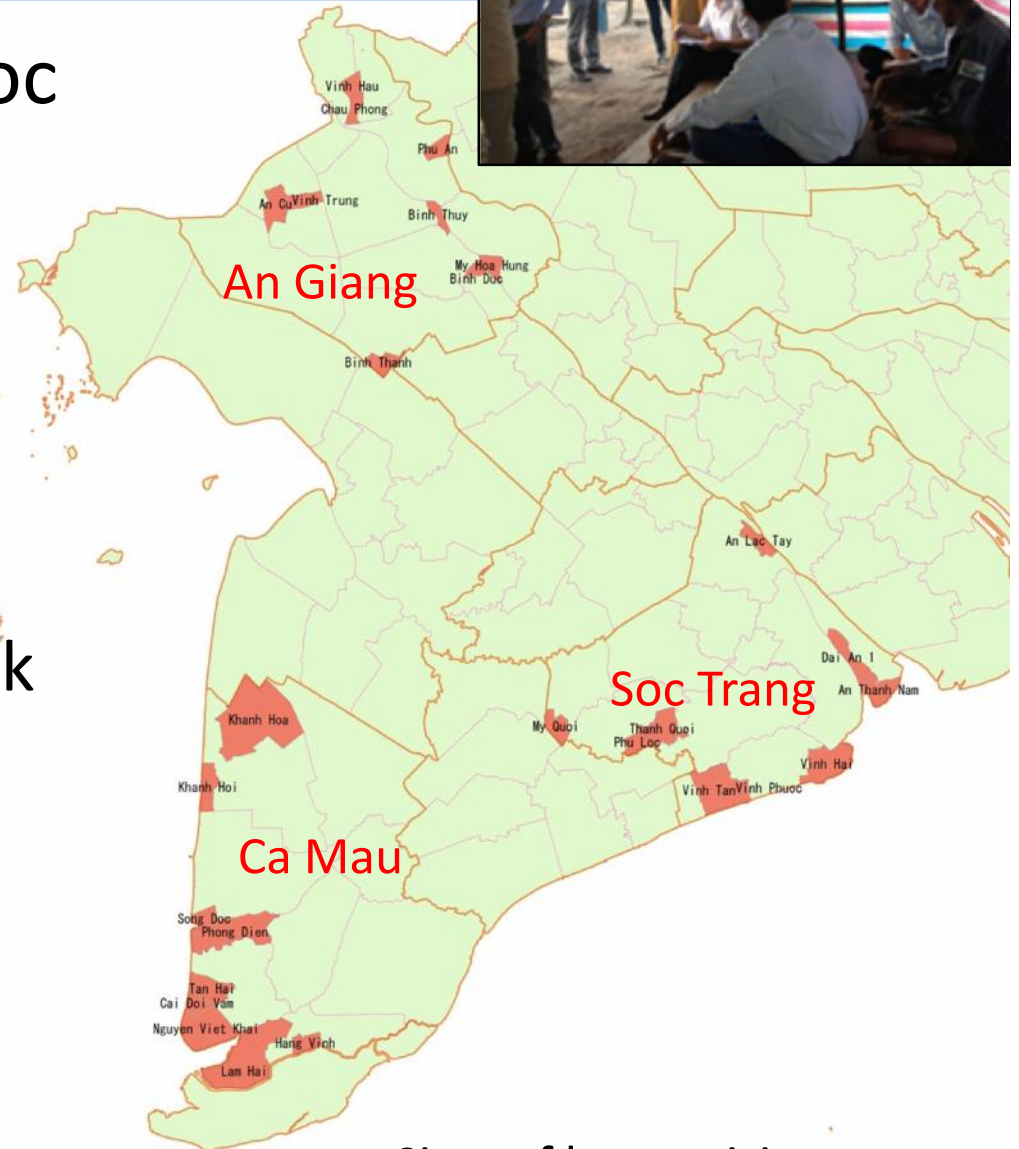


Vulnerability assessment

2100 pop. dens.+ poverty + SLR (stpa5) +disaster history

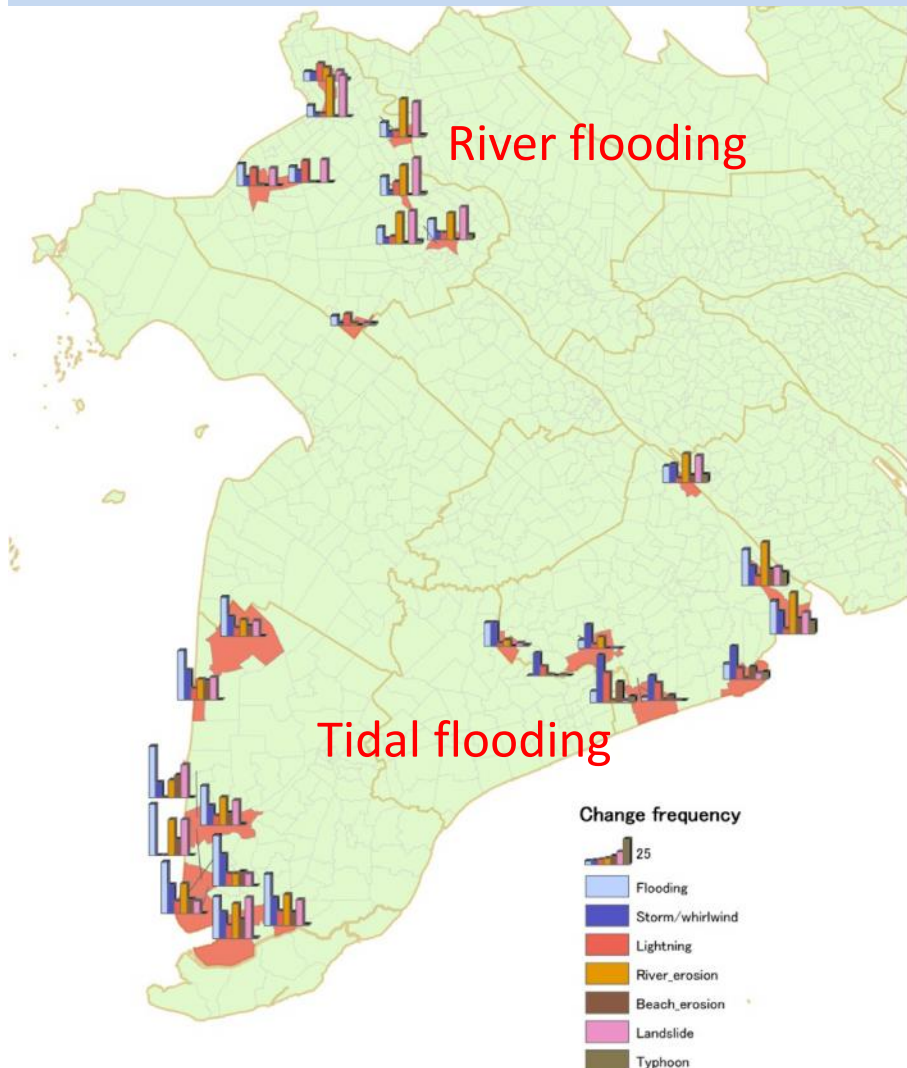
Field survey of perceptions and adaptation

- 2012.11-12 Ca Mau, Soc Trang, An Giang
 - 1350 respondents from 27 wards (9 wards * 3 provinces * 50 residents)
 - Perception and adaptation of climate risk (home visit surveys)
 - Co-work with Water Resource University (WRU) in Vietnam

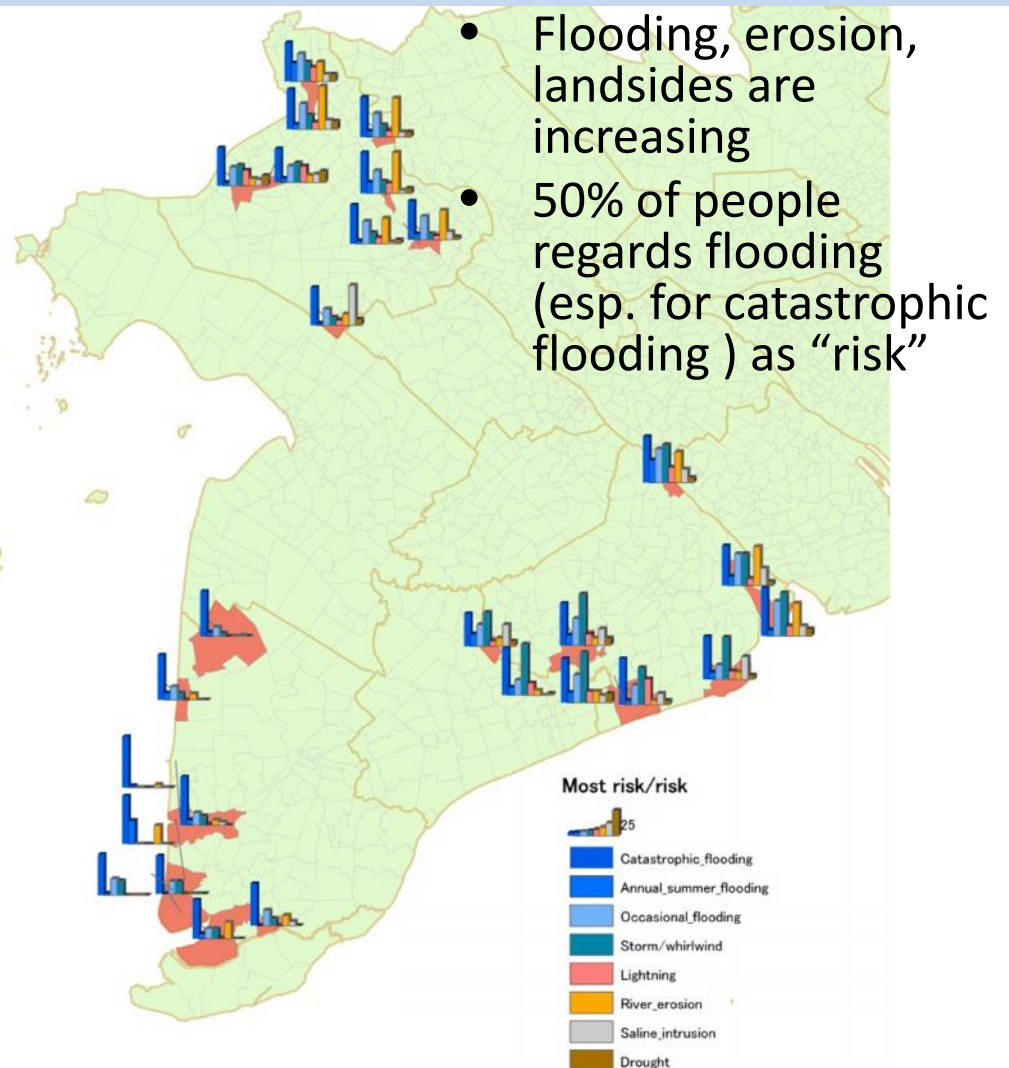


Sites of home visit surveys

Observations & perceptions



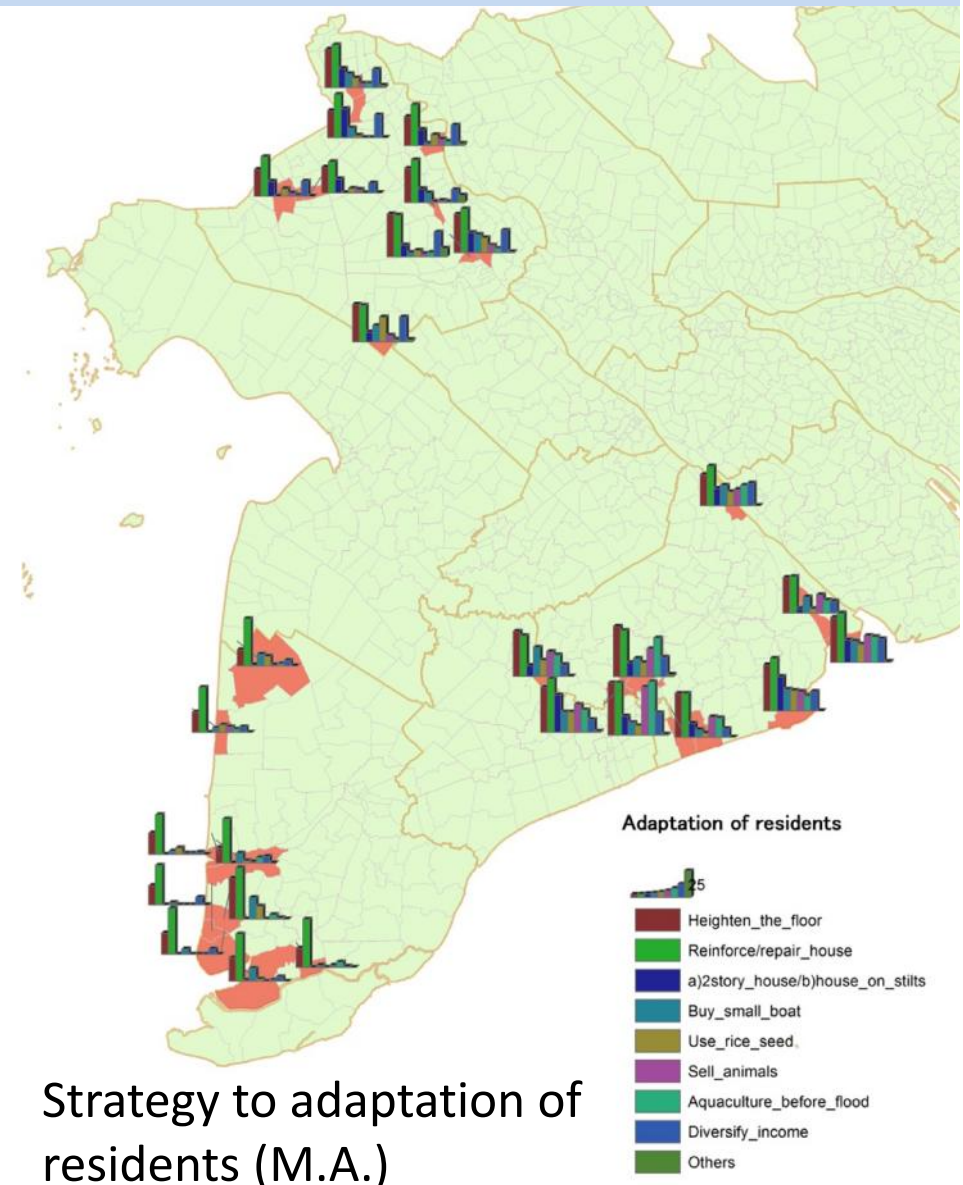
Average change over last decade
- Increase in frequency



The disaster which is perceived as "Most risk" or "Risk"(M.A.)

Adaptation of residents

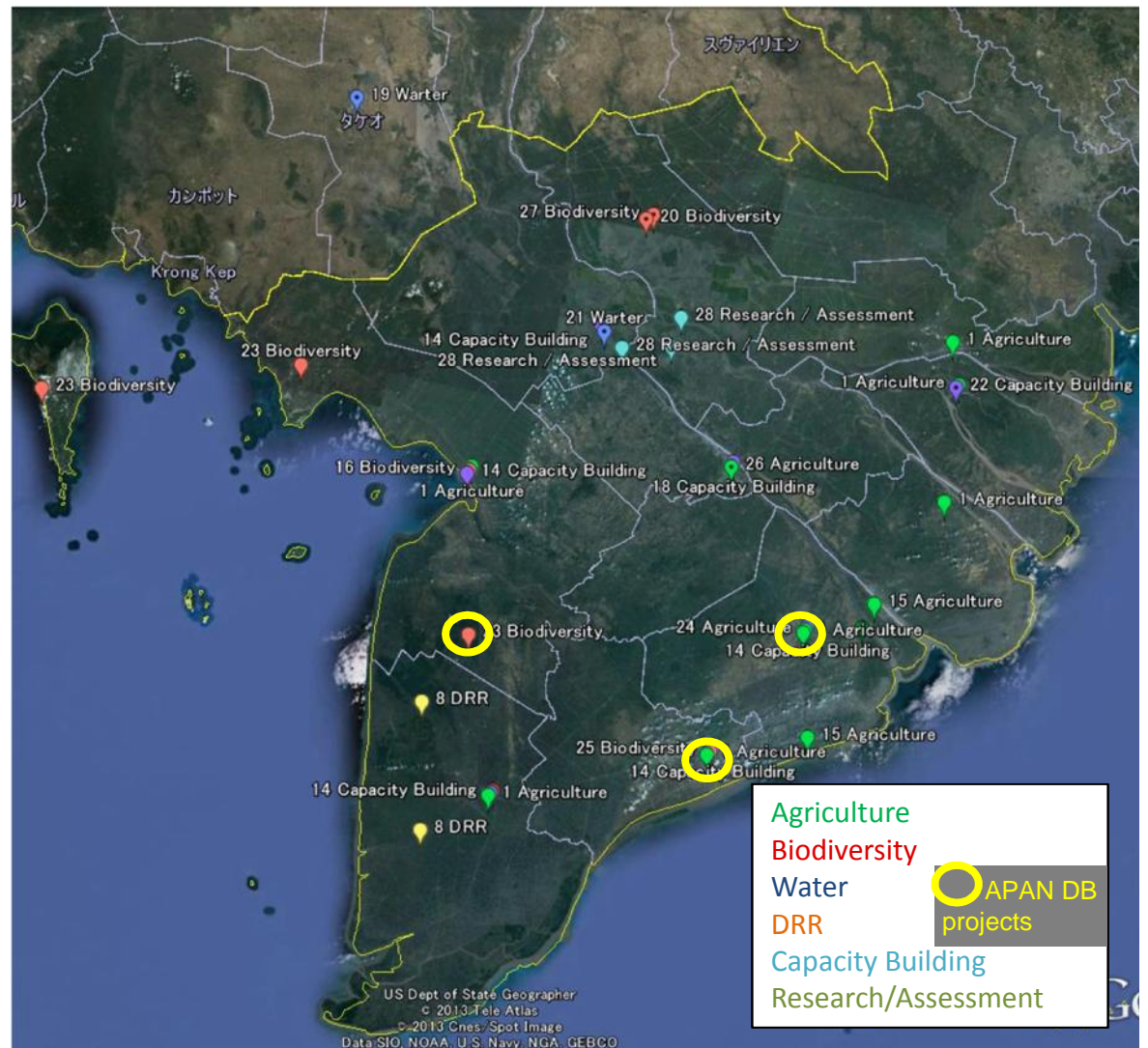
- 50% of people regards flooding (esp. for catastrophic flooding) as “risk”
- Adaptation of residents are:
 - 1) Reinforce/repair house
 - 2) Heighten the floor
 - 3) 3rd adaptations are different among communities (sell animal, diversify income, etc.)



Strategy to adaptation of residents (M.A.)

Mapping of adaptation projects in the Mekong

- Collaboration with APAN and MOEJ
- Existing adaptation
 - Regional, National, International
 - Coastal management, agriculture
- Future adaptation
 - Adaptation technologies, practices
 - Evaluate the impacts of adaptation



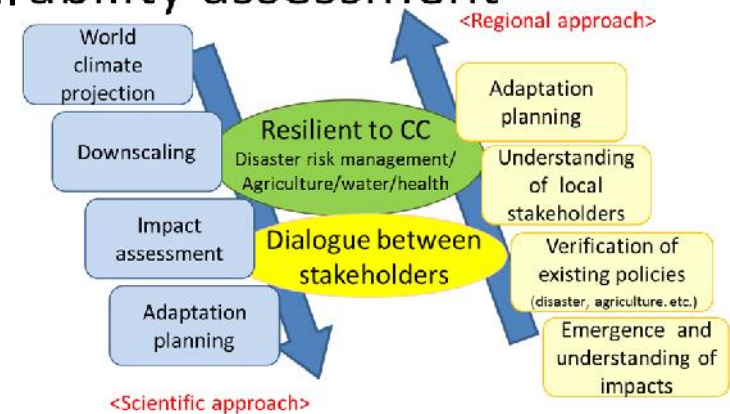
Adaptation projects in the Mekong delta

Concluding remarks

- Vulnerability assessment in the Mekong delta
 - Physical vul.: SLR, natural disasters
 - Social vul.: population, poverty
 - VA should be sophisticated and integrated with other components
- Field survey about perceptions and adaptations of residents
 - Gaps between vulnerability and perceptions
 - Perceptions are generally lower than actual vulnerabilities
 - Flooding is regarded as the most risk
 - Catastrophic, occasional, and annual flooding are different for residents
 - The others are storm, erosion, etc.
 - Community based adaptation will play an important role in responding to disasters
 - Adaptation of residents are identified
 - A critical need to bring in technical, institutional, and financial expertise to design climate adaptation strategies that are appropriate for each community.

Role of stakeholders

- It is important to construct the PDCA cycle for adaptation, recognizing each role of stakeholders.
- Scientist
 - Provide some quantitative and qualitative materials to discuss among policy makers and local communities.
 - Share information such as visualization and mapping
 - Interpret the information such as vulnerability assessment
- Policy makers / local governments
 - Plan/design the plans
 - Finance
 - Decide and prioritize the options
- Local communities / residents
 - Monitor the change in short and long term as residents
 - Inform them to the local government and scientists
 - Action





Thank you very much.

감사합니다.

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