

**CLIMATE CHANGE
ADAPTATION BEHAVIORS:
CASE STUDY OF EXTREME CLIMATE
EVENTS IN VIETNAM**

Uniqueness of the project

- Focus on adaptation behaviors and gaps (both institutional and household levels)
- Focus on a past extreme climate events to see the lessons learned
- Focus on specific sectors/ecosystem
- Extreme climate events
 - Typhoon Xangsane, Vietnam – September 2006
 - Flood the Red River Delta, Vietnam – November 2008

Research questions

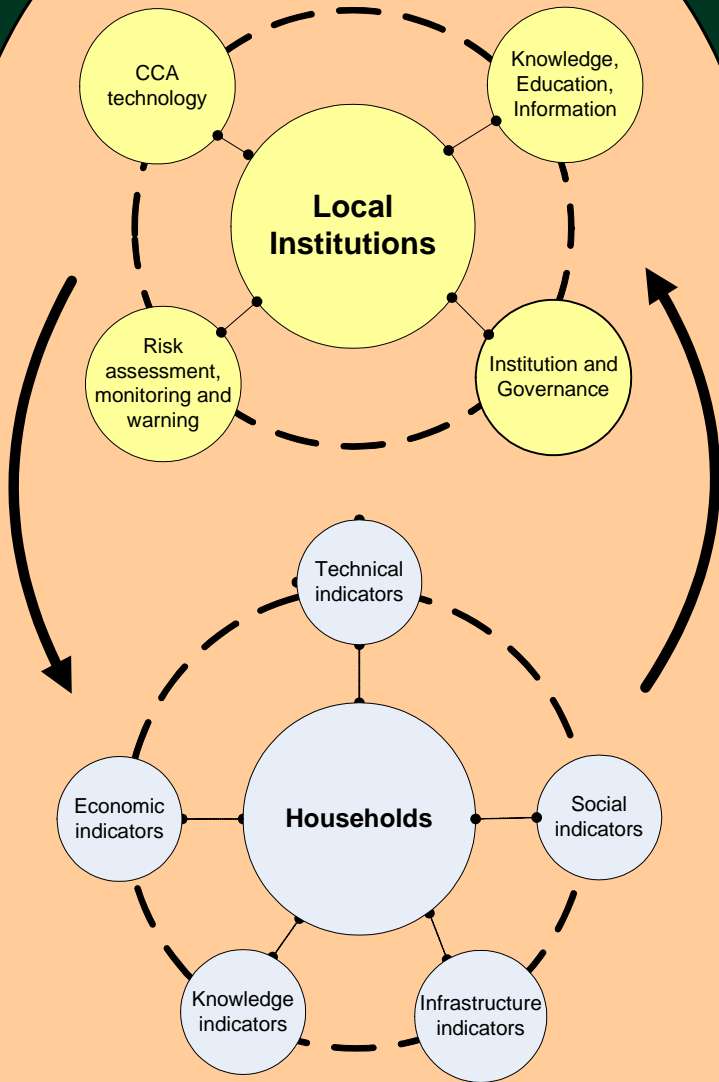
- What have households and communities done before, during, and after the extreme climate event? And why?
- What would they have done but not being done? What were the constraints? What are the barriers to adaptation?
- What are the gaps/needs? How to address the gaps/needs?
- What would/wouldn't they do if the same event happens?
- What are lessons that can be drawn?

Research methodologies

- Divide into household survey + institutional with FGDs and KIs
- Look into adaptive capacity
- Look at ECEs (damages, responses, choices)
- Common framework on types of responses (structural, technological, behavior etc.)

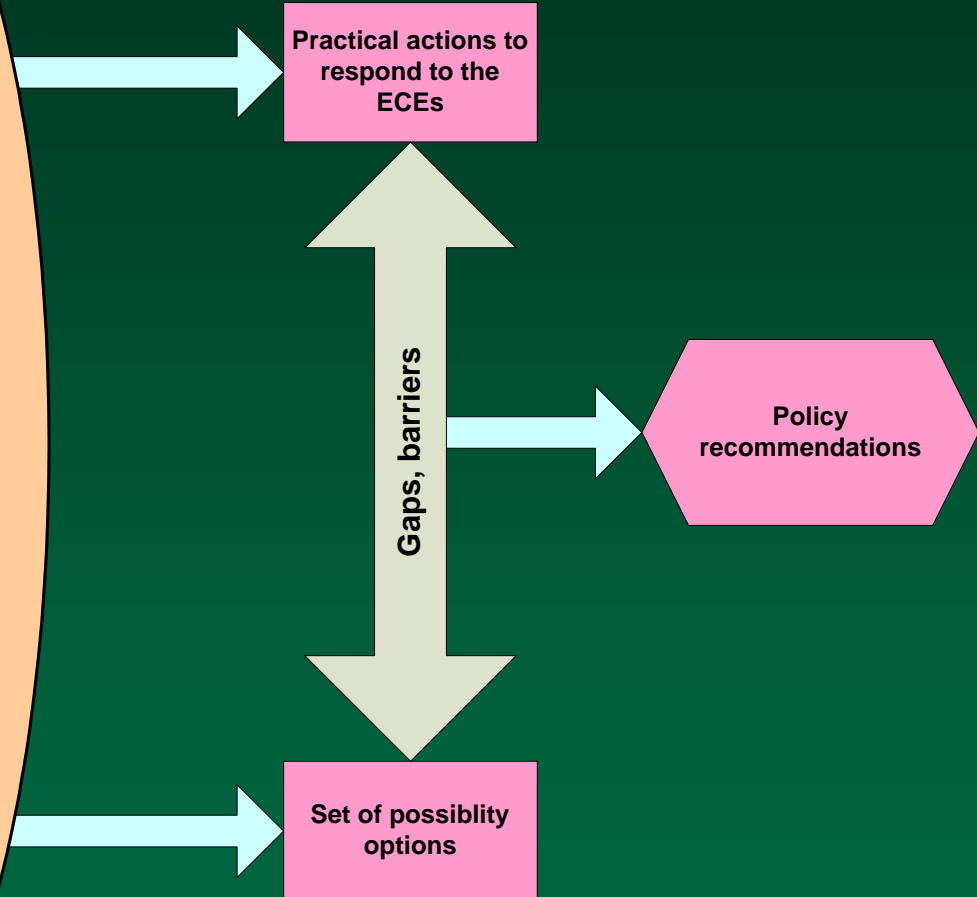


Conceptual framework

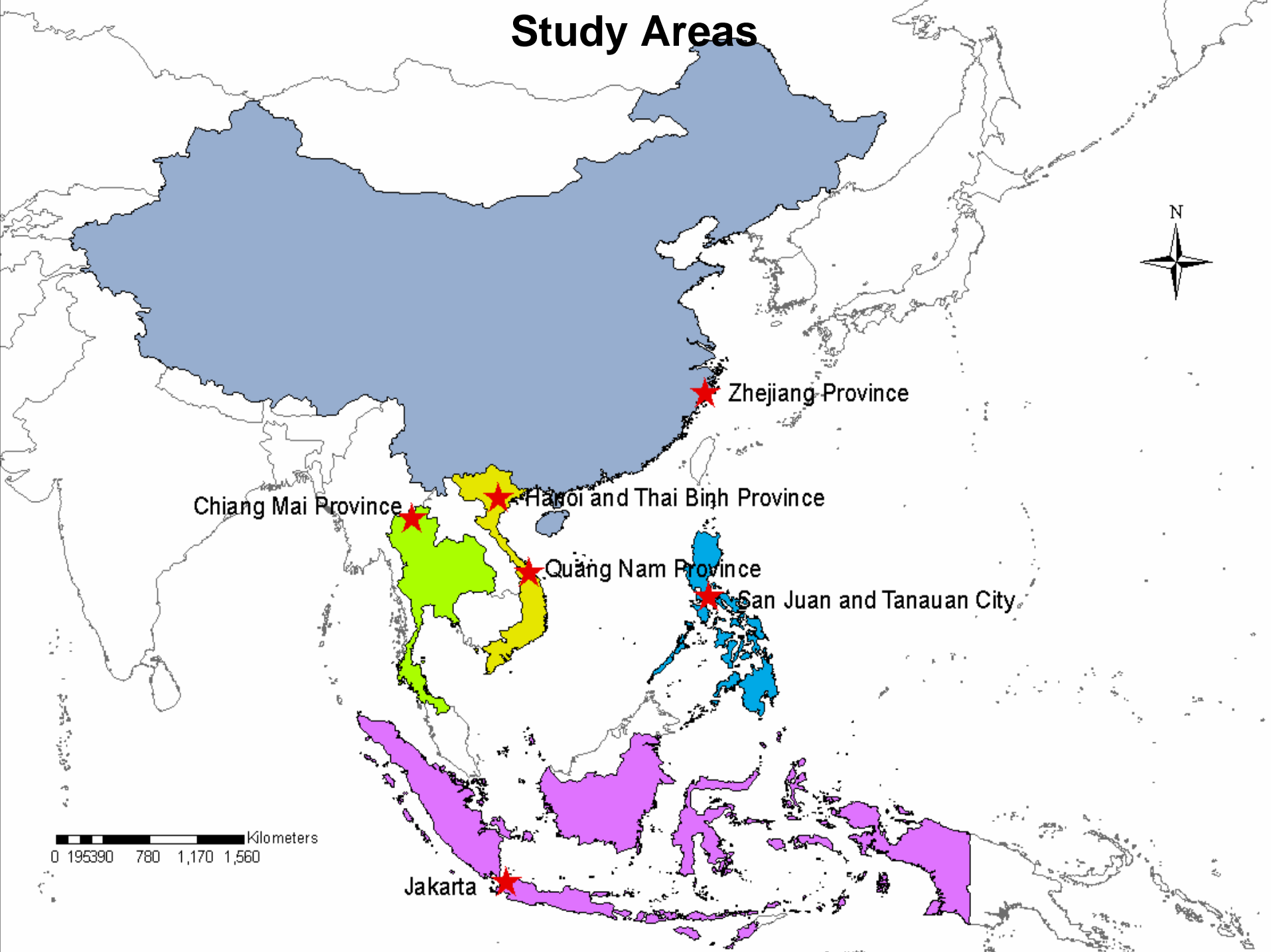


Extreme Climatic Events

- Damages
- Responses (behavior, structural, technological...)
- Choices



Study Areas



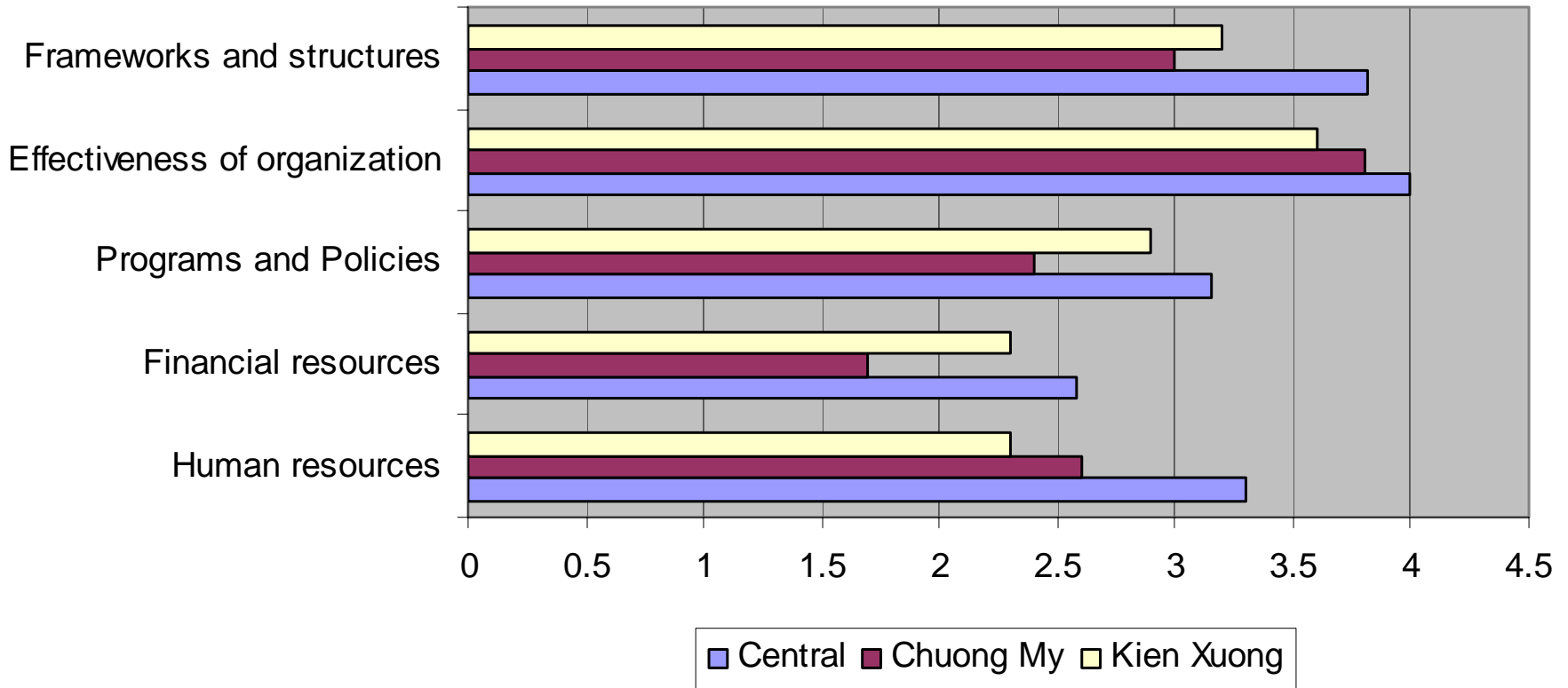
Results from Vietnam: Institution Assessment



Institution and governance

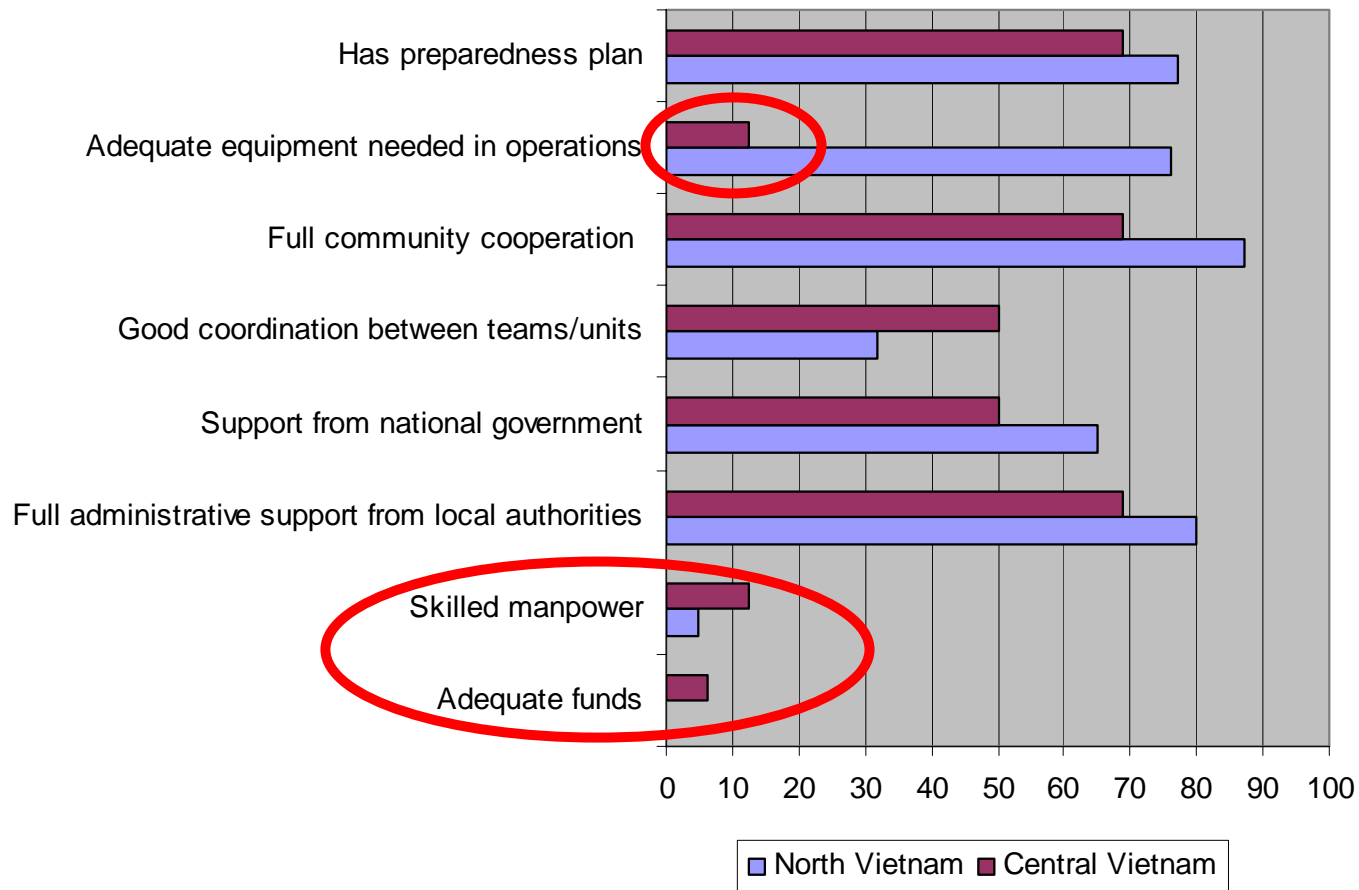
- At commune level, DRM plan only focuses on emergency situation for floods and storms
- At district and provincial level, detailed plan is prepared only for high-risk areas
- Disaster-CC-development linkages have been mentioned, but no concrete intervention.
- Development program, such as relocation failed to integrate disaster aspects
- Staff working on disaster management is mostly part time
- LGUs highly rate the effectiveness of their performing tasks

Institution and governance



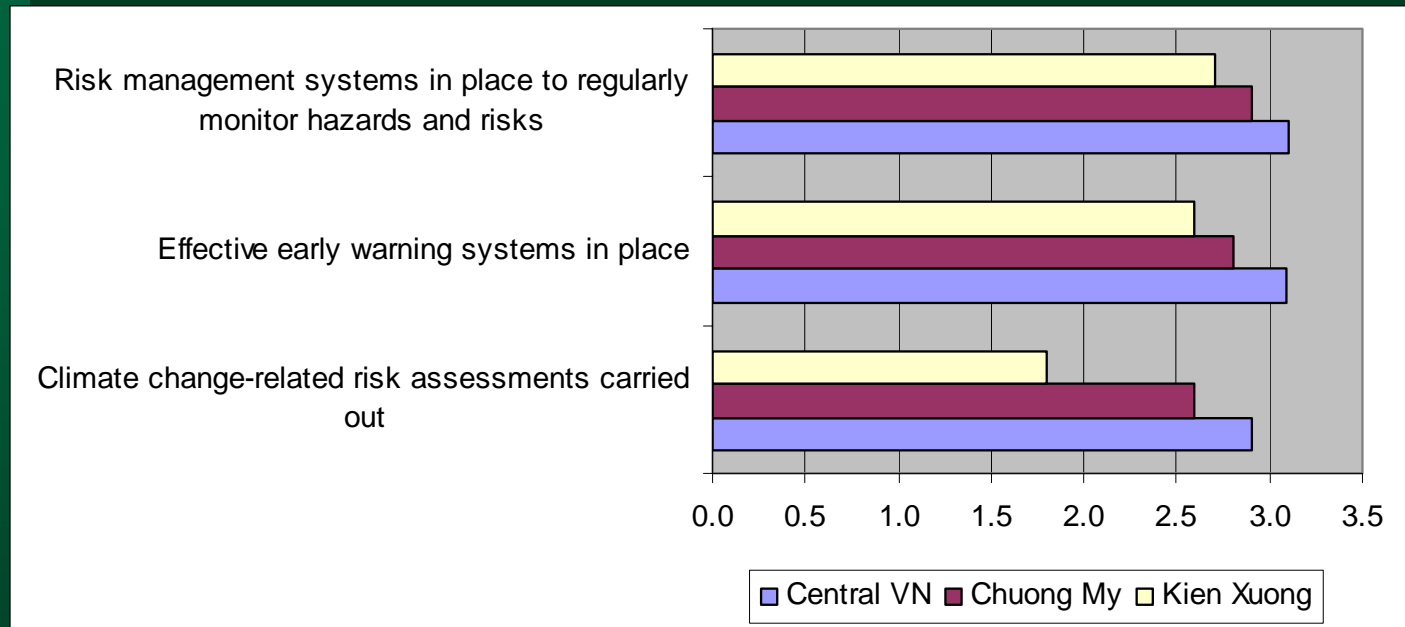
Self adaptive capacity rating

Institution and governance



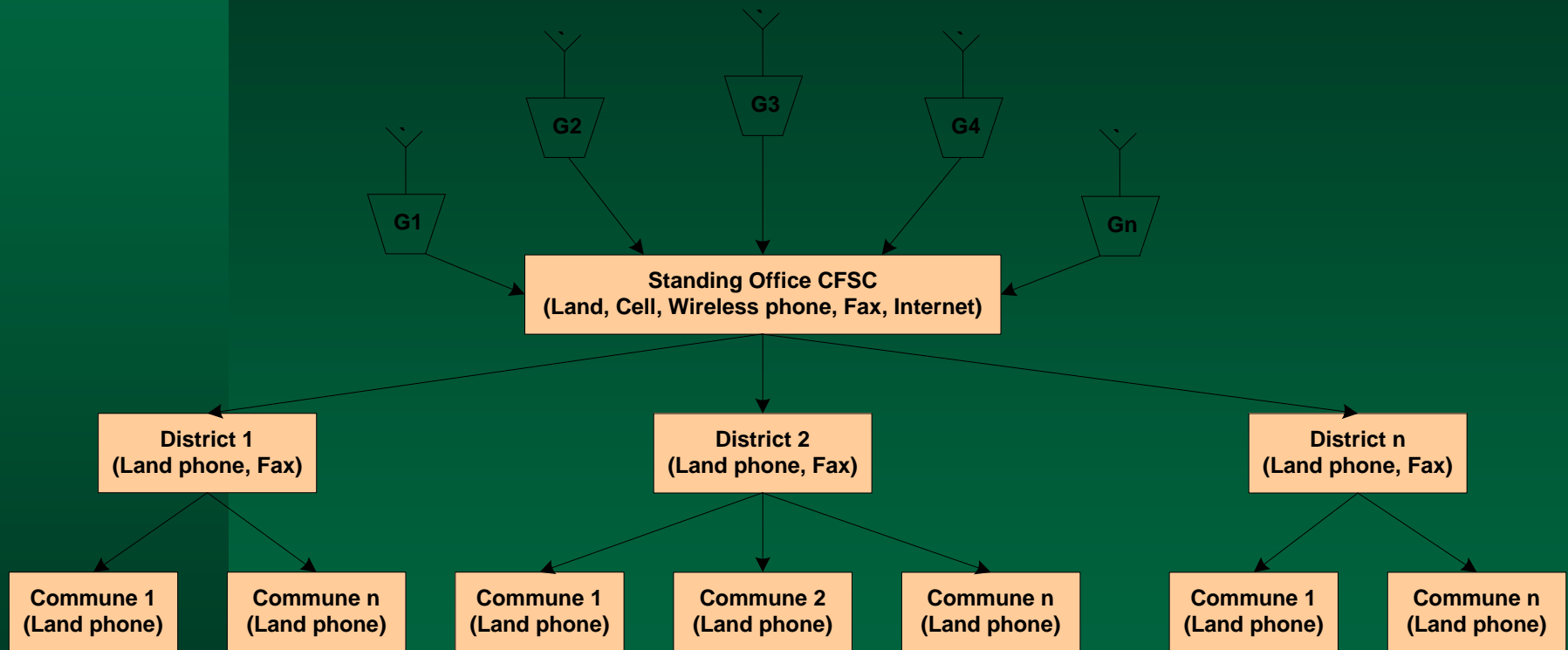
Reasons why LGUs were perceived to be effective

Risk Assessment, Monitoring and Warning



- A flood inundation map was developed after the floods of 1999, but it was not very detailed to map houses
- PCFSC has been technically unable to develop or apply a scientific mapping system and statistical tools for risk and hazard identification
- However based on past experiences, PCFSC is able to identify risk areas, and vulnerable people

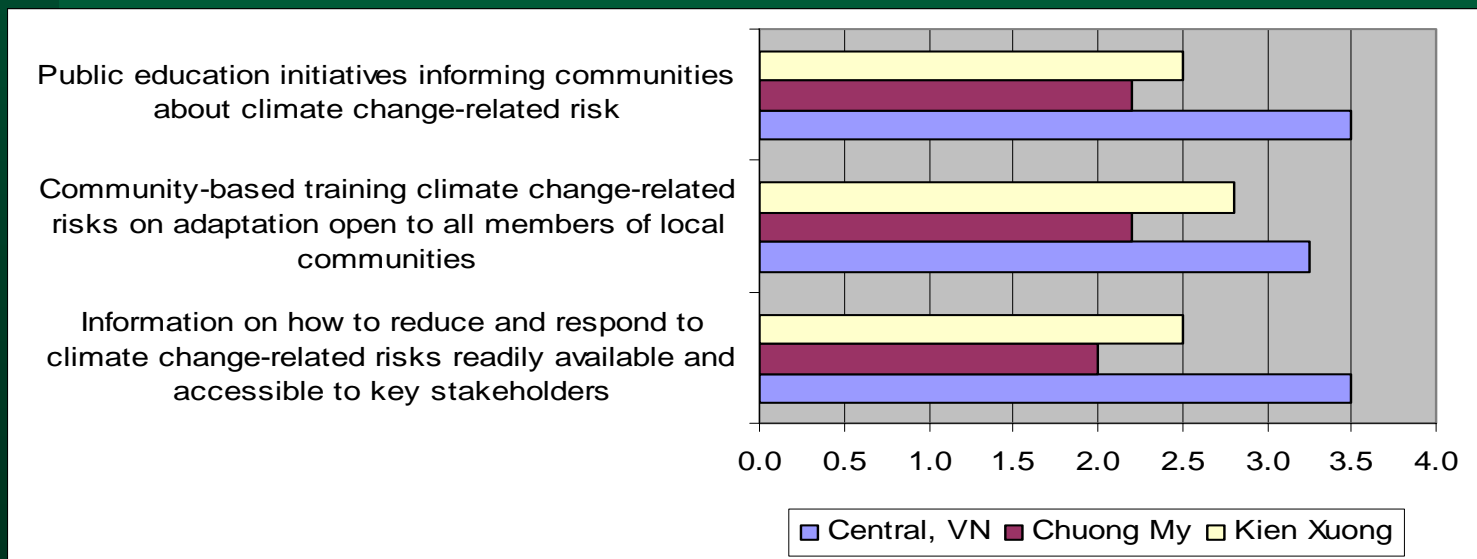
Risk Assessment, Monitoring and Warning



Typical provincial forecast and warning system

Knowledge, Education and Information

- Insufficient information on how to reduce and respond to climate change-related risks readily available and accessible to key stakeholders
- Inadequate community-based training climate change-related risks on adaptation open to all members of local communities
- Lack of public education initiatives informing communities about climate change-related risk



Climate Change Adaptation Technology

- Decision support systems and the application of GIS are mainly used and developed at the national level for use by the PCFSC
- The PCFSC then provides advise and guidance to the district and commune level
- Limited and scattered hydro-met stations
- Conventional technology to deal with climate induced events is under pressure due to CC impacts, environmental degradation and improper infrastructure development

Key gaps identified

- Local government and institutions tend to be reactive in disaster reduction (DR) and Climate Change Adaptation (CCA)
- Insufficient capacity to deal with ECEs in terms of equipment, technology, human resources, low adaptive capacity of government
- Mismatch between what the government units think they can do and their actual capacity
- Understanding of legal documents related to disaster management and CC is weak, especially at the community level and in the organizations which are not directly involved in the disaster management.

Key gaps identified

- No long term plan for CCA, disaster plan management plan focus mainly on response and early recovery
- There are some practices in CCA but are ad hoc and donor driven
- Rigid structure of organization in DR, good vertically, but bad horizontally when consider broader issues in CCA.
- Overlapping authority but lack of coordination across ministries (e.g., CCA is under MONRE; DR is under MARD)
- Most DRM and CCA related staffs are not professionally trained and often receive training for few days. Their main source of knowledge is their past work experience on disaster management related jobs

Lessons learned

- Local government alone should not be the responsible unit. Allocate the responsibility according to a more systematic view of the optimal way to coordinate activity across and within levels of government.
- New agencies for CCA have little power in government agendas and influence and lack capacity, skill, and budget
- The high turnover of staff at the provincial and district level need regular training, especially for new members.

Results from Vietnam: Households Analysis



Economic indicator

- Limited farm land
- High percentage of poverty rate

Study sites	Farm lands, average size		Household poverty level	
	Irrigated area (sqm)	Non-irrigated area (sqm)	Average HH income from all sources (US\$)	% of HH at and below poverty level
Dai Loc, Quang Nam	1534	219	1044	37
Chuong My, Hanoi	1872	641	1813	32
Kien Xuong, Thai Binh	2127	90	1123	27

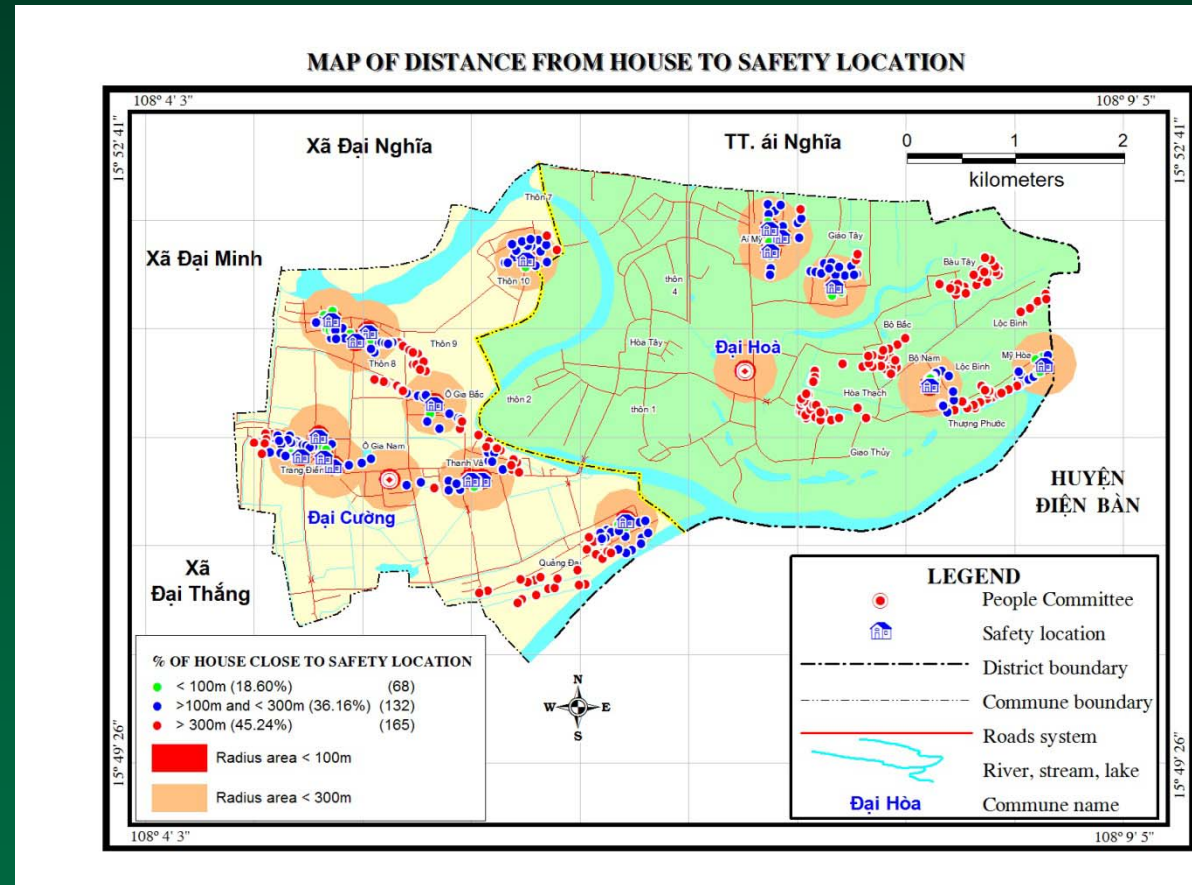
Economic indicator

- Main sources of income are sensitive to CC impact, particularly in Central Viet Nam
- In the north, the income sources are less sensitive to CC

Study sites	Household income per year (US\$)							
	Agriculture	Livestock	Aquaculture	Fishing	Non-farming/ self- employment/ business	Waged labor	Pension	Remittance from relatives
Dai Loc, Quang Nam	698	80	171	14	79	0	0	0
Chuong My, Hanoi	286	771	0	132	270	106	203	46
Kien Xuong, Thai Binh	271	373	0	104	69	179	80	47

Infrastructure indicator

- 30% could not access to safe shelters
- 45% live far away safe shelters more than 300m
- Lack of safe shelters



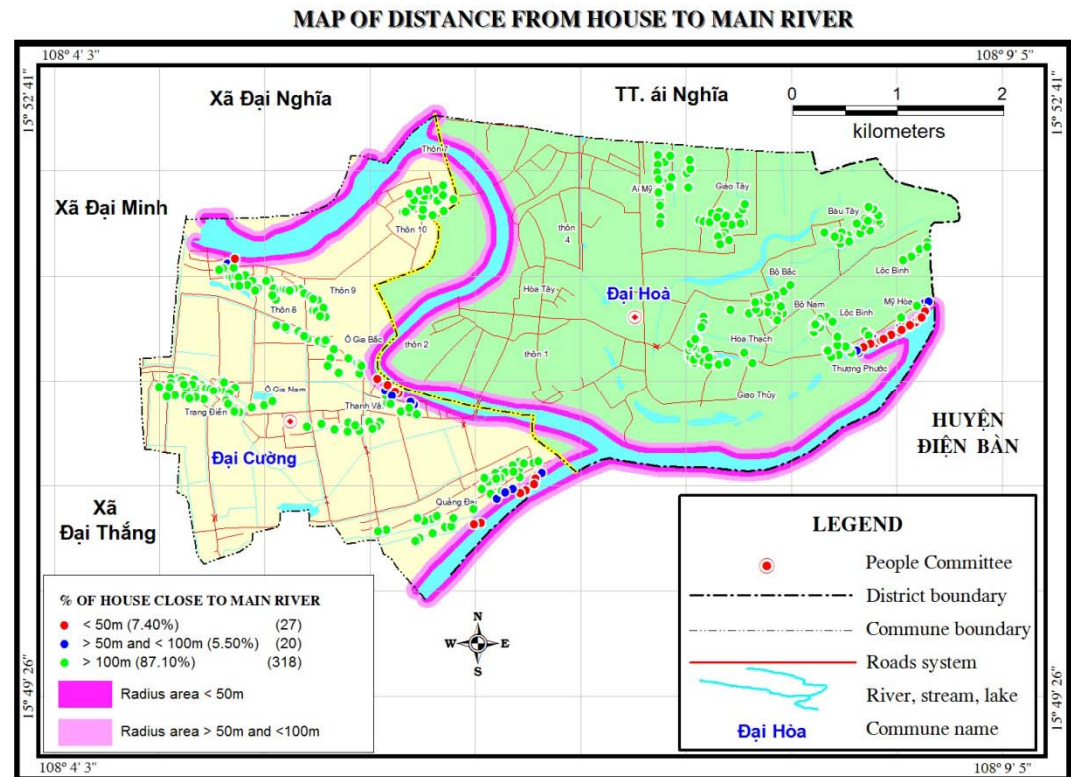
Infrastructure indicator

- High percentage of vulnerable housing
- Households in Central Viet Nam frequently face the flooding, they are well adapted to the flood disasters

Area	Level of permanance			Number of stories			
	Permanent	Semi-permanent	Temporary	One-story	One-story but elevated	Two-story	More than 2-story
Dai Loc, Quang Nam	54	34	12	45	51	4	0
Chuong My, Hanoi	46	51	3	95	2	3	0
Kien Xuong, Thai Binh	71	28	1	95	4	1	0

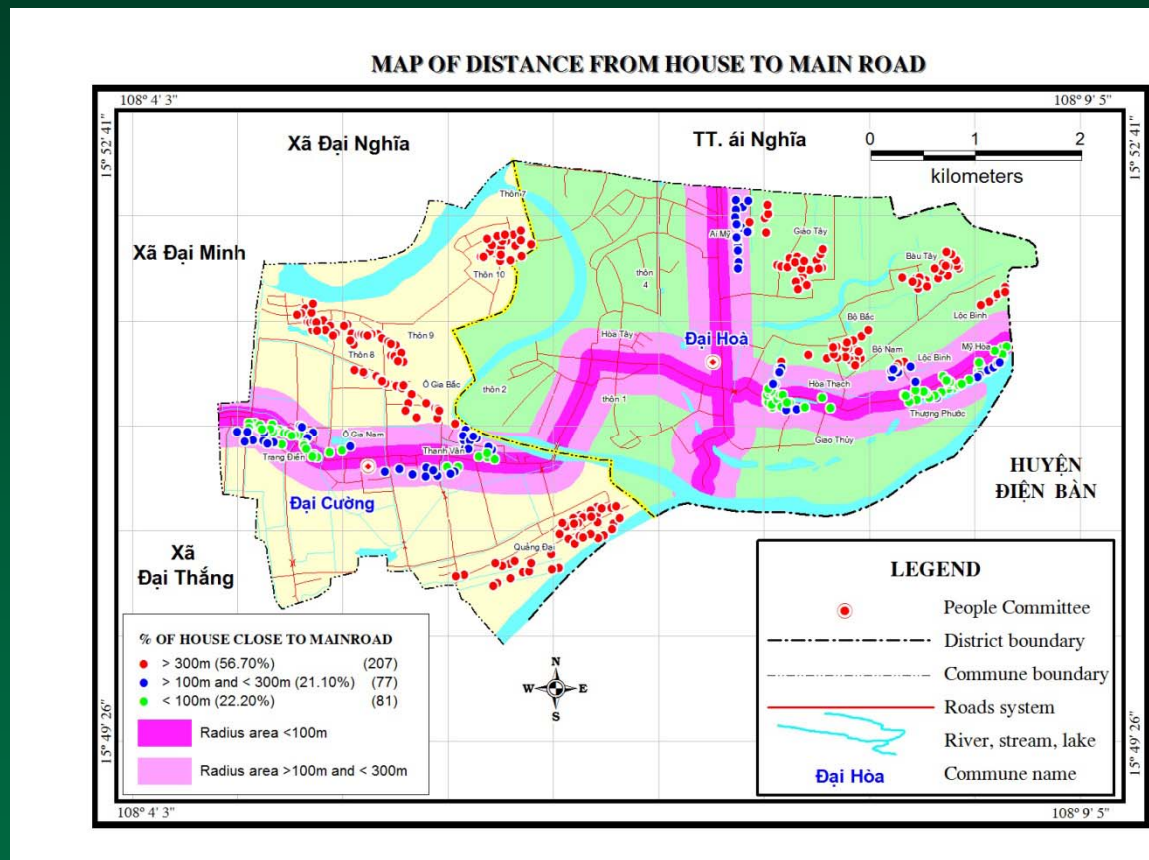
Infrastructure indicator

- 7.4% of houses are located very close to riverbanks (50m buffer zone)



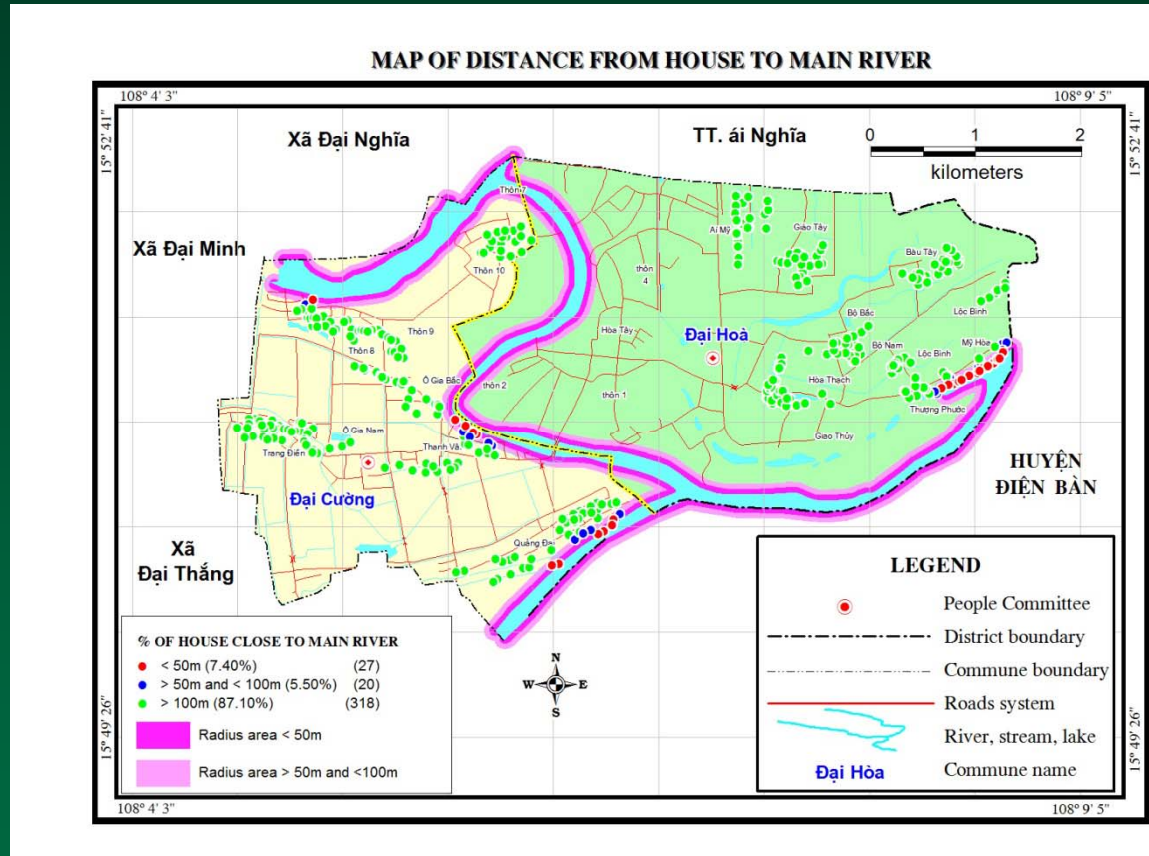
Infrastructure indicator

- 57% households live far away from the main road 300m



Infrastructure indicator

- 4% houses have two story
- 45% houses have attic
- 100% accessing to power
- 100% using well for drinking water



Technology indicator

- Households live relatively far from community centers, limited access to information during the disasters
- People believe their houses is save but they are not particularly in case of typhoon
- People in central are willing to evacuate as they experiences the ECEs

Area	Distance from municipal hall/commune center (km)	Evacuated or will evacuate		Reasons for not evacuating	
		Yes	No	Own house is safe	No safer place to go
Dai Loc, Quang Nam	2.00	85	15	70	30
Chuong My, Hanoi	1.50	3	97	97	1
Kien Xuong, Thai Binh	1.90	25	75	75	12

Technology indicator

Area	Means of transportation to evacuate to shelter available				
	Walking	Car/Bus/ Truck/Jeep	Boat	Motorbike	Bicycle
Dai Loc, Quang Nam	0	70	30	0	0
Chuong My, Hanoi	35	2	43	10	8
Kien Xuong, Thai Binh	60	2	70	20	10

Area	Sources of information					
	TV	Radio	Relatives/n eighbour	Local government officials	Newspaper	Telephone (landline, mobile phone)
Dai Loc, Quang Nam	95	2	0	3	0	0
Chuong My, Hanoi	52	20	11	65	5	65
Kien Xuong, Thai Binh	70	49	4	52	1	52

- Main sources of information is TV and radio
- Main means of transportation for evacuation are boat in Central of Vietnam, however in the North is walking

Social capital indicator

- Relatively strong networking (64% of respondents can get help in case they need, 56% are members of mass organization)
- Relatively strong community cohesion (70% of respondents often share experiences)
- High rate of out migration during disaster season
- People at home living more “at risk”, especially the infirm and elderly, and the communes remained without adequate human resources for disaster response and recovery

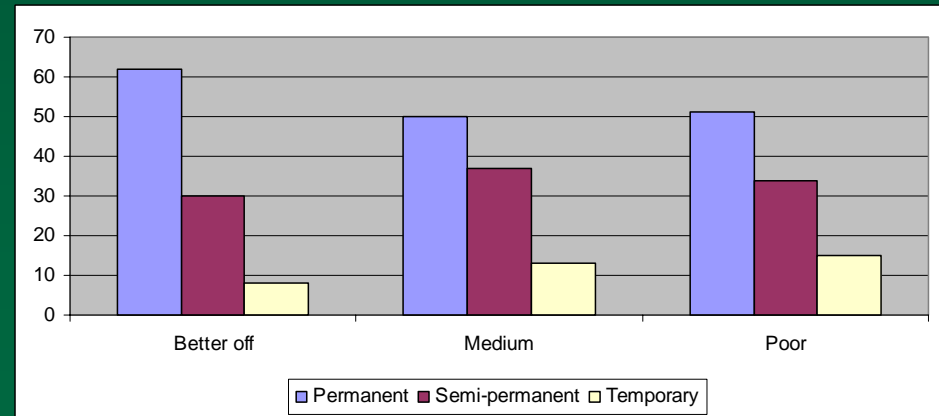
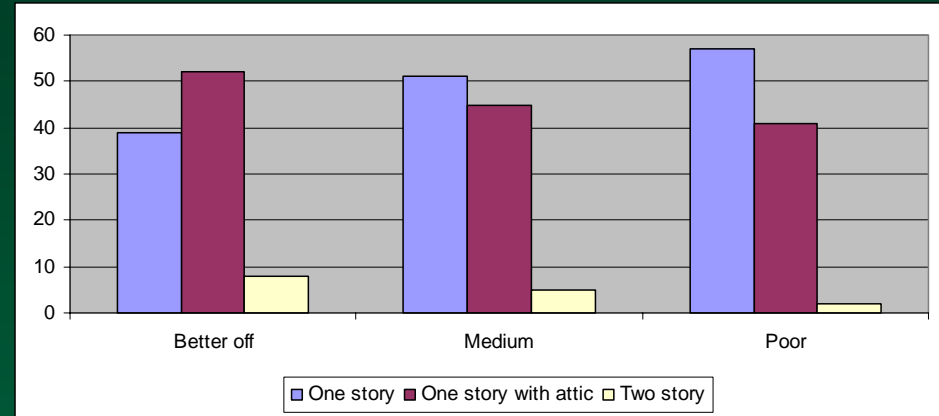
Skill, knowledge indicator

- Rich traditional knowledge on:
 - Housing reinforcement techniques to respond to disasters
 - Store and preserve food and property during the disasters
- However, due to the increasing impacts of climate change
 - 50% of respondents believe that those traditional skills, knowledge are useful
- Limited number of training on CC and DRR issues

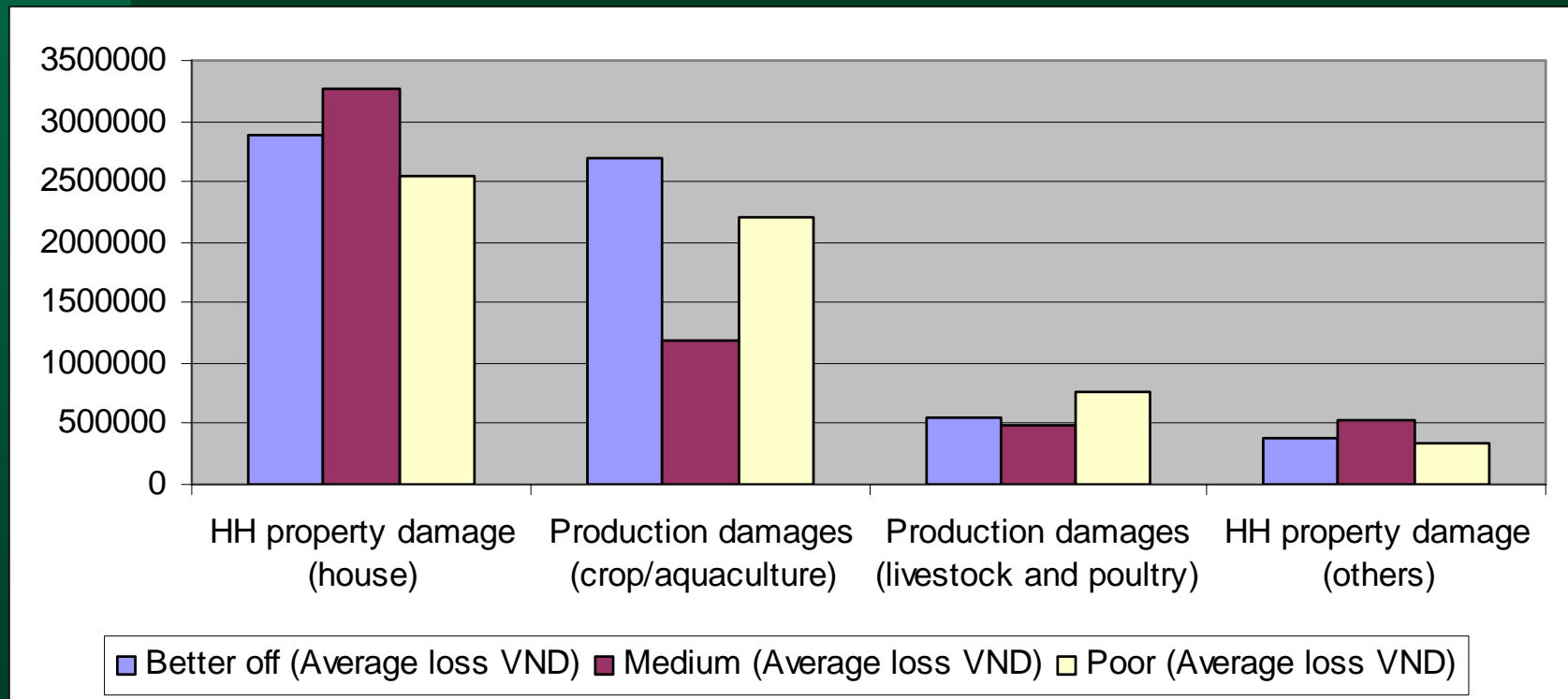
Country	Attended training		Usefulness of training		Indigenous Knowledge of households	
	Yes	No	Yes	No	With	Without
Dai Loc, Quang Nam	12	88	91	9	50	50
Chuong My, Hanoi	9	91	100	0	42	58
Kien Xuong, Thai Binh	21	79	93	7	60	40

Economic status and housing condition

- Higher percentage of the poor living in vulnerable house



Economic status and damage/loss



- Although the poor have less absolute damage but they are more vulnerable

Education and coping behaviors (1)

% within Level of education		Do you agree that encountering that extreme typhoon/flooding was your fate of which you have little control over				Total
		Strongly agree	Agree	Disagree	Strongly disagree	Strongly agree
Level of education	No schooling	36.4%	54.5%	00.0%	09.1%	100.0%
	Elementary school	12.5%	58.3%	20.8%	08.3%	100.0%
	Secondary school	8.2%	52.9%	27.1%	11.8%	100.0%
	High school	6.7%	44.9%	36.0%	12.4%	100.0%
Total		10.0%	52.8%	26.4%	10.8%	100.0%

- Higher educated people are more aware of extreme event that is not hazard-led (or not the act of God)

Education and coping behaviors (2)

% Within level of education		How do you assess risk that your house/farm/business faces with regard typhoon/flooding event in the future		
		The event will be more severe than what we experienced	The event will be about the same as what we experienced	Not sure
Level of education	No schooling	45.5%	0.0%	54.5%
	Elementary school	52.9%	9.2%	37.8%
	Secondary school	62.9%	10.6%	26.5%
	High school	65.2%	11.2%	23.6%
Total		59.9%	10.0%	30.1%

- Higher educated people are more aware of the increasing the extreme events
- 60%: due to over exploitation of NR
- 67%: due to impacts of CC

Key gaps identified

- Traditional coping mechanisms (practices they have been using over time) of households are not as effective as they used to be because EWEs more severe
- There is a gap between revealed behavior of households and their stated behavior
- Household cope with ECEs but not planning to reduce the risks of ECEs
- Households want investment in house structure, 2nd story, but are income constrained

Key gaps identified

- Households do not want to leave their house and community; migration is not an option that they see as viable
- People's awareness about CC and increasing intensity about ECEs would contribute to changes in their adaptive behavior
- Households responded that they needed more information about CC and how to respond/adapt
- Main incomes of households are very sensitive to climate change impacts and intensity of ECEs

Barriers / challenges

- High percentage of non-disaster resistant houses and infrastructures
- Insufficient access to disaster risk management information and planning
- Lack of emergency response equipment and trained personnel
- Low and instable income
- Limited access to financial resources

Recommendations

- Improve houses to withstand typhoons and floods
- Establish and support rescue teams in each community
- Improve the emergency information system and disaster planning mechanisms
- Raise awareness of local communities on climate change
- Build and upgrade rural infrastructure
- Improve environmental sanitation
- Improve productivity and household income