

# Supplementary Materials: Multi-Variate Analyses of Flood Loss in Can Tho City, Mekong Delta

## Questionnaire for Household Survey in CanTho City in the Framework of the Flood Damages Models for Residential Building in Can Tho City within the WISDOM Project

### 1. General information (To be filled in by the interviewer)

- 1.1. Location:           Ward,           District
- 1.2. Address:           Street, House Nr.
- 1.3. Date: Month       Day
- 1.4. Time:
- 1.5. Number of sampling:
- 1.6. GPS point:
- 1.7. Name of interviewer:

Lady and Gentlemen, my name is ..., come from Southern Institute of Water Resources Research and the German Research Centre for Geosciences. We are conducting a survey on flood damage in Can Tho city. Our research aims at improving the flood risk management in the area.

1. I want to talk to people who had a flood damage to their house/flat or furniture/content or shop due to the extreme flood in 2011. Did you have a flood damage in 2011 in this house?

1. Yes ->undertake interview
0. No -> sorry, then you don't belong to our focus group, thank you and good bye (*don't undertake interview*)

Regarding this topic we would like to talk to the household leader/shop owner or the person who has the best knowledge about flood damage to your house/flat or shop.

### 2. Flood Damage in General

- 2.1. First I have some questions about the significance of floods for you. In following, I will mention several events to you. Please tell me for each event separately on a scale from 1 to 6: How high do you estimate the chance that you suffer financial damage due to these events? 1 stands for very likely, 6 stands for very unlikely

Event	Very Unlikely					Very Likely	
1: Burglary	1	2	3	4	5	6	
2: Fire in the house	1	2	3	4	5	6	
3: Flood	1	2	3	4	5	6	
5: Traffic accident	1	2	3	4	5	6	
6: Storm	1	2	3	4	5	6	

2.2. How often was your house affected by flooding?

- 1: One time
- 2: Two times
- 3: Three times
- 4: Four times
- 5: More than four times (specify):

3. Flood season in 2011

3.1. What do you think about flood season in 2011?

- 1: It was the severest flood I have ever known
- 2: It was not the severest flood but water stayed in my house longest.
- 3: Similar with other flood seasons before
- 88: I don't know

3.2. Do you know what type of flood it was?

- 1: Tidal or rain-fed flood
- 2: Flood from upstream
- 3: Both of above
- 88: I don't know

3.3. Before the flood reached your house, did you receive a flood warning?

- 1: Yes
- 2: No, but I know as myself experience ->continue with question 3.6
- 0 No ->continue with question 3.6

3.4. How did you receive the flood warning?

1: TV	6: Loudspeaker announcements
2: Radio	7: Others
3: Newspaper	88: I don't know
5: Neighbors	

3.5. How long did you receive the warning before the flood reached your house?

- 1: .....Days
- 88: I don't know

3.6. How long after the warning you started applying emergency measures?

- 1: .....Days
- 2: I did nothing (go to 3.8)
- 88: I don't know

3.7. Did you apply any emergency measures to reduce damages?

- 1: Saved document and valuable
- 2: Moved vehicle to safe area
- 3: Moved furniture or other movable things to higher places or in safe area.
- 4: Saved oil tanks or canister with other dangerous substances.

- 5: Pumped down water
- 6: Moved pets to save area
- 7: Protect house against water infiltration e.g. sealing doors or windows.
- 8: Move goods/products to the safe area
- 9: Move equipment/furniture of shop to safe area.
- 10: I did nothing (go to 3.8)
- 99: Other (specify):
- 88: I don't know

3.8. Why did you not apply any measures to reduce damages?

- 1: I was not at home
- 2: It was so late, we did not have time
- 3: I did not know what to do exactly
- 4: I was physically (e.g. illness, old) not able to do something
- 5: I had not enough help from others
- 6: I did not expect that the water would rise high, I underestimated the danger
- 7: I did not have enough or appropriate material to apply damage-reducing measure.
- 99: Other (specify):

3.9. What do you think how effective were the applied emergency measures? 1 means "not effective at all", 6 means "very effective"

- |                      |   |   |   |   |                |
|----------------------|---|---|---|---|----------------|
| 1                    | 2 | 3 | 4 | 5 | 6              |
| Not effective at all |   |   |   |   | very effective |
| 88: I don't know     |   |   |   |   |                |

3.10. When was your house affected by flood, during which months?

- 1: Beginning (month): .....                      2: End (month): .....

3.11. When in month the flood comes to your house?

1: Middle of month	4: Constantly during those months
2: End of month	5: When it rains heavily
3: Middle and end of month	

3.12. Do you know the height of highest water point from your ground floor during the flood in 2011?

cm (*the household leader can show the water point in the wall*)

3.13. How long the water stayed in your house?

- 1: ..... hours    (.....months x .....days/month x.....hours/day)
- 88: I don't know

3.14. Which of the following substances was contained in the flood water?

- 1: Sewage water and excrements
- 2: Fuel oil/Gasoline
- 3: Chemicals (pesticides, fertilizer)
- 4: No contamination/ river water
- 5: Other contaminants (specify):

3.15. Which of the following things was transported by the water near your house?

- 1: Mud/silt
- 2: Sand
- 3: Gravel/Stone
- 4: Nothing

3.16. How strong was the flow velocity of the flood water? 1 means “calm” or nearly no flow and 6 means torrential.

- |      |   |   |   |   |            |
|------|---|---|---|---|------------|
| 1    | 2 | 3 | 4 | 5 | 6          |
| calm |   |   |   |   | torrential |

3.17. Was your house affected by riverbank erosion, e.g. foundation undermined, washed away?

- 1: yes
- 2: no

*For houses*

3.18. Did you have any problems with your house due to flood?

- 1: My house was collapsed or washed away
- 2: My house was damage partly (specify)
- 3: My house was full of water which caused damage to the floor, walls, etc.
- 4: Damage to furniture/contents (continue with 3.21)
- 5: no problem/flood damage at all (continue with 3.34)

3.19. How much did you have to pay for repairing (or even rebuilding) the house because of flood damages?

- 1: .....VND (continue with 3.21)
- 2: I did not repair anything (continue with 3.20)
- 88: I don't know (continue with 3.20)

3.20. What was damage and what did you repair at your house because of the flood?

<b>Things</b>	<b>a. Damaged Estimation (VND)</b>	<b>b. Repaired Cost (VND)</b>
1: Entire floor		
2: Walls		
3: Stilts and poles		
4: Doors		
5: Roof		
99: Other (specify) .....		
88: I don't know		

3.21. How many man-days did you need to repair your house?

- 1: ..... man-days
- 88: I don't know

3.22. How many man-days did you need to clean your house?

- 1: ..... man-days
- 88: I don't know

3.23. Why did you not repair your house?

- 1: I don't have enough money
- 2: My house is not allowed to repair because it is in a planning project area.
- 3: I thought it is not necessary because it will be flood next year.

3.24. If you repair, how much do you need to repair your house?

- 1: About .....VND
- 88: I don't know

3.25. What did you pay for buying new furniture, appliances (contents) after flood damages?

- 1: total cost: ..... VND (continue with 3.27)
- 88: I don't know (continue with 3.26)

3.26. What furniture, appliances, other contents were damaged and what did you need to buy after flood?

<b>Things</b>	<b>a. Damaged Estimation (VND)</b>	<b>b. Replaced Cost (VND)</b>
1: Chairs		
2: Table		
3: TV		
4: Stereo system		
5: Computer		
6: Refrigerators		
7: Kitchen equipment		
99: Other (specify)		
88: I don't know		

3.27. Did you lose any pets during the flood?

- 1: Yes, total cost: ..... VND
- 0: No

3.28. Did you lose any agricultural goods which were stored in your house?

- 1: Yes, total cost: ..... VND
- 0: No

3.29. Did you get any financial support after flood event?

<b>From</b>	<b>Amount (VND)</b>	<b>From</b>	<b>Amount (VND)</b>
1: Relatives		3: Country outside VN	
2: Government		99: Other (Specify)	

4. Flood Mitigation

4.1. Which of following information measures you apply? Please specify the time you have applied the mitigation measure (*ask for the specific year if not know ask for the categories*).

Measure	Year	Before Flood 2011	After Flood 2011
<p><b>Information</b></p> <p>1: I gather information how I can protect my house from flood            2: I gather information about flood expose of my house            3: join the neighborhood flood networks (help neighbors when flooding)</p> <p><b>Adaptation</b></p> <p>4: Avoid valuable expensive fix furniture in the flood prone floor instead of water resistant or easily renewable materials.            5: Apply low value usage or in flood prone floor            6: acquire stationary or mobile water barriers to inhibit water infiltration in the house</p> <p><b>Building measure</b></p> <p>7: Installed flood protection (<i>if yes go to 4.2</i>)            8: Install electricity supply in higher floor            9: elevated the house etc. (<i>if yes go to 4.4</i>)            10: used water resistant building material for the house</p> <p><b>Others</b></p> <p>11: I did nothing            88: I don't know            99: Other (specify):</p>			

4.2. What were the building measures did you install to protect your house

1: Gravel, sand, construction waste	5: concrete dam
2: sand bag	6: Silt dam
3: wooden planks	88: I don't know
4: Brick dam	99: Other (specify):

4.3. Do you often renew the flood protection system?

1. On average about ..... months

88. I don't know

4.4. How many cm did you elevate the floor ?

1. cm (from the level when it was built to current level)

88. I don't know

- 4.5. Response efficacy: What do you think how effective do you consider these measure? 1 means not effective at all, 6 means very effective.

Measure	Not Effective			Very Effective		
1: Information measure	1	2	3	4	5	6
2: Adaptation	1	2	3	4	5	6
3: structural measure	1	2	3	4	5	6

- 4.6. Self-efficacy: To what extent are you or a member of your household able to carry out the measures? 1 means unable, 6 means able.

Measure	Unable			Able		
1: Information measure	1	2	3	4	5	6
2: Adaptation	1	2	3	4	5	6
3: structural measure	1	2	3	4	5	6

- 4.7. Response cost: What do you think how costly are the measures? 1 means not costly at all, 6 means very costly

Measure	Not Costly			Very Costly		
1: Information measure	1	2	3	4	5	6
2: Adaptation	1	2	3	4	5	6
3: structural measure	1	2	3	4	5	6

- 4.8. To what extent might each of the following prevent you from preparing for floods? 1 means very unlikely and 6 means very likely

4.8.a: For structural measure

Thing	Very Unlikely			Very Likely		
1: Cost	1	2	3	4	5	6
2: Time needed	1	2	3	4	5	6
2: Skills required to prepare	1	2	3	4	5	6
3: Other things to think about instead	1	2	3	4	5	6
5: Need for cooperation with others	1	2	3	4	5	6
6: other, specify: _____	1	2	3	4	5	6

4.8.b: For avoid damage measure

Thing	Very Unlikely			Very Likely		
1: Cost	1	2	3	4	5	6
2: Time needed	1	2	3	4	5	6
2: Skills required to prepare	1	2	3	4	5	6
3: Other things to think about instead	1	2	3	4	5	6
5: Need for cooperation with others	1	2	3	4	5	6
6: other, specify: _____	1	2	3	4	5	6

4.9. To what extent do you think that? 1 means very likely and 6 means very unlikely

Thing	Very Unlikely			Very Likely		
1: Floods are too destructive to bother preparing for	1	2	3	4	5	6
2: A flood is unlikely to occur again during our lifetime	1	2	3	4	5	6
3: A damaging flood is something that could occur in the future	1	2	3	4	5	6

5. Risk Perception

5.1. How likely will your household/shop experience an extreme flood at your home in the coming 5 year?

1      2      3      4      5      6  
 very unlikely    very likely  
 88: I don't know

5.2. How bad do you estimate the consequences of a potential flood event for your house/ shop?

1      2      3      4      5      6  
 Not bad at all    very bad  
 88: I don't know

6. Flood Management

6.1. Please tell me, if you recognize a change in flood management policies?

1: Flood management increasingly target at preventing floods from occurring?	1: yes	2: no
2: Flood risk and damage are increasingly borne by government?	1: yes	2: no
3: The risk and damages associated with floods need to be borne increasingly by private households	1: yes	2: no

6.2. Do you agree with following statement: Households in areas at risk of flooding are responsible themselves to undertake measures to avoid/mitigate flood damages?

1      2      3      4      5      6  
 disagree    agree  
 88: I don't know

6.3. How content are you with the flood management in your region?

1      2      3      4      5      6  
 discontent    content  
 88: I don't know

7. Housing Situation

7.1. How many years have you lived at this address?

..... years



7.2. Do you own or rent your home?

- 1: own
- 2: rent
- 99: Other (specify):

7.3. In which year was your house constructed?

- 1: Year: .....
- 2: before 1960
- 3: 1960–1970
- 4: 1970–1980
- 5: 1980–1990
- 6: 1990–2000
- 7: 2000–2005
- 8: 2005–present

7.4. What is the value of the house?

- 1: ..... VND
- 2: < 5 mil VND
- 3: 5 mil–10 mil VND
- 3: 10 mil–20 mil VND
- 4: 20 mil–50 mil VND
- 5: 50 mil–100 mil VND
- 6: 100 mil–200 mil VND
- 7: 200 mil–500 mil VND
- 8: 500 mil–1 bil VND
- 9: 1 bil–2 bil VND
- 10: 2 bil–5 bil VND
- 11: more than 5 bil VND

8. *Household Assets*

8.1. How many pets do you feed?

<b>Pet</b>	<b>Amount</b>	<b>Pet</b>	<b>Amount</b>
1: Cats		4: Ducks	
2: Dogs		5: No pet	
3: Chicken		99: Other (specify)	

8.2. How many vehicles does your household have?

<b>Vehicles</b>	<b>Amount</b>	<b>Vehicles</b>	<b>Amount</b>
1: Bicycles		4: Boats	
2: Motorbikes		5: Trucks	
3: Cars		99: Others (specify)	

8.3. How many following things does your house have?

Things	Amount	Things	Amount
1: Radios		7: Washing machine	
2: Stereo system		8: Refrigerators	
3: TV set		9: Ovens	
4: DVD player		10: Air conditionings	
5: Computers		11: Ventilators	
6: Mobile phones		99: Others (specify)	

8.4. What have you stored in your house?

- 1: Fertilizer
- 2: Pesticides
- 3: Fuel/Gasoline/diesel
- 99: Others substance (specify):

9. *Information on The Interviewee*

- 9.1. Name of interviewee:
- 9.2. Gender:
- 9.3. Age:
- 9.4. Level of education:

- 1: Never went to school
- 2: Primary school completed
- 3: Secondary school completed
- 4: High school completed
- 5: Vocational
- 6: University bachelor completed
- 7: Post graduated

10. *Household Profile*

10.1. How many persons live constantly in your house?

..... Persons

10.2. How many children below 12 years old in your household?

..... Children

10.3. Is there anyone in your family has physical/metal challenges (handicapped, blind, deaf)?

- 1: No one
- 2: Yes (specify):

10.4. How many elderly above 60 years old?

..... Person

10.5. What is annual net income of your household in VND

- 1: less than 500.000 VND/month
- 2: 500.000–1.000.000 VND/month
- 3: 1.000.000–2.000.000 VND/month
- 4: 2.000.000–5.000.000 VND/month
- 5: 5.000.000–10.000.000 VND/month
- 6: 10.000.000–20.000.000 VND/month
- 7: 20.000.000–50.000.000 VND/month
- 8: More than 50.000.000 VND/month

The following information about housing situation should be checked by interviewer

10.6. Size of the house:

- 1: .....m<sup>2</sup> (base on area)
- 2: Length: .....m width: .....m

10.7. Number of stories of the house:

..... stories

10.8. Material type of fundament of the house:

- 1: gravel/sand
- 2: stilt (wood/ bamboo)
- 3: stilt (concrete)
- 4: Brick/concrete
- 5: metal fundament pole
- 99: other (specify)

10.9. Material type of the floor of the house:

- 1: gravel/sand
- 2: Wood plank
- 3: concrete
- 4: tiles
- 99: Other (specify):

10.10. Material type of the wall of the house:

- 1: Leaves
- 2: Wood plank
- 3: Tin
- 4: Brick
- 99: Other (specify):

10.11. Material type of the roof of the house:

- 1: Leaves
- 2: Wood plank
- 3: Tin
- 4: tiles
- 5: concrete

99: Other (specify):

10.12. Distance from the house to the river:

1: ..... meters

10.13. Elevation of the house:

1: Ground floor same level as street

2: Other (specify): ± .....cm; ± ..... steps of stair

*To fill in by interviewer*

Time end:

Duration: .....minutes

Comments:

Interviewer

Respondent

Thank you very much!