

# Original Questionnaire for the ‘SCALAR’ household surveys on private climate change adaptation

## Wave 2.a

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This panel survey contains data from households located in large, coastal urban centers in the United States (Houston, New Orleans and Miami greater areas), the Netherlands (Rotterdam greater area and the province of Zeeland), China (Shanghai greater area), and Indonesia (Jakarta greater area, other cities in Java). In each location we used the identical, translated questions in the respective languages of each country. These panel surveys conducted in five waves between 2020-2023 are focused on soliciting information on households' socio-economic background, perceptions, adaptive capacities, self-assessed resilience, place attachment, social influence, policy and other factors influencing individual climate change adaptation behavior surrounding private adaptation to climate change (here contextualized to floods). The surveys were conducted online with the help of YouGov, <https://yougov.co.uk/>. The second survey was conducted in October 2020.

Developing, distributing and analyzing these household surveys on private climate change adaptation was possible thanks to the funding from the **European Research Council project ‘SCALAR: Scaling up behavior and autonomous adaptation for macro models of climate change damage assessment’** (grant agreement no. 758014) under the European Union's Horizon 2020 Research and Innovation Program. Our ERC ‘SCALAR’ Team has been based at the University of Twente in 2018-2021; and from 2021 – at the Delft University of Technology, The Netherlands. This second wave of the survey was conducted from the University of Twente.

### Related publications:

PhD Thesis of Dr. Brayton Noll (2023): <https://repository.tudelft.nl/islandora/object/uuid%3A0d49cb3e-6dd8-4a9e-abc6-b847de938aea?collection=research>

Noll, B., Filatova, T., Need, A., de Vries, P. (2023) ‘Uncertainty in individual risk judgments associates with vulnerability and curtailed climate adaptation’, Journal of Environmental Management, 325, 116462, <https://pubmed.ncbi.nlm.nih.gov/36272292/>

Noll, B., T.Filatova, A.Need (2022) ‘One and done? Exploring linkages between households’ intended adaptations to climate-induced floods’, Risk Analysis, 1-19, <https://doi.org/10.1111/risa.13897>

Noll B., Filatova, T., Need, A. & Taberna, A. (2021) ‘Contextualizing cross-national patterns in household climate change adaptation’, Nature Climate Change <https://doi.org/10.1038/s41558-021-01222-3>

**Note:** Below the **green color** codes the name of the corresponding variable in the dataset. The **yellow color** denotes the internal comments guiding the conditional questions order.

Dear Participants,

Thank you very much for your participation in our previous Survey (March-April 2020) on flood risks and possible adaptation options. Your responses are invaluable and being used for important, international research that aims to understand how people react to flooding and what one can do to reduce their devastating impacts. This time the survey is shorter than the previous one.

This survey has four sections containing:

- 1) few follow-up questions from the previous survey to inquire if your circumstances or opinion have changed;
- 2) questions that ask you about the likelihood of uncertain events;
- 3) a few questions on the individual situation of your household;
- 4) and hypothetical scenarios regarding actions you can imagine yourself taking in response to growing flood risks.

Each of these sections is designed to better understand what affects human perceptions of risks and decision over time. Thus, your participation in this survey and the subsequent ones in 2021 is VERY important and meaningful.

We sincerely thank you for your continued participation and help!

**[Q0\_pre\_Zeta\_US]** Was the questionnaire was answered before Hurricane Zeta hit?

Yes

No

## Follow Up Questions

*In this section we will ask you some follow up questions from the previous survey regarding a few different flood protection actions and your attitudes towards flooding.*

1. **[R2 implementation yes]** **[Note: only if applicable]** In the last survey in March-April 2020, you indicated that, at some point in the future, you intend to complete the following items. There are no 'correct' or 'incorrect' answers here; we just would like to better understand your decisions over time. Please select the option that most accurately portrays their status and your current intentions:

Possible flood protection and damage mitigation measures	I have implemented the measure	I still intend to implement the measure	I no longer intend to implement the measure
<b>[Input measures selected on past survey that they intended to complete]</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>[Input measures selected on past survey that they intended to complete]</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>[Input measures selected on past survey that they intended to complete]</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
etc	etc	etc	etc

2. **[R2 implementation no]** In the last survey in March-April 2020 you indicated that you had no intention to complete the following flood protection and damage mitigation measures. Please indicate if there have been any change in your situation or intention.

The measures	I still do NOT intend to do this	My situation has changed, I DO intend to undertake this**	I implemented this between March and September 2020
<b>[Input ALL measures selected on past survey that they did not intent to complete]</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>[Input ALL measures selected on past survey]</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

that they did not intent to complete]			
[Input ALL measures selected on past survey that they did not intent to complete]	[ ]	[ ]	[ ]
etc	etc	etc	etc

3. **[R2a\_implementation\_change]** [Note: ONLY IF they select column 2 in question 2]  
Please indicate approximately when you intend to implement these measures in the future

The measures	I intend to implement this structural measure in the next 6 months	I intend to implement this structural measure in the next 12 months	I intend to implement this structural measure in the next 18 months	I intend to implement this measure in the future, beyond 18 months in the future
**[Input ALL measures that the respondents changed to Intend to do from question 2]	[ ]	[ ]	[ ]	[ ]
**[Input ALL measures that the respondents changed to Intend to do from question 2]	[ ]	[ ]	[ ]	[ ]
**[Input ALL measures that the respondents changed to Intend to do from question 2]	[ ]	[ ]	[ ]	[ ]

4. **[R02a\_perc\_prob\_change]** In the last survey, we asked you about how likely you thought it is that you would experience a flood.  
You responded with \_\_\_\_ / \_\_\_\_ % / I don't Know  
Is this still the case?  
Yes  
No\*\*

- a) **\*\*[IF answer No]**  
**[R02\_perc\_prob]** How often do you think a flood occurs on the property on which you live (e.g. due to rivers or heavy rain, storms and cyclones)? Which category is the most appropriate?

My house is completely safe  
Less often than 1 in 500 year  
Once in 500 years or a 0.2% chance annually  
Once in 200 years or a .5% chance annually  
Once in 100 years or 1% chance annually  
Once in 50 years or a 2% chance annually  
Once in 10 years or 10% chance annually  
Annually  
More frequent than once per year  
Don't know

**[R02\_perc\_prob\_other]** Other: Once in \_\_\_\_ Years

5. **[R03a\_perc\_damage\_change]** In the last survey, we asked you how severe the physical damage you thought a flood on a similar scale to **[Name of flood depending on country\*\*]** would affect your home on a scale of 1: not at all severe – 5: Very severe. You responded with \_\_\_\_ / I don't know  
Is this still the case?

Yes  
No\*\*

- a) **\*\*[IF answer No]**  
**[R03\_perc\_damage]** In the event of a future major flood in your area on a similar scale to **[Name of flood depending on country\*\*]** how severe (or not) do you think the physical damage to your house would be?

1= Not at all severe  
2  
3  
4  
5= Very severe  
Don't know / Prefer not to say

**[\*\* Indonesia: “the 2020 Jakarta Floods”; China: “the 2017 China Floods in Hunan”; USA: “the flooding from Hurricane Harvey in Houston in 2017”; Netherlands: “the North Sea Flood of 1953”]**

6. **[R04a\_perc\_health\_change]** In the last survey, we asked you to rate how likely you or another member of your household would suffer health consequences in the event of a flood in your area? You responded with \_\_\_\_  
Is this still the case?

Yes  
No\*\*

- a) **\*\*[IF answer No]**  
**[R04\_perc\_health]** In the event of a flood in your area, how likely or unlikely do you think it is that you or another member of your household would suffer health consequences?  
 1= not at all likely  
 2= hardly likely  
 3= somewhat likely  
 4= quite likely  
 5= almost certain
7. **[R05a\_worry\_change]** In the last survey, we asked how worried you were about flooding. You responded with **/ I don't know**  
 Is this still the case?  
 Yes  
 No\*\*
- a. **\*\*[IF answer No]**  
**[R05\_worry]** Please indicate How worried or not are you about the potential impact of flooding on your home?  
 1= not at all worried  
 2= A little worried  
 3= somewhat worried  
 4= quite worried  
 5= very worried
8. In the last six months how frequently have you read information about flooding and other hazards?  
**[R06a\_media\_freq]** From the **general media**  
 1= Very infrequently 2, 3, 4 , 5= Very frequently
- [R06b\_social\_media\_freq]** From **Social Media** (i.e. Facebook, Instagram, WeChat, Weibo, etc.)  
 1= Very infrequently 2, 3, 4 , 5= Very frequently
9. **[R010\_flood\_convo]** Since the last survey in March-April 2020, approximately how many times have you been involved in a conversation or contributed to a discussion (in person or on social media) involving the subject of flooding?  
 \_\_\_\_\_ times
10. **[R011\_local\_flood\_convo]** Approximately how many of these conversations took place with someone who lived in your local area?  
 \_\_\_\_\_ times

*Last time we interviewed you in March- April 2020, we asked you to agree or disagree with six statements regarding your household's ability to respond to challenges. Again, there are no 'correct' or 'incorrect' answers, we want to re-ask to understand if there have been any changes in your situation in the past months.*

11. **[R01a\_resilience\_1\_change]** In response to the statement: “My household can bounce back from any challenge that life throws at it” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree.

Is this still the case?

Yes

No\*\*

- a. **\*\*[IF answer NO]**

**[R01\_resilience\_1]** Please indicate what you currently think about the statement:

My household can bounce back from any challenge that life throws at it;.

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree.

12. **[R01a\_resilience\_2\_change]** In response to the statement: “During times of hardship, my household can change its primary income or source of livelihood if needed” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree.

Is this still the case?

Yes

No\*\*

- a. **\*\*[IF answer NO]**

**[R01\_resilience\_2]** Please indicate what you currently think about the statement:  
During times of hardship, my household can change its primary income or source of livelihood if needed.

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree

13. **[R01a\_resilience\_3\_change]** In response to the statement: “If hardships or natural disasters became more frequent and intense, my household would still find a way to get by” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree.

Is this still the case?

Yes

No\*\*

- a. **\*\*[IF answer NO]**

**[R01\_resilience\_3]** Please indicate what you currently think about the statement:  
If hardships or natural disasters became more frequent and intense, my household would still find a way to get by.

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree

14. **[R01a\_resilience\_4\_change]** In response to the statement: “During times of hardship, my household can access the financial support I need (e.g. such as access to credit at a

bank)” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree. Is this still the case?

Yes

No\*\*

a. \*\*[IF answer NO]

**[R01\_resilience\_4]** Please indicate what you currently think about the statement:  
During times of hardship, my household can access the financial support I need  
(e.g. such as access to credit at a bank)

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree

15. **[R01a\_resilience\_5\_change]** In response to the statement: “My household can rely on the support of family and friends when I need help.” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree. Is this still the case?

Yes

No\*\*

a. \*\*[IF answer NO]

**[R01\_resilience\_5]** Please indicate what you currently think about the statement:  
My household can rely on the support of family and friends when I need help

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree

16. **[R01a\_resilience\_6\_change]** In response to the statement: “My household can rely on the support from my government when I need help (e.g. receiving funding or support in the event of a natural disaster)” you responded with a  on the scale of 1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree. Is this still the case?

Yes

No\*\*

a. \*\*[IF answer NO]

**[R01\_resilience\_6]** Please indicate what you currently think about the statement:  
My household can rely on the support from my government when I need help  
(e.g. receiving funding or support in the event of a natural disaster)

1= Strongly Agree, 2, 3, 4, 5= Strongly Disagree



## Other uncertain and/or risky situations

*The next several questions will ask about your perceptions of other situations that are uncertain. Please answer to the best of your knowledge.*

### 17. Covid-19

**[Q17a\_covid\_risk]** Please indicate how likely it is that you could contract Covid-19

\_\_\_\_\_%  
I dont know

**[Q17b\_covid\_survival]** In the case you are diagnosed covid-19, how likely is it that you would beat/overcome the disease?

\_\_\_\_\_%  
I dont know

**[Q17c\_covid\_asymp]** In this scenario, how likely is it that you are a-symptomatic (i.e. don't have any symptoms)?

\_\_\_\_\_%  
I dont know

### 18. Winning a Lottery

**[Q18\_lottery\_chance]** The government of \_\_\_\_\_ **[insert region\*\*]** is having a lottery where they randomly select **[\*\*\* insert number]** citizens to win **[\*\*\*\*insert monetary amount]**. Please indicate how likely is it that you will be one of the winners.

\_\_\_\_\_%  
I dont know

**[\*\* USA: The United States of America  
China: The Peoples Republic of China  
Indonesia: The Republic of Indonesia  
NL: The European Union]**

**[\*\*\* USA: 33100  
China: 144000  
Indonesia: 27350  
European Union: 44800]**

**[\*\*\*\* NL: 50,000 Euro  
USA: 50,000 dollars  
China: 7,500 yen  
Indonesia: 730 million Rupiah]**

### 19. Car Accident

**[Q19a\_car\_risk]** How likely do you think it is you could be involved in a car accident in the next 12 months?

\_\_\_\_\_%  
I dont know

**[Q19b\_car\_impact]** How severely do you think a mild car accident would impact your life?

1= Little, I am in good health and believe my body would most likely heal quickly

2

3

4

5= A crippling amount. I believe I would need extensive physical therapy  
I dont know.

## 20. Plane Crash

**[Q20a\_plane\_risk]** How likely is it that, on your next flight, the plane you are on crashes?

\_\_\_\_\_ %

I dont know

**[Q20b\_plane\_survival]** In the scenario where the plane you are on crashes, how likely is it that you survive?

\_\_\_\_\_ %

I dont know

## Household situation

*In this section we ask you a few questions related to your household situation.*

21. **[Q21\_move\_city]** In the last 10 years, how many different places (different cities/towns/villages) have you lived in?

\_\_\_\_\_ places

22. **[Q22\_move\_houses]** In the last 10 years, how many times have you moved house?

\_\_\_\_\_ times

23. **[Q23\_social\_network]** How would you describe your social network where you currently live?

1= I have very few friends and/or family living near me

2

3

4

5= I have many friends and/or family living near me

24. **[R09\_savings\_change]** Since the last survey, in March-April 2020, how has your total household finances/ savings changed.

Increased\*\*  
Decreased\*\*  
Stayed the Same

- a. **[\*\*IF answer is Increased or Decreased]**  
**[R09a\_savings\_change\_frac]** By what percentage has your household finances/savings increased/decreased?  
\_\_\_\_\_ %
25. **[R08a\_economic\_comfort\_change]** In the last survey in March-April 2020, we asked you to indicate your level of economic comfort. Your response was \_\_\_\_  
Is this still the case?  
Yes  
No\*\*
- a. **[\*\*IF answer No]**  
**[R08\_economic\_comfort]** When considering your salary along with your expenses, how would you describe your level of “economic comfort”?  
1= Very difficult to live  
2= Difficult to live  
3= Coping  
4= Living comfortably  
5= Living very comfortably  
98= Don’t know/Prefer not to say
26. **[R012\_lost\_job]** In the last 6 months, have you or another financially contributing member of your household lost their job?  
Yes\*\*  
No
- a. **[\*\*IF answer Yes]**  
**[R012a\_lost\_job\_impact]** How much has this job loss impacted you financially  
1: Very little, 2, 3, 4, 5: A considerable amount

## Choice questions

*In this final part of the survey we present you with 3 hypothetical scenarios that relate to where you currently live and whether or not you may consider moving to another place. For each scenario you may choose either to move, stay where you live currently and take extra flood protection actions, or stay where you currently live and do nothing. We present you to some specific characteristics of each place to help inform your decision. Please select the option that most closely aligns with the choice you would take in each scenario.*

**[S1\_current\_situation] Scenario 1:**

Please consider your current situation and the place where you live. Now suppose that you got an opportunity to move to another place and can choose among the options presented below. In each of the options, you may decide whether or not to move, depending on the flood risk, closeness of family and friends, job opportunities, and costs. Read through the characteristics of each option and select the one that most closely aligns with what you would choose. If you do not like either Option 1 or 2, then please choose the box "Status quo" to indicate no desired change.

What would you choose in this situation?

Choice <input type="checkbox"/>	Move	Stay in my current home and <u>take some action</u>	I do <u>NOT</u> change anything (Status Quo)
Characteristics:			
Place	1,2**	Same house or apartment	Same house or apartment
Future Flood Risk	1,2,3**	Reduced, due to the measures you implement (see below)	Same as you currently face
Social Network	1,2**	Same as you currently have	Same as you currently have
Employment/ Economic Prospects	There are many opportunities in your field/ line of work. You will find a good job quickly.	1,2*** *** <input type="checkbox"/>	<input type="checkbox"/> *** Must be same as this box to the left.
Costs to you	The move will cost the approximately 2 months of your salary	1,2**	Zero additional costs

**YOUR  
CHOICE**

**Option 1 [ ]**

**Option 2 [ ]**

**Status Quo [ ]**

**[S2\_moderate\_flood] Scenario 2:**

Again, please consider the place where you currently live. A moderate flood has just occurred in your area. Due to the flood and the resulting humidity the house/ apartment where you place\_ live was damaged, as well as some of your possessions. The total damage is equivalent to roughly 2 months of your salary. Considering this new scenario please read again through the

characteristics of each option and select the option that most closely aligns with what you would choose. If you do not like either Option 1 or 2, then please choose the box "Status quo" to indicate no desired change.

What would you choose in this situation?

<b>Choice</b> <input type="checkbox"/>	<b>Move</b>	<b>Stay in my current home and <u>take some action</u></b>	<b>I do <u>NOT</u> change anything (Status Quo)</b>
<b>Characteristics:</b>			
Place	<b>SAME as the first CE by RESPONDANT</b>	Same house or apartment	Same house or apartment
Future Flood Risk	<b>SAME as the first CE by RESPONDANT</b>	Reduced, due to the measures you implement (see below)	Same as you currently face
Social Network	<b>SAME as the first CE by RESPONDANT</b>	Same as you currently have	Same as you currently have
Employment/ Economic Prospects	There are many opportunities in your field/ line of work. You will find a good job quickly.	<b>SAME as the first CE by RESPONDANT</b> <input type="checkbox"/>	<input type="checkbox"/> *** Must be same as this box to the left.
Costs to you	The move will cost the approximately 2 months of your salary	<b>SAME as the first CE by RESPONDANT</b>	Zero additional costs

**YOUR  
CHOICE**

**Option 1 [ ]**

**Option 2 [ ]**

**Status Quo [ ]**

### **[S3\_heavy\_flood]** *Scenario 3:*

For a final time, please consider where you currently live. A disastrous flood has just occurred. Your house/ apartment was severely damaged, as well as many of your possessions. The damage the flood caused your property is roughly 4 month's equivalents of your salary. Many businesses in the neighborhood are closed. The grocery store where you commonly shop was destroyed. It is estimated schools will be closed for some time. Considering this new scenario please read through the characteristics of each option and select the option that most closely aligns with what you would choose. If you do not like either Option 1 or 2, then please choose the box "Status quo" to indicate no desired change.

What would you choose in this situation?

Choice <input type="checkbox"/>	Move	Stay in my current home and <u>take some action</u>	I do <u>NOT</u> change anything (Status Quo)
<b>Characteristics:</b>			
Place	SAME as the first CE by RESPONDANT	Same house or apartment	Same house or apartment
Future Flood Risk	SAME as the first CE by RESPONDANT	Reduced, due to the measures you implement (see below)	Same as you currently face
Social Network	SAME as the first CE by RESPONDANT	Same as you currently have	Same as you currently have
Employment/ Economic Prospects	There are many opportunities in your field/ line of work. You will find a good job quickly.	SAME as the first CE by RESPONDANT <input type="checkbox"/>	<input type="checkbox"/> *** Must be same as this box to the left.
Costs to you	The move will cost the approximately 2 months of your salary	SAME as the first CE by RESPONDANT	Zero additional costs

**YOUR  
CHOICE**

**Option 1 [ ]**

**Option 2 [ ]**

**Status Quo [ ]**

**\*\*Characteristics to select from**

[S0_chars_place] Place	1/2	1 = You move <u>within</u> the same city/area in which you currently live 2 = You move to <u>another city</u> far away from where you currently live
[S0_chars_flood_risk] Flood Risk	1/2/ 3	1= <response to R02_perc_prob> / 3 (the percent) : “You expect a DECREASE in your flood risk. The new flood likelihood is approximately <input type="text"/>  2= The chance that you will experience flooding on your property is the same as you currently face

		3= Multiply <response to R02 perc prob> x 3 (the percent): You expect an INCREASE in your flood risk. The new flood likelihood is approximately <input type="text"/>
[S0_chars_social_net] Social Network	1/2	<p>1 = [<b>**For SAME city</b> ]: Many of your family and friends have, or are planning on moving out of the area where you currently live</p> <p>1 = [<b>**For Move to DIFFERENT city</b>]: You know almost no one in the new area</p> <p>2 = [<b>**For SAME city</b>]: Your current family and friends in the area are planning to stay where they currently live</p> <p>2 = [<b>**For Move to DIFFERENT city</b>]: You already have several family members and friends in the new area</p>
[S0_chars_employment] Employment	1/2	<p>1 = Your current job/ source of income is stable. Your services are in high demand where you currently work.</p> <p>2 = You will likely lose your job/source of income in the place where you live now. Other job opportunities in the area are also disappearing.</p>
[S0_chars_cost] Costs to you	1/2	<p>1 = You implement additional flood protection measures that reduce your flood risk and cost approximately one month's salary</p> <p>2 = You implement additional flood protection measures that significantly reduce your flood risk and cost approximately two month's salary</p>

Thank you very much for your participation. We look forward to hearing from you again in March 2021!