Supplement of

The determinants affecting the intention of urban residents to prepare for flood risk in China

Tiantian Wang et al.

Correspondence to: Tiantian Wang (wangtiantian@bit.edu.cn) and Tiezhong Liu (liutiezhong@bit.edu.cn)

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The Online Questionnaire

We used the Wenjuanxing website to collect the survey. For ease of understanding, a fully translated version of the questionnaire is provided below. Note, however, that not all of the questions are used in the analysis. The types of survey questions included fill in the blank, demographic questions, single choice questions, multiple choice questions, and rating scales.

Introduction

Research on Public Awareness and Mitigation Measures of Floods.

In recent years, extreme rain events have occurred frequently and flooding has caused significant losses to the country and its people. The purpose of this questionnaire is to understand the public's awareness of flooding caused by extreme rainfall and their choice of response measures. This questionnaire is anonymous, all the data you provide will be treated confidentially and will not have any adverse impact on you and your work life. In addition, the answers to this questionnaire are not right or wrong, and are for academic research purposes only. Your active cooperation is of great importance to this research work, and your support and cooperation are greatly appreciated!
Table S1
The questionnaire.

| Item | Description of question | Response scale |
|------|-------------------------|----------------|
| 1    | Reinforcement of houses or/and construction of water retaining walls. | Categorical variable, respondent’s willing to implement measures: 1=strongly unwilling, 2=unwilling, 3=undecided, 4=partly willing, 5=strongly willing. |
| 2    | Prepare sandbags, life jackets and other emergency supplies. | |
| 3    | Participate in emergency drills or/and learn about flooding. | |
| 4    | Purchasing flood insurance. | |
| 5    | Move the shelter to a safe area away from flooding. | Categorical variable, likelihood of occurrence according to the respondent: 1=never, 2=rarely, 3=sometimes, 4=often, 5=always. |
| 6    | The number of occurrences of very heavy rainfall has increased in 5 years. | |
| 7    | Spending to withstand damage caused by heavy rainfall has increased. | |
| 8    | How likely do you think flooding is to cause damage to infrastructure (telecommunications, electrification and transportation, etc.) in your area? | Categorical variable, likelihood of occurrence according to the respondent: 1=very small, 2=small, 3=medium, 4=high, 5=very high. |
| 9    | How likely do you think you are to be a victim (property damage or injury) in a flood? | |
| 10   | How dangerous do you think the flood is to your life? | Categorical variable, respondent perceives the measures to be: 1=not effective at all, 2=not effective, 3=not effective, not ineffective, 4=effective, 5=very effective. |
| 11   | Prepare sandbags, life jackets and other emergency supplies. | |
| 12   | Participate in emergency drills or/and learn about flooding. | |
| 13   | Reinforcement of houses or/and construction of water retaining walls. | |
| 14   | Purchasing flood insurance | |
| 15   | Move the shelter to a safe area away from flooding. | |
| 16   | I think I have the ability to take the above flood protection measures. | Categorical variable, respondent thinks that him/herself or a member of the household is capable of taking the described measures: 1=fully disagree, 2=partly disagree, 3=partly disagree, partly agree, 4=partly agree, 5=fully agree. |
| 17   | When a flood occurs, I think I will be able to keep my property safe. | |
| 18   | When the flood occurs, I think I have the ability to keep my life safe. | |
| 19   | When the flood occurs, I think I have the ability to help others out of danger. | |
| 20   | Prepare sandbags, life jackets and other emergency supplies. | Categorical variable, respondent perceives the measure to be: 1=a very short time to implement, 2=a short time, 3= do not know, 4=a long time, 5=a very long time (time needed to implement the measure)/1=very low-cost, 2=low-cost, 3=do |
| 21   | Participate in emergency drills or/and learn about flooding. | |
| 22   | Reinforcement of houses or/and construction of water retaining walls. | |
| 23   | Purchasing flood insurance. | |
|   |   |
|---|---|
| 24 | Move the shelter to a safe area away from flooding. |
| 25 | Infrastructure is interrupted or destroyed in the area where you live. |
| 26 | Serious damage to your personal belongings (e.g. vehicles, outdoors/residential areas). |
| 27 | Destruction partial/total of your residence. |
| 28 | Injuries to individuals or family members. |
| 29 | Death of an individual or family member. |
| 30 | I don't think we can reduce the loss in the flood no matter what measures we take (fatalism). |
| 31 | I think flood prevention is a matter for the authorities and has less to do with individuals. |
| 32 | I think individuals have the responsibility to protect their families from floods. |
| 33 | How much influence does your family have on your implementation of flood prevention measures? |
| 34 | How much influence do your neighbors or friends have on your implementation of flood protection measures? |
| 35 | What is the impact of government policies on your implementation of flood prevention measures? |
| 36 | I am confident that the flood defenses are maintained well. |
| 37 | I have confidence in the technological skills of flood risk managers. |
| 38 | I rely heavily on the local flood control facilities. |
| 39 | Gender |
| 40 | Age |
| 41 | Personal yearly income |
| 42 | Education level |

Categorical variable, worry about flood occurrence and consequences: 1=quite don’t worry, 2=don’t worry, 3=do not know, 4=worry, 5=very worry.

Categorical variable, respondent's attitudes towards flood prevention: 1=strongly disagree, 2=partly disagree, 3=partly disagree, partly agree, 4=partly agree, 5=strongly agree.

Categorical variable, respondent’s felling: 1=very small, 2=small, 3=medium, 4=high, 5=very high.

Categorical variable, respondent’s attitudes to the flood protect projects: 1=strongly disagree, 2=partly disagree, 3=partly disagree, partly agree, 4=partly agree, 5=strongly agree.

Dummy variable, 1=female, 0=male.

Age of the respondents grouped into 5 classes: 1=’”Under 20 years old”, 2=’”20-30 years old”, 3=’”31-40 years old”, 4=’”41-60 years old”, 5=’”Over 60 years old”.

Continuous variable of net yearly income

Respondents' education level grouped into 4 classes: 1=’”junior high school or below”, 2=’”Senior high school”, 3=’”Associate degree or bachelor degree”, 4=’”Master's degree or
|   | Housing     | Dummy variable, 1=homeownership, 0=tenancy. |
|---|-------------|------------------------------------------|
|   | Floor level | Dummy variable, 1="First floor or basement", 2="Second floor", 3="Third or upper floors", 4="other". |
| Constructs         | Item                                                                 | Description of question                                                                 | Response scale (1-5)          |
|-------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------|
| Intention (IN)    | IN1                                                                 | Reinforcement of houses or / and construction of water retaining walls.                  |                               |
|                   | IN2                                                                 | Prepare sandbags, life jackets and other emergency supplies.                             |                               |
|                   | IN3                                                                 | Participate in emergency drills or / and learn about flooding.                           |                               |
|                   | IN4                                                                 | Purchasing flood insurance.                                                             |                               |
|                   | IN5                                                                 | Move the shelter to a safe area away from flooding.                                   |                               |
| Perceived likelihood (PL) | PL1                                | The number of occurrences of very heavy rainfall has increased in 5 years.             | “absolutely no”-              |
|                   | PL2                                                                 | Spending to withstand damage caused by heavy rainfall has increased.                    | “absolutely have”             |
| Perceived consequence (PC) | PC1                              | How likely do you think flooding is to cause damage to infrastructure (telecommunications, electrification and transportation, etc.) in your area? | “very small”-“very high”      |
|                   | PC2                                                                 | How likely do you think you are to be a victim (property damage or injury) in a flood? |                               |
|                   | PC3                                                                 | How dangerous do you think the flood is to your life?                                  |                               |
| Response efficacy (RE)| RE1                              | Prepare sandbags, life jackets and other emergency supplies.                             | “not effective at all”-       |
|                   | RE2                                                                 | Participate in emergency drills or / and learn about flooding.                          | “very effective”              |
|                   | RE3                                                                 | Reinforcement of houses or / and construction of water retaining walls.                 |                               |
|                   | RE4                                                                 | Purchasing flood insurance.                                                             |                               |
|                   | RE5                                                                 | Move the shelter to a safe area away from flooding.                                   |                               |
| Self-efficacy (SE)| SE1                                                                 | I think I have the ability to take the above flood protection measures.                 |                               |
|                   | SE2                                                                 | When a flood occurs, I think I will be able to keep my property safe.                  |                               |
|                   | SE3                                                                 | When the flood occurs, I think I have the ability to keep my life safe.                |                               |
|                   | SE4                                                                 | When the flood occurs, I think I have the ability to help others out of danger.        |                               |
| Attitude (AT)     | AT1                                                                 | I don't think we can reduce the loss in the flood no matter what measures we take (fatalism). | “strongly disagree”-         |
|                   | AT2                                                                 | I think flood prevention is a matter for the authorities and has less to do with individuals. | “strongly agree”             |
|                   | AT3                                                                 | I think individuals have the responsibility to protect their families from floods.    |                               |
| Trust in public flood protection (TR) | TR1                              | I am confident that the flood defenses are maintained well.                           |                               |
|                   | TR2                                                                 | I have confidence in the technological skills of flood risk managers.                  |                               |
|                   | TR3                                                                 | I rely heavily on the local flood control facilities.                                  |                               |
| Response cost     | RC1                                                                 | Prepare sandbags, life jackets and other emergency supplies.                           | “very low-cost”-             |
|                   | RC2                                                                 |                                                                                       | “very high”                  |

Table S2
Flood-risk precautionary behavior scale.
| (RC) | RC2  | Participate in emergency drills or / and learn about flooding. | expensive” |
|------|------|-------------------------------------------------------------|------------|
|      | RC3  | Reinforcement of houses or / and construction of water retaining walls. |            |
|      | RC4  | Purchasing flood insurance. |            |
|      | RC5  | Move the shelter to a safe area away from flooding. |            |
| SN1  |      | What influence does your family have on your implementation of flood protection measures? |            |
| SN2  |      | What influence do your neighbors, friends or relatives have on your implementation of flood protection measures? | “very small”-“very high” |
| SN3  |      | What is the impact of government policies on your implementation of flood prevention measures? |            |
| W1   |      | Infrastructure is interrupted or destroyed in the area where you live. | “quite don’t worry”-“very worry” |
| W2   |      | Serious damage to your personal belongings. |            |
| W3   |      | Destruction partial / total of your residence. |            |
| W4   |      | Injuries to individuals or family members. |            |
| W5   |      | Death of an individual or family member. |            |

Note: The items of red were deleted according to factor loading below 0.5.
Table S3
Results of validation factor analysis.

| Construct | Item | Factor loading | Cronbach's alpha | CR  | AVE  |
|-----------|------|----------------|------------------|-----|------|
| IN        | IN1  | 0.727          |                  |     |      |
|           | IN2  | 0.833          | 0.746            | 0.841| 0.569|
|           | IN3  | 0.706          |                  |     |      |
|           | IN4  | 0.747          |                  |     |      |
| PL        | PL1  | 1.000          | 1.000            | 1.000| 1.000|
|           | PC1  | 0.809          |                  |     |      |
| PC        | PC2  | 0.861          | 0.778            | 0.871| 0.693|
|           | PC3  | 0.825          |                  |     |      |
|           | RE1  | 0.699          |                  |     |      |
| RE        | RE2  | 0.801          | 0.766            | 0.798| 0.506|
|           | RE3  | 0.704          |                  |     |      |
|           | RE4  | 0.608          |                  |     |      |
|           | SE1  | 0.810          |                  |     |      |
| SE        | SE2  | 0.831          | 0.819            | 0.878| 0.643|
|           | SE3  | 0.784          |                  |     |      |
|           | SE4  | 0.781          |                  |     |      |
| AT        | AT1  | 0.728          | 0.746            | 0.717| 0.594|
|           | AT2  | 0.921          |                  |     |      |
|           | W1   | 0.792          |                  |     |      |
| W         | W2   | 0.865          | 0.850            | 0.899| 0.690|
|           | W3   | 0.825          |                  |     |      |
|           | W4   | 0.838          |                  |     |      |
|           | SN1  | 0.854          |                  |     |      |
| SN        | SN2  | 0.821          | 0.732            | 0.849| 0.653|
|           | SN3  | 0.745          |                  |     |      |
| TR        | TR1  | 0.918          | 0.769            | 0.896| 0.811|
|           | TR2  | 0.883          |                  |     |      |

Note: IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection. CR: Composite reliability; AVE: Average variance extracted.
Table S4
The result of Fornell-Larcker criterion.

| Construct | IN   | PL   | PC   | RE   | SE   | RC   | AT   | W    | SN   | TR   |
|-----------|------|------|------|------|------|------|------|------|------|------|
| IN        | 0.755|      |      |      |      |      |      |      |      |      |
| PL        | 0.208| 1.000|      |      |      |      |      |      |      |      |
| PC        | 0.302| 0.524| 0.832|      |      |      |      |      |      |      |
| RE        | 0.502| 0.036| 0.134| 0.711|      |      |      |      |      |      |
| SE        | 0.280| 0.019|-0.098| 0.249| 0.802|      |      |      |      |      |
| RC        | 0.131| 0.129|      | 0.088| 0.155| 0.775|      |      |      |      |
| AT        | -0.131| 0.069|-0.025|-0.166| 0.078| 0.208| 0.771|      |      |      |
| W         | 0.302| 0.197| 0.381| 0.230|-0.048| 0.161|-0.074| 0.831|      |      |
| SN        | 0.301| 0.159| 0.210| 0.262| 0.195| 0.140|-0.021| 0.216| 0.808|      |
| TR        | 0.105| -0.134|-0.140| 0.135| 0.190| 0.035|-0.068|-0.065| 0.169| 0.900|

Note: The number on the diagonal is the square root of the latent variable AVE, and the number below the diagonal is the correlation coefficient between the latent variables. IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; RC: Response cost; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection.
### Table S5
The result of HTMT.

| Construct | IN  | PL  | PC  | RE  | SE  | RC  | AT  | W   | SN  | TR  |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| IN        | 0.238 |     |     |     |     |     |     |     |     |     |
| PL        | 0.393 | 0.595 |     |     |     |     |     |     |     |     |
| PC        | 0.714 | 0.061 | 0.184 |     |     |     |     |     |     |     |
| RE        | 0.343 | 0.026 | 0.131 | 0.329 |     |     |     |     |     |     |
| SE        | 0.242 | 0.182 | 0.155 | 0.249 | 0.251 |     |     |     |     |     |
| RC        | 0.149 | 0.120 | 0.097 | 0.240 | 0.090 | 0.493 |     |     |     |     |
| AT        | 0.379 | 0.214 | 0.468 | 0.305 | 0.099 | 0.240 | 0.149 |     |     |     |
| W         | 0.407 | 0.185 | 0.277 | 0.379 | 0.245 | 0.254 | 0.121 | 0.273 |     |     |
| SN        | 0.144 | 0.148 | 0.177 | 0.198 | 0.233 | 0.067 | 0.068 | 0.079 | 0.229 |     |
| TR        | 0.144 | 0.148 | 0.177 | 0.198 | 0.233 | 0.067 | 0.068 | 0.079 | 0.229 |     |

Note: IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; RC: Response cost; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection.
Table S6  
Results of structural model.

| Hypothesis   | Path coefficient | T-statistic value | P-value |
|--------------|------------------|------------------|---------|
| H1a: PL → IN       | 0.072            | 3.340**          | 0.001   |
| H1b: PC → IN       | 0.171            | 7.003***         | 0.000   |
| H1c: PL → W → IN    | 0.000            | 0.125ns          | 0.901   |
| H1d: PC → W → IN    | 0.047            | 4.547***         | 0.000   |
| H2a: RE → IN       | 0.358            | 13.570***        | 0.000   |
| H2b: SE → IN       | 0.190            | 8.431***         | 0.000   |
| H2c: RC → IN       | -0.067           | 2.359*           | 0.014   |
| H3: AT → IN        | -0.079           | 3.436**          | 0.001   |
| H4: SN → IN        | 0.084            | 3.694***         | 0.000   |
| H5a: TR → AT       | -0.068           | 2.488*           | 0.013   |
| H5b: TR → PL       | -0.134           | 5.031***         | 0.000   |
| H5c: TR → PC       | -0.140           | 5.532***         | 0.000   |
| H5d: TR → IN       | 0.007            | 0.216ns          | 0.829   |

Note: *** p < 0.001, ** p < 0.01, * p < 0.05, ns p > 0.05. IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; RC: Response cost; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection.
| Path   | Total effects ($c + a \times b$) | Direct effects ($c$) | Indirect path | Indirect effects ($a \times b$) |
|--------|---------------------------------|----------------------|---------------|-------------------------------|
| AT → IN| -0.079**                        | -0.079**             |               |                               |
| PC → IN| 0.218***                        | 0.171***             | PC → W → IN   | 0.047***                      |
| PC → W | 0.383***                        | 0.383***             |               |                               |
| PL → IN| 0.072**                         | 0.072**              | PL → W → IN   | 0.000ns                       |
| PL → W | -0.003ns                        | -0.003ns             |               |                               |
| RC → IN| -0.067*                         | -0.067*              |               |                               |
| RE → IN| 0.358***                        | 0.358***             |               |                               |
| SE → IN| 0.190***                        | 0.190***             |               |                               |
| SN → IN| 0.084***                        | 0.084***             |               |                               |
| TR → AT| -0.068*                         | -0.068*              |               |                               |
| TR → IN| -0.036ns                        | 0.007ns              | TR → PL → IN  | -0.007ns                      |
|        |                                  |                      | TR → PL → W → IN| 0.000ns                      |
|        |                                  |                      | TR → PC → IN  | -0.031**                      |
|        |                                  |                      | TR → PC → W → IN| -0.009**                      |
|        |                                  |                      | TR → AT → IN  | 0.004ns                       |
| TR → PC| -0.140***                       | -0.140***            |               |                               |
| TR → PL| -0.134***                       | -0.134***            |               |                               |
| W → IN | 0.124***                        | 0.124***             |               |                               |

Note: *** p < 0.001, ** p < 0.01, * p < 0.05, ns p > 0.05. IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; RC: Response cost; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection.
| Items | M   | SD  | Items | M   | SD  | Items | M   | SD  |
|-------|-----|-----|-------|-----|-----|-------|-----|-----|
| PL1   | 2.667 | 1.124 | SE1  | 3.404 | 1.022 | AT1  | 2.424 | 1.098 |
| PC1   | 3.498 | 1.183 | SE2  | 3.114 | 1.049 | AT2  | 1.848 | 1.074 |
| PC2   | 3.109 | 1.165 | SE3  | 3.489 | 1.036 | AT3  | 4.225 | 0.831 |
| PC3   | 3.385 | 1.294 | SE4  | 3.039 | 1.002 | SN1  | 3.509 | 1.047 |
| IN1   | 3.358 | 1.304 | RC1  | 3.742 | 0.889 | SN2  | 3.205 | 1.059 |
| IN2   | 3.835 | 1.216 | RC2  | 2.648 | 0.996 | SN3  | 3.958 | 0.933 |
| IN3   | 4.201 | 0.921 | RC3  | 2.09  | 1.011 | TR1  | 3.51  | 0.903 |
| IN4   | 3.51  | 1.138 | RC4  | 3.329 | 0.917 | TR2  | 3.653 | 0.811 |
| IN5   | 2.988 | 1.299 | RC5  | 4.333 | 0.912 | TR3  | 3.705 | 0.939 |
| RE1   | 3.924 | 0.895 | W1   | 3.743 | 1.055 |
| RE2   | 4.27  | 0.839 | W2   | 3.855 | 1.068 |
| RE3   | 4.275 | 0.808 | W3   | 3.662 | 1.191 |
| RE4   | 3.744 | 0.941 | W4   | 4.168 | 1.112 |
| RE5   | 3.825 | 1.101 | W5   | 4.054 | 1.302 |

Note: IN: Intention; PL: Perceived likelihood; PC: Perceived consequence; RE: Response efficacy; SE: Self-efficacy; RC: Response cost; AT: Attitude; W: Worry; SN: Social norm; TR: Trust in public flood protection.