**Appendix A: Consequentiality statement**

*Part of the introduction to the survey:*

This survey is part of a project that focuses on the management of the natural areas in and around your community. We ask about your present use of this natural environment, and about your opinion about future management of the natural areas. This project is a partnership between The Development Institute, IUCN-NL, the Institute for Environment and Sanitation studies at the University of Ghana, and the Institute for Environmental Studies (IVM) at the Vrije Universiteit Amsterdam in the Netherlands. Your answers are very valuable for the project. The outcomes of this survey will be very useful in helping us to understand your preferences, experiences, and to inform the next steps in our project.

*Part of the introduction to the DCE:*

To investigate what the community management of the natural areas can and should look like we would like to ask you to make a number of choices. These choices are presented to you in the upcoming hypothetical situations and contain trade-offs between your monthly money contribution and changes in coastal land loss, fish abundance and visitors. For each hypothetical situation, please indicate which option you would prefer. While doing so, please keep in mind that the money spend on these projects cannot be used for other purposes.

**Appendix B: Steps taken to statistically compare the WTP disparities between the study sites.**

In this appendix we provide an extensive description of the steps that we take to statistically compare the differences in WTP from time and money payments between the rural and urban sites. For a visual overview see Figure A1.

1. We take 10,000 random draws from the triangular distribution of the attribute coefficients, obtained from the RPL model outcomes. We do this for the money and TimeIVoT samples in both the rural and urban study site, meaning that we do this for four samples in total. By taking into account the full distribution of the attribute coefficients, as an alternative to only the mean estimates, we include as much information as possible in our analysis.
2. We use these 10,000 random draws to calculate 10,000 WTP values for all three attributes in all of the four samples. As an example, we calculate 10,000 WTP values for the urban erosion attribute that result from the money payments and 10,000 WTP values for the urban erosion attribute that result from the TimeIVoT payments. We calculate this for each attribute and in both of the study sites separately. See Equation 1 for this calculation.

 (A.1)

With *a* indicating the attribute (erosion control, fish abundance or visitors), *p* indicating the payment (Money or TimeIVoT), *s* indicating the study site (urban or rural) and *d*=1…10,000 representing the draws. Please note that we take the exponential of the fixed coefficient of the payment since the payments were included in the RPL models with a lognormal distribution and the standard deviation restricted to 0.

1. We use the WTP values to calculate percent differences (*PDs*) between WTP estimates derived from the money payments and the TimeIVoT payments. A *PD* presents the percentage difference between the estimated WTPmoney and WTPtime(IVoT) for a given attribute in each study site. We calculate *PDs* instead of absolute differences to account for differences in preferences for the attributes across both sites that may affect absolute differences in WTP. Using the urban erosion attribute again as example, this means that we end up with 10,000 values that represent the percent difference between the WTP for erosion resulting from the money payments and the WTP for erosion resulting from the TimeIVoT payments. Again, we do this for each attribute and in both of the study sites. See Equation 2 for this calculation.

 (A.2)

With *a* indicating the attribute (erosion control, fish abundance or visitors), *s* indicating the study site (urban or rural) and *d*=1…10,000 representing the draws.

1. Fourth, we statistically compare these *PD*s, per attribute, between the rural and urban site to assess whether WTP disparities are larger in the former. For this we apply Mann-Whitney U tests in which we compare the 10,000 *PD*s for the rural site with the 10,000 *PD*s for the urban site. We apply a non-parametric test here since we do not know the distribution and standard error of the PDs. We furthermore show the results separately for each of the three attributes.

**[LOCATION OF FIGURE A1]**

*Figure A1: Visualization of the steps we take to statistically compare WTP disparities across the urban and rural study site*

**Appendix C: Visual presentation of the distribution of WTPtime(days) and WTPmoney**

**[LOCATION OF FIGURE C1]**

Figure C1: Rural willingness to pay (WTP) distributions for money and time for the three attributes ‘erosion control’ (left), ‘fish abundance’ (middle) and ‘visitors’ (right)

**[LOCATION OF FIGURE C2]**

Figure C2: Urban willingness to pay (WTP) distributions for money and time for the three attributes ‘erosion control’ (left), ‘fish abundance’ (middle) and ‘visitors’ (right)

**Appendix D: Sensitivity analyses on urban rural WTP disparities**

In this appendix we describe the results of two sensitivity analyses that we performed regarding the conclusion that market integration reduces WTP disparities between time and money experiments.

To account for possible sample differences between the money and converted time samples in each site we applied Kruskal-Wallis and Chi-square tests. We found that respondents in the rural money sample possess more durable goods than the respondents in the rural converted time sample. According to theory more durable goods and thus a higher level of market integration would lead to higher WTP via money payments. At the same time, more durable goods and thus a higher level of market integration would lead to lower WTP via time payments. Accounting for this sample difference would therefore mean that, in the rural samples, WTPmoney would be lower because currently respondents with many durable goods are overrepresented in the money sample. WTPtime(MW), WTPtime(SE) and WTPtime(IVoT) would also be lower because respondents with many durable goods are currently underrepresented in the time sample. Since the size of the identified WTP disparities is very large (at least 347%) and WTP decreases under both payment modes, the sample difference regarding durable goods does not affect our conclusion.

Second, to account for possible sample differences between the full time samples and the converted time samples we also performed the procedure as described in Section 4.3 and Appendix B for the full time samples. We use the results of TimeMW and TimeSE as conversion rates here since TimeIVoT can only be estimated for the converted time samples. Results of this analysis are presented in Tables D3 and D4. The main difference between these results and the results presented in Section 5.3 and Tables D1 and D2 are those regarding the erosion attribute. Namely, we find that the differences in WTP disparities across study site for the erosion attribute are not significantly different (TimeMW) or significantly larger in the urban study site (TimeSE). The reason for these different results is that in the rural area respondents in the full time sample have a lower WTPtime(days) (e.g. 12.36 days for 1 meter reduction in erosion) than respondents in the converted time sample (e.g. 19.33 days for 1 meter reduction in erosion). This is as expected since those that are excluded from the converted time sample answered “no” to the question whether they want to contribute time. The fact that they expressed lower WTP values thus makes sense. However, in the urban area we find that the people that have answered “no” to the question whether they want to contribute time expressed higher WTPtime(days) in the experiment (e.g. WTPtime(days) for 1 meter reduction in erosion equals 5.36 days in the full sample but 3.94 days in the converted time sample). This highly questions the choice behavior expressed by the group of urban respondents that is excluded from the converted time sample. Different behavioral anomalies could be underlying this result, and since these respondents were not captured by the usual way of identifying protesters this highlights the need to check if respondents actually want to contribute time or investigate possible effects of preference learning and attribute non-attendance. Since in the full time samples WTPtime(days) for erosion is lower in the rural study site but higher in the urban study site, the size and the direction of the differences in WTP disparities changes and causes the different results presented in Tables D1 and D2.

Table D.1: Median of the percent differences (between WTPmoney and the full time sample WTPtime(MW)) in each site and the results of the Mann-Whitney U tests on the differences in the percent differences between the urban and rural study site.

|  |  |  |
| --- | --- | --- |
| **Attribute** | *Median percent difference* | *Mann-Whitney U tests* |
|  | *Urban* | *Rural* | *p-value* |
| Erosion control | 467% | 465% | 0.358 |
| Fish abundance | 439% | 597% | 0.000 |
| Visitors | 61% | 304% | 0.000 |

Table D.2: Median of the percent differences (between WTPmoney and the full time sample WTPtime(SE)) in each site and the results of the Mann-Whitney U tests on the differences in the percent differences between the urban and rural study site.

|  |  |  |
| --- | --- | --- |
| **Attribute** | *Median percent difference* | *Mann-Whitney U tests* |
|  | *Urban* | *Rural* | *p-value* |
| Erosion control | 2,661% | 2,213% | 0.000 |
| Fish abundance | 2,463% | 2,773% | 0.000 |
| Visitors | 394% | 1,374% | 0.000 |