

Supplementary Information

Appendix A: Choice experiment section from the individual questionnaire

Read out the introduction for choice experiment first and describe the process.

For this next section of the questionnaire, I want you to think about how to compensate for the impact that the Bujagali or Isimba Hydropower Project has on people and the environment. The compensator will create a new environmental project that will make up for the damage that the Hydropower Project has on the environment by improving the environment somewhere else (but in the same area). They have decided that they will do this by improving the state of the Central Forest Reserves in this area. They consider that the Central Forest Reserves are degraded because of too much fuelwood gathering and other pressures, and they would like to find ways to reduce this degradation.

At the same time, the compensator would like to make sure that local communities are not negatively affected by their environmental project, or that they might receive some benefits from it. The activities that the compensator wants to carry out as part of their project could affect you positively or negatively and we would like to see which activities you prefer.

We are working with the National Environment Management Authority (NEMA) to try and improve the projects used to compensate for the damage caused by the hydropower projects by taking your views and opinions into account. The results from this survey will be reported to NEMA and we will have discussions with them about how best to take these findings forward.

So for the environmental project that the compensator wants to implement, there are five different activities that will take place. We will show you a card which has three projects, each with different activities and I will ask you to select your preferred option. Even if you don't like any option, please choose the one you like better than the other ones. I will show you seven cards and would like you to choose your preferred option each time. I will take note of your choices as we go along.

Before we begin, I need to explain the five activities for the environmental project. Here is a card with a list of all the activities and different options to choose from. Please listen carefully as you will need this information when you make your choices. Please feel free to ask questions at any stage.

Description of the attributes and levels...(as per Table 1 in manuscript).

Do you have any questions about what I have just described to you? **Make sure that the respondent understands the different project activities (attributes) and levels that you have described.**

Now we will begin. I will present you with one card at a time and you need to select which alternative you would prefer. Please ask if you have any questions as we go along.

(Shuffle the choice cards and then show them one at a time, informing the respondent about what options are in each alternative. The order in which the cards are shown will be changed from participant to participant. Show the participant one card again (it must be any randomly selected card) and note the answer)

1. Which alternative would you prefer?

a) Choice set 1

Card shown: _____

Alternative selected: _____

b) Choice set 2

Card shown: _____

Alternative selected: _____

c) Choice set 3

Card shown: _____

Alternative selected: _____

d) Choice set 4

Card shown: _____

Alternative selected: _____

e) Choice set 5

Card shown: _____

Alternative selected: _____

f) Choice set 6

Card shown: _____

Alternative selected: _____

2. How hard or easy did you find it to make the choices?

Very hard Hard No feeling Easy Very easy

3. How sure are you about your answers?

Very sure Sure No feeling Unsure Very unsure

4. Did you pay attention to each of the project activities when you were making your choices or did you ignore some?






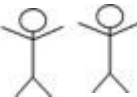

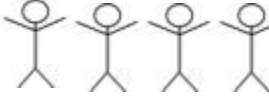






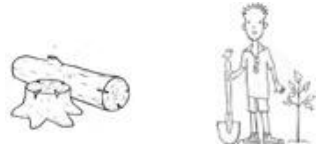







Paid strong attention to all of them Paid attention to all of them

Not sure Didn't pay much attention to some Paid no attention to some

1. [Interviewer only]. How difficult did it seem to be for the respondent to make the decisions in the experiment (tick one)?

Very difficult	Difficult	Medium	Easy	Very easy

Fig. A.1. Example of a choice card used in the study

Choice card 5			
	Scenario 1	Scenario 2	Scenario 3
Sustainable livelihood 	 <p>1 000 000 UGX / year</p>	 <p>1 000 000 UGX / year</p>	 <p>500 000 UGX / year</p>
Employment 	 <p>70</p>	 <p>140</p>	 <p>140</p>
Tourism revenue-sharing 			<p>0 revenue-sharing</p>
Tree planting and removal of alien trees 			
Access to spiritual sites 	 <p>Visitors – 1000 UGX</p>  <p>Residents – 500 UGX</p>	 <p>Visitors – 0 UGX</p>  <p>Residents – 0 UGX</p>	 <p>Visitors – 1000 UGX</p>  <p>Residents – 500 UGX</p>
Choice:			

Appendix B

A similar number of respondents found the CE hard and easy; 48% finding the CE hard or very hard, and 43% finding it easy or very easy. The vast majority of the respondents were sure or very sure of their choices (88%). 45% and 38% of the respondents said they paid attention or strong attention to all of the attributes when they were read out. Only 6% and 10% said that they paid no or not much attention to some of the attributes. Interviewers rated 38% of the respondents as finding the CE difficult or very difficult, 29% medium and 34% easy or very easy. All these results suggest that the CE was appropriately pitched and reliably answered.

Table B.1. Characteristics of respondents.

Characteristic	Number
No individuals sampled	1215
No. HHs	747
No. people per village	
Bujagali-West (Kikubamutwe)	240
Bujagali-East (Kyabirwa)	184
Kalagala-West (Kalagala)	235
Kalagala-East (Bubugo Bugobi)	237
Isimba-West (Nampaanyi)	156
Isimba-East (Bwase Buseteta)	163
Gender	
Males	467
Females	748
Age	
18-30 years	397
31-45 years	387
46-60 years	274
60+ years	157
Education level	
Primary school	652
Secondary school	316
College/university	34
No formal education	213
Time respondent has lived in the village	
<5 years	90
5-9 years	67
>10 years	1053
Not sure	5

Characteristic	Number
Whether the dam has affected the respondents wellbeing	
Very positively	12
Positively	96
Neutral	363
Negatively	431
Very negatively	212
Don't know/ would rather not say	101
Average household poverty score (based on the Basic Necessities Survey) in each village	
Bujagali-West (Kikubamutwe)	0.60
Bujagali-East (Kyabirwa)	0.57
Kalagala-West (Kalagala)	0.55
Kalagala-East (Bubugo Bugobi)	0.54
Isimba-West (Nampaanyi)	0.45
Isimba-East (Bwase Buseteta)	0.48
How hard/easy respondent found the questions	
Very hard	191
Hard	393
No feeling	103
Easy	431
Very easy	97
How sure respondent is of their answers	
Very sure	576
Sure	491
No feeling	114
Unsure	31
Very unsure	3
How much attention respondent paid to the attributes when they were read out	
Didn't pay much attention to some	121
Paid no attention to some	74
Paid attention to all of them	542
Paid strong attention to all of them	459
Not sure	19
CE difficulty (ranked by interviewer)	
Very difficult	182
Difficult	274
Medium	348
Easy	259
Very easy	152

Appendix C

Table C.1. RPL model parameter estimates for the pooled and individual village choice data, with no interactions with socio-economic variables, and standard deviations of the parameters. The mean RPL model parameter estimates reflect the sample's values for marginal utility (or disutility) that would be derived from the attributes and levels, compared to the baselines for each attribute. Standard errors are in parentheses. Significance thresholds are 1% (*), 5% (**) and 10% (*). The Pseudo R-squared and Akaike Information Criterion (AIC) values report adequate fits for all models.**

Attribute / level	Pooled village data	Bujagali-West Kikubamutwe	Bujagali-East Kyabirwa	Kalagala-West Kalagala	Kalagala-East Bubugo Bugobi	Isimba-West Nampaanyi	Isimba-East Bwase Buseta
Location	-	Bujagali (Construction complete)	Bujagali (Construction complete)	Kalagala (no development)	Kalagala (no development)	Isimba (Construction underway)	Isimba (Construction underway)
Sustainable livelihood schemes (per shilling earned)	0.025 *** [0.002]	0.017 *** [0.005]	0.042 *** [0.013]	0.025 *** [0.005]	0.024 *** [0.004]	0.027 *** [0.007]	0.027 *** [0.006]
Employment (per person employed)	0.022 *** [0.001]	0.036 *** [0.004]	0.021 *** [0.004]	0.023 *** [0.003]	0.018 *** [0.003]	0.020 *** [0.004]	0.020 *** [0.004]
Revenue sharing – investing in Central Forest Reserve ^a	2.195 *** [0.132]	2.953 *** [0.357]	2.180 *** [0.541]	2.702 *** [0.306]	2.073 *** [0.265]	2.021 *** [0.454]	1.890 *** [0.422]
Revenue sharing – investing in community development ^a	4.129 *** [0.248]	6.668 *** [0.738]	3.687 *** [0.856]	3.925 *** [0.555]	2.342 *** [0.457]	5.507 *** [0.921]	6.253 *** [1.029]
Tree planting programme - Planting of native trees ^b	1.145 *** [0.219]	0.308 [0.564]	2.909 ** [1.233]	1.244 ** [0.491]	1.618 *** [0.464]	0.987 [0.676]	0.217 [0.572]
Tree planting programme - Clearing alien trees ^b	-0.628 ** [0.252]	-2.233 *** [0.670]	0.930 [1.320]	-0.228 [0.569]	0.302 [0.531]	-1.062 [0.727]	-1.416 ** [0.653]

Attribute / level	Pooled village data	Bujagali-West Kikubamutwe	Bujagali-East Kyabirwa	Kalagala-West Kalagala	Kalagala-East Bubugo Bugobi	Isimba-West Nampaanyi	Isimba-East Bwase Buseta
Tree planting programme - Planting native trees and clearing alien trees ^b	0.967 *** [0.282]	0.328 [0.728]	3.639 ** [1.767]	0.846 [0.577]	1.235 ** [0.555]	0.948 [0.880]	0.228 [0.799]
Visitors and residents pay to access the spiritual sites ^c	0.512 *** [0.161]	1.211 *** [0.416]	-0.144 [0.729]	0.564 [0.347]	0.351 [0.323]	0.219 [0.495]	0.204 [0.498]
Visitors and residents do not pay to access the spiritual sites ^c	-0.232 ** [0.091]	-0.223 [0.233]	-0.727 ** [0.327]	-0.127 [0.205]	0.138 [0.177]	-0.425 [0.271]	-0.316 [0.276]
Standard deviations of parameters							
Sustainable livelihood schemes	0.027 *** [0.002]	0.025 *** [0.004]	0.024 *** [0.005]	0.033 *** [0.004]	0.029 *** [0.004]	0.030 *** [0.006]	0.023 *** [0.005]
Employment	0.007 *** [0.001]	0.013 *** [0.002]	0.014 *** [0.004]	0.008 *** [0.002]	0.005 * [0.003]	0.004 [0.004]	0.002 [0.004]
Revenue sharing – investing in Central Forest Reserve ^a	2.148 *** [0.129]	2.363 *** [0.345]	1.893 *** [0.562]	1.849 *** [0.289]	1.772 *** [0.245]	2.784 *** [0.452]	3.254 *** [0.476]
Revenue sharing – investing in community development ^a	3.501 *** [0.236]	4.505 *** [0.624]	3.083 *** [1.077]	3.420 *** [0.508]	2.683 *** [0.472]	4.218 *** [0.876]	5.541 *** [0.988]
Tree planting programme - Planting of native trees ^b	0.012 [0.263]	1.031 *** [0.376]	0.423 [0.835]	0.220 [0.442]	0.031 [0.446]	0.999 * [0.571]	0.846 [0.538]
Tree planting programme - Clearing alien trees ^b	1.214 *** [0.124]	1.304 *** [0.376]	2.068 *** [0.396]	0.999 *** [0.278]	0.937 *** [0.293]	0.697 [0.540]	0.578 [0.601]
Tree planting programme - Planting native trees and clearing alien trees ^b	1.115 *** [0.207]	0.613 [0.554]	1.011 [1.099]	0.537 [0.491]	1.246 *** [0.362]	1.050 [0.730]	2.301 *** [0.772]

Attribute / level	Pooled village data	Bujagali-West Kikubamutwe	Bujagali-East Kyabirwa	Kalagala-West Kalagala	Kalagala-East Bubugo Bugobi	Isimba-West Nampaanyi	Isimba-East Bwase Buseta
Visitors and residents pay to access the spiritual sites ^c	0.556 *** [0.182]	0.519 [0.367]	1.321 *** [0.342]	0.347 [0.569]	0.657 ** [0.302]	0.915 ** [0.375]	1.262 *** [0.335]
Visitors and residents do not pay to access the spiritual sites ^c	0.935 *** [0.119]	0.730 *** [0.311]	1.047 ** [0.446]	1.100 *** [0.219]	0.605 * [0.317]	0.849 ** [0.369]	0.768 * [0.452]
Model fit							
Log likelihood function	-5794.907	-1021.386	-830.287	-1133.579	-1176.717	-718.261	-761.259
Pseudo R-squared	0.276	0.354	0.315	0.268	0.247	0.302	0.292
AIC/N	1.595	1.444	1.537	1.633	1.680	1.573	1.594

a Dummy coding used for the two attribute levels with the “no tourism revenue-sharing” option as a baseline

b Dummy coding used for the three attribute levels with the “no planting of native trees and no clearing of alien trees” option as a baseline

c Dummy coding used for the two attribute levels with the “visitors pay to access sacred sites but residents do not pay” option as a baseline

Appendix D

Table D.1. Marginal rates of substitution for significant RPL model parameter estimates for the pooled data and individual villages. All values are relative to the ‘sustainable livelihoods’ attribute and 2.5% and 97.5% confidence intervals are in parentheses. Non-significant estimates are shown as a dash.

Attribute / level	Pooled village data	Bujagali-West Kikubamutwe	Bujagali-East Kyabirwa	Kalagala-West Kalagala	Kalagala-East Bubugo Bugobi	Isimba-West Nampaanyi	Isimba-East Bwase Buseeta
Location	-	Bujagali (Construction complete)	Bujagali (Construction complete)	Kalagala (no development)	Kalagala (no development)	Isimba (Construction underway)	Isimba (Construction underway)
	Ratio [CIs]	Ratio [CIs]	Ratio [CIs]	Ratio [CIs]	Ratio [CIs]	Ratio [CIs]	Ratio [CIs]
Employment	0.9 [0.7; 1.1]	2.1 [1.2; 5.4]	0.5 [0.2; 1.3]	0.9 [0.6; 1.5]	0.7 [0.5; 1.2]	0.7 [0.4; 1.5]	0.7 [0.4; 1.4]
Revenue sharing – investing in Central Forest Reserve	88.3 [75.3; 106.3]	175.5 [105.2; 407.4]	51.3 [35.2; 91.1]	108.3 [76.4; 165.8]	85.0 [60.4; 128.4]	75.5 [43.7; 135.6]	70.8 [39.0; 124.4]
Revenue sharing – investing in community development	165.7 [136.7; 207.7]	399.0 [223.8; 1016.1]	86.7 [49.0; 188.9]	157.5 [95.8; 275.8]	95.7 [50.6; 174.4]	207.5 [128.4; 395.5]	234.8 [149.4; 415.4]
Tree planting programme - Planting of native trees	46.4 [32.0; 57.8]	-	69.7 [30.7; 89.3]	50.0 [12.6; 78.5]	66.2 [34.8; 95.2]	-	-
Tree planting programme - Clearing alien trees	-24.9 [-50.8; -5.3]	-132.7 [-450.1; -34.8]	-	-	-	-	-52.9 [-144.4; -5.1]

Attribute / level	Pooled village data	Bujagali-West Kikubamutwe	Bujagali-East Kyabirwa	Kalagala-West Kalagala	Kalagala-East Bubugo Bugobi	Isimba-West Nampaanyi	Isimba-East Bwase Buseta
Tree planting programme - Planting native trees and clearing alien trees	38.9 [19.5; 58.2]	-	86.6 [10.6; 125.3]	-	50.8 [8.4; 94.3]	-	-
Visitors and residents pay to access the spiritual sites	20.5 [7.6; 33.7]	71.6 [19.7; 214.4]	-	-	-	-	-
Visitors and residents do not pay to access the spiritual sites	-9.4 [-17.8; -2.0]	-	-17.0 [-40.6; -2.6]	-	-	-	-

Appendix E

Table E.1. Krinsky – Robb test for significance of differences between attribute levels in the pooled village sample.

Attribute levels	Parameter difference and standard error
Revenue sharing: Investing in Central Forest Reserve vs investing in community development	-1.933 *** [0.230]
Tree planting programme - Planting of native trees vs Clearing alien trees	1.773 *** [0.110]
Tree planting programme - Clearing alien trees vs Planting native trees and clearing alien trees	-1.595 *** [0.175]
Tree planting programme - Planting of native trees vs Planting native trees and clearing alien trees	0.178 [0.203]
Visitors and residents pay to access the spiritual sites vs Visitors and residents do not pay to access the spiritual sites	0.744 *** [0.129]

Significance thresholds are 1% (***), 5% (**) and 10% (*), standard error in parentheses

Appendix F

Table F.1. Likelihood ratio test of parameter equality between the pooled model and the model with villages separated.

Log likelihood function: pooled model	-5794.908
Log likelihood function: sum of village models	-5641.489
χ^2 statistic	306.838
Degrees of freedom	90
Significance level	$p < 0.01$

Appendix G

Table G.1. Probability values for tests of differences between MRS estimates between villages and the pooled data, for those variables significant in both data sets. Values represent the probability of accepting the null hypothesis that the differences between the MRS estimates (significant in both villages) are equal to zero. Significant results are shown in bold and instances where variables were not significant in both villages, with a dash.

Attribute / level	Pooled	Pooled	Pooled	Pooled	Pooled	Pooled	K-E	K-E	K-E	K-E	K-E	I-E	I-E	I-E	I-E	K-W	K-W	K-W	B-W	B-W	B-E
	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs	vs
	K-E	I-E	K-W	B-W	B-E	I-W	I-E	K-W	B-W	B-E	I-W	K-W	B-W	B-E	I-W	B-W	B-E	I-W	B-E	I-W	I-W
Employment	0.260	0.287	0.490	0.003^a	0.088	0.267	0.512	0.286	0.004^a	0.186	0.519	0.296	0.009^a	0.210	0.505	0.018^a	0.106	0.302	0.012^a	0.015^a	0.220
Revenue sharing – investing in Central Forest Reserve	0.438	0.234	0.178	0.006^a	0.030^a	0.273	0.288	0.187	0.015^a	0.055	0.355	0.102	0.011^a	0.198	0.431	0.079	0.017^a	0.141	0.006^a	0.019^a	0.144
Revenue sharing – investing in community development	0.042^a	0.094	0.394	0.002^a	0.043^a	0.231	0.010^a	0.105	0.001^a	0.419	0.025^a	0.132	0.096	0.018^a	0.362	0.012^a	0.085	0.229	0.006^a	0.063	0.029^a
Tree planting programme - Planting of native trees	0.102	-	0.423	-	0.083	-	-	0.214	-	0.450	-	-	-	-	-	-	0.180	-	-	-	-
Tree planting programme - Clearing alien trees	-	0.166	-	0.013^a	-	-	-	-	-	-	-	-	0.123	-	-	-	-	-	-	-	-
Tree planting programme - Planting native trees	0.307	-	-	-	0.063	-	-	-	-	0.153	-	-	-	-	-	-	-	-	-	-	-

and clearing alien
trees

Visitors and residents - - - **0.032^a** -
pay to access the
spiritual sites

Visitors and residents - - - - 0.167 -
do not pay to access
the spiritual sites

a Statistically significant, $p < 0.05$