SUPPLEMENTARY INFORMATION TO

Enhancing the elicitation of diverse decision objectives for public planning

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Content

SI-1. Case and stakeholder characteristics

Table SI-1: Overview over case characteristics. For confidentiality reasons, the identity of the case studies is not revealed.

Case ID	Decision	No. Organizations[a,b]	No. of affected citizens	No. members of dec. Committee[b]	Participants invited to survey	Timepoint of survey / date of survey	Involvement of researchers in decision process	Master-list[c]
EN	In which way should the wastewater system of the region be organized?	10	10'000	13	31	Decision had been made and was currently being implemented. April 2018	None.	1
GB	What does a good wastewater system for the rural conditions of the community look like in 2040?	2	100	8	21	Start of decision process. March/April 2018	Lead of decision support process.	2
OA	In which way should the wastewater system of the region be organized, given that measures against micropollutants need to be taken?	5	70'000	9	12	Before a second phase of the decision process, where a subset of alternatives will be further analyzed. May/June 2018	Adjunct consultant who gave some inputs in the decision process and conducted an MCDA.	1
RU	Should the community rehabilitate their own wastewater treatment plant or connect to a neighboring city?	3	1'500	8	15	Start of decision process. April/May 2018	Work package on stakeholders and their perspectives.	1
WI	In which way should the wastewater system of the region be organized, given that measures against micropollutants need to be taken?	5	50'000	10	13	Decision was imminent. May/June 2018	Guest and observer in meetings.	1
Total		25		43	92			

a This is the number organizations directly involved in the elaboration of the decision. There are usually more organizations affected and involved.
b Excluding consultants.
c See SI-2 for the master lists

Table SI-2: Stakeholder characteristics and classification. The data was collected either directly in the survey or by stakeholder analysis.

Variable	**Description/ Question**	**Measurement scale**	**Levels**	**Usage in models (see SI-4)**
age	Age group of the participants	ordinal	under 35 years 35-44 years 45-54 years 55-64 years 65 years and older	continuous as 1, 2, 3, 4, 5
gender	Gender of participants	nominal	male, female	dummy coded (1st level part of intercept)
employment	Current employment status	nominal	yes no no_answer	dummy coded (1st level part of intercept)
kids	Do you have kids?	nominal	yes no no_answer	dummy coded (1st level part of intercept)
community	How many years have you been living in your community?	ratio	integer	continuous
experience	How many years have you been dealing with wastewater issues?	ratio	integer	continuous
scope	Scope of stakeholder	nominal	local_regional cantonal national	dummy coded (1st level part of intercept)
sector	Sector of stakeholder	nominal	public private civil_society	dummy coded (1st level part of intercept)
field	General function/ role of stakeholder	nominal	politics administration planning_consulting operations_maintenance citizen intermediary_organisation science	dummy coded (1st level part of intercept)
impacted	To what extent are you personally affected by the effects of a decision on wastewater disposal in …?	ordinal	not at all affected very weakly rather weakly rather strongly very strongly	continuous as 1, 2, 3, 4, 5
influence	How great is your personal influence on a possible decision on wastewater disposal in …?	ordinal	no influence very small rather small rather large very large	continuous as 1, 2, 3, 4, 5

Variable	**Description/ Question**	**Measurement scale**	**Levels**	**Usage in models (see SI-4)**
decision_freq	How often do you have to make decisions that have consequences primarily for others and less for yourself?	ordinal	less than once a year annually several times a year monthly weekly or more often	continuous as 1, 2, 3, 4, 5
decision_function	Function of stakeholder in the current decision	nominal	decision_elaboration legal_supervision decision_support interest_representation none	dummy coded (1st level part of intercept)

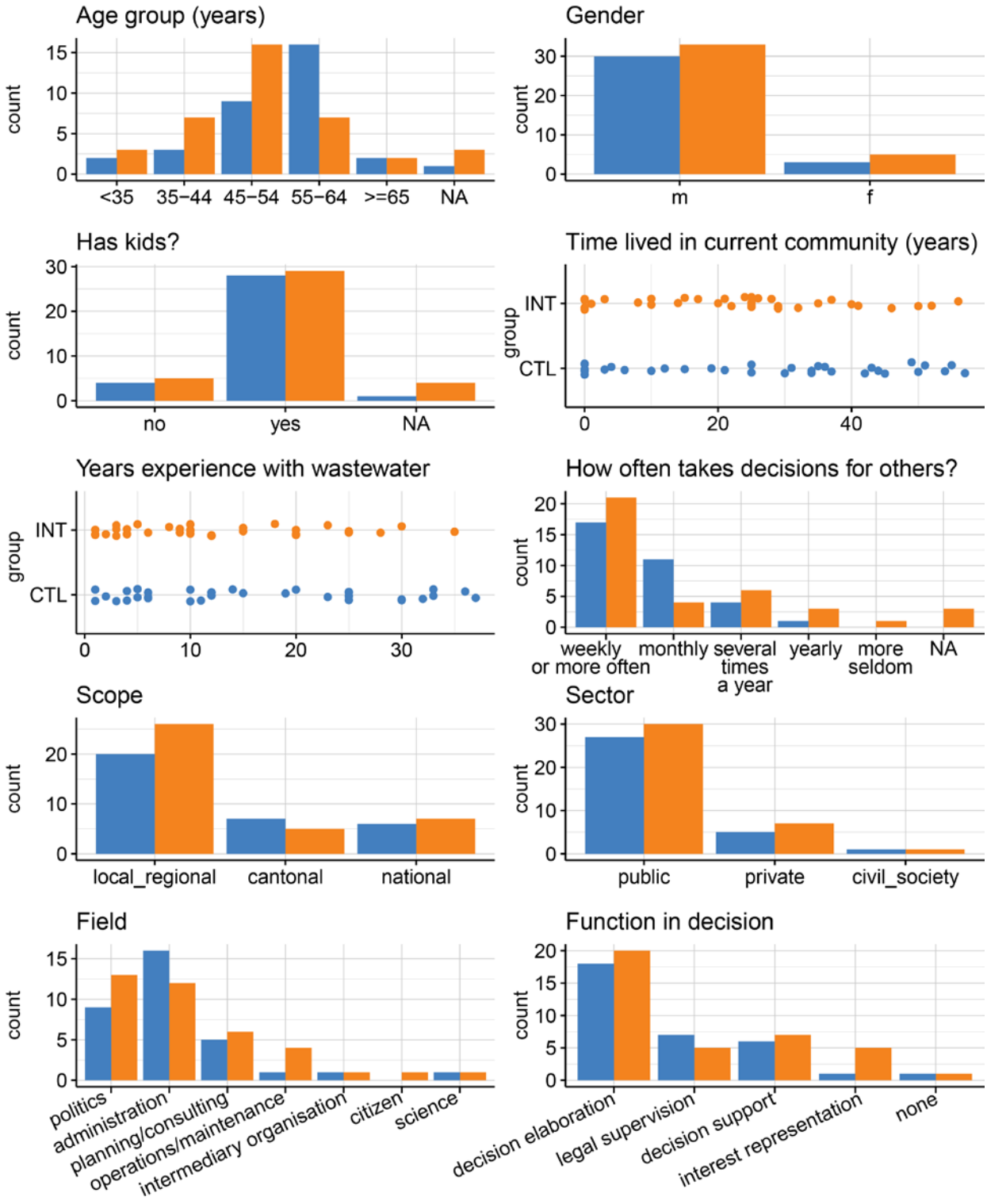

Figure SI-1: Stakeholder characteristics of control group (CTL, bars on the left, blue) and intervention group (INT, bars on the right, orange). For an explanation of the variables see Table SI-2.

SI-2. Master list of objectives for sustainable urban water management

Table SI-3: Literature sources informing the objectives on master list

No	Source
1	*Balkema, A.J., Preisig, H.A., Otterpohl, R., and Lambert, F.J.D. 2002. 'Indicators for the sustainability assessment of wastewater treatment systems', Urban Water, 4: 153-161. https://doi.org//10.1016/S1462-0758(02)00014-6
2	DWA 2014. 'DWA-A 272: Grundsätze für die Planung und Implementierung Neuartiger Sanitärsysteme' (DWA). ISBN: 978-3-944328-63-8
3	Foxon, T.J., Mcilkenny, G., Gilmour, D., Oltean-Dumbrava, C., Souter, N., Ashley, R., Butler, D., Pearson, P., Jowitt, P., and Moir, J. 2002. 'Sustainability criteria for decision support in the UK water industry', Journal of Environmental Planning and Management, 45: 285-301. https://doi.org/10.1080/09640560220116341
4	Hoffmann, S., Hunkeler, D., and Maurer, M. 2014. 'Nachhaltige Wasserversorgung und Abwasserentsorgung in der Schweiz: Herausforderungen und Handlungsoptionen'. (Bern). http://www.nfp61.ch/de/news-medien/publikationen, accessed:10/2018
5	Lienert, J., Scholten, L., Egger, C., and Maurer, M. 2015. 'Structured decision-making for sustainable water infrastructure planning and four future scenarios', EURO Journal on Decision Processes, 3: https://doi.org/10.1007/s40070-014-0030-0
6	Lundie, S., Ashbolt, N., Livingston, D., Lai, E., Kärrman, E., Blaikie, J., and Anderson, J. 2008. ' Sustainability Framework: PART A: Methodology for evaluating the overall sustainability of urban water systems' (Water Services Association of Australia). ISBN: 1-920-760-25-3
7	Marques, R.C., Da Cruz, N.F., and Pires, J. 2015. 'Measuring the sustainability of urban water services', Environmental Science & Policy, 54: 142-151. https://doi.org/10.1016/j.envsci.2015.07.003
8	NaWaTech 2012. 'D1.2: Sustainability Criteria Catalogue. ' http://www.nawatech.net/index.php/component/jdownloads/viewcategory/3-public-reports-and-deliverables, accessed:10/2018
9	Sartorius, C., Hillenbrand, T., Levai, P., Nyga, I., Schulwitz, M., and Tettenborn, F. 2016. 'Indikatoren zur Bewertung alternativer Wasserinfrastrukturen im Projekt TWIST++'. http://www.twistplusplus.de/twist-de/inhalte/Nichttechnische_Arbeiten.php, accessed:10/2018
10	*Spiller, M. 2016. 'Adaptive capacity indicators to assess sustainability of urban water systems – Current application', Science of The Total Environment, 569–570: 751-761. https://doi.org/10.1016/j.scitotenv.2016.06.088
11	van Buuren, J.C.L. 2010. 'Sanitation Choice Involving Stakeholders, a participatory multi-criteria method for drainage and sanitation system selection in developing cities applied in Ho Chi Minh City, Vietnam', (PhD Thesis, Wageningen University). http://edepot.wur.nl/157236, accessed:10/2018
	*These are review papers that summarize available literature.

Table SI-4: Master list of objectives used in the online surveys. Due to the slightly different nature of the decision cases, we did not use the full list of 35 objectives in all surveys. Instead, we compiled a master list 1 (29 objectives, used in cases EN, OA; RU, WI) and a master list 2 (30 objectives, used in case GB).

No	Objective	Category	Part of master list
1	Low health risks due to direct contact with wastewater or facilities (e.g., backwater into cellar, inspection of package plant)	social	both
2	High sanitary protection for recreational water use (e.g., swimming)	social	both
3	Low impairment of landscape	environmental	1
4	Few nuisances to residents (noise, odor, traffic)	social	1
5	Little time required by end-users	social	2
6	Little time required by public authorities	governance	both
7	High prestige by leading the way	future	both
8	High degree of co-determination for municipalities	governance	both
9	Fair distribution of burdens and costs	social	both
10	High autonomy of municipalities (few dependencies on other municipalities)	governance	both
11	High intergenerational equity (distribution of cost over time)	future	1
12	High recovery of phosphorous (e.g., for fertilizer)	resources	both
13	High recovery of nitrogen (e.g., for fertilizer)	resources	2
14	Low net water consumption	resources	2
15	Little land consumption / space requirements	resources	both
16	Low greenhouse gas emissions from other sources (e.g., transport of sewage sludge, sewage treatment)	environmental	both
17	Low net energy consumption (low greenhouse gas emissions)	environmental	both
18	High net heat production (e.g., for district heating, gas production from sludge)	resources	1
19	Low annual cost	economic	both
20	Low investment cost	economic	both
21	Many jobs in the wastewater sector in the region	social	both

No	Objective	Category	Part of master list
22	High potential for innovation and knowledge gain	future	both
23	Low impairment of protected areas (nature, landscape, river banks)	environmental	both
24	Good state of ground water and spring water resources	environmental	both
25	Good ecological state of surface waters (rivers, lakes)	environmental	both
26	High removal of micropollutants	environmental	both
27	High operational flexibility (adaptability without construction)	technical_operational	both
29	Professional operations and management (high reliability, fast emergency response, good monitoring)	technical_operational	both
30	High degree of continually achieved objectives	process	2
31	High protection against wastewater spills (overflow onto street, into cellar)	technical_operational	both
32	High structural flexibility (ease of extension, retrofitting, deconstruction)	technical_operational	both
33	Low need for technical adaptions over time (robustness)	technical_operational	both
34	Healthy fish stock (preservation of biomass for fishing)	environmental	both
35	High attractiveness of household installations (e.g., design, ease of use, odors)	social	2

Table SI-5: Objectives per category in the master lists.

Category	Master list 1		Master list 2	
	Total	Relative (%)	Total	Relative (%)
economic	2	7	2	7
environmental	8	28	7	23
future	3	10	2	7
governance	3	10	3	10
resources	3	10	4	13
social	5	17	6	20
technical_operational	5	17	5	17
process	0	0	1	3

SI-3. Illustration of the objective classification used in the study

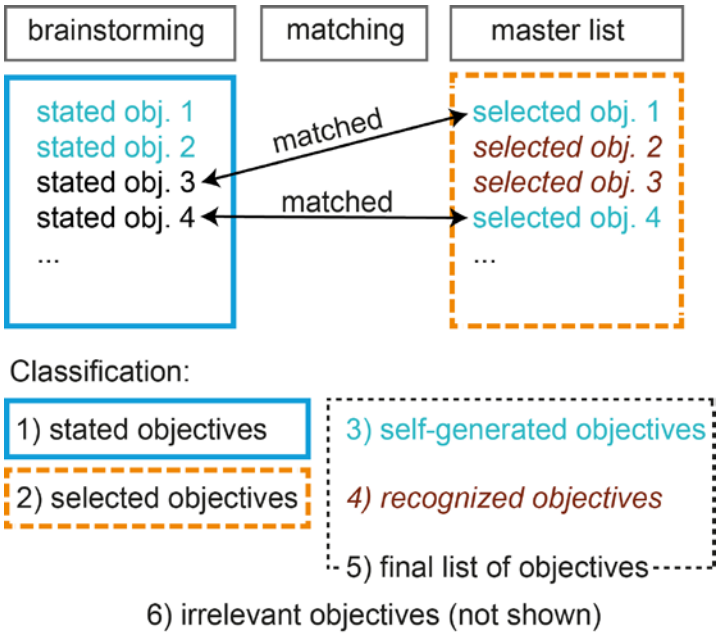

Figure SI-2: Illustration of the classification of the objectives generated in the survey. For a text explanation see section 5.6 in the main text.

SI-4. Models

Notation:

i: index of observations. $i = 1, \ldots, n$

Y_i: response variable (dependent variable) for observation i

Categorical variables were converted to dummy variables. In the model structure they are not explicated for every level, but indicated by multiple coefficients, e.g., $\beta_{5-10}\text{field}_\text{i}$. The first level is always part of the intercept. The variable "steps" refers to the objective generation steps 1a-1d, see Figure 1 in the main text. The socio-demographic variables are explained in Table SI-2.

Table SI-6: Models used in the analysis.

Name	Model type		Model structure
Model-1-CTL	Poisson generalized linear mixed model with random intercept	$Y_i \sim Poisson(\mu_i)$	$\log(\mu_i) = \beta_o + u(\text{participant}_i) + \beta_{1-3}\text{step}_{a-d,i}$ $u(\text{participant})$: random intercept for participant, $u(\text{participant}_i) \sim \mathcal{N}(0, \sigma_u)$ $\text{step}_{k,i} = \begin{cases} 1 & \text{if observation belongs to step } k \\ 0 & \text{if observation does not belong to step } k \end{cases}$

Name	Model type	Model structure
Model-1-INT	Poisson generalized linear mixed model with random intercept	$Y_i \sim Poisson(\mu_i)$ $\log(\mu_i) = \beta_o + u(\text{participant}_i) + \beta_{1-4}\text{step}_{a-d,i}$ $u(\text{participant})$: random intercept for participant, $u(\text{participant}_i) \sim \mathcal{N}(0, \sigma_u)$ $\text{step}_{k,i} = \begin{cases} 1 & \text{if observation belongs to step } k \\ 0 & \text{if observation does not belong to step } k \end{cases}$
Model-2	Poisson generalized linear model	$Y_i \sim Poisson(\mu_i)$ $\log(\mu_i) = \beta_o + \beta_1 \text{group}_i$ $\text{group}_i = \begin{cases} 1 & \text{if observation belongs to step 1c of INT group} \\ 0 & \text{if observation belongs to step 1b of CTL group} \end{cases}$
Model-3	Poisson generalized linear model	$Y_i \sim Poisson(\mu_i)$ $\log(\mu_i) = \beta_o + \beta_1 \text{brainst}_i$ $\text{brainst}_i = \begin{cases} 1 & \text{if observation belongs to master list step} \\ 0 & \text{if obs. belongs to the last brainstorming step} \end{cases}$
Model-4-CTL	Proportional odds mixed model with random intercept	$\text{logit}[P(Y_i \leq j)] = \alpha_j - \beta_{1-2}\text{step}_{b-d,i} - u(\text{participant}_i)$ j: rating category, $j = 1, \ldots, 5$ $u(\text{participant}_i)$: random intercept for participant, $u(participant_i) \sim \mathcal{N}(0, \sigma_u)$
Model-4-INT	Proportional odds mixed model with random intercept	$\text{logit}[P(Y_i \leq j)] = \alpha_j - \beta_{1-3}\text{step}_{b-d,i} - u(\text{participant}_i)$ j: rating category, $j = 1, \ldots, 5$ $u(\text{participant}_i)$: random intercept for participant, $u(\text{participant}_i) \sim \mathcal{N}(0, \sigma_u)$
Model-5	Proportional odds mixed model with random intercept	$\text{logit}[P(Y_i \leq j)] = \alpha_j - \beta_1 \text{recogn}_i - u(\text{participant}_i)$ j: rating category, $j = 1, \ldots, 5$ $u(\text{participant}_i)$: random intercept for participant, u $(\text{participant}_i) \sim \mathcal{N}(0, \sigma_u)$ $\text{recogn}_i = \begin{cases} 1 & \text{if observation belongs to a recognized objective} \\ 0 & \text{if observation belongs to a self} - \text{generated objective} \end{cases}$
Model-6	Proportional odds model	$\text{logit}[P(Y_i \geq j)] = \alpha_j - \beta_1 \text{recogn}_i$ j: ranking, $j = 5, \ldots, 1$ $\text{recogn}_i = \begin{cases} 1 & \text{if observation belongs to a recognized objective} \\ 0 & \text{if observation belongs to a self} - \text{generated objective} \end{cases}$

Name	Model type		Model structure
Model-7-SOC	Poisson generalized linear model	$Y_i \sim Poisson(\mu_i)$	$\log(\mu_i) = \beta_o + \beta_1 \text{gender}_i + \beta_2 \text{age}_i + \beta_{3-4} \text{kids}_i + \beta_5 \text{community}_i$
Model-7-FUN	Poisson generalized linear model	$Y_i \sim Poisson(\mu_i)$	$\log(\mu_i) = \beta_o + \beta_{1-2} \text{scope}_i + \beta_{3-4} \text{sector}_i + \beta_{5-10} \text{field}_i + \beta_{11} \text{experience}_i$
Model-7-DEC	Poisson generalized linear model	$Y_i \sim Poisson(\mu_i)$	$\log(\mu_i) = \beta_o + \beta_{1-2} \text{scope}_i + \beta_{3-4} \text{sector}_i + \beta_{5-10} \text{field}_i + \beta_{11} \text{experience}_i$
Model-8	Proportional odds mixed model with random intercept		$\text{logit}[P(Y_i \leq j)] = \alpha_j - \beta_{1-7} \text{category}_{2-8,i} - u(\text{participant}_i)$ j: rating category, $j = 1, \ldots, 5$ $u(\text{participant}_i)$: random intercept for participant, $u(\text{participant}_i) \sim \mathcal{N}(0, \sigma_u)$ category: categorical variable with the levels: 1 economic (part of intercept), 2 environmental, 3 future, 4 organizational / governance, 5 legal, 6 resources, 7 social, 8 technical / operatonal.

SI-5. Results

SI-5.1 Response statistics

Table SI-7: Response statistics of survey. For the five case studies (see Table SI-1); the number of participants invited to participate (invited), the number of people that answered the survey (responses), the response rate before drop out (resp_rate), and the number of drop-outs, excluded, and usable responses.

case	invited	responses	resp.rate	drop*	excluded	usable
EN	31	20	65%	2	1[a]	17
GB	21	17	81%	1	1[b]	15
OA	12	12	100%	0	0	12
RU	15	15	100%	1	0	14
WI	13	13	100%	0	0	13
Total	92	77	84%	4	2	71

* Three more participants dropped out after step 5 in the survey, which concerned demographics and feedback. Their answers were included for the main analysis.

[a,b] Excluded because s/he misunderstood the task in the intervention survey (INT) and changed the objectives at each stage instead of adding new objectives.

SI-5.2 Objectives generated at different steps

Table SI-8: Percentage of objectives of the final list that were generated on average at the different survey steps. For an overview of the steps see Figure 1 in the main text.

Group	Survey step	Step number	Average percentage of final objectives generated
CTL	a_brainst.	1a	69%
CTL	b_control	1b	9%
CTL	d_masterlist	1d	22%
INT	a_brainst.	1a	56%
INT	b_perspect.	1b	7%
INT	c_categ.	1c	10%
INT	d_masterlist	1d	27%

SI-5.3 Cluster Analysis: relationship between stakeholder roles and their views

SI-5.3.1 Method

To explore similarities in the views of stakeholders, we used cluster analysis. More specifically, we used the ratings of objectives selected from the master list (Figure SI-2) as a proxy measure for the stakeholders' views. These objectives were rated on a five-point scale (4 essential, 3 important, 2 rather important, 1 rather not important, 0 not at all important). If objectives were not selected from the master list (irrelevant objectives; and therefore not given a rating) we assumed that participants considered the objective to be "not at all important" (rating 0). For the purpose of this analysis, we assumed the ratings to be on an interval scale. We disregarded any objectives not on the master list, as the analysis required a common data base. For the same reason, one case (GB) was excluded, as a different master list had been used (see Table SI-4). We used an agglomerative hierarchical clustering with Wards clustering method (Ward 1963), and the "city-block distance" as distance measure, as implemented in the R package "stats" (R Core Team 2018).

SI-5.3.2 Results and discussion

With cluster analysis we did not find obvious relationships between stakeholder characteristics and their views on the importance of objectives. One conjecture would be that stakeholders within one decision case might cluster together, as issues have different prominence in the cases. A second conjecture would be that stakeholders from a similar field of work (e.g., administration, consulting, politics, see Table SI-2) would be more similar.

If we cut the dendrogram at a height of 75, we can identify four clusters (Figure SI-3). We can see some clustering dependent on the case, e.g. for case "EN" on the very left or for case "WI" on the

very right (Figure SI-3). However, this is not a consistent pattern (Figure SI-4). For the "field" of the stakeholders this seems even more erratic (Figure SI-3, Figure SI-4). Indeed, if we compare several stakeholder characteristics to the cluster membership at the four cluster level, no obvious relations emerge (Figure SI-4).

There are three explanations for these findings. The importance of the objectives might be rather a matter of individual preference than of the stakeholder characteristics we collected. In addition, these might be more connected to general attitudes than to the specific situation in the decision cases. On the other hand, the sample of participants might be too similar in their views to detect strong effects. If we had a larger and more diverse sample of participants, a clearer relationship between cluster membership and some characteristics could emerge. Lastly, it could be that stakeholders of each case would actually cluster more together as they engage further with the decision and move towards a joint perspective. This could be an interesting topic for further research.

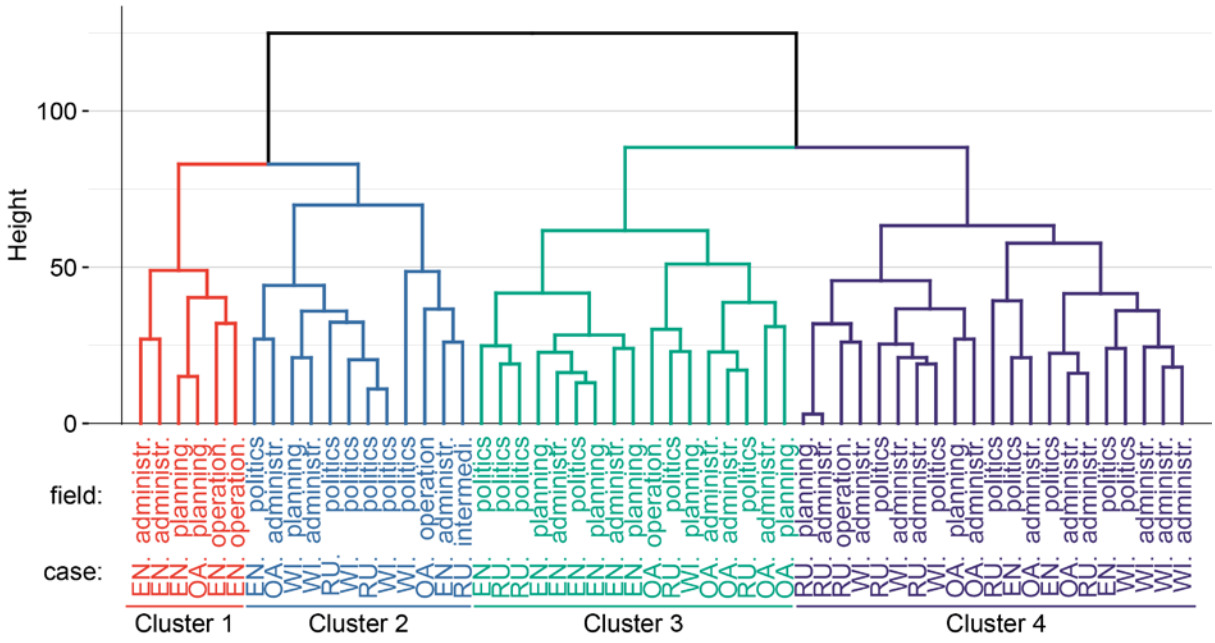

Figure SI-3: Dendrogram of cluster analysis on ratings of objectives (step 3 of survey, Figure 1 main text). Each branch on the x-axis at height zero represents one participant. Participants that are more similar in their ratings of the objectives are clustered together, i.e., their branches are joined, at lower height (y-axis). For each participant the case to which it belongs and the field of work is given (see Table SI-1 and Table SI-2 for descriptions).

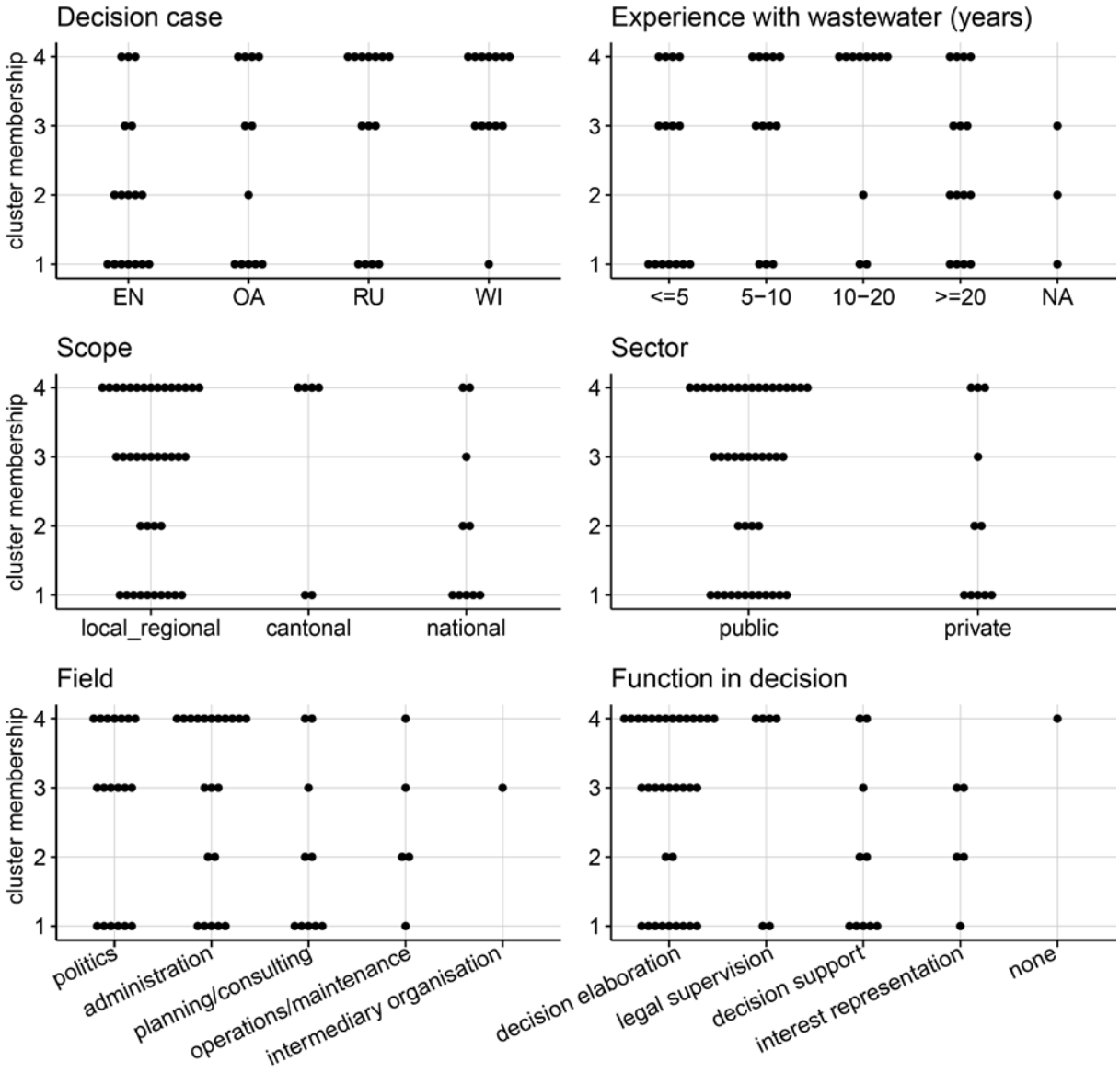

Figure SI-4: Plot of cluster membership vs. socio-demographic variables. Y-axis: four clusters as identified in cluster analysis (see Figure SI-3); x-axis: different socio-demographic and professional characteristics: For details on these variables see Table SI-2; for details on the variable "Decision case" see Table SI-1. Each dot indicates the cluster membership of one participant.

SI-5.3.3 References

R Core Team. 2018. *R: A Language and Environment for Statistical Computing* (R Foundation for Statistical Computing: Vienna, Austria).

Ward, J.H. 1963. 'Hierarchical Grouping to Optimize an Objective Function', *Journal of the American Statistical Association*, 58: 236-244. 10.1080/01621459.1963.10500845

SI-5.4 Importance of objectives belonging to different categories

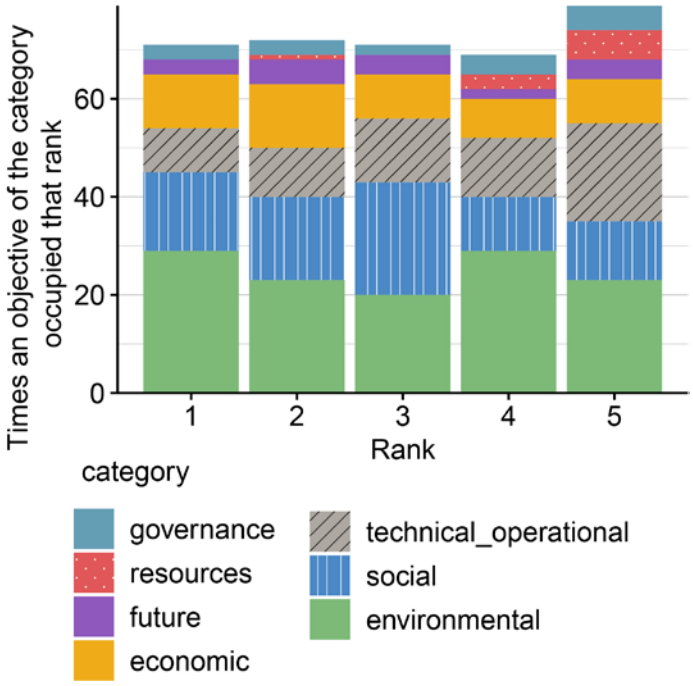

Figure SI-5: Rank distribution of categories of the five highest ranked objectives of the participants. The numbers are not the same for each rank due to joint ranks.

SI-6. Survey evaluation

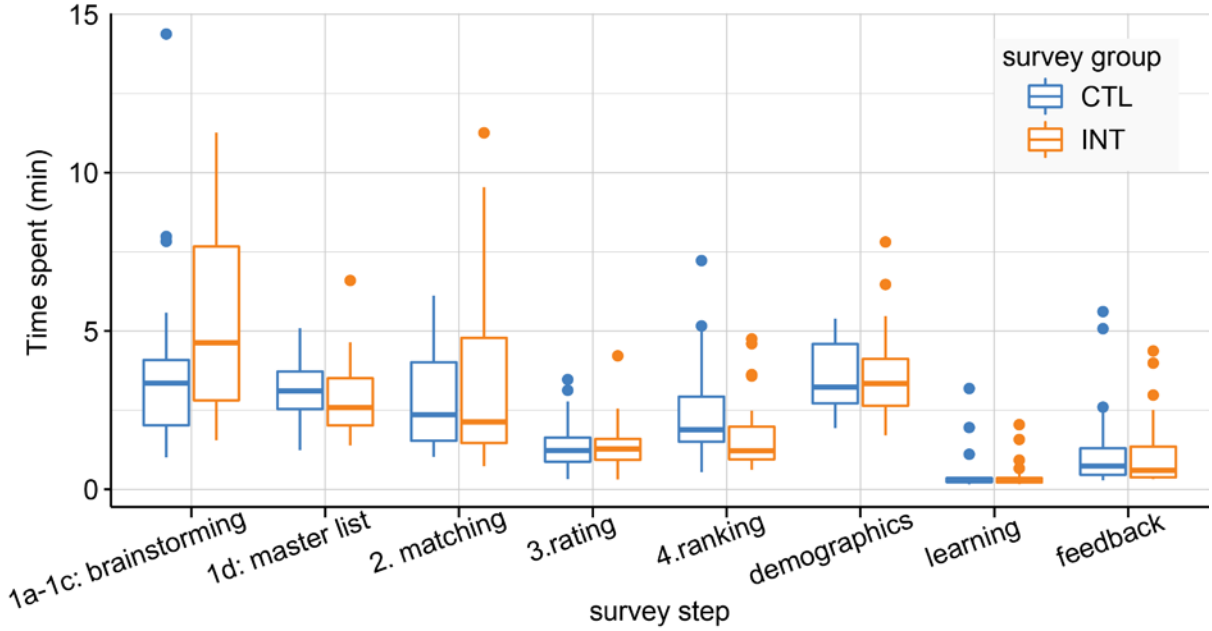

Figure SI-6: Time spent on pages of the survey for of different tasks. Boxplots show the .25, .5, and .75 quartiles of the times of all participants who completed the entire survey. Whiskers extend to the maximum and minimum points within 1.5 times the interquartile range. Points beyond the whiskers are displayed as outliers. CTL: control group, INT: intervention group. For a description of the survey steps and groups see Figure 1, main text.

Table SI-9: Which task did participants find difficult? (N = 11). Only those 11 respondents (of 68 who completed the entire survey) that had perceived the survey as "difficult" were asked to answer this question (note: none of the participants perceived the survey as "very difficult"). For a description of the survey steps see Figure 1, main text.

Task	Number	% of all
1a: initial brainstorming	2	3
1b: perspectives	3	4
1c: categories	0	0
1d: master list	2	3
2. matching	3	4
3. ranking	5	7
4. rating	2	3
other	2	3

SI-7. Paper version of the online survey

In the following, a translation to paper of the online survey process for the intervention group (INT) in one case (RU) is shown. The survey was originally issued in German. Horizontal bars represent new survey pages. The step in the survey structure is (see Figure 1 in the main text) is indicated by square brackets behind each question. All text in square brackets was not shown to participants.

Survey on wastewater disposal in RU

Welcome to this survey on wastewater disposal in the municipality RU [one of the decision cases, see Table SI-1]**!**

This survey addresses the objectives that are relevant for planning and decision-making on wastewater disposal in the municipality RU. It is carried out by the research group for decision analysis of the Swiss Federal Institute of Aquatic Science and Technology (Eawag). The aim of the survey is to discover and to better understand the views and priorities of various actors, including yourself.

Filling in this questionnaire takes about 20 to 35 minutes. There are no right or wrong answers, we are interested in your honest opinion.

Thank you very much for taking the time to complete this survey. Your contribution is very important for our research (…)

If you have any questions, please contact us: (...)

Note on privacy protection: (...)

Your role in the decision process

This survey is about your honest assessment as an actor in the decision process concerning wastewater disposal in the municipality RU. If you are a representative of the municipality, an organization or an interest group (e.g. local council, representative of a cantonal department), please answer in this role.

If you have several roles, answer in what you consider to be the most important one. If you are involved only as a private person, then answer as a private person.

I will answer the questions in this role:

List your objectives [step 1a]

If you do not have an objective in mind, it is easy to lose your way. It is also difficult to make a good decision if you do not know what objectives you want to achieve and what criteria you want to consider.

When deciding on the future of wastewater disposal in the municipality RU, various aspects can be relevant. An example of an often named objective is "low annual costs". The formulation of an objective always indicates a desired direction. In this case, "lower" costs are better than "higher" costs.

Please state all the objectives (criteria) which are relevant for a decision on the future of wastewater disposal in the municipality RU from your point of view. List all the objectives that come to your mind spontaneously, not just the most important ones.

Please fill in at least two answers.

Objective A: _____

Objective B: _____

Objective C: _____

Objective D: _____

Objective E: _____

Objective F: _____

…

[Further lines to input more objectives appeared as participants filled in their objectives]

List more objectives [step 1b]

Below, you can see the objectives you have stated so far. Wastewater systems fulfil functions of great social importance. Normally, they function so well that large sections of the population are not aware of them. However, changes to the current system (e.g. through construction measures) can have an impact on third parties. Briefly put yourself in the position of other citizens, groups or organizations that may be affected.

Can you think of any other objectives from the point of view of others? Please add them to the list.

Objective A: _____

Objective B: _____

Objective C: _____

Objective D: _____

Objective E: _____

Objective F: _____

…

[Participants could see all objectives they entered in previous steps. Further lines to input more objectives appeared as participants filled in their objectives]

List more objectives [step 1c]

Below, you can again see the objectives you have stated. The topic of wastewater disposal often affects very different domains. Objectives can usually be assigned to one of these categories:

Economic objectives

Environmental objectives

Objectives concerning resources

Social / societal objectives

Technical / operational objectives

Organizational objectives

What other objectives can you think of when you think of these categories? Please complete the list if you can think of more objectives

Objective A: _____

Objective B: _____

Objective C: _____

Objective D: _____

Objective E: _____

Objective F: _____

[Participants could see all objectives they entered in previous steps. Further lines to input more objectives appeared as participants filled in their objectives]

List of objectives part 1 [step 1d]

In the following two lists you will find a wide selection of objectives for sustainable wastewater infrastructures. This is a list of objectives that have been relevant in several other decisions in the past.

Part 1:

Please select all objectives that you find relevant for a decision on the future of wastewater disposal in the municipality RU. Please go through the objectives one by one and select all relevant objectives, regardless of whether you have already stated these objectives yourself.

[The objectives given in Table SI-4 appeared in randomized order]

- ☐ Few nuisances to residents (noise, odor, traffic)
- ☐ Little land consumption / space requirements
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ …
- ☐ None of these objectives is relevant

List of objectives part 2 [step 1d]

Further possible objectives.

Please select all objectives that you find relevant for a decision on the future of wastewater disposal in the municipality RU. Please go through the objectives one by one and select all relevant objectives, regardless of whether you have already stated these objectives yourself.

[The objectives given in Table SI-4 appeared in randomized order]

- ☐ Good state of ground water and spring water resources
- ☐ High operational flexibility (adaptability without construction)
- ☐ …
- ☐ …

☐ …	☐ …
☐ …	☐ …
☐ …	☐ …
☐ …	☐ …
☐ …	
☐ …	☐ None of these objectives is relevant

Comparison of your own objectives with the objectives from the list [step 2]

Sometimes objectives mean the same, but are formulated differently. We would like you to create a final list of all relevant objectives and avoid double entries.

On the left, you see the objectives that you have stated yourself. On the right, you see the objectives selected from the list. Next to each of these objectives is a drop-down menu. Please go through the objectives step by step. Are there objectives on the left that mean the same as an objective on the right?
If yes: Please select this objective from the drop-down menu.
If no: Select "no correspondence".

These are the objectives that you have named yourself:	
[listed here were all objectives that were stated by the participant]	[listed here were all objectives that were selected from the master list. The objectives on the left could be mapped to these objectives via drop-down menus.]

Do you have any further feedback or remarks specifically about the objectives that you have not been able to state so far?

Importance of the objectives [step 3]

On the left you can see all the objectives that you have either stated yourself or chosen from the list. Some objectives are probably more important than others when it comes to decision-making on wastewater disposal in the municipality the municipality RU.

Please select how important these objectives are for such a decision-making. We are interested in your personal assessment as {*participant's role as stated in the beginning of the survey***}.**

	essential	important	rather important	rather not important	not at all important
[here appeared the final list of objectives, stated or selected]	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

Ranking of essential objectives [step 4]

On the left, there is a list of all the objectives that you have rated as essential. Can you rank them?

Select a rank for each objective: the most important objective receives rank 1, the second most important receives rank 2, etc.

Each rank may only occur once.

[Here all objectives that were rated as essential appeared. Participants could assign ranks via drop-down menus]

Ranking of important objectives [step 4]

On the left, there is a list of all the objectives that you have rated as important. Can you rank them?

Select a rank for each objective: the most important objective receives rank 1, the second most important receives rank 2, etc.

Each rank may only occur once.

[Here all objectives that were rated as important appeared. Participants could assign ranks via drop-down menus]

Feedback on the objectives [step 5]

How certain are you that you could express your actual views with your answers?

very certain	certain	neither	uncertain	very uncertain
☐	☐	☐	☐	☐

Can you think of anything more to say about the objectives?

Your role in the decision-making process [step 5]

You have answered the survey as {participant's role as stated in the beginning of the survey}. Do you have any other roles that could be important in the decision-making process? Please choose.

- ☐ political role
- ☐ operational role
- ☐ engineer
- ☐ consultant
- ☐ citizen
- ☐ no further role
- ☐ Other: _____

Imagine you had not answered the questions as {participant's role as stated in the beginning of the survey} but in another role. Would you have answered differently?

- ☐ Yes
- ☐ No

[This question appeared only if another role was ticked]

What exactly would have been different about your answers?

[This question appeared only if another role was ticked]

How long have you been dealing with wastewater issues?

Please click and drag the slider handle to enter your answer.

Each answer must be between 0 and 50.

How many years?

0 ——————————●—— 50

To what extent are you personally affected by the effects of a decision on wastewater disposal in the municipality RU?

very strongly	rather strongly	rather weakly	very weakly	not at all affected
☐	☐	☐	☐	☐

How great is your personal influence on a possible decision on wastewater disposal in the municipality RU?

very large	rather large	rather small	very small	no influence at all
☐	☐	☐	☐	☐

New insights [step 5]

Did you gain new insights into wastewater disposal during the survey?

☐ Yes

☐ No

New insights [step 5]

Was there a particular part of the survey where you gained this insight?

☐ No

☐ List your objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives with different categories as examples
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives from another person's point of view
[*Screenshot of the corresponding page as an aid to memory*]

☐ Choose from list of objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Comparison of your own objectives with the objectives from the list
[*Screenshot of the corresponding page as an aid to memory*]

☐ Importance of the objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Ranking essential / important objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Another part, namely: _____

[This question appeared only if a new insight was ticked "yes"]

What exactly are the new insights?

[This question appeared only if a new insight was ticked "yes"]

New views [step 5]

Did anything change in your views while you were filling in the survey?

☐ Yes

☐ No

New views [step 5]

Was there a certain point in the survey when something changed in your views?

☐ No

☐ List your objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives with different categories as examples
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives from another person's point of view
[*Screenshot of the corresponding page as an aid to memory*]

☐ Choose from list of objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Comparison of your own objectives with the objectives from the list
[*Screenshot of the corresponding page as an aid to memory*]

☐ Importance of the objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Ranking essential / important objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Another part, namely: _____

[This question appeared only if a changed view was ticked "yes"]

What exactly has changed in your views?

[This question appeared only if a changed view was ticked "yes"]

Information about yourself [step 5]

We would like to know a little more about you as a person.

Please indicate your age group.

- ☐ under 35 years
- ☐ 35-44 years
- ☐ 45-54 years
- ☐ 55-64 years
- ☐ 65 years and older

Are you currently employed?

☐ Yes

☐ No

☐ No answer

How would you describe your profession / your professional field?

Do you have children?

☐ Yes

☐ No

☐ No answer

Please enter your postal code.

How many years have you been living in your community?

0 ——————————○ 100

How often do you have to make decisions that have consequences primarily for others and less for yourself?

weekly or more	monthly	several times a year	annually	less than once a year
☐	☐	☐	☐	☐

Feedback [step 5]

Do you have any feedback or questions about the survey or the research project?

How difficult did you find the survey overall?

Very easy	easy	neither	difficult	very difficult
☐	☐	☐	☐	☐

Feedback [step 5]

[This question was only shown if participants had answered "difficult" or "very difficult"]

Which part of the survey difficult or very difficult?

☐ No

☐ List your objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives with different categories as examples
[*Screenshot of the corresponding page as an aid to memory*]

☐ List more objectives from another person's point of view
[*Screenshot of the corresponding page as an aid to memory*]

☐ Choose from list of objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Comparison of your own objectives with the objectives from the list
[*Screenshot of the corresponding page as an aid to memory*]

☐ Importance of the objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Ranking essential / important objectives
[*Screenshot of the corresponding page as an aid to memory*]

☐ Another part, namely: _____

Why did you find this part difficult or very difficult?

[This question was only shown if participants had answered "difficult" or "very difficult"]

Thank you very much for your participation!

Your answers are very important for our research. If you have any questions, you can contact the project manager: (…)

Further information on this research project can be found on the project website (…).