Supplementary Material Werg, Grothmann, Löchtefeld

Table S1 & Table S2

Table S1. Complete list of items and answers per item / answer category in %; answers were coded 1(strongly disagree) to 6 (strongly agree)

Item	Strongly agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly disagree	Do not know	n.s.
1. HEAVY RAIN EVENTS AND ADPTATION IN YOUR MUNICIPALITY								
My municipality has already been affected by heavy rain events in the past.	66.2	24.7	9.1	0	0	0	0	
My municipality will be strongly affected by heavy rain events in the upcoming years.	33.8	32.5	23.4	1.3	0	0	9.1	
My department (work area) can initiate effective protective measures regarding heavy rain / flooding.	33.8	42.9	15.6	7.8	0	0	0	
Protective measures against heavy rain / flooding by governmental actors are sufficient to also protect private households from flood-related damages.	3.9	1.3	3.9	11.7	39.0	39.0	1.3	
Private households are, despite potential barriers, capable to implement effective (self-protective) measures against heavy rain / flooding.	24.7	45.5	27.3	1.3	1.3	0	0	
Through joint action (government / citizens) we can implement effective measures again heavy rain / flooding in our municipality.	42.9	44.2	11.7	0	1.3	0	0	
It is mainly with the responsibility of governmental bodies to implement measures against heavy rain / flooding.	6.5	13.0	31.2	20.8	19.5	9.1	0	
Private households are also highly responsible to implement measures against heavy rain / flooding.	33.8	42.9	19.5	1.3	2.6	0	0	
I have extensive knowledge regarding the potential threats to my municipality by heavy rain events.	20.8	42.9	22.1	11.7	2.6	0	0	
I have extensive knowledge regarding my department's (work area) possibilities to foster / implement protection against heavy rain / flooding.	24.7	50.6	19.5	2.6	2.6	0	0	

Item	Strongly agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly disagree	Do not know	n.s.
2. STRUCTURAL MEASURES (PLANNING PRECAUTION) IN THE MUNICIPALITY								
Strategies based on infiltration								
Decentral infiltration and evaporation								
Very effective	26.0	45.5	16.9	7.8	3.9	0	0	0
Very realizable	2.6	18.2	24.7	35.1	18.2	0	1.3	0
Central infiltration								
Very effective	5.2	33.8	28.6	22.1	7.8	0	2.6	0
Very realizable	0	5.2	22.1	46.8	20.8	0	5.2	0
Protection of and creation of retention areas								
Very effective	40.3	53.2	6.5	0	0	0	0	0
Very realizable	0	5.2	18.2	50.6	20.8	3.9	1.3	0
(Partial) unsealing of sealed surfaces								
Very effective	20.8	41.6	29.9	7.8	0	0	0	0
Very realizable	1.3	5.2	33.8	35.1	15.6	9.1	0	0
Strategies based on buffering								
Detention of discharge peaks in or on buildings (e.g., collection of water on rooftops or in reservoirs below the driveways to underground parking)								
Very effective	19.5	44.2	26.0	3.9	3.9	0	0	0
Very realizable	0	6.5	29.9	33.8	22.1	0	0	0
Multifunction use of traffic areas and open spaces (e.g., temporary detention of rain water on green and recreational areas and on parking lots)								
Very effective	37.7	46.8	9.1	6.5	0	0	0	0
Very realizable	0	10.4	18.2	41.6	23.4	5.2	0	0
Strategies based on delay								
Greening of rooftops								
Very effective	20.8	41.6	29.9	3.9	3.9	0	0	0
Very realizable	1.3	15.6	41.6	24.7	13.0	0	2.6	1.3
Construction of detention basins								
Very effective	22.1	51.9	23.4	1.3	1.3	0	0	0
Very realizable	0	7.8	33.8	35.1	20.8	1.3	0	0
Strategies based on drainage								
Reactivation of former ditches and watercourses								
Very effective	27.3	49.4	16.9	2.6	0	0	3.9	0
Very realizable	1.3	10.4	16.9	36.4	24.7	2.6	7.8	0
Open drainage of rainwater								
Very effective	16.9	49.4	19.5	9.1	0	0	5.2	0
Very realizable	0	9.1	28.6	40.3	11.7	2.6	6.5	1.3
Emergency drainage via streets and walkways								
Very effective	28.6	24.7	26.0	13.0	0	1.3	6.5	0
Very realizable	5.2	9.1	29.9	27.3	13.0	2.6	13.0	0
Draining water of outer areas								
Avoiding the discharge of rainwater from agricultural areas into the sewage water system and into residential areas.								
Very effective	26.0	37.7	10.4	5.2	1.3	0	19.5	0
Very realizable	0	2.6	24.7	26.0	14.3	1.3	29.9	1.3
Systematic drainage of runoff water in the outskirts of the municipality and erosion protection								
Very effective	24.7	31.2	11.7	3.9	0	0	27.3	1.3
Very realizable	0	1.3	19.5	26.0	13.0	2.6	35.1	2.6

Item	Strongly agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly disagree	Do not know	n.s.
General								
A concept for water-sensitive planning and development tailored to the municipal's needs providing guidelines for municipal decision-making and acting								
Very effective	31.2	42.9	16.9	2.6	1.3	0	3.9	1.3
Very realizable	3.9	13.0	29.9	29.9	13.0	1.3	7.8	1.3
Legally binding standards for the Town and County Planning Code								
Very effective	32.5	44.2	16.9	2.6	0	0	3.9	0
Very realizable	3.9	9.1	31.2	36.4	10.4	1.3	7.8	0
3. ACTIVATION MEASURES – ACTIVATING CITIZENS TO TAKE SELL-PROTECTIVE MEASURES								
Model houses regarding heavy rainfall events: Activation of selected private households in different neighborhoods that implement exemplary self-protective measures								
Very effective	16.9	35.1	29.9	9.1	0	0	9.1	0
Very realizable	1.3	9.1	29.9	33.8	9.1	2.6	13.0	1.3
Hazard maps for heavy rain events that show citizens if their property is located in a potentially hazardous area								
Very effective	45.5	35.1	11.7	6.5	0	0	1.3	0
Very realizable	22.1	41.6	23.4	7.8	2.6	0	2.6	0
Indicating areas at risk from heavy rain / flooding in land-use plans								
Very effective	33.8	32.5	20.8	7.8	0	0	3.9	1.3
Very realizable	14.3	42.9	28.6	6.5	0	0	6.5	1.3
Charts indicating responsibilities regarding structural measures / planning vs. self-protection that can be used for communication with citizens								
Very effective	23.4	32.5	27.3	5.2	0	0	10.4	1.3
Very realizable	14.3	39.0	23.4	6.5	1.3	0	13.0	2.6
Flood pass: Risk assessment of private property including information on self-protective measures								
Very effective	27.3	46.8	13.0	5.2	0	0	7.8	0
Very realizable	14.3	29.9	27.3	15.6	3.9	0	9.1	0
Information brochures for private households, informing citizens about heavy rain related risks and self-protective measures								
Very effective	22.1	37.7	32.5	5.2	0	0	2.6	0
Very realizable	28.6	50.6	13.0	2.6	1.3	0	3.9	0
Information brochures for those authorized to present building documents, that are to encourage those authorized to promote self-protection when in touch with clients / house builders								
Very effective	27.3	44.2	19.5	5.2	0	0	3.9	0
Very realizable	22.1	51.9	16.9	2.6	1.3	0	5.2	0
Municipal consultation offers, offering citizens information on potential risks and self-protective measures								
Very effective	29.9	41.6	22.1	5.2	0	0	1.3	0
Very realizable	13.0	33.8	39.0	10.4	2.6	0	1.3	0
Heavy rain related standards for house builders in development areas (e.g., concerning sealing)								
Very effective	46.8	35.1	13.0	2.6	0	0	2.6	0
Very realizable	11.7	37.7	23.4	19.5	2.6	1.3	3.9	0
Standars for house owners of existing buildings to install backflow flaps								
Very effective	53.2	31.2	7.8	3.9	0	0	3.9	0
Very realizable	33.8	15.6	16.9	22.1	2.6	1.3	7.8	0
Photographic documentation of past regional flood damages								
Very effective	16.9	23.4	32.5	19.5	2.6	0	3.9	1.3
Very realizable	23.4	29.9	26.0	10.4	2.6	1.3	5.2	1.3
Higher standards in reconstruction or expansion plans for existing buildings and for new buildings (e.g. regarding infiltration, backwater, sealing, green roofs)								
Very effective	36.4	39.0	19.5	0	0	0	3.9	1.3
Very realizable	13.0	9.1	32.5	33.8	3.9	1.3	5.2	1.3

Item	Strongly agree	Agree	Slightly agree	Slightly disagree	Disagree	Strongly disagree	Do not know	n.s.
4. QUESTION CONCERNING OWN BACKGROUND								
Activating private households to undertake self-protective measures ...								
... I think is very effective for preventing damages from heavy rain.	33.8	45.5	18.2	1.3	1.3	0	0	
... I think is easy realizable by my work department.	5.2	16.9	26.0	33.8	14.3	2.6	1.3	
I am motivated to implement ...								
... measures with my work department aiming at the activation of private households for taking self-protective measures.	16.9	35.1	20.8	13.0	10.4	2.6	0	1.3
... regulative or structural measures for avoiding damage from heavy rainfall at the municipal level with my work department.	10.4	50.6	14.3	13.0	6.5	3.9	0	1.3
In my municipality ...								
... many measures aiming at the activation of private households for taking self-protective measures have already been implemented.	11.7	27.3	33.8	19.5	2.6	0	5.2	0
... many heavy-rainfall-related regulative or structural measures for avoiding damage from heavy rainfall have already been implemented.	9.1	18.2	26.0	23.4	10.4	1.3	10.4	1.3

Item	**Answer categories / answers in %**
Gender	female: 35.1 %; male: 63.6%; diverse: 0%; not specified: 1.3 %
Age	18-29 yrs.: 6.5 %; 30-39 yrs.: 22.1 %; 40-49: 15.6 %; 50-59: 41.6 %; >60: 13.0 %; not specified: 1.3 %
Municipal background	Employee of a municipal government: 79.2 % Employee of a municipal enterprise: 20.8 %
Activating private households as part of job description	Strongly agree (14.3 %); agree (11.7 %); slightly agree (15.6%); slightly disagree (22.1 %); disagree (27.3 %); strongly disagree (9.1 %)
Area of responsibility	Environment (42.9 %); wastewater (29.9 %); planning (14.3 %); other area (13 %); other areas named: fire and emergency management (1.3 %), fire service (1.3 %), climate adaptation (1.3 %), climate protection (2.6 %), climate protection and climate adaptation (1.3 %), construction and maintenance of roads including drainage (1.3 %), traffic infrastructure (1.3 %), and water management (2.6 %).
Federal state	Baden-Württemberg (6.5 %); Bavaria (13.0 %); Berlin (2.6%); Brandenburg (3.9 %); Bremen (6.5 %); Hamburg (6.5 %); Hesse (6.5 %); Mecklenburg-West Pomerania (3.9 %); Lower Saxony (5.2 %); North Rhine-Westphalia (26 %); Rhineland-Palatinate (5.2 %); Saarland (2.6 %); Saxony (5.2 %); Saxony-Anhalt (1.3 %); Schleswig-Holstein (5.2 %); Thuringia (0.0 %)

Table S2. Coefficients for the explanatory variables from multiple regression analyses for the four dependent variables.

	B	SE	t	Sig
Model for D1.1 Motivation for activation measures				
Constant	-1.36	1.313	-1.201	0.234
E1	0.018	0.152	0.119	0.905
E2	0.146	0.174	0.838	0.405
E3	0.207	0.157	1.318	0.192
F1**	0.483	0.122	3.968	0.000
Res2	0.208	0.147	1.416	0.161
K1*	0.417	0.191	2.178	0.033
K2	-0.201	0.227	-0.888	0.378
Model for D2.1 Motivation for planning measures				
Constant	0.991	0.872	1.136	0.260
E1	0.136	0.158	0.864	0.391
F1	0.103	0.129	0.802	0.425
K2**	0.474	0.174	2.717	0.008
Model for D1.2 Assessed status of implementation of activating measures				
Constant	0.039	0.865	0.045	0.964
F1**	0.345	0.127	2.717	0.008
K1	0.177	0.197	0.894	0.375
K2	0.346	0.260	1.329	0.189
Model for D2.2 Assessed status of implementation of planning / structural measures				
Constant	2.731	0.600	4.554	0.000
K1*	0.326	0.124	2.622	0.011