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Multi-sectoral and systemic drought risk in forested cold climates: stakeholder-informed vulnerability factors from Sweden

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S1. Supplementary tables

Table S1 – Sectoral vulnerability factors, their subcategories and impact scores

Sectoral Vulnerability factor	*Subcategory*	*Agricultural*	*Energy*	*Environmental*	*Forestry*	*Water resources*	*Water supply*	*All sectors*
(A) Dynamic models for decision support	Tools	0,42	0,33	0,68	0,50	0,78	0,44	0,56
(A) Funding for small scale water projects	Supply	0,75	0,20	0,65	0,32	0,71	0,35	0,54
(A) Local knowledge about adaptive approaches	Tools	0,71	0,58	0,66	0,58	0,70	0,63	0,65
(A) Local resolution risk modelling	Tools	0,64	0,46	0,67	0,50	0,79	0,69	0,65
(A) Possibilities for development of water storage	Supply	0,85	0,70	0,68	0,23	0,79	0,81	0,68
(A) Scientists employed in sector	Tools	0,61	0,38	0,45	0,48	0,59	0,43	0,49
(A) Species shift for climate adaptation (forests)	Species	0,44	0,13	0,64	0,73	0,54	0,21	0,56
(A) Species suitable for future drought projections	Species	0,72	0,10	0,64	0,58	0,50	0,35	0,55
(A) Use of adaptive measures	Tools	0,79	0,43	0,74	0,67	0,80	0,65	0,71
(C) Ability to apply for and receive funds	Funds	0,64	0,25	0,58	0,29	0,48	0,35	0,48
(C) Alternative water source & water supply	Supply	0,81	0,60	0,76	0,18	0,79	0,83	0,70
(C) Apt size of water permits to sustain irrigation	Irrigation	0,88	0,30	0,64	0,13	0,73	0,58	0,57
(C) Permanent water restrictions	Supply	0,89	0,60	0,67	0,28	0,52	0,71	0,63
(C) Regional water distribution networks	Supply	0,50	0,25	0,58	0,18	0,71	0,77	0,55
(C) Sectoral actor's level of available assets	Funds	0,80	0,50	0,60	0,31	0,63	0,83	0,63
(C) Use of effective irrigation systems	Irrigation	0,98	0,25	0,56	0,09	0,70	0,64	0,55
(C) Use of irrigation	Irrigation	0,94	0,25	0,51	0,11	0,65	0,56	0,51
(C) Water available for irrigation during drought	Irrigation	0,98	0,30	0,61	0,07	0,67	0,67	0,57
(S) Access to public drinking water service	Supply	0,75	0,15	0,73	0,20	0,79	0,88	0,66
(S) Baseline water stress	Stress	0,92	0,63	0,84	0,35	0,94	0,80	0,79
(S) Competing water interests	Stress	0,81	0,60	0,72	0,23	0,77	0,75	0,68
(S) Dependency on sector as only source of income	Funds	0,86	0,40	0,45	0,33	0,44	0,79	0,56
(S) Deteriorating ecosystems	Stress	0,58	0,25	0,79	0,48	0,66	0,46	0,62
(S) Distribution of hydropower plants	Supply	0,54	0,68	0,57	0,13	0,65	0,58	0,55
(S) Drought resilient seedlings	Species	0,83	0,15	0,61	0,73	0,55	0,39	0,61
(S) Drought resilient stand mixtures	Species	0,81	0,20	0,67	0,70	0,57	0,50	0,63
(S) Drought tolerance of current species	Species	0,90	0,25	0,76	0,75	0,68	0,47	0,70
(S) Fragmented forests or forests of small size	Stress	0,40	0,13	0,65	0,41	0,44	0,25	0,47
(S) Growth limiting conditions	Setting	0,90	0,25	0,64	0,79	0,68	0,69	0,70
(S) Land and soil degradation	Stress	0,60	0,10	0,70	0,27	0,42	0,58	0,52
(S) Level of groundwater exploitation	Stress	0,80	0,50	0,79	0,41	0,75	0,77	0,71
(S) Monocultures	Species	0,55	0,13	0,68	0,59	0,48	0,25	0,55
(S) Possibility to expand irrigation practices	Supply	0,90	0,30	0,52	0,06	0,52	0,58	0,49
(S) Presence of forest & forest vegetation	Setting	0,50	0,50	0,72	0,57	0,73	0,39	0,62
(S) Presence of wetlands, lakes and ponds	Setting	0,63	0,75	0,91	0,56	0,88	0,77	0,78
(S) Productivity of land	Setting	0,88	0,00	0,50	0,40	0,36	0,50	0,50

(S) Proportion of fertile soils	Setting	0,85	0,10	0,48	0,40	0,42	0,39	0,49
(S) Reliable water resource for water supply	Supply	0,92	0,40	0,75	0,23	0,87	0,83	0,73
(S) Sectoral actor's level of solvency	Funds	0,88	0,35	0,29	0,21	0,25	0,75	0,48
(S) Shallow rooted crops/species	Species	0,73	0,15	0,59	0,65	0,50	0,32	0,55
(S) Soil water holding capacity	Setting	0,92	0,65	0,82	0,75	0,82	0,73	0,80
(S) Species outside its natural range	Species	0,29	0,10	0,60	0,50	0,41	0,15	0,44
(S) The elevation	Setting	0,31	0,70	0,54	0,44	0,69	0,59	0,53
(S) The geographical characteristics	Setting	0,73	0,75	0,73	0,71	0,75	0,86	0,75
(S) Water dependent ecosystems	Setting	0,68	0,50	0,88	0,44	0,81	0,63	0,72
(S) Water quality deterioration	Stress	0,68	0,25	0,78	0,25	0,71	0,77	0,66

Table S2 – Governance vulnerability factors, their subcategories, and impact scores

Governance Vulnerability factor	*Subcategory*	*Society*	*Agricultural*	*Energy*	*Environmental*	*Forestry*	*Water resources*	*Water supply*	*All sectors*
(A) Availability of drought risk assessment	Tools	0,70	0,61	0,54	0,71	0,60	0,79	0,71	0,69
(A) Building standards relating to water efficiency	Policies	0,66	0,46	0,30	0,61	0,17	0,58	0,68	0,60
(A) Drought early warning systems	Tools	0,69	0,73	0,38	0,55	0,42	0,66	0,65	0,63
(A) Drought monitoring schemes	Tools	0,74	0,68	0,38	0,66	0,44	0,68	0,65	0,67
(A) Groundwater monitoring	Tools	0,79	0,71	0,45	0,71	0,46	0,80	0,77	0,73
(A) Long-term supply & demand assessments	Tools	0,78	0,69	0,63	0,79	0,50	0,88	0,77	0,75
(A) Planned drought prevention measures (authority level)	Policies	0,79	0,65	0,65	0,76	0,46	0,81	0,63	0,74
(A) Real time DRA and DRM tools	Tools	0,71	0,75	0,29	0,61	0,48	0,69	0,66	0,66
(A) Relevant data regarding drought	Tools	0,73	0,81	0,71	0,71	0,50	0,79	0,68	0,71
(C) Collaborative decision making & development (authority)	Governance	0,72	0,64	0,44	0,73	0,35	0,75	0,72	0,69
(C) Competence-level within authorities*	Governance	0,74	0,84	0,25	0,63	0,58	0,70	0,67	0,70
(C) Coordinated Water Strategy (authority level)	Policies	0,77	0,64	0,70	0,78	0,25	0,87	0,67	0,74
(C) Coordination & cooperation among authorities*	Governance	0,74	0,75	0,33	0,64	0,41	0,61	0,66	0,68
(C) Decision support systems regarding drought	Tools	0,72	0,66	0,46	0,69	0,58	0,79	0,67	0,69
(C) Defined water use rights	Policies	0,77	0,67	0,88	0,74	0,21	0,81	0,73	0,73
(C) Drought awareness within authorities	Governance	0,76	0,77	0,67	0,71	0,50	0,85	0,71	0,73
(C) Drought plan incl raising awareness (authority level)	Policies	0,75	0,60	0,44	0,74	0,42	0,83	0,68	0,71
(C) Financial capacity of the government*	Governance	0,65	0,77	0,25	0,60	0,33	0,55	0,52	0,61
(C) Local water management plan	Policies	0,77	0,73	0,65	0,80	0,25	0,88	0,70	0,75
(C) Presence of a DMP	Policies	0,75	0,58	0,63	0,76	0,42	0,77	0,72	0,72

(C) Social/physical capacity within authorities*	Governance	0,63							0,63
(C) Water transfer and drought policies	Policies	0,73	0,70	0,50	0,69	0,25	0,81	0,67	0,69
(C) Water use priority classes in authority level DMP	Policies	0,77	0,78	0,63	0,71	0,29	0,77	0,73	0,73

Table S3 - Societal vulnerability factors, their subcategories, and impact scores

Societal vulnerability factors	*subcategory*	*Society*
(C) Drought awareness among water users	Setting	0,75
(S) Access to public drinking water service	Supply	0,75
(S) Size of population	Setting	0,69
(S) Size of town	Setting	0,67
(S) Societal financial dependency on DWC industries	Setting	0,77

Table S4- Overview of respondent characteristics

Sector	***Gender identity***			***Place of employment***					***Work experience***			***Drought experience***			***Geographical location***	
	F	**M**	**NA**	**Authority**	**Enterprise**	**NGO**	**Research**	**Trade association**	**0-5 yrs**	**5-10 yrs**	**>10 yrs**	**1-2**	**2**	**3-4**	**North**	**South**
Agricultural	10	3		2	1		5	5	4	2	7	1	2	10	1	12
Energy	1	6		1	4		1	1	2	1	4	1	1	5	2	5
Environmental	15	16	4	29		1	5		10	5	20	8	14	13	7	28
Forestry	1	12	1	4	4		6		1	1	12		3	11	4	10
Water resources	8	6	1	11	1	1	2		2	9	4	3	4	8		15
Water supply	8	7	1	14	1			1	2	2	12	3	3	10	2	14

Organization	**Gender identity**			**Work experience**			**Geographical location**		**Drought experience**		
	F	**M**	**NA**	**0-5 yrs**	**5-10 yrs**	**>10 yrs**	**North**	**South**	**1-2**	**2**	**3-4**
Authority	32	25	5	16	15	31	9	53	14	19	29
Enterprise	2	9	1	2	3	7	5	7		4	8
NGO		2		1		1		2	1		1
Research	6	12	1	1	1	17	2	17	1	5	13
Trade association	4	3		1	2	4		7	1		6

Geographical location	**Gender identity**			**Work experience**			**Drought experience**		
	F	**M**	**NA**	**0-5 yrs**	**5-10 yrs**	**>10 yrs**	**1-2**	**2**	**3-4**
North	6	9	1	5	2	9	4	6	6
South	38	42	6	16	19	51	13	22	51

Table S5 – Number of respondents per sector as well as primary field of focus within the sector

Sector and primary focus	*Respondents (n)*
Agricultural	**13**
Crop production	7
Advocacy activities for green industries	1
Crop and vegetable production, & animal husbandry	1
Animal husbandry & production	2
Food strategy	1
Other	1
Energy	**7**
Hydropower	6
Other	1
Environmental	**35**
Aquatic ecosystems	9
Both aquatic & terrestrial ecosystems	16
Terrestrial ecosystems	10
Forestry	**14**
-	1
Both production and nature conservation	1
Ecosystem services	1
Nature conservation	4
Production	6
Research	1
Unspecified	**1**
-	1
Water intensive industry	**1**
Paper- & pulp industry	1
Water resources	**15**
Exercise of authority	1
Society	1
Water management	1
Water quality effects in physical planning	1
Water resource management	11
Water supply	**16**
Drinking water production & distribution	16
Grand Total	**102**

Table S6 –Significant differences in sectoral factor ratings (p-value <0.05) based on pairwise Wilcoxon Rank sum test, with corrections for multiple testing, using the Benjamini-Hochberg method for p-value adjustment.

Sectoral vulnerability factor	*Sectors*		*p-value*	*Subcategory*
Funding for small scale water projects	Energy	Agricultural	0,0142	Supply
Funding for small scale water projects	Environmental	Energy	0,0142	Supply
Funding for small scale water projects	Forestry	Agricultural	0,0142	Supply
Funding for small scale water projects	Forestry	Environmental	0,0142	Supply
Funding for small scale water projects	Water resources	Energy	0,0142	Supply
Funding for small scale water projects	Water resources	Forestry	0,0142	Supply
Funding for small scale water projects	Water supply	Agricultural	0,0157	Supply
Funding for small scale water projects	Water supply	Environmental	0,0142	Supply
Funding for small scale water projects	Water supply	Water resources	0,0142	Supply
Species shift for climate adaptation (forests)	Forestry	Energy	0,0180	Species
Species shift for climate adaptation (forests)	Water supply	Forestry	0,0180	Species
Sectoral actor's level of available assets	Forestry	Agricultural	0,0096	Funds
Sectoral actor's level of available assets	Water supply	Forestry	0,0079	Funds
Sectoral actor's level of solvency	Energy	Agricultural	0,0148	Funds
Sectoral actor's level of solvency	Environmental	Agricultural	0,0048	Funds
Sectoral actor's level of solvency	Forestry	Agricultural	0,0046	Funds
Sectoral actor's level of solvency	Water resources	Agricultural	0,0101	Funds
Sectoral actor's level of solvency	Water supply	Energy	0,0395	Funds
Sectoral actor's level of solvency	Water supply	Environmental	0,0148	Funds
Sectoral actor's level of solvency	Water supply	Forestry	0,0046	Funds
Sectoral actor's level of solvency	Water supply	Water resources	0,0302	Funds
Dependency on sector as only source of income	Forestry	Agricultural	0,0351	Funds
Apt size of water permits to sustain irrigation	Energy	Agricultural	0,0126	Irrigation
Apt size of water permits to sustain irrigation	Environmental	Agricultural	0,0432	Irrigation
Apt size of water permits to sustain irrigation	Forestry	Agricultural	0,0005	Irrigation
Apt size of water permits to sustain irrigation	Forestry	Environmental	0,0021	Irrigation
Apt size of water permits to sustain irrigation	Water resources	Forestry	0,0021	Irrigation
Apt size of water permits to sustain irrigation	Water supply	Agricultural	0,0301	Irrigation
Apt size of water permits to sustain irrigation	Water supply	Forestry	0,0055	Irrigation
Use of effective irrigation systems	Energy	Agricultural	0,0010	Irrigation
Use of effective irrigation systems	Environmental	Agricultural	0,0003	Irrigation
Use of effective irrigation systems	Forestry	Agricultural	0,0000	Irrigation
Use of effective irrigation systems	Forestry	Environmental	0,0003	Irrigation
Use of effective irrigation systems	Water resources	Agricultural	0,0290	Irrigation
Use of effective irrigation systems	Water resources	Forestry	0,0008	Irrigation
Use of effective irrigation systems	Water supply	Agricultural	0,0034	Irrigation
Use of effective irrigation systems	Water supply	Forestry	0,0014	Irrigation
Use of irrigation	Energy	Agricultural	0,0022	Irrigation
Use of irrigation	Environmental	Agricultural	0,0007	Irrigation
Use of irrigation	Forestry	Agricultural	0,0001	Irrigation

Use of irrigation	Forestry	Environmental	0,0007	Irrigation
Use of irrigation	Water resources	Agricultural	0,0101	Irrigation
Use of irrigation	Water resources	Energy	0,0400	Irrigation
Use of irrigation	Water resources	Forestry	0,0007	Irrigation
Use of irrigation	Water supply	Agricultural	0,0033	Irrigation
Use of irrigation	Water supply	Forestry	0,0033	Irrigation
Water available for irrigation during drought	Energy	Agricultural	0,0006	Irrigation
Water available for irrigation during drought	Environmental	Agricultural	0,0005	Irrigation
Water available for irrigation during drought	Forestry	Agricultural	0,0000	Irrigation
Water available for irrigation during drought	Forestry	Environmental	0,0001	Irrigation
Water available for irrigation during drought	Water resources	Agricultural	0,0271	Irrigation
Water available for irrigation during drought	Water resources	Forestry	0,0008	Irrigation
Water available for irrigation during drought	Water supply	Agricultural	0,0022	Irrigation
Water available for irrigation during drought	Water supply	Forestry	0,0004	Irrigation
Possibility to expand irrigation practices	Energy	Agricultural	0,0076	Supply
Possibility to expand irrigation practices	Environmental	Agricultural	0,0076	Supply
Possibility to expand irrigation practices	Forestry	Agricultural	0,0001	Supply
Possibility to expand irrigation practices	Forestry	Environmental	0,0007	Supply
Possibility to expand irrigation practices	Water resources	Agricultural	0,0108	Supply
Possibility to expand irrigation practices	Water resources	Forestry	0,0032	Supply
Possibility to expand irrigation practices	Water supply	Agricultural	0,0103	Supply
Possibility to expand irrigation practices	Water supply	Forestry	0,0007	Supply
Land and soil degradation	Energy	Agricultural	0,0434	Stress
Land and soil degradation	Environmental	Energy	0,0099	Stress
Land and soil degradation	Forestry	Environmental	0,0099	Stress
Land and soil degradation	Water supply	Energy	0,0434	Stress
Productivity of land	Energy	Agricultural	0,0032	Setting
Productivity of land	Environmental	Agricultural	0,0032	Setting
Productivity of land	Environmental	Energy	0,0032	Setting
Productivity of land	Forestry	Agricultural	0,0032	Setting
Productivity of land	Forestry	Energy	0,0122	Setting
Productivity of land	Water resources	Agricultural	0,0050	Setting
Productivity of land	Water supply	Agricultural	0,0050	Setting
Productivity of land	Water supply	Energy	0,0050	Setting
Proportion of fertile soils	Energy	Agricultural	0,0077	Setting
Proportion of fertile soils	Environmental	Agricultural	0,0077	Setting
Proportion of fertile soils	Environmental	Energy	0,0336	Setting
Proportion of fertile soils	Forestry	Agricultural	0,0157	Setting
Proportion of fertile soils	Water resources	Agricultural	0,0209	Setting
Proportion of fertile soils	Water supply	Agricultural	0,0157	Setting
Drought resilient seedlings	Energy	Agricultural	0,0301	Species
Drought resilient seedlings	Environmental	Energy	0,0375	Species
Drought resilient seedlings	Forestry	Energy	0,0375	Species
Drought resilient seedlings	Water supply	Agricultural	0,0375	Species

Drought resilient stand mixtures	Energy	Agricultural	0,0442	Species
Drought resilient stand mixtures	Environmental	Energy	0,0442	Species
Drought resilient stand mixtures	Forestry	Energy	0,0442	Species
Shallow rooted crops/species	Energy	Agricultural	0,0378	Species
Shallow rooted crops/species	Forestry	Energy	0,0378	Species
Shallow rooted crops/species	Water supply	Agricultural	0,0378	Species
Species suitable for future drought projections	Energy	Agricultural	0,0470	Species
Species suitable for future drought projections	Environmental	Energy	0,0470	Species
Drought tolerance of current species	Energy	Agricultural	0,0234	Species
Drought tolerance of current species	Environmental	Energy	0,0267	Species
Drought tolerance of current species	Forestry	Energy	0,0281	Species
Drought tolerance of current species	Water supply	Agricultural	0,0358	Species
Deteriorating ecosystems	Environmental	Energy	0,0196	Stress
Deteriorating ecosystems	Forestry	Environmental	0,0240	Stress
Deteriorating ecosystems	Water supply	Environmental	0,0240	Stress
Presence of wetlands, lakes and ponds	Environmental	Agricultural	0,0078	Setting
Presence of wetlands, lakes and ponds	Forestry	Environmental	0,0011	Setting
Presence of wetlands, lakes and ponds	Water resources	Forestry	0,0175	Setting
Water dependent ecosystems	Forestry	Environmental	0,0003	Setting
Water dependent ecosystems	Water resources	Forestry	0,0218	Setting
Water dependent ecosystems	Water supply	Environmental	0,0218	Setting
Water quality deterioration	Environmental	Energy	0,0105	Stress
Water quality deterioration	Forestry	Agricultural	0,0105	Stress
Water quality deterioration	Forestry	Environmental	0,0003	Stress
Water quality deterioration	Water resources	Forestry	0,0141	Stress
Water quality deterioration	Water supply	Energy	0,0308	Stress
Water quality deterioration	Water supply	Forestry	0,0061	Stress
Access to public drinking water service	Energy	Agricultural	0,0163	Supply
Access to public drinking water service	Environmental	Energy	0,0064	Supply
Access to public drinking water service	Forestry	Agricultural	0,0042	Supply
Access to public drinking water service	Forestry	Environmental	0,0009	Supply
Access to public drinking water service	Water resources	Energy	0,0103	Supply
Access to public drinking water service	Water resources	Forestry	0,0025	Supply
Access to public drinking water service	Water supply	Energy	0,0042	Supply
Access to public drinking water service	Water supply	Forestry	0,0009	Supply
Level of groundwater exploitation	Forestry	Agricultural	0,0499	Stress
Level of groundwater exploitation	Forestry	Environmental	0,0169	Stress
Level of groundwater exploitation	Water resources	Forestry	0,0499	Stress
Level of groundwater exploitation	Water supply	Forestry	0,0499	Stress
Possibilities for development of water storage	Forestry	Agricultural	0,0008	Supply
Possibilities for development of water storage	Forestry	Environmental	0,0011	Supply
Possibilities for development of water storage	Water resources	Forestry	0,0008	Supply
Possibilities for development of water storage	Water supply	Forestry	0,0008	Supply
Alternative water source & water supply	Forestry	Agricultural	0,0010	Supply

Alternative water source & water supply	Forestry	Environmental	0,0002	Supply
Alternative water source & water supply	Water resources	Forestry	0,0014	Supply
Alternative water source & water supply	Water supply	Forestry	0,0010	Supply
Competing water interests	Forestry	Agricultural	0,0027	Stress
Competing water interests	Forestry	Environmental	0,0009	Stress
Competing water interests	Water resources	Forestry	0,0018	Stress
Competing water interests	Water supply	Forestry	0,0027	Stress
Permanent water restrictions	Environmental	Agricultural	0,0433	Supply
Permanent water restrictions	Forestry	Agricultural	0,0067	Supply
Permanent water restrictions	Forestry	Environmental	0,0176	Supply
Permanent water restrictions	Water resources	Agricultural	0,0245	Supply
Permanent water restrictions	Water supply	Forestry	0,0201	Supply
Regional water distribution networks	Forestry	Agricultural	0,0255	Supply
Regional water distribution networks	Forestry	Environmental	0,0065	Supply
Regional water distribution networks	Water resources	Forestry	0,0065	Supply
Regional water distribution networks	Water supply	Forestry	0,0065	Supply
Reliable water resource for water supply	Energy	Agricultural	0,0081	Supply
Reliable water resource for water supply	Forestry	Agricultural	0,0006	Supply
Reliable water resource for water supply	Forestry	Environmental	0,0007	Supply
Reliable water resource for water supply	Water resources	Energy	0,0140	Supply
Reliable water resource for water supply	Water resources	Forestry	0,0007	Supply
Reliable water resource for water supply	Water supply	Energy	0,0349	Supply
Reliable water resource for water supply	Water supply	Forestry	0,0013	Supply
Baseline water stress	Energy	Agricultural	0,0441	Stress
Baseline water stress	Forestry	Agricultural	0,0029	Stress
Baseline water stress	Forestry	Environmental	0,0029	Stress
Baseline water stress	Water resources	Forestry	0,0029	Stress
Baseline water stress	Water supply	Forestry	0,0163	Stress

Table S7a –Significant difference in governance factor ratings (p-value <0.05) for sectoral drought risk depending on sectoral focus of respondents, based on pairwise Wilcoxon Rank sum test, with corrections for multiple testing, using the Benjamini-Hochberg method for p-value adjustment.

Governance vulnerability factor	*Sectors*		*p-value*	*subcategory*
Relevant data regarding drought	Forestry	Agricultural	0,0385	Tools
Long-term supply & demand assessments	Forestry	Environmental	0,0203	Tools
Long-term supply & demand assessments	Water resources	Forestry	0,0203	Tools
Groundwater monitoring	Water resources	Forestry	0,0254	Tools
Groundwater monitoring	Water supply	Forestry	0,0254	Tools
Coordinated Water Strategy (authority level)	Forestry	Environmental	0,0089	Policies
Coordinated Water Strategy (authority level)	Water resources	Forestry	0,0089	Policies
Drought plan incl raising awareness (authority level)	Water resources	Forestry	0,0393	Policies
Local water management plan	Forestry	Environmental	0,0077	Policies
Local water management plan	Water resources	Forestry	0,0077	Policies
Water transfer and drought policies	Forestry	Environmental	0,0295	Policies
Water transfer and drought policies	Water resources	Forestry	0,0207	Policies
Defined water-use rights	Forestry	Agricultural	0,0483	Policies
Defined water-use rights	Forestry	Energy	0,0483	Policies
Defined water-use rights	Forestry	Environmental	0,0121	Policies
Defined water-use rights	Water resources	Forestry	0,0138	Policies
Defined water-use rights	Water supply	Forestry	0,0194	Policies

Table S7b Significant difference in governance factor ratings (p-value <0.05) for societal drought risk depending on respondents' place of employment, based on pairwise Wilcoxon Rank sum test, with corrections for multiple testing, using the Benjamini-Hochberg method for p-value adjustment.

Governance vulnerability factor	*Sectors*		*p-value*	*subcategory*
Water transfer and drought policies	Research	Authority	0,04467	Policies
*Financial capacity of the government**	Company	Authority	0,038918	Authority
*Financial capacity of the government**	Research	Authority	0,038918	Authority
*Social/physical capacity within authorities**	Company	Authority	0,004864	Authority
*Social/physical capacity within authorities**	Research	Authority	0,026956	Authority

S2. List of questions and vulnerability factors included in the survey as well as their response options.

Questions are listed in bold text, and response options are listed in parentheses after each question.

The respondents were also given a short introduction to the concept of risk and vulnerability before answering the survey questions.

Background information collected

Q1. **What is your language preference for answering the survey?** *(Swedish/English)*

Q2. **Where are you currently employed?** *(Academia/ Governmental authority or public sector/NGO/Private or state-owned enterprise/sector association/Research institute/Other)*

Follow-up question if answer to Q2 was "governmental authority or public sector":

Q2.1. What level of authority or part of public sector do you work in?

(*Municipality/County administrative board/National level agency/Water district board/Other)*

Q3. **What sector do you primarily work with?** *(Agriculture/Forestry/Water resources/Water supply/Environment & ecosystem services/Energy production/Water intensive industry)*

Q4. **Which of the following areas do you primarily focus on in your work?** Different multiple-choice options were given depending on answer to Q3. The response options were:

- Agriculture: *(Crop production/Livestock breeding/Vegetables & fruit production/Other (free text))*
- Forestry: *(Wood production/Forest conservation/Other (free text))*
- Water supply*: (Drinking water production & distribution/ Other (free text))*
- Water resources: *(Water resources management/ Other (free text))*
- Environment & ecosystems*: (Terrestrial ecosystems/aquatic ecosystems/both)*
- Energy production*: (hydropower/nuclear power/thermal power/Other (free text))*
- Water intensive industry*: paper & pulp industry/metallurgical industry/chemical industry/Other (free text)*

Q5. **How long have you worked in this field?** *(0-5 years/5-10 years/>10 years)*

Q6. **How do you judge your level of experience & knowledge concerning drought-related issues in this field?** *(0-no experience/1/2/3/4 – significant experience)*

Q7. **Gender** *(Female/Male/ Non-binary/I'd rather not disclose)*

Q8. **Geographical location** *(County)*

Sectoral vulnerability factors

Q9. **What impact do the following factors have on the risk of negative drought impacts in your sector or field of expertise? Indicate their impact on a scale from 0 (no impact) to 4 (large impact)[1] depending on their impact on the risk of negative drought impacts in your sector or primary field of focus.**

Factors included in this section:

Existence of local knowledge about adaptive approaches for the sector regarding drought

Presence of adaptive measures regarding drought

Presence of financial support for small scale water projects

Presence of forest management practices that induce climate-adapted species transitions

Presence of scientists employed in sector

The distribution of hydropower plants

The age of hydropower plants

Availability of dynamic models for decision support regarding drought

[1] The option "I don't know" was also available

Availability of dynamic vegetation models for decision support regarding drought
Availability of local resolution risk modelling regarding drought
Availability of drought insurance
In-house ability to apply and receive tender amounts and financial support
Sectoral actor's level of available assets
Sectoral actor's level of solvency (ability to pay off one's debts)
The financial dependency on sector as only source of income for actors
Appropriate size of water allocation in water permits to sustain irrigation during droughts
Presence of effective irrigation systems
Presence of irrigation
The amount of water available for irrigation during drought
The possibility to expand irrigation practices
Having growth limiting conditions
Level of land and soil degradation
The elevation
The geographical characteristics of the area
The level of fertilizer use
The level of productivity of land
The proportion of fertile soils
The soil water holding capacity
Presence of drought resilient seedlings during planting
Presence of drought resilient stand mixtures
Presence of fragmented forests or forests of small size
Presence of monocultures
Presence of shallow rooted crops/species
Presence of species outside its natural range
Presence of species outside its xeric distribution limit
Presence of species/stock suitable for future drought projections
The drought tolerance of cultivated/existing species
Presence of deteriorating ecosystems
Presence of land area covered by forest & forest vegetation
Presence of land area covered by wetlands, lakes and ponds
Presence of water dependent ecosystems
Presence of water quality deterioration
Access to public drinking water service
Level of groundwater exploitation
Possibilities for development of water storage
Presence of alternative water source & water supply
Presence of competing water interests
Presence of permanent water restrictions

Presence of regional water distribution networks

Presence of reliable water resource for water supply

Presence of water stress

Availability of decision support systems regarding drought

Availability of results from a drought risk assessment

Availability of drought early warning systems

Availability of relevant data regarding drought

Availability to long-term supply and demand assessments

Availability to real time drought risk assessment and management tools

Presence of drought monitoring schemes

Presence of groundwater monitoring

The financial capacity of the government to offer drought related support

The level of competence within authorities to offer drought related support

The level of coordination & cooperation among authorities to offer drought related support

The level of drought awareness within authorities

The social/physical capacity within authorities to offer drought related support

Presence of an authority level drought management plan

Presence of building standards relating to water efficiency

Presence of collaborative decision making & development at authority level, through inclusion of local knowledge and use of public participation

Presence of coordinated Water Strategy at authority level

Presence of authority level drought plan that includes drought awareness-raising measures

Presence of local water management plan

Presence of planned drought prevention measures on authority level

Presence of water transfer and drought policies

Existence of defined water use rights

Existence of water use priority classes in authority level drought management plan

Q10. **How confident are you with your rankings for this section?** (*0- highly unsure/1/2/3/4- highly confident)*

Q11. **Are you missing any factor(s) that you think has/have a large impact on the risk of experiencing negative effects from droughts in your sector? Please add them, as you add factors, please indicate their impact (0-4) and your confidence.**

Societal vulnerability factors

Q12. **What impact do the following factors have on the risk of negative drought impacts in Swedish society? Indicate their impact on a scale from 0 (no impact) to 4 (large impact)[2] depending on their impact on the risk of negative drought impacts in Swedish society.**

Factors included in this section:

[2] The option "I don't know" was also available

Area having an aging population

Level of social integration

The level of drought awareness among water users

The level of socio-economic drought susceptibility of population

The presence of population decline

The size of town

The size of population

Access to public drinking water service

The financial dependency of society on water dependent industries

Availability of decision support systems regarding drought

Availability of results from a drought risk assessment

Availability of drought early warning systems

Availability of relevant data regarding drought

Availability to long-term supply and demand assessments

Availability to real time drought risk assessment and management tools

Presence of drought monitoring schemes

Presence of groundwater monitoring

The financial capacity of the government to offer drought related support

The level of competence within authorities to offer drought related support

The level of coordination & cooperation among authorities to offer drought related support

The level of drought awareness within authorities

The social/physical capacity within authorities to offer drought related support

Presence of an authority level drought management plan

Presence of building standards relating to water efficiency

Presence of collaborative decision making & development at authority level, through inclusion of local knowledge and use of public participation

Presence of coordinated Water Strategy at authority level

Presence of authority level drought plan that includes drought awareness-raising measures

Presence of local water management plan

Presence of planned drought prevention measures on authority level

Presence of water transfer and drought policies

Existence of defined water use rights

Existence of water use priority classes in authority level drought management plan

Q13. **How confident are you with your rankings for this section?** (*0- highly unsure/1/2/3/4- highly confident)*

Q14. **Are you missing any factor(s) that you think has/have a large impact on the risk of experiencing negative effects from droughts in your sector? Please add them, as you add factors, please indicate their impact (0-4) and your confidence.**