

Supplementary Material

Questionnaire for the decision-making group with the aim of comparatively evaluating constructed wetland technologies as an alternative to decentralized sewage treatment. The Analytic Hierarchy Process (AHP) is a decision-making tool to select the most appropriate technology for the treatment of the scenario under study. In this decision-making process, opinions will be incorporated by completing this questionnaire, which contains questions with 12 comparisons between alternatives. All questions need to be answered based on Saaty's Fundamental Scale (Table 1), which transforms the decision-makers' verbal judgment of preferences into a scale of numerical values.

Table 1 – Saaty's fundamental scale (1977) for importance values using the AHP method.

Intensity of Importance	Definition	Explanation
1	Equal importance	Both activities contribute equally to the objective.
3	Small importance of one over the other	Experience and judgment favor one activity over another.
5	Great or essential importance	Experience or judgment strongly favors one activity over another.
7	Very great or demonstrated importance	One activity is strongly favored over the other. This can be demonstrated in practice.
9	Absolute importance	The evidence favors one activity over the other, with the highest degree of safety.
2, 4, 6, 8	Intermediate values	When looking for a compromise condition between two definitions.
Reciprocals of non-zero numbers above	If an activity has one of the above non-zero numbers associated with it when compared to activity j, then j will have the reciprocal value when compared to i.	

In the following questions, mark with an “X” one of the two options presented in each line. Add in the last column the importance intensity of the selected option, based on Saaty's Fundamental Scale (Table 1).

1 – Considering the process of choosing the best technological alternative for the decentralized sewage treatment, which of the indicators presented below has greater weight in the decision making?

	Option 1	Option 2	Importance
a)	Environmental ()	Economic ()	
b)	Environmental ()	Social ()	

c)	Economic ()	Social ()	
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2 - Considering the environmental criteria for choosing the technology, which of the alternatives has greater weight in the decision making?

	Option 1	Option 2	Importance
a)	Exemption from primary treatment ()	Compliance with Legislation ()	
b)	Exemption from primary treatment ()	Required unit surface area ()	
c)	Compliance with Legislation ()	Required unit surface area ()	

3 - Considering the economic criteria for choosing the technology, which of the costs has the greatest weight in the decision making?

	Option 1	Option 2	Importance
a)	Implementation Costs ()	Operating Costs ()	
b)	Implementation Costs ()	Lifetime Costs ()	
c)	Operating Costs ()	Lifetime Costs ()	

4 - Considering the social criteria for choosing technology, which of the costs has greater weight in the decision making?

	Option 1	Option 2	Importance
a)	Public Acceptance ()	Operational Complexity ()	
b)	Public Acceptance ()	Construction Complexity ()	
c)	Construction Complexity ()	Operational Complexity ()	

Table S1 - Comparison matrix of sustainability criteria for AHP of CWs in a case study in Frederico Westphalen-RS.

	Environmenta l	Economic	Social
Environmental	1.00	0.17	5.00
Economic	6.00	1.00	3.00
Social	0.20	0,33	1.00
Sum of values	7.20	1.50	9.00

Table S2 - Standardized matrix of sustainability criteria for AHP of CWs in a case study in Frederico Westphalen - RS.

	Environmenta l	Economic	Social	Priority Vector
Environmental	0.14	0.11	0.56	27%

Economic	0.83	0.67	0.33	61%
Social	0.03	0.22	0.11	12%

Table S3 - Comparison matrix of environmental indicators for AHP of CWs in a case study in Frederico Westphalen - RS.

	Required unit surface area	Exemption from primary treatment	Compliance with Legislation
Required unit surface area	1.00	0.50	0.11
Exemption from primary treatment	2.00	1.00	0.13
Compliance with Legislation	9.00	8.00	1.00
Sum of values	12.00	9.50	1.24

Table S4 - Standardized matrix of environmental indicators for AHP of CWs in a case study in Frederico Westphalen - RS.

	Required unit surface area	Exemption from primary treatment	Compliance with Legislation	Priority Vector
Required unit surface area	0.08	0.05	0.09	8%
Exemption from primary treatment	0.17	0.11	0.10	12%
Compliance with Legislation	0.75	0.84	0.81	80%

Table S5 - Comparison matrix of economic indicators for AHP of CWs in a case study in Frederico Westphalen-RS.

	Implementation cost	Operating cost	Lifetime cost
Implementation cost	1.00	3.00	3.00
Operating cost	0.33	1.00	0.20
Lifetime cost	0.33	5.00	1.00
Sum of values	1.67	9.00	4.20

Table S6 - Normalized matrix of economic indicators for AHP of CWs in a case study in Frederico Westphalen - RS.

	Implementation cost	Operating cost	Lifetime cost	Priority Vector
Implementation cost	0.60	0.33	0.71	55%
Operating cost	0.20	0.11	0.05	12%
Lifetime cost	0.20	0.56	0.24	33%

Table S7- Comparison matrix of social indicators for AHP of CWs in a case study in Frederico Westphalen - RS.

	Public Acceptance	Construction Complexity	Operational Complexity
Public Acceptance	1.00	8.00	0.50
Construction Complexity	0.13	1.00	0.20
Operational Complexity	2.00	5.00	1.00
Sum of values	3.13	14.00	1.70

Table S8- Standardized matrix of social indicators for AHP of CWs in a case study in Frederico Westphalen - RS.

	Public Acceptance	Construction Complexity	Operational Complexity	Priority Vector
Public Acceptance	0.32	0.57	0.29	40%
Construction Complexity	0.04	0.07	0.12	8%
Operational Complexity	0.64	0.36	0.59	53%