GOVAQUA Assessment Tool for Water Governance Innovations

Gül Özerol, Jyri Mustajoki, César Casiano Flores, Ulf Stein, Joanne Vinke-de Kruijf, Suvi Sojamo, Antti Belinskij

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Governance innovations for a transition to sustainable and equitable water use in Europe (GOVAQUA)

Contents

Summary

The overall goal of the GOVAQUA project is to identify, assess, develop and validate water governance innovations to support and accelerate a transition towards sustainable and equitable water use in Europe. We have built a conceptual framework and based on it, we have developed the GOVAQUA assessment tool for systematically assessing how the broader water governance structure and arrangements affect the design, uptake and implementation of the innovations. The tool has been co-created and tested by the six Living Labs of the project, providing empirical insights not only for developing the innovations but also for further refining and finalising the tool. The results of the tool application also contribute towards the ultimate goal of the project, which is to validate good practices of water governance innovations and to co-create detailed and contextualised transition pathways to reach the broader policy aims.

The GOVAQUA assessment tool comprises multi-dimensional and cross-sectoral criteria and indicators that build on existing assessment approaches and integrate the thematic innovation approaches covered in GOVAQUA. The development of the tool was an iterative process. First, an initial set of criteria and indicators were identified through a review of the literature and policies. To identify the different ways to assess water governance innovations, we reviewed existing assessment approaches and policy targets at the European Union (EU) and global levels, focusing on the targets of the Water Framework Directive (WFD), European Green Deal (EGD), and Sustainable Development Goals (SDGs).

The first version of the assessment tool was discussed in an expert workshop with project partners and the External Advisory Board. The main questions discussed in the workshop were: 1) what criteria and indicators should be included in the assessment, 2) how well the indicators meet the principles of good indicators, 3) what assessment scales should be used on each indicator, and 4) how well the indicators support the targets of WFD, EGD and SDG. The final version of the assessment tool consists of 32 indicators classified into nine criteria. A four-point scale is applied to assess each indicator. The indicator set is accompanied by open-ended questions to describe the governance baseline.

GOVAQUA Living Labs have already applied the tool to assess the current status of their broader governance regime and to set ambitions for a desired water governance future. After this application, a representative and complementary set of innovations are explored and experimented within the Living Labs. The second application will take place towards the end of the Living Lab processes in 2026, to gain insights on the added value of the innovations to improve the status of water governance.

The primary users of the tool are water managers and other stakeholders at the basin or catchment level. The tool is meant to assist them with 1) identifying the strengths and weaknesses of the current water governance structure; and 2) focusing their efforts on improving practices with regard to the most relevant and urgent issues. As the assessment is conducted at the governance level within which the innovation is designed and implemented, the tool is suitable to address any type of governance innovation. When applying the tool, users are encouraged to engage national-level stakeholders that have responsibility and decision-making power in the broader water management and governance processes.

This document is based on the GOVAQUA Deliverable 1.3 Assessment Tool v2 (zenodo.org). It consists of a brief review of the existing assessment approaches and relevant policy targets, the description of the elements of the tool, including guidance on how to apply the tool in practice.

1. Introduction

Main policy documents on the European and global levels, such as the WFD, EGD and SDGs, have goals and specific targets to improve water sustainability. To reach those targets, innovations in water and water-related sectors have been called for (EC, 2019; EEA, 2019). Innovations are defined as "the use of new ideas, products or methods where they have not been used before" (EUROSTAT, n.d.), and can be related to both the process of innovating and the product of that process. Within the context of the GOVAQUA project, we define **water governance innovations** as the intentional redesign or introduction of new rules, roles, processes or actor constellations that markedly depart from prevailing arrangements to tackle emerging challenges or seize opportunities.

Through the GOVAQUA project, we aim to identify, assess, develop and validate such innovations. We analyse and compare water governance innovations form four thematic perspectives: legal and regulatory approaches, participatory and collaborative approaches, economic and financial approaches, and digital approaches. The project also houses six Living Labs in diverse geographical contexts and governance arrangements across Europe: Crau Aquifer in France, Archipelago Sea Basin in Finland, Axarquía Region in Spain, River Thames in the UK, Nordic Hydropower in Finland and Sweden, and the Dunavăț Region in the Danube delta Romania. Through the Living Labs, a **representative and complementary set of innovations** are explored, experimented with, and evaluated by stakeholders and experts. Examples of innovations being developed within the Living Labs include water markets, innovative financing mechanisms, water stewardship, water user participation, citizen science, and drought management plans.

The GOVAQUA assessment tool addresses the **urgent need for comprehensive approaches**. While cross-sectoral integration is widely promoted in water governance, sectoral silos and politics, as well as power asymmetries, continue to prevail (Allouche et al., 2015.; Endo et al., 2017). Existing approaches to assess water governance fail to respond to the need for a sustainability transition within and beyond the water sector. We address these knowledge gaps in two ways. First, we advance water governance assessments by developing **a comprehensive assessment tool in collaboration with the Living Labs**. The application of the tool creates insights from across Europe on the challenges and levers for integrating the diverse needs and interests of multiple actors and sectors. In addition, it can help to assess progress towards a sustainable and equitable water use. Second, by examining and assessing water governance arrangements across multiple sectors, we enhance the understanding of **the linkages and dependencies within and among sectors** that need reconciliation to achieve sustainable and equitable water use. By involving stakeholders, practical insights are created for different river basin settings. Together, these insights contribute towards solving sustainability challenges in water governance as presented in the WFD, EGD and SDGs.

The GOVAQUA assessment tool comprises **multi-dimensional and cross-sectoral criteria and indicators** that build on existing assessment approaches and integrate the thematic innovation approaches. It offers a unique perspective to assess how the water governance structure at the catchment or basin level impacts the design and implementation of a specific innovation and its contribution to sustainable and equitable water use. GOVAQUA Living Labs have applied the tool to assess the current governance structure, to set ambitions for a desired water governance future, and to inform the innovation selection and design. After being tested by the Living Labs, the tool has been made openly available for application in different settings. The **intended users of the tool** mainly include water managers and other stakeholders at the basin or catchment level. The tool and its documentation are published on the project website and will be included in the GOVAQUA Online Academy, which is planned to be launched in 2026.

2. Existing Assessment Approaches

Various approaches offer relevant dimensions, criteria or indicators for governance assessment (UNDP, 2013). These approaches have been designed for different purposes. Thus, their applicability depends on the needs of the cases being assessed and how their purposes fit in with these needs. Here we review four approaches as to whether they offer a framework of dimensions, criteria and indicators that can be applied for assessing the governance structure of a river basin/catchment, and whether they pay attention to other aspects of governance and transition in the water sector.

The **OECD water governance indicator framework** comprises 12 principles across the **dimensions of efficiency, effectiveness, and trust and engagement** (OECD, 2015). It focuses on policy frameworks, institutions and instruments, which are operationalised as **three indicators for each principle**. An assessment methodology has been built based on the framework, including preparation, diagnosis and action phases, and a **self-assessment toolkit for each principle** (OECD, 2018). The guidance offered by the framework is **practice-oriented**, thus needs little tailoring for practitioner use. However, the framework also has limitations. First, while it contains criteria and indicators for assessing water governance and a specific principle on innovative governance, it pays little attention to the systemic transition needed in the water and related sectors. Second, despite its call for an inclusive approach to assessment, it focuses on governments, with most principles centred around the levels and functions of governmental authorities (Akhmouch et al., 2018). Third, the framework is meant to be applicable at local, basin or national levels, but its application at non-national levels has been limited (cf. Martín Velasco et al., 2023).

The **Governance Assessment Tool** (GAT) conceptualises **governance as a 'structural context'**, or a 'regime' that underlies policy fields and sectors relevant for implementing policy measures, strategies or projects (Bressers, 2009). The regime is described along **five dimensions**: 1) levels and scales, 2) actors and networks, 3) problem perspectives and goal ambitions, 4) strategies and instruments, and 5) responsibilities and resources (Bressers and Kuks, 2003). The regime can be to some degree **supportive** and to some degree **restrictive** for implementation. GAT uses **four criteria** to assess this degree: extent, coherence, flexibility and intensity. The criteria are applied by asking questions for each dimension. Questions have been typically answered by researchers. Reflecting on accessibility and applicability, a **practitioners' version** has been developed that enables a self-assessment by answering 20 questions with five possible answers (Özerol and Bressers, 2023). While the GAT has been applied to assess multiple governance levels and become practitioner-oriented, it pays little attention to the sustainability transition.

The **STEER conceptual framework** provides a deeper understanding of **how governance and management system characteristics influence its performance**. This framework also examines how these relationships are affected by the surrounding social and environmental conditions. The framework emphasises results linked to actualized coordination and collaboration, as well as social learning and resolving conflicts. **Impacts** refer to the extensive and lasting effects produced by various **outcomes** on society or broader environmental, economic, and social conditions (Koontz and Thomas, 2006). These effects can be direct or indirect, intentional or unintentional. Indicators for measuring these impacts might be tailored to specific contexts, depending on the goals of water governance and management, like improving water quality to meet regulatory standards. Alternatively, they might be based on universally accepted standards, such as sustainability principles related to water security.

The **Urban Water Management Transitions Framework** sees water as a driving force in the evolution of urban areas and proposes a typology of six city-states (Brown et al., 2008). The traditional progression involves advancing through states to reach a **water-sensitive city** (WSC) state. The concept of WSC suggests that most of the population lives in urban areas, and it is necessary to transition to sustainable water management at the city level. The **WSC Index** has been developed to support cities' transition (Chesterfield et al., 2016) by benchmarking their water management to identify **strengths and weaknesses** in social, technical and ecological aspects (Wong et al., 2020). It includes **seven goals** that are assessed using **34 indicators**. The indicators are designed to allow users to measure progress towards a WSC state. The WSC index has also been applied with an integrated perspective to **urban water management and climate adaptation** (Özerol et al., 2020).

3. Policy Targets at the EU and Global Levels

By using the GOVAQUA assessment tool, water managers can assess the status of their governance structure and set ambitions for a desired water future. To set relevant and realistic ambitions, it is important to be aware of the policy targets at the EU and global levels. However, it could be challenging to use those targets as indicators due to several reasons. For instance, the impacts of water governance innovations will probably only be seen after many years. It can also be necessary to prioritise polity targets according to the local context, taking into account national policy targets. Recognizing the limitations and importance of higher-level targets, we review of **the targets of the WFD, the EGD and SDG6 that can be translated into assessment criteria**. Many water policy goals are not commonly known to stakeholders. Thus, we focus on the policy pieces and their targets that are relevant from a governance perspective.

The WFD (EC, 2000) serves as a **pivotal piece of the EU water policy, emphasizing sustainability and equity**. It forms a comprehensive framework for the protection, enhancement, and restoration of European water bodies. The WFD integrates with other EU directives to promote sustainable water governance through binding targets and institutional monitoring, and fostering innovations that influence water management practices. It encourages the **active participation of stakeholders** in implementing its objectives towards achieving **"good status" for all water bodies, ensuring sustainable water use, and implementing cost recovery principles**. Some goals or targets of the WFD, such as the ones on water status and cost recovery, have proven difficult to achieve due to local and national challenges. The envisioned contribution of public participation to improving water status has also been limited (Rimmert et al., 2020). Therefore, ambitions can vary across basins in terms of the targets to be achieved.

The **EU Biodiversity Strategy** 2030 (EC, 2020a) is a **core part of the EGD**, which aims to support a green recovery after the Covid-19 pandemic. It is a **comprehensive and long-term plan to protect nature and reverse ecosystem degradation**. The strategy has one highly relevant target that aims to restore "at least 25,000 km of free-flowing rivers". A key element of the Strategy is the Nature Restoration Law (European Parliament and the Council, 2024). It combines an overarching restoration objective for the long-term recovery of nature with restoration targets. Its target on "river connectivity" focuses on identifying and removing barriers that prevent the connectivity of surface waters, reiterating the free-flowing rivers target. The **EU Mission "Restore our Ocean and Waters"** (EC, 2020b) provides **five overarching objectives** for 2030: 1) Filling the knowledge and emotional gap, 2) regenerating marine and freshwater ecosystems, 3) zero pollution, 4) decarbonising our ocean and waters, and 5) revamping governance. These objectives are mutually supportive; **the Mission aims to enable the restoration of the water cycle as a whole**. It has two targets that are especially relevant for GOVAQUA, namely Target 3 (30 percent of EU-waters are highly to fully protected), and Target 5 (30 percent of rivers and surface water bodies are renaturalised). Both targets rely on multiple measures, such as removing obstacles to sediment flow, reducing pressures on water bodies, and improving biodiversity, with an ambition for an EU-wide programme for de-damming rivers.

The **EU Strategy on Adaptation to Climate Change** ('Adaptation Strategy') aims to forge a climate-resilient EU as outlined by the 2050 vision (EC, 2021). The strategy applies to the whole policy cycle, with its **four objectives** being to make adaptation 1) smarter, 2) more systemic, 3) swifter, and 4) to step up international action on adaptation. Ultimately, the Strategy intends to **instigate mass adaptation actions towards enhanced climate resilience**. Of special relevance is the objective on faster climate adaptation, which mentions safeguarding the availability of freshwater resources. The EC aims to achieve this, for example, through an enhanced engagement of the Common Implementation Strategy of the WFD and Flood Directive, and promoting the use of drought management plans and economic instruments.

The SDG framework includes 17 goals for balancing the economic, social and environmental dimensions of sustainable development (United Nations, 2015). SDG6 aims to **"ensure availability and sustainable management of water and sanitation for all"**. This goal includes several relevant targets and indicators, for example, achieving universal and equitable access to safe and affordable drinking and sanitation, implementing integrated water resources management and improving water quality.

4. GOVAQUA Assessment Tool

The GOVAQUA assessment tool (syke.fi) is applied to assess the broader regime of water governance innovations. As described in the GOVAQUA Living Lab Process Design document (Sojamo et al., 2023) (zenodo.org), **niche innovations and the governance regime mutually affect each other**. The innovations can 'fit and conform', being in tune with the regime, or 'stretch and transform', demanding regime changes (Smith and Raven, 2012). The relationship between an innovation and its regime can change over time in three ways: 1) an innovation exerts influence on the regime, 2) the regime becomes more supportive of the change that is pursued by the innovation, or 3) the regime hinders the change that is pursued by the innovation (Beers and van Mierlo, 2017). Applying the tool at various points in time can provide an improved understanding of these dynamics, including why an innovation is successful or not.

The tool consists of two main components: **questions for baseline description and a set of criteria and indicators**. Both components were co-designed by project partners and the External Advisory Board. Four key perspectives contributed to the co-design process: 1) review of existing assessment approaches; 2) identification of relevant EU and global policy targets; 3) discussions and reflections during online project meetings; and 4) expert workshop at the project consortium meeting in Malaga, Spain. The first version of the tool was tested by the Living Labs, improving tool applicability in terms of being simple, tailored and complete, and offering lessons to provide effective guidance for future users of the tool. After the testing, we analysed the feedback and application results. The objectives of this analysis were twofold. First, the set of criteria and indicators and the scoring method were finalised using the feedback from the Living Labs. Second, the initial results were analysed as illustrative examples of how the regimes support or hinder water governance innovations.

The **primary users of the tool** are water managers and other practitioners at the basin or catchment levels. By applying the tool, they can identify the strengths and weaknesses of their current water management practices and focus improving the practices to the most relevant issues. Thus, the tool is not targeted, for example to lay members of the public or academics. Stakeholders with responsibility or decision-making power at the national level, such as policy officials from ministries, can provide broader insights and are encouraged to be also engaged when applying the tool. Considering the varying local contexts at the basin or catchment level, the assessment criteria and indicators can be further tailored for practical use, while still building on existing assessment approaches.

Baseline description of the governance regime

The first task when applying the tool is to describe the baseline for the current governance structure and for the governance innovations that are being co-created and implemented. This relates to understanding and benchmarking the current water governance setting, which is also the first of three tasks within the Living Lab Exploration phase (cf. Living Lab Process Design (Sojamo et al., 2023)(zenodo.org)).

For the baseline description (see the Assessment Tool Excel (syke.fi)), the tool has a set of questions to be answered by the user. Stakeholders can be involved for instance through workshops or expert interviews. The questions are based on the five dimensions of GAT (presented here in the order recommended for application): 1) **problem perspectives and ambitions,** 2) **strategies and instruments**, 3) **levels and scales**, 4) **actors and networks**, and 5) **resources and responsibilities**. There are two series of questions for each dimension:

- **Descriptive questions** that provide a description of the governance regime;
- **Assessment questions** that focus on whether dimensions are supported or not and, hence, what perhaps can or should be improved to enable successful implementation.

Table 1 presents the set of questions for the baseline description. Depending on the objectives and needs of the user, the baseline description may focus only on Part A: Descriptive questions or also incorporate Part B: Assessment questions (see Appendix A for further guidance on conducting the baseline description). The questions are aimed to be answered by users of the tool to a) understand the water governance

challenges and problems to be addressed, b) if they are already known, consider them from the perspective of the specific governance innovation in focus.

Table 1. Questions to develop the baseline by describing the governance regime
Source: Adapted from Bressers et al. (2013)

Dimension	Part A: Descriptive questions	Part B: Assessment questions
Problem perspectives and goal ambitions	1. What are the key water management and governance problems in the area? If already selected, which water management and governance problem does the innovation in question address? How urgent are these problems to stakeholders? 2. What are the public perceptions regarding the problem? What is the level of public awareness? 3. What goals are set in the relevant policy documents and political statements in relation to the problem? 4. Have any of the problem perspectives or goals changed over time or are likely to change in the future?	21. Is any important problem perspective missing or overlooked in the context that should be considered during the innovation process?
Strategies and instruments*	5. Which strategies or policy instruments are already in place to address the problem at hand? If known, which strategies or instruments does the innovation adopt? 6. Which other strategies or policy instruments could be applied to solve the problem addressed by the innovation? 7. Have any of the strategies or instruments changed over time or are likely to change in the future?	22. Are there any key strategies or policy instruments missing or overlooked in the context that should be considered during the innovation process?
Levels and scales	8. Which administrative levels (municipality, county, province, state, etc.) are involved in solving the problem, and if known, co-creating and testing of the innovation? 9. Which hydrological level (catchment or sub catchment) is relevant for the problem, and if known, for the innovation, and in what way? 10. Are there any mismatches between the administrative and hydrological regions that complicate solving the problem, or if known, applying the innovation? 11. Have any of the levels changed over time or are likely to change in the future?	23. Are any relevant levels missing or overlooked in the context that should be considered during the innovation process?
Actors and networks	12. Which actors are involved in solving the problem, or if known, co-creating and testing the innovation and in what role? What network relationships do they have within or outside the problem frame and what type of interactions take place between the actors? 13. Which actors are only involved as affected by or beneficiaries of the problem solving, or if known, the innovation? 14. Have any of the actors or networks changed over time or are likely to change in the future?	24. Are any relevant stakeholders missing or overlooked in the context that should be during the innovation process? 25. Do relevant external networks support the innovation?
Responsibilities and resources	15. Which organization(s) have the responsibility to implement solutions to solve the problem, or if known, implement the innovation? What kind of legal mandate does the organization have? 16. What resources (legal authority, funding, personnel, expertise, etc.) do responsible organisations have to fulfil their tasks? 17. What is the scope of knowledge base that is available and accessible on the water system at the catchment level? 18. Have any of the responsibilities or resources changed over time or are likely to change in the future?	26. Do the organizations responsible for the innovation have the resources for implementation? 27. Is the innovation supported by resources that ensure transparency and monitoring? 28. Is the knowledge base sufficient and used in an efficient way?

* Strategies refer to the policy style for public intervention or decision-making (Bressers and Kuks, 2013). Meanwhile, instruments can be understood as the tools, approaches or techniques used to achieve a policy objective, which refers here to sustainable and equitable water use.

Assessment criteria and indicators

The core of the tool is the assessment of the state of the governance structure now and after introducing a certain innovation against relevant criteria and indicators. Table 2 presents the set of assessment criteria and indicators included in the tool. Within the context of GOVAQUA, the **two underlying fundaments of water governance are sustainability and equity**. Through the assessment tool, these fundaments are translated into **9 criteria** that are assessed using **32 indicators**. Detailed questions for assessing the indicators and the possible scores for each indicator can be found here: GOVAQUA Assessment Tool (syke.fi). The order in which the criteria and indicators are applied does not have to follow the order presented in Table 2 and can be tailored to user needs.

Table 2. The set of assessment criteria and indicators

Criteria	Indicator titles
1. State of the freshwater environment	1.1. Achievement of relevant policy requirements
2. Fair sharing of data and information	2.1. Completeness of available water data and information 2.2. Accuracy of available water data and information 2.3. Access to water data and information 2.4. Effectiveness of water information sharing
3. Distributional justice	3.1. Allocation of water resources among users 3.2. Access of population to safe water and sanitation 3.3. Distribution of benefits from water access among users 3.4. Distribution of costs from water access among users 3.5. Distribution of harmful impacts among users 3.6. Exposure and preparedness to water-related climate hazards
4. Recognitional justice	4.1. Recognition of different water users and their needs 4.2. Balance among the values and roles of water users
5. Procedural justice	5.1. Representation of water users and stakeholders 5.2. Participatory mechanisms to involve water users and stakeholders 5.3. Representation of different types of knowledge 5.4. Involvement of water users in vulnerable conditions 5.5. Transparency of decision-making processes in the water sector 5.6. Accountability of the decision-makers of the water sector
6. Financial efficiency and effectiveness	6.1. Economic value of water investments 6.2. Non-economic values of water investments 6.3. Financing available for different water uses
7. Institutional capacity	7.1. Resources and capacity of stakeholders in water governance 7.2. Leadership of responsible organisations in water governance 7.3. Ownership of water-related problems by different stakeholders
8. Horizontal and vertical coordination	8.1. Coordination among organisations in water-using sectors 8.2. Coordination among multiple levels of water governance 8.3. Fit between administrative and hydrological levels 8.4. Consideration of external actors and factors in water governance
9. Enabling policy mix	9.1. Completeness of policy instruments 9.2. Effectiveness of policy instruments 9.3. Coherence among the policy instruments

The criteria and indicators focus on the catchment/basin level and **how the governance structure at the catchment/basin level support or hinder the innovation**, acknowledging that the structure and key actors may also stem from or operate at the national level. The five governance dimensions of the baseline

description form the basis for assessing the criteria and indicators. The reasoning behind this dual approach (i.e., first a baseline description and then an assessment), is the premise that the dimensions of the governance regime should be first described, including its main problems, strategies, levels, actors, resources, etc., before assessing the regime based on multiple criteria and indicators, which relate to one or more governance dimensions. For instance, the dimension "Problem perspectives and goal ambitions" is linked to the criterion "State of the freshwater environment", whereas it can also be linked to multiple indicators of policy goals that are relevant for the criteria on coordination and policy mixes.

Not all the assessment criteria focus on the same group of actors. For the justice-related criteria, a differentiation is made between water users (as both individuals and divided into different demographic, social and economic groups) and organised stakeholders (water user organisations, governmental and non-governmental organisations, private companies, professional organisations, academia, etc.), depending on the focus of specific indicators. For the institutional capacity and horizontal and vertical coordination criteria, the focus is on organised stakeholders, namely public sector, civil society, and the private sector.

When developing the indicators, we paid attention to the **four principles of good indicators**: credibility, salience, legitimacy and feasibility (see Figure 1). These principles apply to a single indicator at a time. The selected set of indicators also satisfies certain principles, such as avoiding overlaps between indicators, compactness of the set, and covering all the important issues.
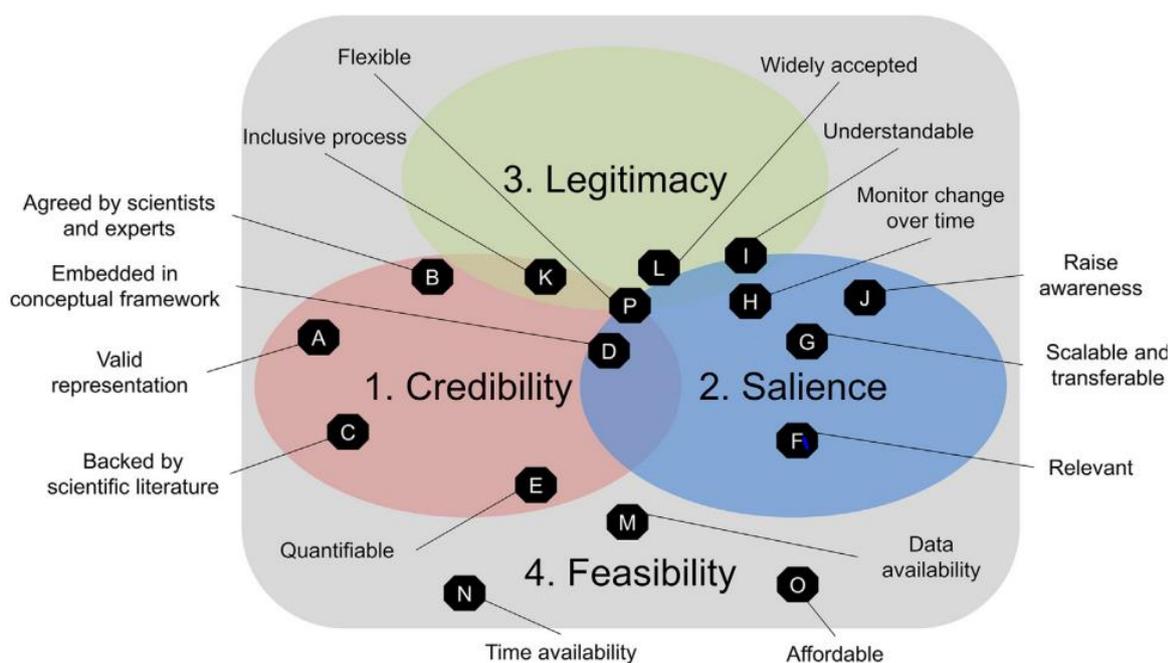

Figure 1. Principles for selecting good indicators. Source: van Oudenhoven et al. (2018)

Scoring method

The selection of the scoring method is important in terms of providing a desired level of accuracy for the assessment. The reviewed assessment approaches offer different options for scoring the criteria and indicators. The scoring methods of those approaches were discussed during the expert workshop by answering the following questions: 1) What are the advantages and disadvantages of the above scoring methods? 2) Which scoring methods fit the best for the GOVAQUA assessment tool and why? 3) Do you know other scoring methods that can be used for the GOVAQUA assessment tool? Reflecting on the discussions, a **four-point scale** was designed, with potential **scores from 1 to 4 for all indicators** and two additional scores to address the situations where there is **insufficient data** to score the indicator, or the indicator is **not relevant** for the given innovation. This scoring method is expected to offer adequate differentiation of the status in each indicator, while also avoiding the 'middle point bias'.

The assessment tool applies the **four-point scale** with potential **scores from 1 to 4 for all indicators**:

1 = an extremely negative judgement that implies a fully undesired level for sustainability and/or equity.

2 = a negative judgement that implies an undesired level for sustainability and/or equity, with ample room for improvement.

3 = a positive judgment that implies a desired level for sustainability and/or equity, with room for improvement.

4 = an extremely positive judgment that implies a fully desired level for sustainability and equity that should be preserved.

For each indicator, the tool provides descriptions for scores 1 and 4, whereas no descriptions are provided for scores 2 and 3. This choice has been made to allow for simplicity during the scoring process. The user can select the score 2 if the status is not fully undesired, but also not at a desired level. Similarly, the score 3 can be select if the status is at a desired level, while there is still room for improvement. Overall, the scoring method doesn't aim to quantify the assessment results, but rather show the status and potential for transitioning towards a fully desired level of sustainability and equity.

The political and institutional context, within which the governance innovations take place, varies significantly across river basins in Europe. Thus, no specific descriptions are provided for indicator scores. The scoring method is deemed flexible enough to reflect the variety in local contexts and concrete enough to differentiate what is being assessed with different types of indicators. At the same time, scoring is only one aspect of the assessment. It is essential to substantiate the scores and also reflect on the specifics of the local context that need further attention. To address these issues, the tool incorporates two measures, as shown in the last four columns of the tool. First, in addition to the four scores, options of **insufficient data** and **not relevant** can be used to assess the indicator by answering the respective questions. The "insufficient data" option allows the users to reflect the data availability conditions in their basin/catchment, whereas the "not relevant" option offers the flexibility to exclude the indicators that do not fit the local context of the governance innovation that is being tested. Second, for each indicator, the users are encouraged to substantiate the chosen scores (or not giving a score) by proving a brief explanation of their reasoning.

Application of the tool

The tool consists of the questionnaire for assessing the baseline description, as well as the criteria and indicators for assessing how the governance regime at the catchment/basin level supports or hinders the water governance innovations with the developed scale. Appendix B provides further guidance on the application of the assessment tool.

It is strongly recommended is to organise a workshop for external stakeholders so that they can contribute to the assessment of indicators. Sharing information about the tool prior to such a workshop is also essential for effective participation. GOVAQUA Living Lab partners discussed the baseline description and assessment with their external stakeholders in a workshop setting. Such stakeholders also act as a "sounding board" to test whether the indicator set and scoring method apply to the local context.

Based on the assessment results, the level of achievement is identified for each indicator and ambitions are set to improve the governance structure through innovations. For indicators that are assessed to be at a (fully) undesired level, ambitions should be set to prioritise the sustainability and/or equity issues related to the indicator. For indicators that with a (full) desired level, they set ambitions to improve or protect their status. Considering that there are multiple indicators under each criterion (except criterion 1), it is likely that for the same criterion, the scores can be low for some indicators and high for others. There are too many such possible outcomes to account for, and the GOVAQUA assessment tool prioritises the value of

considering multiple aspects of the regime over the quantification of assessment results. Therefore, we haven't included a step for the aggregation of the assessment results from the indicator level to the criterion level, nor from the criterion level to the regime level.

If deemed essential, the users can consider the relative importance, or the weight, of indicators to aggregate the results from the indicator level to the criterion level. In that case, answering the following questions would guide the users in choosing the aggregated score: Can a high score in most of the indicators compensate for a low score in one high-weight indicator? Could having a very low score for a high-weight indicator be interpreted as a low score for the whole criterion? Would having a very high score for a high-weight indicator be sufficient to give a high score for the whole criterion? While aggregating the results to the criterion level might provide an overall picture, it is still valuable to set the ambitions at the indicator level, where the actions for improving the governance structure can be more concretely identified. Regarding the aggregation to the regime level, this is not an advisable step, as it would imply giving a single score for the whole governance structure. Such a score lacks added value for improving the decision-making processes and oversimplifies the complexity of governance.

After the first application of the tool, it is strongly recommended to apply the tool regularly to reflect upon and move forward with ambitions. During the period between different applications, changes can occur in the governance structure. Therefore, the second and subsequent applications can be broader in scope, including both the assessment of indicators and involving stakeholders to reflect on the governance enablers and barriers based on the lessons learned for improving the regime.

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Appendix A. Guidance for Conducting the Baseline Description

Application process of the baseline description

The template for answering the questions about the baseline description can be found in the GOVAQUA Assessment Tool Excel (syke.fi). The baseline questions can be used in multiple ways, with or without engaging other stakeholders. The most straightforward way is that an internal team fills in Part A, the descriptive part, to prepare a description of the governance context of an innovation. The team could leave it here and use this description for their own information. It is also possible to go one step further to fill in part B, the assessment part. Note that since part A provides the basis for part B, this can only be filled out after part A has been filled out.

Stakeholders could be engaged by sharing and validating the results with them in a meeting or workshop, or to even develop descriptions with stakeholders. Such stakeholder interactions could help improving the quality of the results and achieving a common understanding of an innovation and its governance context (for more information, please refer to Bressers et al, 2016, section 3.4, pp. 57-63).

Points of attention

Multiple descriptive questions are included for each dimension. There is no strict format to answer the questions. For instance, simply a "yes" or a "no" can be sufficient to differentiate between governance factors that are supportive vs. hindering. Each dimension also contains one descriptive question regarding changes over time (past and future). This question aims to draw attention to the dynamic nature of the governance context, by accounting for the impact of past or planned policy changes that can impact the current context.

In the problem perspectives and goal ambitions dimension, the first question is about the problem addressed by the innovation. Here, a distinction is made between a water management problem (e.g. poor water quality, too little water) and water governance problem. Water governance refers to institutional frameworks (arrangements, approaches, and instruments) through which state bodies, market actors, civil-society organisations and knowledge communities interact in the use, allocation, development, management, and protection of water resources and aquatic ecosystems.

Part B focuses on questions that measure "extent", i.e. what is missing or overlooked in the governance context that should be considered in the case at hand. In the original GAT, the coherence, flexibility and intensity of a governance setting are also considered as assessment criteria. Here, the focus is on extent, as this is the most important criterion to contribute to sustainable and equitable water use.

Suggestions for the practical use of baseline descriptions

For the assessment questions, the user can decide to answer these by themselves or in collaboration with stakeholders (e.g. in a workshop). When done collaboratively, answering all questions might take significant time, which might not be readily available. Hence, it might be useful to select specific dimensions and questions and to only focus on these. It should be noted that not all stakeholders will have to assess all the dimensions. When used in a collaborative setting, there is likely to be a need to adapt certain questions to make them more understandable. Such decisions are up to the tool user, depending on their stakeholder network and the local context.

Ideally, an explanation should be provided for each answer so that tool users can compare and learn from each assessment, both over time and across difference catchments/basins. Nevertheless, it is up to the tool user in how much detail these questions are answered. The tool user also decides on what timeframe to consider in answering these questions.

In the strategies and instruments dimension, the user is asked to reflect on the types of policy styles as well as the tools, approaches or techniques relevant for the innovation that is being implemented. It is highly recommended to link the baseline description to specific policy decisions and innovations so that stakeholders can be supported in addressing urgent challenges.

Appendix B. Guidance for Applying the Assessment Tool

Aim and users of the tool

The GOVAQUA assessment tool aims to provide decision support by diagnosing the current status of water governance and set ambitions for a desired status by identifying the factors that support or hinder the design and implementation of innovations. The primary users of the tool are water managers at the catchment or basin level, and other relevant stakeholders at the basin or catchment level to help them identify the strengths and weaknesses of the current water governance structure and to focus the improvement of practices to the most relevant and urgent issues. When applying the tool, it is also encouraged to engage national-level stakeholders that have responsibility and decision-making power in the broader water management and governance processes.

Tool application process

A basic way of using the tool is to first apply it at the start of the governance innovation to assess the current status. Based on the results of this ex-ante assessment, the tool user can diagnose the most relevant and urgent issues to be improved in the current status, and set ambitions to improve them. The second application of the tool can be carried out ex-post, i.e., after the implementation of the innovation to analyse whether any positive governance change has been achieved though applying the innovations. On the basis of this second assessment, the ambitions can be set/revised in terms of transitioning towards sustainable and equitable water use. However, there are also other ways of applying to tool, and the use of the tool should be adapted to meet the needs of the user and their local context.

The practical application of the Excel tool (syke.fi) itself is straightforward. The indicators are gone through one-by-one and on each indicator, the user is first asked to answer "Yes" or "No" to the questions whether the indicator is relevant for the innovation and whether there is sufficient data to assess the indicator. If the answer is "Yes" for both questions, then the user assesses the indicator with a four-point scale. Finally, the user also provides and explanation for the given score, and if needed, for the relevance/sufficiency of the data. If an individual expert is carrying out the assessment, the tool user is the expert themselves, whereas when collecting input from stakeholders, for example in a workshop, the user is typically the facilitator of the workshop. In what follows, we provide recommendations to facilitate the application of the tool. Based on the experiences from applying the tool in GOVAQUA Living Labs, we aim to revise this guidance for future users of the tool.

Suggestions for the practical application of the tool

Preliminary assessment: The assessment criteria and indicators are recommended to be applied as a whole for mutual exchange, learning and comparison opportunities. However, assessing all the criteria and indicators might require a detailed analysis and data from multiple organisations. Therefore, we suggest that **the tool user first prepares a preliminary assessment internally** and also identifies which stakeholders should be invited to assess the indicators. It may not be reasonable that all the stakeholders assess all the indicators; then it should be identified **which stakeholders assess which indicators**. This assessment can then be discussed and **finalised with the stakeholders in a workshop setting**, which should also be used for **setting shared ambitions towards sustainable and equitable water use in their catchment/basin**.

Short-term vs. long-term goals of assessment: The ultimate, long-term goal of the assessment tool is to contribute to the **transition to a sustainable and equitable water use**. At the same time, its collaborative application also has short-term benefits, such as **raising awareness and creating ownership** among the stakeholders of water governance, and **pinpointing the main governance issues** that support or hinder the innovation being implemented. Some of these benefits can already be achieved during the baseline description, which is recommended as the step before applying the tool for the first time.

Inclusiveness and representation: To achieve inclusive and representative results, the tool should be applied by not one user, but a broader team representing the stakeholders. If deciding on whom to involve is not straightforward, the tool user can conduct a stakeholder mapping to identify the relevant stakeholders. Such a mapping exercise can also create insights into several aspects within the tool, such as the criteria on recognitional and procedural justice. Depending on the number of stakeholders, the tool user might need to prioritise whom to involve in tool application. Specific attention should be paid to engaging "hard to reach" stakeholders, such as farmers. When the tool is applied by an inter-organizational team, this can also help ensure institutional memory by not relying on a single department or organisation for the assessment.

Ownership at the catchment/basin level: It is likely that the tool user is not the water authority at the catchment/basin level. Without the involvement of such authorities, the assessment might yield limited results, for instance due to a lack of information to score the indicators or the reluctance of stakeholders to endorse the assessment results. To **ensure a catchment/basin-level ownership, water authorities should be engaged early on for the application of the tool**. If relevant, the ownership can be improved by involving participants from the policy sphere, such as local or regional governments. These measures can help improve the ownership of assessment results and make them part of "the everyday work" of stakeholders.

A sound qualitative approach: Most of the criteria and indicators included in the tool are qualitative, aiming to identify the governance issues that support or hinder the innovation, and identifying the areas for improvement. As a result, the assessment of some indicators might not be simple, unless there is evidence available based on recent assessments. For instance, with indicators referring to "effectiveness", the score can be subjective depending on the opinion of the tool user and stakeholders. Nevertheless, such indicators should be scored using informed and reasoned judgments. For instance, involving an interdisciplinary team that brings together different types of knowledge required for assessing different criteria, can contribute to reducing personal biases in answers. To prevent divergent interpretations, each criterion comes with a description, which guides the tool users to provide their score for the different indicators. We suggest this qualitative approach considering that the assessment capacity to quantify the necessary data is often lacking in water governance. That said, if quantitative data are available for a given indicator, they should be used to justify the score.

Continuance of the tool: The application of the assessment tool is not a once-only process. To make the best out of it, the tool should be applied multiple times to compare the results from different applications and set ambitions towards transitioning to sustainable and equitable water use. The decision on how often to apply the tool can be guided by the local and national policy cycles, which also potentially contributes to the relevance of the tool for policymaking. Reports from each application as well as supporting data and documents should be shared among the involved stakeholders, contributing to institutional memory.