

# Towards Holistic Stakeholder Engagement Evaluation: Insights from the H2020 OPTAIN Project

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## Sammendrag

*Mot en helhetlig evaluering av interessenters engasjement: Erfaringer fra H2020-prosjektet OPTAIN.* Artikkelen presenterer et omfattende rammeverk og en helhetlig tilnærming til evaluering av deltagelse i forskerprosjekter. Rammeverket tar utgangspunkt i teori om deltagelse og setter søkelys på kriterier for å evaluere prosess (hvordan engasjement ble utformet og tilrettelagt) og virkninger av medvirkningen (effekter for læring, innsikt). Vi presenterer strategien og arbeidet med deltagelse i EU prosjektet OPTAIN (2021-2025). OPTAIN har hatt som mål å evaluere effekter av miljøltiltak i landbruket for avrenning av vann og næringsstoffer og medvirkning vært en sentral del i forskningsaktivitetene. Evalueringen av deltagelse i prosjektet har omfattet intervjuer med forskere i 14 studieområder i Europa, og også spørreundersøkelser med interessenter. Resultater fra evalueringen viser at fleksibilitet og anerkjennelse av ulike praksis for brukermedvirkning har vært viktig å oppnå gode resultater. Fokus på effektiv og relevant deltagelse, utvik-

ling av relasjoner og tillit med aktører, samt bidrag til merverdi for prosjektresultater og for interessenter har vært viktige elementer i prosjektet.

## Summary

This paper introduces a comprehensive framework for evaluating stakeholder engagement in environmental research, distinguishing its instrumental, substantive, and normative dimensions. Grounded in the H2020 OPTAIN project, which assessed Natural Small Water Retention Measures via modelling and stakeholder co-creation in 14 diverse European small watersheds, the typology defines: *instrumental engagement* as a pragmatic tool for efficient goal achievement, *substantive engagement* as fostering trust, learning, and responsive decisions for societal-ecological impacts, and *normative engagement* as upholding ethical principles like fairness, inclusivity, and democratic rights. Drawing on literature from governance and participatory research the typology highlights

how stakeholder processes can be assessed differently across these dimensions. This framework can aid researchers and practitioners in designing, implementing, and evaluating engagement by clarifying whether the emphasis is on end goals, learning and relationships, or democratic legitimacy and by tailoring strategies to balance efficiency, quality, and ethical commitments.

## Introduction

Over the past decades there has been a growing emphasis on integrating stakeholder involvement into research, with expert and public deliberation being a requirement for funding by many research programmes (Andersen et al., 2021; Gerlak et al., 2023; Kujala et al., 2022). It is a development associated with the expectation that engagement will provide increased understanding of complex systems, ownership in solutions that are legitimate, increased awareness and social capital, and increased compliance with policy (Huzzard, 2021). The benefits achieved however are closely associated with the level of participation, which may range along a continuum from one way flow of information, to exchange of information, to a situation where stakeholders are equal partners in knowledge co-creation (Arnstein, 1969). Also, the engagement processes and the type of stakeholders involved determine the degree that different voices, knowledge and values are considered (Blackstock et al., 2007). For identifying and understanding the impact of engagement in sustainability research for science and groups in society, we argue for the need to define and evaluate the engagement. Without evaluating engagement, we miss the opportunity to assess different types of impacts, learn from challenges experienced, and recommend strategies for improvement (Lavallee et al., 2012).

The project OPTAIN (Optimal strategies to retain and re-use water and nutrients in small agricultural catchments across different soil-climatic regions in Europe) has prioritized stakeholder engagement as a central strategy throughout the research and dissemination processes. OPTAIN aimed to assess the effects

of Natural Small Water Retention Measures (NSWRMs) by modelling efforts and stakeholder co-creation processes in 14 case study locations covering small watersheds in diverse European biogeographical regions. Stakeholders were invited to collaborate in joint fact-finding and co-creation activities related to the different stages in the project for modelling the impact of NSWRMs, their optimal spatial allocations and for supporting policy analysis. These collaborative activities were expected to directly contribute to achieving OPTAIN's goals of optimizing strategies for retaining and re-using water and nutrients in small agricultural catchments (Nesheim & Enge, 2022; van den Brink et al., 2022).

Few papers focus on evaluation of engagement processes and impacts of engagement in research projects, (see Huzzard, 2021). This paper contributes to this field by presenting the strategy and the processes for stakeholder engagement in OPTAIN, including the framework for evaluating and monitoring the engagement processes in the project. Drawing on stakeholder theory (Freeman, 1984, 2010), different frameworks have been proposed to assess the quality and the impact of engagement. This paper introduces a holistic framework for assessing stakeholder engagement, incorporating instrumental, substantive and normative elements. The evaluation framework presented draws on a paper by Fiorino that focuses on instrumental, substantive and normative rationality for engagement (Fiorino, 1990), and on the framework presented by Rowe and Frewer (2000) which includes nine benchmarks for assessing whether the engagement is fair and effective. The paper first presents the OPTAIN project and its multi-actor engagement, then introduces its conceptual framework and methods as applied in the project for evaluating engagement. The Results section evaluates stakeholder engagement activities in OPTAIN against the holistic framework, before discussing strengths and weaknesses of the approach. The paper ends with some concluding remarks and lessons learned.

## The OPTAIN project

The main goal of OPTAIN was to promote the adoption of NSWORMs to address drought, flooding, nutrient runoff, and erosion based on data and modelling results and stakeholder engagement. The project brought together partners from 12 countries (Belgium, Czech Republic, Germany, Hungary, Italy, Latvia, Lithuania, Norway, Poland, Slovenia, Sweden, Switzerland), engaging local actors like farmers and advisors to identify and assess effective water retention and reuse of water and nutrients at both farm and catchment levels (Figure 1).

Key tasks included identifying promising NSWORMs, gathering environmental and socio-economic data, selecting indicators and scenarios, modelling the effectiveness of measures at different scales, and exploring incentives for implementation. Stakeholders contributed throughout, from data collection to policy discussions, ensuring the project's solutions reflect real-world constraints and practical knowledge.

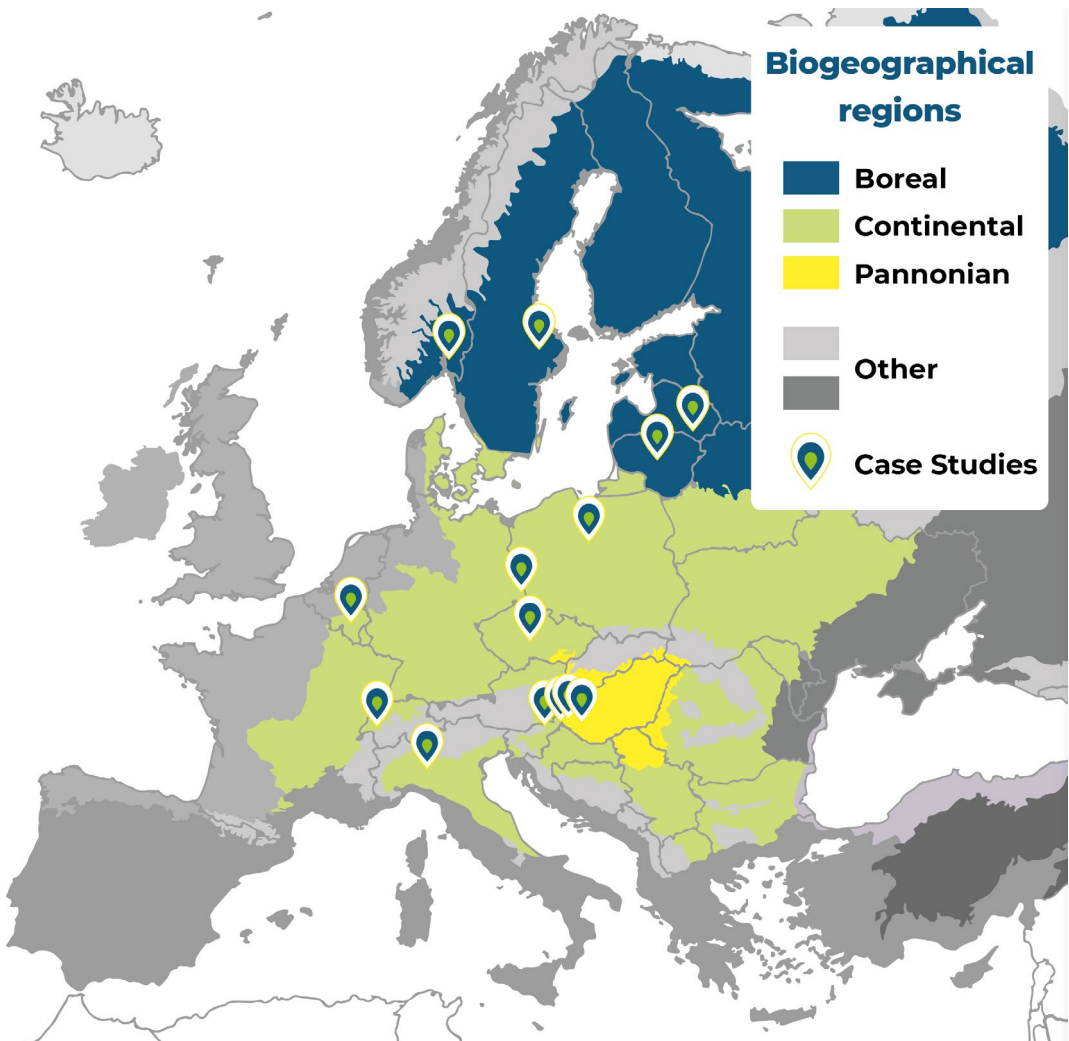


Figure 1. OPTAIN case studies representing different biogeographical regions in Europe

## Multi-actor engagement in OPTAIN

As a preparatory phase for stakeholder engagement, stakeholder mapping was undertaken by researchers in the cases (case study leaders) to understand the stakeholder landscape. Stakeholders, defined as any individuals or groups “who can affect or is affected by the project” (Freeman, 1984) in the agri-environmental context were farmers, agricultural advisors, civil society members, decision-makers in both public and private sectors, namely agriculture, environment, river basin management bodies. Representatives from these groups have been invited to join the project’s Multi Actor Reference Groups (MARGs). Most cases started in areas where the respective case study leaders (CSLs) had not been working before (nine cases). In five cases the MARGs were established in areas where the CSL were already collaborating with some stakeholders.

To accommodate the variety and high number of identified stakeholders, MARGs specified different levels of engagement referring to an “inner circle” of stakeholders interacting more closely with the project, and an “outer circle” of stakeholders that were engaged during specific themes or phases of OPTAIN. The engagement activities included four MARG workshops for multi-actor information exchange, and bilateral engagement as part of surveys and interviews.

## Conceptual framework for evaluating engagement in research

### Theory on evaluating participatory research

Evaluating participatory research is important because it enables understanding and learning from engagement activities for project outcomes, value for the stakeholders involved, and for society. Whether the evaluation is undertaken during and/or only after the project determines the possibilities to learn and modify for more suited engagement methods and documentation while the project is ongoing. The selected evaluation framework with criteria and methods define the data for analysis. Holistic evaluation of participatory research implies a

focus on evaluating the process of engagement (how engagement was designed and facilitated) and the impacts of engagement (its effects on the ground). Here we briefly present the typology by Fiorino (1990) which defines rationalities for engagement comprising an instrumental, a substantive and a normative dimension. In discussing these dimensions, we refer to the work of other authors evaluating engagement, e.g. (Kujala et al., 2022; Rowe & Frewer, 2000).

**Instrumental engagement:** The engagement is a means to an end, i.e. it is a tool to achieve specific, pre-defined goals. The outcome, not the process itself is the motivation. Engagement is used as a tool for an efficient process; achieve specific, predetermined goals efficiently. Kujala et al. (2022) captures the same dimension with their concept of “pragmatic” engagement prioritizing problem-solving and consensus. A common way of assessing instrumental impact of research projects is to measure the number of publications, or outlets (Huzzard, 2021).

**Substantive engagement:** This reflects sensitivity to social and political values and local conditions, with engagement used to improve the quality of decisions. Substantive engagement can refer to the degree that the project builds trust, supports interactive learning and increased awareness for actors involved, that there is room for open and critical dialogue. Existence of trust is known to be a key factor for quality of engagement facilitating for co-creation and learning (Hurlbert & Gupta, 2015; Polman & Slangen, 2008). Outcomes of participation bring more tangible short and long-term impact for nature and society (Gerlak et al., 2023).

**Normative** – Engagement is the *right* thing to do, based on principles. This dimension emphasizes the *process* and democratic ideals, based on the belief that the public should have a right to be involved in decisions that affect them. Evaluating the *normative* aspects of the research process ensures that these core ethical principles of fairness, transparency, and inclusivity are upheld in how stakeholders are engaged (Rowe et al., 2008; Rowe & Frewer, 2000). A normative evaluation of stakeholder engagement involves

assessing participation according to values, ethical principles, and standards.

**Approach for evaluating engagement in OPTAIN**

The approach to evaluate engagement in OPTAIN involved addressing perspectives from both the different researchers and the stakeholders participating in MARG workshops in the respective 14 case studies. It was an aim for the project to contribute to harmonized and meaningful engagement. To achieve this, (i) an annual evaluation of engagement by means of milestone reports was undertaken focusing on the frequency of interactions, the length and type of interactions, and on the stakeholder groups, (ii) digital internal project meetings (InterVision meetings) were held every six weeks to discuss approaches to engagement and to share experiences across cases, and (iii) interviews with CSLs were conducted about the engagement processes. Below the analytical framework focusing on evaluating benefits for instrumental, substantive and normative dimensions of engagement are presented (Table 1).

**Instrumental elements:** This centred on (i) whether the engagement undertaken enabled, easy understanding for stakeholders and also efficient engagement processes, and (ii) on the degree that the engagement resulted in useful information for research activities. The criteria considered were, resource accessibility (convenience of time and place of interactions, human resource capacity, understandable research language), task definition, cost efficiency, and added value for specified research decisions (Rowe & Frewer, 2000).

**Substantive elements:** The assessment addressed the development of relationships and trust with different stakeholder groups, structured decision making, mutual exchange of information between researchers and stakeholders, and stakeholder’s perception of benefits from engaging. Content analysis was undertaken on data from interviews with CSLs concerning established relationships and trust and added value (learning and mutual interactions). Also considered were results from stakeholder questionnaire on trust and added value.

**Normative elements:** We used and adapted the framework by Rowe and Frewer (Rowe et al., 2008; Rowe & Frewer, 2000) by taking their

Table 1. Holistic stakeholder engagement framework

Topics	Goals		
	Instrumental	Substantive	Normative
<b>Reasons for engagement</b>	Focuses on the efficient and acceptable process. Effective participation makes better results, reduces the probability of error.	Quality of research decisions. Contribution to environment and society. Ability for multi-actor interaction, open dialogue and critical questions and mutual learning.	Engagement is seen as ethical and a democratic principle, “the right thing to do”. The public has a right to be involved in decisions that affect them.
<b>Evaluation criteria with OPTAIN examples</b>	Resource accessibility, Task definition, and Cost-effectiveness, Strategic input into the project (collecting information)	Development of trust, Structured decision making, Multi-actor interaction.	Representativeness, Independence, Early Involvement, Transparency Influence,
<b>Mechanisms</b>	Discussion in internal meetings for coordinated and efficient approach and protocols.	Nurturing engagement by focusing on the development of trust, sharing best practices of engagement in internal meetings.	Project milestones, engagement guidelines and protocols.
<b>Documentation</b>	Interviews with researchers (2022 and 2025). Stakeholder uestionnaire results (each case three times)	Interviews with researchers (2022 and 2025), MARG workshop reports	Logging reports, MARG workshop reports.

acceptance criteria (five normative benchmark criteria from the framework): Representativity, transparency, independence, early involvement, influence. Selected criteria are normative because they set value-based standards for stakeholder engagement, defining what makes a process ethically and socially acceptable. They focus on fairness, inclusiveness, transparency, influence, and independence, important norms that guide how engagement should be done to be legitimate and just.

### Data collection

The combination of recorded notes from interviews and reported data (survey responses, and logs) collected regularly during the project have been used for evaluating the process and the impacts of engagement.

**Logging of interactions:** A template to report on all interactions with stakeholders, including information on involved stakeholder categories, and what type of interactions. Researchers in the case studies reported on this annually.

**Stakeholder questionnaires:** Participants in the MARGs workshops were asked to rank, (i) the relevance of the environmental challenges being addressed, (ii) if project could contribute to problem solving in their area, (iii) if they could influence the project approach, (iv) if they trusted that their opinion would be taken into account, (v) on their perspective of added value of engaging in the project. The questionnaire included possibilities to add qualitative information. Stakeholders in 14 cases in 2022, 2024 and 2025 responded to the questionnaires.

**Interviews:** Semi-structured interviews with case study researchers in each case were undertaken in 2022, and in 2024/5 focusing on their experience of engagement, establishment of relations and trust, and added value (for more details, Nesheim et al. 2026). The interactive nature of the interviews allowed exploring the engagement in the different respective cases, regarding experiences, perspectives and attitudes of the informants. Each interview lasted 1,5 – 2 hours. The case study leaders (CSLs)

received the interview notes for comments and confirmation.

## Results

### Instrumental impact: Evaluating engagement for its efficient and strategic inputs

*Efficiency of the engagement process* was evaluated in OPTAIN by considering the criteria, task definition, resource accessibility, cost efficiency, which differed across cases and for different research tasks. “Task definition”: The internal “InterVision meetings” were an important mechanism for coordination across the case studies as they provided space for discussions and agreeing on content of protocols and guidelines that were developed prior to the different engagement activities provided for clearly defined tasks. Altogether 32 InterVision meetings were organized with CSLs and other project researchers, each including between 20-30 participants. “Resource accessibility”: The interviews with CSLs indicated that availability of *human resources*, and also time were not always sufficiently considered. The need for data in the project, perhaps in particular on the understanding of policy gaps, laws and regulation, institutions and sector responsibilities placed high demand on stakeholders, and the timeline of research did not always correspond well to the availability of some stakeholders (e.g. farmers). “*Cost-efficiency*” was considered in all case studies. Both interviews and the logging of stakeholder interactions document solutions for cost efficient engagement. Successful solutions reported were organizing physical workshops in the local study area for the convenience of local actors, and virtual workshops or hybrid workshops to facilitate attendance from national and regional level actors. Another cost effective solution was where relevant to make use of already established platforms for MARGs (Nesheim et al., 2026).

*The impact of information from engagement for strategic input* to the project was evaluated by considering the benefit of engagement for research decision making. Overall, CSLs ranked in 2022 and in 2024/25 the contribution of stakeholders to different research tasks with

very high (8 out of 12 CSLs) and high (4 out of 12 CSLs) value. CSL informed in interviews on input from stakeholders to five research tasks: environmental data, socio-economic data, selection of measures, indicators and scenarios and selection of measures was seen as having the highest additional value (for details see Nesheim et al. 2026).

### **Substantive impact: Evaluating the quality and wider effects of interactions**

*The quality of engagement* was evaluated considering the criteria, trust, structured decision making and multi-actor interaction (Table 2). “*Trust*”: Stakeholders were asked if they experienced that their voice was heard, and if they expected that the project would help solve environmental challenges. The CSLs were asked about the development of relationships, and on strategies to promote trust. CSLs in all cases explained that relationships and trust with stakeholders did develop further. Some said that close and frequent cooperation occurred with two to three stakeholders. Strategies as transparency, personal engagement and being responsive, continuity of engagement and delivery of results were emphasized as mechanisms for building trust. Documentation included statements that stakeholders asked for more information, for collaboration, and data provision. The analysis of the 2025 stakeholder questionnaire shows that 97 % of the respondents trusted that the project would deliver useful knowledge fully or to some degree. 90 % also said that they fully or to some degree trusted that their opinion would be considered. “*Structured decision-making*”: It was shown to stakeholders how input from previous engagement activities were considered in the project, but time to elaborate on the reasoning behind all research decisions was not prioritized (information from MARG workshop reports). “*Multi-actor interaction*”: The logging of interactions documented that multi-actor workshops occurred regularly during the project period<sup>1</sup>.

<sup>1</sup> Additional to multi-actor interactions, bilateral meetings between researchers and stakeholders were over-numbering MARGs, with a peak of 179 interactions in 2022.

Four workshops in line with project cycle of tasks were organized: this enabled interaction between researchers, agricultural and environmental authorities, advisors, farmers and landowners.

*The impact of engagement for environment and society* – was evaluated considering, increased awareness, understanding and learning. They lead to capacity-building impacts understood as changes in skills and expertise, social change impacts (changes to social systems, structures, behaviours) and environmental change impacts (changes in natural resources and ecosystems), leading to more interest and implementation of NSWRMs. The following quote exemplifies the researchers’ perspective; “joint discussions, gave us different perspectives from different actors and sectors on topics”. The stakeholder questionnaire results (final year) show that participants found information from OPTAIN (environmental pressures, effects of measures, a general increased understanding of different perspectives) to be of use in other occasions. Engagement that started under OPTAIN lead to some new collaborations with authorities, farmers associations, and other entities.

### **Normative impact: Evaluating democratic ideals**

*Democratic ideals* were evaluated considering the criteria, stakeholder representativity, early involvement, independence, transparency and influence (Table 2). “*Representativity*”: The stakeholder categories defined the first years of the project (van den Brink et al., 2022); i.e. farmers, authorities, national and local level, experts / scientific advisors, private companies commercial, NGOs / associations were considered. Regular involvement of stakeholders during the project period across activities was only reached by some cases and not for all stakeholder types. In some cases, certain stakeholders were only involved as part of surveys (i.e. not in the MARG workshops) representing “*Irregular involvement*” . “*Early involvement*”: The logs of interactions, and a milestone reports on establishment of MARGs documented engagement of stakeholders during the first months of

the project. “*Independence*”: A balanced engagement of actors from water management / nature conservation and agricultural sectors indicate compliance, and protocols for the MARG workshops and other engagement activities promoted unbiased participation processes. “*Transparency*”: MARG workshop reports document that stakeholders were provided with information material prior to workshops, minutes from workshops were provided to the stakeholders, information presented in the local language. “*Influence*”: The interviews document a mixed approach, input from stakeholders were considered, but in the end, final decisions were taken by the researchers. The main hindrance for responding to stakeholders’ input to research decisions, was the ability of the model to calculate indicators for certain measures.

## Discussion

Holistic frameworks for stakeholder engagement are still relatively scarce, and the literature is fragmented across disciplines and traditions. This fragmentation contributes to confusion in terminology, with overlapping concepts, making it difficult to compare studies and accumulate knowledge (Jolibert & Wesselink, 2012). The evaluation of stakeholder engagement involves assessing both the process of engagement (how the engagement was designed and facilitated) and its impacts (the tangible effects and outcomes resulting from the engagement).

Instrumental dimensions are essential for delivering project outcomes because they focus on achieving specific goals for the engagement processes. This approach sees engagement as a strategic tool to manage stakeholders.

Substantive dimensions of engagement are often the most challenging to design, conduct and evaluate because it has the highest ambition, aiming to reach higher levels of Arnstein’s participation ladder (Arnstein, 1969), striving for deeper involvement and empowerment of stakeholders rather than just communication and consultation. It brings social learning where participants (here researchers and MARG stakeholders) collectively develop new understand-

ing and skills through ongoing interaction, enabling shared knowledge, trust, and adaptive solutions over time.

Trust is essential for open dialogue, mutual understanding, and collaboration, which are necessary for addressing complex social and political values, and for producing meaningful, lasting outcomes. This dimension demands ongoing relationship-building, respect for diverse perspectives, and willingness to navigate conflicts constructively. Normative dimensions of stakeholder engagement emphasize ethical principles such as representativity, independence, early involvement and transparency and are crucial for designing successful engagement approach. Research teams should use ethical guidelines to shape processes that not only achieve practical goals but also uphold democratic values and moral responsibility, fostering ethical relationships with stakeholders.

## Evaluating the engagement process

Several criteria across the instrumental, substantive and normative dimensions addressed in this paper were useful for evaluating / assessing the engagement process. Moreover, having data on the perspective of stakeholders broadened the view, and it fills a significant research gap where literature is more developed on guidelines and best practices (BiodivERSA, 2014; Reed, 2008) than with evaluations, especially scarce across years and cases.

In OPTAIN interactive discussions across case studies in the InterVision meetings, the developed protocols and guidelines for engagement were important for an efficient and targeted engagement process. Furthermore, the InterVision meetings represented possibilities to voice experiences and reflections on the engagement activities. The process contributed to a harmonious approach, learning across case studies, and possibly less stakeholder fatigue. While physical meetings were important, allowing virtual and hybrid meetings enabled a cost-efficient approach and engagement with more stakeholders. Other important strengths were the focus on building relationships and

Table 2. Evaluation of benchmark themes and criteria based on information from interviews and stakeholder questionnaires

Benchmark themes		Stakeholders (information from stakeholder questionnaires)	Project researchers (CSLs) (information from InterVision meetings and from interviews, workshop reports)
Dimensions	Criteria in OPTAIN		
<b>Instrumental</b>	Task definition Resource accessibility Cost efficiency	Most stakeholders did not experience constraints in attending meetings. Some indicated time constraints, a few found it difficult to understand the model approach.	Internal "InterVision meetings", protocols and guidelines for engagement provided for coordinated and clearly defined tasks. Resource accessibility was a challenge due to need for data; timeline of research did not always correspond well that of stakeholders. Cost-efficiency was considered in all cases anchoring of results by flexible use of virtual, physical and hybrid meetings; making use of existing platforms where relevant.
	Strategic input to the project (five research tasks)	Not applicable.	CSLs informed in interviews on value from input by stakeholders to five research decisions (environmental data, socio-economic data, selection of measures, indicators and scenarios).
<b>Substantive</b>	Development of trust, Structured decision making Multi-actor interaction	>90% of stakeholders trusted that their voice would be heard and that the project will help solve environmental challenges. MARG workshops with different stakeholders enabled multi-actor interaction and networking.	Relationships and trust with stakeholders developed, with close co-creation interaction with some (documented by stories). Stakeholders were shown how input from previous engagement activities were considered (documented MARG workshop reports) Four workshops in line with project cycle of tasks were organized enabling interaction between different types of stakeholders.
	Increased awareness, Understanding different perspectives Learning, new knowledge	Stakeholders found information from OPTAIN (environmental pressures, effects of measures, a general increased understanding of different perspectives) to be of useful for their professional work and in other occasions.	Achievements are indicated as exemplified by quotes, and MARG workshop. MARG workshops facilitated effective knowledge exchange with water management professionals, representatives from local water law companies, including farmers, and local authorities from both the community and county levels.
<b>Normative</b>	Representativity, Early involvement Independence Transparency Influence	No specific feedback.	Broad involvement was achieved for surveys, participation in workshops remained challenging for some stakeholder groups. Logging reports document early involved in the project. A balanced engagement of actors from water management / nature promoted unbiased participation processes. All cases shared invitation and agenda to meetings upfront and minutes post events providing for transparency. The interviews document a mixed approach, input from stakeholders influenced decisions, but researchers made final decisions.

trust with stakeholders. The process of building relationships was supported by early engagement, transparency (e.g. sharing agendas, and minutes), independence (the modelers are independent specialists) and being responsive (Nesheim et al., 2026). It was experienced that close interaction with stakeholders was useful and needed for successful co-creation processes.

Reported challenges in the project were resource accessibility due to demand for data and time. The demand for data often exceeded the available time and resources for both researchers and stakeholders, making the approach less accessible in practice. Additionally, the stakeholder questionnaire was brief and provided more general feedback, not capturing nuances of engagement (few stakeholders used the qualitative part to provide any additional feedback). While it might be important to address power relations in some projects, it was not considered essential in OPTAIN.

### **Evaluating the impact of engagement**

Particularly criteria associated with the substantive dimension were useful for assessing the impact of engagement. The criteria under the normative dimension were all process related. While impact of engagement also can have the potential to contribute to democratic processes in society this was not a focus in OPTAIN.

The OPTAIN project primarily demonstrated the instrumental value of stakeholder engagement for delivering research outcomes, with clear added value in supporting research tasks through Multi-Actor Reference Groups (MARGs). Other process criteria revealed mixed results, showing that influence of stakeholders on research decisions represented mixed decision making (but final decisions were always taken by researchers), clearly defined engagement tasks representing a strength for impact of engagement. Regarding impact for increased awareness and knowledge, the framework adequately addressed the degree that engagement contributed to its objectives. While information from the interviews, and from the stakeholder questionnaire provided

relevant information for this, it lacked depth. The project's emphasis on trust-building likely contributed positively, though these factors are inherently difficult to study and quantify.

### **Concluding remarks**

Although stakeholder engagement is widely expected in research projects, comprehensive frameworks for designing and assessing it holistically are rare. Existing approaches tend to focus on specific aspects or metrics for success, rather than integrating instrumental, substantive and normative dimensions of engagement. Stakeholder engagement in OPTAIN played a crucial role by enabling joint fact-finding, co-designing research features for increased relevance and reliability, and supporting widespread communication to researchers, policymakers, and the public. The flexible approach to engagement acknowledging the different cultures and practices of engagement across cases was important for the project success. Having a framework for nurturing and evaluating focus on engagement in the project contributed to general awareness of engagement in the project.

The OPTAIN experience also shows that significant trade-offs exist among criteria (instrumental vs. normative, and across process criteria); broad participation often compromises depth of engagement. Although full stakeholder representativeness was not achieved, the project's outcomes and impacts remain highly valuable. Consortium discussions on criteria/indicators and operational mechanisms for engagement are important for anchoring the approach. Our contribution in this paper was to present such a holistic framework for stakeholder engagement evaluation and demonstrate its practical application within the OPTAIN project. This can provide research teams with a replicable model for designing, monitoring, and refining engagement in complex, multi-site projects.

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## References

Andersen, P. D., Hansen, M., & Selin, C. (2021). Stakeholder inclusion in scenario planning—A review of European projects. *Technological Forecasting and Social Change*, 169, 120802. <https://doi.org/10.1016/j.techfore.2021.120802>

Arnstein, S. R. (1969). A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*, 35(4), 216–224. <https://doi.org/10.1080/01944366908977225>

BiodivERsA. (2014). *Stakeholder Engagement Handbook*. <https://www.biodiversa.eu/wp-content/uploads/2022/12/stakeholder-engagement-handbook.pdf>

Blackstock, K. L., Kelly, G. J., & Horsey, B. L. (2007). Developing and applying a framework to evaluate participatory research for sustainability. *Ecological Economics*, 60(4), 726–742. <https://doi.org/10.1016/j.ecolecon.2006.05.014>

Fiorino, D. J. (1990). Citizen Participation and Environmental Risk: A Survey of Institutional Mechanisms. *Science, Technology, & Human Values*, 15(2), 226–243. <https://doi.org/10.1177/016224399001500204>

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman.

Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge university press.

Gerlak, A. K., Guido, Z., Owen, G., McGoffin, M. S. R., Louder, E., Davies, J., Smith, K. J., Zimmer, A., Murveit, A. M., Meadow, A., Shrestha, P., & Joshi, N. (2023). Stakeholder engagement in the co-production of knowledge for environmental decision-making. *World Development*, 170, 106336. <https://doi.org/10.1016/j.worlddev.2023.106336>

Hurlbert, M., & Gupta, J. (2015). The split ladder of participation: A diagnostic, strategic, and evaluation tool to assess when participation is necessary. *Environmental Science & Policy*, 50, 100–113. <https://doi.org/10.1016/j.envsci.2015.01.011>

Huzzard, T. (2021). Achieving impact: Exploring the challenge of stakeholder engagement. *European Journal of Work and Organizational Psychology*, 30(3), 379–389. <https://doi.org/10.1080/1359432X.2020.1761875>

Jolibert, C., & Wesselink, A. (2012). Research impacts and impact on research in biodiversity conservation: The influence of stakeholder engagement. *Environmental Science & Policy*, 22, 100–111. <https://doi.org/10.1016/j.envsci.2012.06.012>

Kujala, J., Sachs, S., Leinonen, H., Heikkinen, A., & Laude, D. (2022). Stakeholder Engagement: Past, Present, and Future. *Business & Society*, 61(5), 1136–1196. <https://doi.org/10.1177/00076503211066595>

Lavallee, D., Williams, C., Tambor, E., & Deverka, P. (2012). Stakeholder engagement in comparative effectiveness research: How will we measure success? *Journal of Comparative Effectiveness Research*, 1, 397–407. <https://doi.org/10.2217/cer.12.44>

Nesheim, I., & Enge, C. (2022). *Meaningful engagement is important for effective co-creation of knowledge*. <https://www.optain.eu/news/meaningful-engagement-important-effective-co-creation-knowledge>

Nesheim, I., Szulecka, J., Enge, C., & Korn Varga, I. (2026). *DI.3: Report on actor involvement, MARG activities and experiences*. [www.optain.eu](http://www.optain.eu)

Polman, N. B. P., & Slangen, L. H. G. (2008). Institutional design of agri-environmental contracts in the European Union: The role of trust and social capital. *NJAS - Wageningen Journal of Life Sciences*, 55(4), 413–430. [https://doi.org/10.1016/S1573-5214\(08\)80029-2](https://doi.org/10.1016/S1573-5214(08)80029-2)

Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*, 141(10), 2417–2431. <https://doi.org/10.1016/j.biocon.2008.07.014>

Rowe, G., & Frewer, L. (2013). Public Participation Methods: A Framework for Evaluation. *Sci Technol & Hum Values*, 25. <https://doi.org/10.1177/016224390002500101>

Rowe, G., & Frewer, L. J. (2000). Public Participation Methods: A Framework for Evaluation. *Science, Technology, & Human Values*, 25(1), 3–29. <https://doi.org/10.1177/016224390002500101>

Rowe, G., Horlick-Jones, T., Walls, J., Poortinga, W., & Pidgeon, N. F. (2008). Analysis of a normative framework for evaluating public engagement exercises: Reliability, validity and limitations. *Public Understanding of Science*, 17(4), 419–441. <https://doi.org/10.1177/0963662506075351>

van den Brink, C., de Vries, A., Nesheim, I., & Enge, C. (2022). *Stakeholder mapping report, covering the case studies*. [https://www.optain.eu/sites/default/files/delivrables/OPTAIN%20DI.1%20-%20Stakeholder%20mapping%20report%20final\\_revised\\_2022\\_0.pdf](https://www.optain.eu/sites/default/files/delivrables/OPTAIN%20DI.1%20-%20Stakeholder%20mapping%20report%20final_revised_2022_0.pdf)