



# OPTAIN

Optimal Strategies to Retain Water and Nutrients

## D1.1: Stakeholder mapping report, covering the case studies

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# Project Consortium



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## Summary

The lead of the first Work Package (WP1) in OPTAIN coordinates and harmonizes stakeholder activities and ensures the link between the 14 OPTAIN case studies, research and modelling work across all WPs. At the start of the OPTAIN project, WP1 facilitates the establishment of Multi-Actor Reference Groups (MARG) in each case study and provides communication techniques to encourage active stakeholder engagement for the lifetime of OPTAIN.

Stakeholder engagement is important because a sound scientific solution not necessarily results in solving a real-world problem. Key lesson learned is that engagement of stakeholders is essential during all phases of the project: the phase of the identification of the problem, assessment of the problem, scenarios to solve the problem and in the phase of implementing the solution.

The purpose of the stakeholder mapping activity is to identify possible and relevant stakeholders for the reference group, the MARG. Applying a top-down approach, the different case study leaders have been responsible for identifying stakeholders and to categorise them according to pre-defined categories. The pre-defined categories were used as a framework to enable a comparative analytical approach of the case studies, as presented in this report. The various stakeholders may or may not be contacted as part of the mapping exercise. More relevant stakeholders are likely to "appear" during the project period. Then, the concerning stakeholder information should be added to this table for project record.

The need for case study leaders (CSL) to consider the intended engagement role for stakeholders in the project research cycle was emphasized when identifying and prioritising stakeholders for involvement. It is expected that the number of stakeholders involved in each case study will increase during the project period and that the current stakeholders identified for participation in the MARGs may change. This stakeholder mapping report is prepared prior to the actual engagement activities in the project.

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## Abbreviations

CS	Case study
CSL	Case study leader
MARG	Multi-Actor Reference Group
NSWRM	Natural/Small Water Retention Measures
WP	Work Package

# 1. Introduction

## 1.1. Introduction to the report

OPTAIN (EU-funded research and innovation project) proposes a social and scientific journey towards the increasing and better understanding of the multiple benefits of Natural/Small Water Retention Measures (NSWRM). NSWRM are multi-functional measures that use natural means for the management of water and nutrients in a river catchment. This also comprises small technical solutions and measures which positively affect water use efficiency of the agricultural production. The challenge is to identify sound combinations and allocations of NSWRM that respond to the characteristics and management of a specific catchment. This research and innovation project is carried out by elaborating from the current state of knowledge, the experience of stakeholders from the case studies involved in the project and innovative scientific modelling and optimization approaches.

Our work package (WP1) coordinates and harmonizes stakeholder activities and ensures the link between the 14 OPTAIN case studies (see Figure 1 and Table 1), research and modelling work across all WPs. At the start of the OPTAIN project WP1 facilitated the establishment of Multi-Actor Reference Groups (MARGs) in each case study and provides communication techniques to encourage active stakeholder engagement for the lifetime of OPTAIN.

It is meant to directly involve local actors in all 14 case studies. Local actors have the practical knowledge on constraints and benefits of current and historic systems and are actual implementers of the measures that will be suggested by OPTAIN project. The case studies are led by senior researchers of the participating universities and institutes. All case study leaders have been asked to identify these stakeholders in a so-called stakeholder mapping exercise. The purpose of the stakeholder mapping activity is to identify possible and relevant stakeholders for the reference group, the MARG. The following report describes the results of this exercise for all OPTAIN MARGs. The analysis is divided in a quantitative and qualitative part.

## 1.2. Multi-Actor Reference Groups in OPTAIN

Following the definition of the multi-actor approach, a platform for multi-actor engagement can be seen as “a more-or-less ongoing mechanism in which actors meet regularly to foster exchange and promote joint decision making and collaboration in a continuously evolving way” (Acquaye-Baddoo et al., 2010). In our attempt to address the agriculture-drinking water nexus within a multi-actor context of OPTAIN, the approach of multi-actor platforms (Sundnes e.a., 2018) is adapted to Multi-Actor Reference Groups to stress i) the role of the actors in the project and ii) the evolution of the reference group as function of the evolutionary stages of OPTAIN in which specific phases can be distinguished. The MARG also reflects different levels of engagement – informing, consulting and involving – depending on the role of the stakeholders (see e.g. Arnsteins ladder of participation<sup>1</sup> and chapter 2 on methodology). The level of engagement is also

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<sup>1</sup> <https://www.citizenshandbook.org/arnsteinsladder.html>



reflected in the organization of the MARG by defining an inner circle (stakeholders engaged during the entire lifetime of OPTAIN) and an outer circle (stakeholders engaged during specific themes or phases of OPTAIN).

The shift from stakeholders to actors, as specified by the EU commission, reflects a change of perspective, looking at stakeholders as more than just “having a stake”. Instead, actors have an interest, a potential and an ability to take part in the co-production of knowledge and solutions to complex dilemmas of governance and management in these sectors.

Although our approach rests on this distinction, the words stakeholder and actor are used interchangeably, both implying the meaning of the latter. Multi-actor processes can be seen as devices to ensure that produced knowledge is scientifically valid and relevant (Van der Riet, 2003). Firstly, transparency in processes and trust between stakeholders is important for ensuring trustworthy analyses and solutions. Secondly, these processes ensure a multi-perspective research focus through bridging various interests, in an effort to maximize benefits and minimizing losses amongst the stakeholders and actors.

While engagement processes often concern stakeholder engagement for policy making or for obtaining social licence for particular interventions, Lacroix and Megdal (2016) stress the social learning aspects of engagement processes: “while engagement as a learning process may not solve [conflicts] per se, it is considered very important to overcome persistent norms and “difficult-to-change socio-technical systems”.

A multi-actor approach is devised to ensure meaningful stakeholder involvement, with real impacts on the research process and outcomes through co-creation of knowledge and solutions. Such engagement should take place all through the project: From the planning of work and experiments, their execution up until the dissemination of results and a possible demonstration phase (EC, 2017). This will facilitate joint knowledge production and cross-fertilising interactions between a range of actors, including end-users, in ways that will lead to shared ownership to both process and results (Belmans et al., 2018; Levidow and Neubauer, 2014).

### 1.3. Stakeholder mapping in OPTAIN

OPTAIN aims to identify efficient NSW RM to better adapt to extreme events (floods, droughts) and reduce conflicts between agricultural water uses and other human and environmental demands for water. OPTAIN will conduct a multi-sectoral policy assessment to complement the results of the multi-objective modelling/optimization framework. We will thus provide a more comprehensive picture on the efficiency of measures, as well as the trade-offs and win-win situations to be addressed in different contexts. Further, OPTAIN aims to directly address these overlapping challenges by involving the MARGs to examine and recommend options for water, soil, land and nutrient management in the case studies, on the basis of the post-processed (simplified and properly visualized) multi-objective optimization results and supported by multicriteria decision analysis where actors can weigh the importance of single objectives in pairwise comparisons. More information about the projects aims,

approaches and expected outcomes can be found on the project website: [www.optain.eu](http://www.optain.eu).

Stakeholder mapping is understood as a process identifying key stakeholders to engage with, across the full stakeholder spectrum, and determining the basis for engaging these stakeholders. Stakeholder analysis is the systematic identification, evaluation, and prioritization of everyone who can influence, or has an interest in, a project. An often-cited definition of a stakeholder is “any group or individual who can affect or is affected by the achievement of the organisation’s objectives” (Freeman, 1984). The purpose of the MARG and the purpose and role of the stakeholder mapping exercise in OPTAIN is to understand the stakeholder interactions in the project. Insight in these interactions is needed to maximize the impact of OPTAIN.

OPTAIN aims at a Joint Fact Finding<sup>2</sup>, in which stakeholders (farmers, agri-advisors, authorities, NGO’s, experts, scientists, ...) create a joint knowledge base. The arena for creating and communicating for this joint knowledge base is the MARG. Joint Fact Finding is especially relevant as decision support tool in an arena – such as OPTAIN – which is dominated by expert knowledge (Schenk et al., 2016). In addition, a common knowledge base will enhance the impact of OPTAIN as all stakeholders consider themselves as co-owner of this jointly created knowledge base. WPI functions as the process manager essential for facilitating the Joint Fact Finding process (Karl et al., 2007). The expert role in the Joint Fact Finding process in OPTAIN is taken care of by the case study leader. Finally, for Joint Fact Finding a good representation of the stakeholders is required (Karl et al., 2007; Schenk et al., 2016).

The purpose of the stakeholder mapping activity is to identify possible and relevant stakeholders for the MARG. More stakeholders can be identified than those to be included in the reference group. The various stakeholders may or may not be contacted as part of the mapping exercise. More relevant stakeholders are likely to “appear” during the project period. Then, case study leaders should add this stakeholder information to their mapping table.

The list of potential stakeholders for any project often exceeds both the time available for analysis and the capability to sensibly map and display the results. The challenge is to focus on the right stakeholders who are currently important and to create a visual representation of this critical sub-set of the total community - the key stakeholders. The long-term advantage of this approach is to build a strong supporter base, capable of extending the message beyond the scope of the project partners.

EU level stakeholders are important to reach an even higher impact with the project. However, no stakeholders on EU level have been identified in this stakeholder mapping exercise. The reason is that EU level stakeholders will be involved on project level rather than inside the individual case studies.

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<sup>2</sup> <https://scienceimpact.mit.edu/joint-fact-finding>

## 1.4. The stakeholder mapping context – the different case study areas

Water stress is one of the major factors limiting crop production in Europe and is expected to increase with climate change. The most effective adaptation strategies aim to maximize water availability and to use the available water more efficiently. At farm level, NSWRM increase water use-efficiency by operating either directly, through improved cropping and more efficient water management, or indirectly by enabling the cultivation of more productive crops due to increased water and nutrient availability. Although comprehensive sets of techniques to increase the water retention on both catchment and farm levels and associated benefit matrices exist (e.g. [nwrn.eu/benefits](http://nwrn.eu/benefits)), knowledge on the effectiveness of different scale- and region-specific measures across various soil-climatic regions and agricultural systems under changing climate conditions is still incomplete (EC, 2014; Collentine and Futter, 2018; Garnier and Holman, 2019). To this end, the direct involvement of local actors, such as farmers and advisers is key, as they have the practical knowledge on constraints and benefits of current and historic systems. Moreover, they are actual implementers of the measures and can directly assess their benefits and drawbacks. Suitable approaches should not only address dry and wet spell management and the biophysical benefits in the biogeographic regions covered, they can also be combined with techniques for the reuse of water and nutrients from streams to tackle both the quantity and quality of water and to foster sustainable and resilient agri-ecosystems.

Therefore, the site specific effects of a large set of NSWRM on agricultural water-use efficiency will be assessed for a total of 14 case studies across a wide range of soil-climatic zones and agricultural systems (see Figure 1 and Table 1). The case study sizes are rather small (<250 km<sup>2</sup>) and the dominant project-related problems are nutrient losses/pollution and often problems with both floods and droughts. The range of soil-climatic zones is covered by 3 biogeographical regions. The Boreal Region of the European Union includes much of the Baltic sea, the Baltic states of Estonia, Latvia and Lithuania, and most of Sweden and Finland. Most of the land is below 500 meters (1,600 ft.) and is fairly flat. The north of the region merges into the forest and tundra of the Arctic

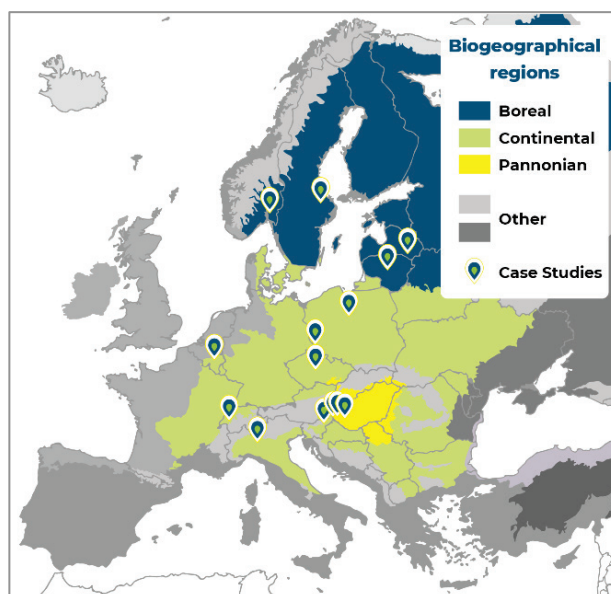


Figure 1 OPTAIN case studies per biogeographical region

Biogeographic Region, while the south merges into the deciduous forests of the Continental Biogeographic Region. The Continental Region extends from central France to the Ural Mountains. The climate is generally hot in summer and cold in winter, with less variation of temperature in the west, where the Atlantic has a moderating influence. The terrains are generally flat in the north and hillier further south, apart from the wide floodplains of the Danube and Po rivers. The Pannonian Region is a large alluvial basin

surrounded by the Carpathian Mountains to the north and east, the Alps to the west and the Dinaric Alps to the south. The basin was once the bed of an inland sea. The region is sheltered by the mountains, but has complex weather caused by the interaction of wet winds from the west, drier winds from the south and cooler winds from the Carpathians and Alps, which sometimes results in severe storms.

Table 1. OPTAIN Case studies

Case study nr	Case country	Case name	Bio-region	Size km <sup>2</sup>	Problems with:
1	Germany	Schwarzer Schöps	Continental	136	P losses, floods and droughts
2	Switzerland	Petite Glâne	Continental	101	P losses and droughts
3a	Hungary	Csorsza	Pannonia	21	P losses and floods
3b	Hungary	Felso-Valicka	Pannonia	21	P losses and floods
4	Poland	Upper Zglowiaczka	Continental	78	P losses, N losses, floods and droughts
5	Austria / Slovenia	Pesnica	Continental	137	Floods and droughts
6	Slovenia / Hungary	Kebele- Kobiljski potok	Continental/ Pannonia	247	P losses, N losses, floods and droughts
7	Belgium	La Wimbe	Continental	128	Floods and droughts
8	Lithuania	Dotnuvele	Boreal	176	P losses and N losses
9	Italy	Cherio	Continental	153	N losses, floods and droughts
10	Norway	Hobøl	Boreal	56	P losses, N losses and floods
11	Hungary	Tetves	Pannonia	117	P losses and floods
12	Czech Rep.	Čechtický	Continental	72	P losses, N losses and floods
13	Latvia	Deviete	Boreal	254	P losses, N losses and floods
14	Sweden	Sävjaån Headwaters	Boreal	125	P losses, floods and droughts

The following chapters describe the method and analysis used for stakeholder mapping (chapter 2) and the results and discussion of the stakeholder mapping for the 14 OPTAIN case studies (chapter 3). In chapter 4 some final remarks are made.

## 2. Method and analysis

### 2.1. Theory on stakeholder analysis and participation benchmarks

The need to involve various end users and policy makers as informants in research projects for the purpose of validity and relevance of results is increasingly recognized by modelers, funders of research programmes and decision makers. Steps of involving stakeholders have become an essential part of any modelling activity (e.g. Voinov et. al, 2016). It is recognized as important from the initial phase of data collection to the final phases of formulating policy advices. In order to plan and arrange for meaningful and appropriate involvement there is a need to understand the stakeholder community in question; that is, who are the different actors to be involved to ensure precise modelling results and relevant policy advices. Stakeholder analysis is a way of generating information about the “relevant actors” to understand their behaviour, interests, agendas, and influence on decision-making processes (Brugha and Varvasovsky, 2000). Policy advices need to consider the local and national governance regime, practices, culture and norms - only then will the policy advice have impact. Understanding the stakeholder community means to understand who is affected by the decisions in question and in what way, and who is influencing the decisions being made. Taking this perspective into the agro-environmental management context means recognising that the advised measures and associated incentives will impact farmers and the larger civil society differently in socio-economic and environmental terms. Only by understanding who has a stake in an initiative and why, the actors’ roles and inter-relationships with each other can be effectively involved in environmental decision-making (Freeman, 1984). Understanding the stakeholder community also implies awareness of issues such as stakeholder representativity having an impact on who and what is included, and who is omitted (Mitchell et al., 1997) and power relations between stakeholders (Reed et al., 2009).

Methods for undertaking stakeholder analysis refers to ways of identifying and categorizing stakeholders, as well as investigating relationships between them. Typically, in natural resource management, a normative perspective on stakeholder analysis looks at the possible conflicting interests of various stakeholders, as they may use and compete for the same resources. It follows the need to understand the different perspectives of the actors involved. From the same normative perspective, participatory natural resource management and development literature advocates evolving involvement of stakeholders at every stage of the project cycle (Fraser et al., 2006; Stringer et al., 2006). Within this literature, it is often argued that sustainable management of natural resources will benefit from a platform facilitating learning among stakeholders by sharing their perception of the situation in order to reach consensus (Rist et al., 2006). An instrumental approach to stakeholder analysis on the other hand, focuses more on understanding actors for the purpose of achieving a desired outcome. An instrumental approach is typically implemented as part of business developments (Freeman, 1984), or natural research projects where an important purpose is to overcome obstacles to the adoption of new technologies (Johnson et al., 2004). In this view, the project’s purpose and management context instructs what are appropriate and relevant methods for stakeholder mapping and analysis.

Regarding methods for identifying stakeholders, the appropriate approach will be context dependent (Heidrich et al., 2009). It is common to apply a combination of methods, including literature review, a review of relevant official websites of organisations (Duggan et al., 2013), and snowball identification based on expert interviews (Reed et al., 2009; Savin-Baden and Major, 2013). Often, identifying stakeholders is an iterative process where additional stakeholders are included during the project.

Methodological approaches for characterisation and classification of stakeholders, may either be top-down “analytical categorisations” or bottom-up “reconstructive methods”. While reconstructive methods involve the stakeholders themselves in the analysis (Dryzek and Berejikian, 1993), analytical categorisation are undertaken by the analysts. The categories may be pre-defined using a theoretical approach or developed in collaboration with stakeholders themselves (Reed and Curzon, 2015). Category domains often include type of employment or role for instance, the role as an NGO. It may also refer to such as levels of interest and influence, cooperation and competition, urgency and legitimacy. These dimensions can then be visualized in a matrix or Venn diagram. Ranking the level of influence and interest with reference to a topic may be used for better identifying and understanding the roles of stakeholder in society. This will inform relevant ways of engaging and involving the rent stakeholders in a particular project. Some stakeholders may for example be defined as “key players” with influence and interest, while others are “subjects” with high interest and little influence, and so on.

Different methods can be applied to investigate the relationships between stakeholders. The three most common methods refer to (i) Actor-linkage matrices, ii) Social Network Analysis providing insights into patterns of communication, trust and influence between actors in social networks, and; iii) Knowledge Mapping analysing the content of information between these actors (Reed et al. 2009). Analysing these relationships can provide a better understanding of how different groups will interact and how to communicate more efficiently with the stakeholders involved (Reed and Curzon, 2015).

### **Participation and benchmarks**

A framework for the evaluation of participation (engagement) against agreed benchmarks for participation enables assessing the development of engagement in the project (Wilson and Wilde 2003). Frewer (1999) highlights the importance of benchmarking participation activities “in terms of their acceptance to the public, and effectiveness as processes”. Rowe and Frewer (1999; 2000) have developed an evaluation framework for public participation consisting of a set of evaluative criteria related to the acceptance and effectiveness of such processes. The criteria related to acceptance are: i) representativeness, which considers whether actors represent a broader public or relevant affected groups to avoid strong bias; ii) independence, related to unbiased management of the process, iii) early involvement, based on considerable literature suggesting that there are benefits to start participation processes as early as possible; iv) influence, to ensure that results of participation have actual impact on decisions/ policy; v) transparency, allowing for insight in decision-making and the process of involvement. The following criteria are related to the process: vi) resource accessibility, considering the participants’ access to information, human resources, material resources and time; vi) task definition, to reduce uncertainty or dispute by clearly defining activities and expectations; (vii) structural decision making, ensuring appropriate decision-making

mechanisms; (viii) cost effectiveness, considering whether processes are cost-effective. This framework can be applied to evaluate various types of public participation processes. Rowe and Frewer (2000) argue that measuring and operationalising these criteria is a practical and empirical issue. The authors recommend to “consider which aspects of the process are desirable and then to measure the presence or quality of these process aspects”.

## 2.2. Methodology and project analytical context

The purpose of OPTAIN is to identify efficient techniques for the retention and reuse of water and nutrients in small agricultural catchments across continental, pannonian and boreal biogeographical regions in Europe, and contribute to acceptance and better implementation of natural/small water retention measures (NSWRM). The project aims to include stakeholders as co-producers of knowledge and practices on the NSWRM considering both environmental and socio-economic indicators (e.g. Karl et al., 2007; Schenk et al., 2016). The project approach to stakeholder engagement and analysis can be described as normative approach, as an emphasis will be placed on understanding the perspective of the different actors involved (Fraser et al. 2006; Stringer et al. 2006) as this is seen as important for identifying appropriate NSWRM.

The framework for researcher – stakeholder co-production refers to 14 different case studies in 13 countries in Europe. As part of the project implementation strategy, MARGs shall be developed for each of the 14 case studies. Each of these reference groups represent the project platform for interacting with stakeholders in each case. The different case study leaders have been responsible for identifying stakeholders to be included in the MARGs and to categorise them according to pre-defined categories. The pre-defined categories were used as a framework to enable a comparative analytical approach on the 14 case studies. Identification of stakeholders in each case study has been done through a top down approach.

The methods suggested to CSL in October 2020 for identifying stakeholders were:

- The snowball method: Using a pool of initial key informants who in turn suggest other relevant informants.
- To identify stakeholders by considering authors of policy documents and reports as relevant for involvement.

Regarding the pre-defined categories, a table with columns specifying categories or aspects to be mapped was provided. For each stakeholder identified the CSL specified: the type of employment / main role (pre-defined); the associated level of governance (local / regional / national); the purpose / reason for the CSL to involve the stakeholder (pre-defined); the expected benefit for the stakeholder to be involved (open category); the expected interest of the stakeholder to be involved (open category) and the CSL planning level of engagement (informing / consulting / involving).

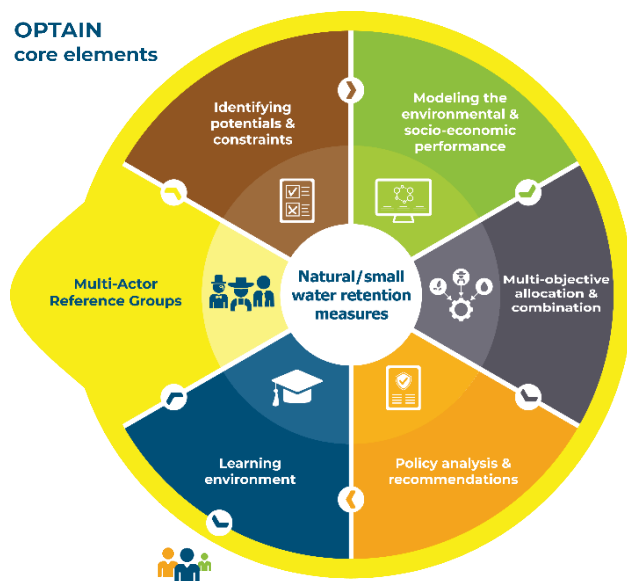
Regarding “reason to involve” the following aspects were pre-defined:

- ***Contribute with local knowledge***: This aspect is understood as experienced-based knowledge from a specific geographic area. In addition to the personal experiences, it may also comprise insights from ancestral knowledge, knowledge from neighbors

and expert knowledge (Nesheim et al. 2006). Local knowledge of relevance for the project includes farmer knowledge of soil and hydrology, farm level experience of measures (where are they efficient and why), and local perspectives of effective and ineffective policies. These are valuable information that can enhance or correct suggested measures or decisions that may work well theoretically, but needs adaptation for a local context. In addition to farmers, other actors such local private companies may also be relevant for access to local knowledge. It is important to capture the semantics used by different stakeholders. so that it can be considered for catalogue, indicators and beyond.

- **Contribute with scientific / expert knowledge:** Refers to what qualified or professional individuals know as a result of their technical practices, training, and experience (Booker and McNamara 2004). These stakeholders can be scientists, but also farmers and agri-environmental advisors possessing expert or scientific knowledge. The stakeholders can contribute science-based and expert-based knowledge regarding impact of measures in the case study area.
- **Contribute with knowledge about policy:** May refer to individuals in positions to advise on local, regional, national government policy. This can be government employees, authorities or advisors in private companies. It can be sector specific. On local level however, an advisor or authority may be responsible for both agricultural and environmental issues. The purpose is for the stakeholders to contribute with knowledge about agro-environmental governance having impact in the case area.
- **Contribute to / take part in the Learning environment.** In OPTAIN, the term “Learning Environment” refers to an interactive web-tool for scenario evaluation and exploration based on the optimal trade-off solutions provided by each case study. It will be the main tool to disseminate the knowledge co-created within OPTAIN to a wider audience and an information system accessible at the OPTAIN website. The relevant stakeholder group or audience for the Learning Environment refers to practitioners, regional planners, decision makers, researchers, graduate and post-graduate students, and anyone else interested in NSWRM.

The need for CSLs to consider engagement that is planned to take place during the different phases of research in OPTAIN when identifying stakeholders was emphasised (Figure 2 and Annex 2). As the CSLs themselves are involved in the different research activities (Figure 2), they are seen as qualified for identifying appropriate stakeholders with reference to such engagement in needs. The different phases of the project refer to: (i) identifying NSWRM potentials and constraints; (ii) modelling environmental and socio-economic performance of selected NSWRM; (iii) optimal trade-off modelling of different NSWRM; (iv) policy analysis and recommendation and (v)



Optimal Strategies to Retain Water and Nutrients in small agricultural catchments  
 Figure 2 Position of the MARGs related to the other OPTAIN core elements and phases (Semko and Bokal 2021)



learning environment (Figure 2). Stakeholders engaged in the project will range from people closely engaged throughout the project period to others which may interact with the project only a few times. For the purpose of this report, an overview of what stakeholders should be addressed/targeted during different phases of the project is also provided, based on feedback and dialogue with the work package leads involved in the project (see chapter 3.4).

The stakeholder identification and mapping activities undertaken by the CSL during the first few months of the project from October to November 2020 were needed as first steps to establish the MARGs in the project. It is however expected that the number of stakeholders involved in each case study will increase during the project period and that the current stakeholders identified for participation in the MARGs may change.

An important objective for a stakeholder analysis is to understand actors' roles in society, while it is common for stakeholders to have several roles. A stakeholder may be both a farmer, a politician and work in the administration. Understanding the role of the stakeholders engaging in the MARG means understanding the context of the information being received. It also means understanding the audience for the research information. This stakeholder mapping report is prepared prior to the actual engagement activities in the project. Hence, understanding the role of stakeholders, identifying their expected contribution, and interest of stakeholders is at best preliminary. Based on the current available information, an analysis of the identified and mapped stakeholders is presented in chapter 3, including a brief discussion on the need for involvement to reach the project objectives of increased acceptance and better implementation of NSWRM.

A relevant focus for a stakeholder analysis in OPTAIN is the influence and interest domains of stakeholders. The project aims to include actors which both have high interest and high influence within all stakeholder categories. This is a project strategy for gaining access to data, and to ensure that stakeholders with high interest in the project and the NSWRM will take part in the co-creation of knowledge. Including stakeholders with high influence will increase the impact of the project on the implementation of measures for reduced soil erosion, increased water retention and improved water quality in water bodies. The current analysis of stakeholder interest domain is based on CSLs' expectation of stakeholders influence and interest. The analyses draw attention to the involvement of stakeholders in all categories on case study level.

The analysis in this report is prepared considering initial information in hand by the case study leaders on the role of stakeholders. A more in-depth understanding of this situation will be gained later in the project period. It is as such proposed to revise the report after two years in the project for an updated analysis of stakeholders being engaged in the project and their position regarding interest and influence.

### **Project approach to benchmarks for stakeholder engagement**

Frewer (1999; 2000) refers to the following relevant criteria for stakeholder benchmarks: (i) representativeness, (ii) independence, (iii) early involvement, (iv) influence, (v) transparency (acceptance criteria) and (vi) task definition, (vii) structural decision making, (viii) resource accessibility, (ix) cost effectivity (process criteria). In OPTAIN these criteria are all considered, but the criteria are given different priority and weight. Furthermore, the project also needs to take into account the situation and the risk of

stakeholder fatigue, and stakeholders availability to use time and resources on research projects. Below we in brief describe the project's approach to Frewer's criteria.

**Representativeness:** Overall representativity is accounted for mainly with regard to making sure that stakeholders from the different governance levels, and from the relevant sectors, mainly water management, agriculture, and nature conservation are represented in the MARGs inner and outer circle<sup>3</sup>. Representativity from a statistical perspective is not an intention of the project. This means that project results will not be presented to reflect the opinion of stakeholder categories, but rather to represent co-creation involving the specific stakeholders and actors, which the project has been engaging with.

**Independence:** While the project does not aim for representative samples from the identified stakeholder categories, it is still an objective to avoid bias in the selection of stakeholders in the MARG, so that there is no particular overrepresentation of certain groups.

**Early involvement:** The project operation cycle specifies early and continuous engagement as an important approach. The first engagement efforts in the project was undertaken in the pre- project phase, and then during the first half year of the project.

**Influence:** To ensure significant impact, the project will engage stakeholders with influence on decision-making. Stakeholders will also be invited to provide knowledge, inputs and feedback on the research approaches that will enable influence on the outcomes of project.

**Transparency:** The project aims for a transparent approach on two main levels: (i) to the general public by means of websites and newsletters presenting project plans and results, and (ii) to the MARG group specifically by means of providing minutes after meetings and by informing about what to expect from the project, plans and decisions made. The recruitment MARG participants involved presenting information about the project in the native language, using case study specific leaflets as well as an information sheet and consent form for stakeholder engagement.

**Task definition, and structural decision making:** The project task definition is defined by the overall project topics and phases (Figure 2). Furthermore, before each MARG workshop a protocol is developed specifying tasks and the process for engagement. This guides the task definition across cases and ensures that the process for engagement is reflected on for providing meaningful engagement.

**Resource accessibility:** In the project context, resources refers to human resources facilitating the process as well as their knowledge about local conditions, policies, and policy arrangements. The project considers resource accessibility by adapting to the availability of stakeholders, not for stakeholders to adapt to the project. Resource accessibility, including access to human resources, is always a limiting factor, this is considered by being respectful to stakeholders' time constraints. Further, participants

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<sup>3</sup> 'Outer circle' refers to stakeholders whom the project (esp. the CSLs) have less frequent contact with, such as stakeholders being involved only as informants in surveys. 'Inner circle' stakeholders represent those whom the project has frequent contact with, those that take part in the MARG workshops throughout the project period.

will have access to the appropriate resources to enable them to successfully fulfill their brief (Ng and Hamby, 1997).

**Cost-effectiveness:** This criterion is considered by aiming for a high value for the resources spent on various activities. In some cases it could entail to facilitate for a hybrid meeting so that stakeholders who would have too high travel costs can participate digitally, or to approach some stakeholders bilaterally. It also means aiming for an efficient use of time and resources spent by the researchers in facilitating participation.

## 3. Results and discussion

The following chapter provides results and discussion on stakeholders based on the filled-in mapping sheets by the case study leaders in all 14 case studies. All individual mapping sheets were compiled for the analysis. Both the inventory of stakeholders and this stakeholder mapping report is prepared prior to the actual engagement activities in the project. Hence, the quantitative and qualitative analysis of the stakeholders that will be active in the Multi-Actor Reference Groups in OPTAIN is at best preliminary. Sub-section 3.1 presents a quantitative overview of identified stakeholders on project and case study level. Sub-section 3.2 presents results on description of purpose, the reason to involve stakeholder, and sub-section 3.3 discusses the stakeholder benefits and interest of stakeholders. Sub-section 3.4 finally discusses the types of stakeholders to be engaged during different phases of the project.

### 3.1. Description of stakeholder categories on project and case study level

In total, the 14 case studies have identified 294 stakeholders relevant as members in the respective case study MARGs. Table 2. presents the number of stakeholders per case study, specified on the local, regional and national level. These levels were upfront specified in the stakeholder mapping format (see format in Annex 1 and chapter 2).

The number of stakeholders identified per case varies from 10 up to 50 stakeholders. In most case studies between 10 and 20 stakeholders were identified. Two case studies identified ~50 stakeholders, in which are mostly local stakeholders. As it is expected that more than 10 stakeholders will be engaged as part of the case study MARG, this indicates that quite a few additional stakeholders than those currently identified will be involved in OPTAIN. The large variation of number of stakeholders identified across case studies may reflect differences in case study leaders' previous work experience in the case study area. Previous work experience in an area signify already existing relations knowledge of local stakeholders. Having previous experience from an area is clearly an advantage for identifying possible stakeholders.

The identified stakeholders were categorised across different levels of governance, local, regional and national. Some case studies also referred to combinations of levels. Most stakeholders were mapped as belonging at the local level (37%), followed by the regional level (30%). The national level makes up 21% of the stakeholders. In some case studies stakeholders were also identified for a federal level of governance, as in the Belgian case. That more identified stakeholders can be found on local level, and that the least number of stakeholders are found on the national level was expected. A wider range of stakeholder categories are relevant on local level, i.e. it is not common to have a regional or national level farmer. The relatively high percentage of stakeholders on regional and national level may indicate that all CSLs already have relations with stakeholders from previous projects on these levels. Local stakeholders are important for local knowledge and practical implementation of measures. Regional and national stakeholders are important for policy development.

30% regional and 21% national at the project level is quite high – possibly reflecting that the project case partners have been able to identify many actors related to the early stage of OPTAIN while in executing the OPTAIN-activities more local actors will be engaged. In all case studies (but one) both the national, regional and local level are included in the stakeholder mapping. The combination of different stakeholders is likely to aid OPTAIN in making impact on different levels. As a general perspective it is argued that it is important for all case studies to identify stakeholders on all levels of governance.

EU level stakeholders are important to reach an even higher impact with the project. However, no stakeholders on EU level have been identified in this stakeholder mapping exercise. The reason is that EU level stakeholders will be involved on project level rather than inside the individual case studies.

Table 2. Number of stakeholders per case study, specified on the local, regional and national level.

Case study nr	Case country	Case name	Bio-region	Total # stakeholders	# Local level	# Regional level	# National level	# Federal level	# combination of N / R / L	# Unknown or unclear
1	Germany	Schwarzer Schöps	Continental	19	6	10	1			2
2	Switzerland	Petite Glâne	Continental	21	6	8	6			1
3a	Hungary	Csorsza	Pannonia	14	3	3	7		1	
3b	Hungary	Felso-Valicka	Pannonia	12	1	3	7		1	
4	Poland	Upper Zglowiaczka	Continental	14	8	6				
5	Austria / Slovenia	Pesnica	Continental	15	4	5	6			
6	Slovenia / Hungary	Kebele- Kobiljski potok	Continental/ Pannonia	14	8	3	3			
7	Belgium	La Wimbe	Continental	25	15	3	1	6		
8	Lithuania	Dotnuvele	Boreal	11	4	1	6			
9	Italy	Cherio	Continental	16	6	7	3			
10	Norway	Hobøl	Boreal	47	34	11	1			1
11	Hungary	Tetves	Pannonia	14	2	4	7		1	
12	Czech Rep.	Čechtický	Continental	5	1	1	3			
13	Latvia	Deviete	Boreal	54	24	21	9			
14	Sweden	Sävjaån Headwaters	Boreal	13	4	2	3		4	
			<b>sum</b>	<b>294</b>	<b>128</b>	<b>88</b>	<b>63</b>	<b>6</b>	<b>24</b>	<b>4</b>
					<b>44%</b>	<b>30%</b>	<b>21%</b>	<b>2%</b>	<b>8%</b>	<b>1%</b>

### Stakeholder categories

Stakeholder categories vary from environmental / agricultural / water authorities, to farmers, landowners, municipalities, scientists, NGOs and private companies. The categories were already specified in the stakeholder mapping format. Table 3 presents the number of stakeholders per case study regarding the specific case study categories. From the table we see:

- All case studies identified a mix of different stakeholder categories.
- All case studies have selected one or more environmental and/or agricultural authorities. One case study also added the water authority as relevant stakeholder. In total the different authorities make up 30% of all stakeholders. An analysis of the governance level is mentioned below.
- 12 out of 14 case studies selected one or more farmers in their case study site. In total 50 farmers are a stakeholder within OPTAIN project. Farmers make up 17% of all stakeholders.
- Different NGOs (13%) and private companies (5%) were selected. NGOs are for instance farmers' organisations, (local) environmental groups or organisations for nature conservation. The type of private companies varies from a grass production companies to more water and tourism related companies and a rural advisory and training centre.
- One third of the selected stakeholders is categorised as "other". This is significant and might debate the comprehensiveness of the categories in the stakeholder mapping format. More on this will follow in chapter 4. Looking into the answers in more detail we see the following.
  - ~35 stakeholders in the "other" category are listed as stakeholders bringing expert knowledge such as scientists, research institutes or local councils.
  - ~40 stakeholders in the "other" category are listed as stakeholders bringing local knowledge such as farmers' professional consultants, agricultural advisors or residents.
  - ~20 stakeholders in the "other" category are listed as stakeholders bringing policy knowledge such as local governments, ministries or tourism departments.

Table 3. Number of stakeholders per case study, specified per case study category.

Case study nr	Case country	Case name	Bio-region	Total # stakeholders	# Authority agric. Sector	# Authority env. sector	# Authority water sector	# Expert scientific knowledge	# Farmer	# Landowner	# Municipality	# NGO	# Private company	# Other
1	Germany	Schwarzer Schöps	Continental	19	2	1	6					5	1	4
2	Switzerland	Petite Glâne	Continental	21	5	4			5			6		1
3a	Hungary	Csorsza	Pannonia	14	1	1		2	3			1		6
3b	Hungary	Felso-Valicka	Pannonia	12	1	1		2	1			1		6
4	Poland	Upper Zglowiaczka	Continental	14	3	3			2			3	2	1
5	Austria / Slovenia	Pesnica	Continental	15	2	3			2			1		7
6	Slovenia / Hungary	Kebele-Kobiljski potok	Continental/ Pannonia	14	1	2			5		1	1	2	2
7	Belgium	La Wimbe	Continental	25	2	5			5				1	12
8	Lithuania	Dotnuvele	Boreal	11	1	4			3			1		2
9	Italy	Cherio	Continental	16	1	2			4			2		7
10	Norway	Hobøl	Boreal	47	9	9			14			1	1	13
11	Hungary	Tetves	Pannonia	14	1	1		2				1	1	8
12	Czech Rep.	Čechtický	Continental	5	1	2			1			1		
13	Latvia	Deviete	Boreal	54	3	5			5			14	2	25
14	Sweden	Sävjaån Headwaters	Boreal	13	1	3			1	1			4	3
			<b>sum</b>	<b>294</b>	<b>34</b>	<b>46</b>	<b>6</b>	<b>6</b>	<b>51</b>	<b>1</b>	<b>1</b>	<b>38</b>	<b>14</b>	<b>97</b>
			<b>%</b>		<b>12%</b>	<b>16%</b>	<b>2%</b>	<b>2%</b>	<b>17%</b>	<b>0%</b>	<b>0%</b>	<b>13%</b>	<b>5%</b>	<b>33%</b>

### Stakeholder benchmark levels in the project

The above tables (Table 2 and 3) present an overview of a total of 294 stakeholders being identified as relevant for involvement cross case studies after 5 months into the project. This overview reflects the expected numbers for each case study, numbers that vary greatly. It is useful to consider the initial mapping as an illustration of the case study leaders' view of the situation during the initial stages of the project, rather than a measure of the ideal number of MARG members. Some case study leaders have been working in the case study area prior to this project, while others are not familiar with the situation. As part of a revision of this deliverable, after 21 months of the project, a discussion with CSLs to identify realistic involvement of stakeholders was undertaken. Table 4 presents an overview of benchmarks, a minimum expected number of stakeholders to be involved per case study specified on coarse stakeholder categories. The coarse stakeholder categories presented in table 4, reflects the large variation in the situation of governance and actors cross case studies. For the purpose of specifying benchmarks, a very detailed table does not, to our opinion, serve the purpose. However,

the template for logging of stakeholder engagement in OPTAIN (below) allows for a detail monitoring of engagement activities as well as for an analysis and discussion of the level and type of engagement with different types of stakeholders within the different cases.

The ranges that are indicated as benchmarks in table 4, reflect that while there are similarities and some common features, the different MARGs are individual case studies with unique perspectives, challenges and needs. It is therefore important to maintain a flexible approach to ensure that participation remains meaningful and relevant throughout the project period. Overall for each case study the engagement of stakeholder will aim to cover the relevant governance levels, and agriculture, water environment associated stakeholders.

Table 4. Overview of benchmarks for involving different stakeholder categories in the project.

Stakeholder categories	Outer circle		Inner circle	
<b>Farmers</b>	6- 12		3-4	
<b>Agriculture, water, environment authorities / advisors local level, / regional level / federal / national</b>	National / federal level: 4?	Regional / local level 6- 8	National level / federal level: 2	Regional / local level 4
<b>Experts, advisors</b>	4-6		2-4	
<b>Private companies, advisors</b>	4-6		2-4	
<b>NGOs / Farmer associations</b>	2-6		2-6	

### Logging of engagement in the project

Following the mapping of stakeholders and the establishment of MARGs in each of the 14 case studies, it is essential to follow the development of the MARG participation and engagement over time. For this purpose, a detailed logging template was developed by WP1, with information on the time and format of the activities, stakeholder types present, information on the core group of stakeholders as well as content and outcomes of the meetings. As part of logging stakeholder interactions, the case study leaders are also asked to comment on the outcome of the activities and how they contributed to the impact of the case study.

The case study leaders will continue to log the interactions with various stakeholders throughout the project. WP1 is responsible for compiling these logs across the different case studies. The compiled logs are annually presented in the form of an internal report that enables continuous monitoring and opportunity for adjustments and follow-up as needed. The annual logging reports will be compiled and form the basis for a final report on the stakeholder engagement activities at the end of the project in deliverable “D1.3: Actor involvement summary report”. The logging compilations are typically visualised in tables with overviews of type of activities and types of actors involved. Table 5 shows the format from the annual internal reporting.



Table 5. Tables included in the annual internal project reporting.

Case nr.	Case country	Case name	Participant category													Tot. nr. interactions	Nr. participants pr. interaction	Comments						
													Authority participants											
													Level		Type									
			Farmer	(Production type)	Agri-advisor / other consultant	Scientific expert	Priv. company	NGO	Politician	Local / municipal	River basin	State / regional	National	Agriculture	Environment	Water mgmt.	Cultural heritage	Combinat./ other						
1																								
2																								
Case nr.	Case country	Case name	Total nr. interactions logged	Location			Duration			Type of meeting				Type of engagement				Link to task	Comments					
				Physical	Virtual	Phone / email	~1 hour (or less)	1-4 hrs (half day)	>4 hrs (whole day)	MARG workshop	Bilateral meeting	External workshop	Farm visit / field demo	Open discussion	Focus group	Semi-struct. interviews	questionnaire							
1																								
2																								

## Stakeholder categories and levels

Table 6 presents the division of stakeholder categories at different levels at the project level, instead of case study level as in previous tables (Local, Regional, National). The tables show that a great number of stakeholders operating at various levels will be reached during the lifetime of OPTAIN. At the same time, a great number of stakeholders will be invited in the MARG to improve the quality and impact of the results during the lifetime of OPTAIN. And because the thematic focus of OPTAIN evolves during the lifetime of the project from selecting effective measures, optimization of measures at different scales towards policy actions and recommendations for actions, more stakeholders (local, regional and national) will be part of the MARGs.

Table 6. Division of stakeholder categories at different levels (Local, Regional, National)

Stakeholder category	Total # stakeholders	Total % stakeholder	# Local level	# Regional level	# National level	# Federal level	# combination of N / R / L	# Unknown or unclear
Authority agric. Sector	33	11%	2	13	12	2	4	
Authority env. sector	47	16%	2	19	17	4	4	1
Authority water sector	6	2%	4	2				
Expert scientific knowledge	6	2%		6				
Farmer	51	17%	50				1	
Landowner	1	0%	1					
Municipality	1	0%		1				
NGO	38	13%	10	13	14			1
Private company	14	5%	5	6			3	
Other	97	33%	35	28	20		12	2
<b>Grand Total</b>	<b>294</b>	<b>100%</b>	<b>109</b>	<b>88</b>	<b>63</b>	<b>6</b>	<b>24</b>	<b>4</b>

### 3.2. Description of purpose, the reason to involve stakeholders

The case study leaders' perspective on the reason for involving stakeholders into the MARGs are presented in Table 7 and Figure 3. It is seen that 40% of all stakeholders are expected to provide local knowledge into the project, 26% of all stakeholders are expected to bring expert (scientific) knowledge, and 18% are expected to bring knowledge and experience from a policy point of view. A smaller group will bring knowledge into the Learning environment (WP7) or serve a combination of interests. This overview of the CSLs' perspective on the need for different types of knowledge, indicate more stakeholders representing local knowledge are necessary. This reflects the situation that efficient and appropriate NSWRM need to be identified based on a local perspective. An appropriate NSWRM is suited to the local soil and climatic situation. It also reflects that there is a need to involve a diversity of stakeholders reflecting local knowledge and end-users. Various stakeholder types such as farmers, authorities, advisors etc. may possess different types of experience. It is important to understand the variety of situations on local level that may impact what are seen as appropriate NSWRM. Expert (scientific) knowledge is also seen as important to complement the knowledge of OPTAIN researchers. In this regard, a reflection can be made on the understanding that different stakeholder types e.g. farmers, advisors, etc. can represent contribution of expert knowledge. Regarding the quite small number of identified stakeholders to take part in and make use of the learning environment, may reflect that work to develop this platform will take place only later in the project. However, it may also indicate a need for more reflection in the project on who are the stakeholders that will make use of and contribute to the learning environment, to be the project's main dissemination and an important co-creation product.

Table 7. The CLS' reason to involve stakeholders

Case study nr	Case country	Case name	Bio-region	Total # stakeholders	# Local knowledge	# Policy	# Expert (scientific) knowledge	# Learning environment (WP7)	# Combination of interests
1	Germany	Schwarzer Schöps	Continental	19			1	1	17
2	Switzerland	Petite Glâne	Continental	20	7	7	3	3	
3a	Hungary	Csorsza	Pannonia	14	3	3	8		
3b	Hungary	Felso-Valicka	Pannonia	12	1	3	8		
4	Poland	Upper Zglowiaczka	Continental	14	9	3	2		
5	Austria / Slovenia	Pesnica	Continental	15	6	2	7		
6	Slovenia / Hungary	Kebele-Kobiljski potok	Continental/ Pannonia	14	5	3	6		
7	Belgium	La Wimbe	Continental	25	10	5	3	7	
8	Lithuania	Dotnuvele	Boreal	11	5	3	3		
9	Italy	Cherio	Continental	16	7	3	4	2	
10	Norway	Hobøl	Boreal	47	30				17
11	Hungary	Tetves	Pannonia	14	3	3	8		
12	Czech Rep.	Čechtický	Continental	5	2	2	1		
13	Latvia	Deviete	Boreal	54	26	14	14		
14	Sweden	Sävjaån Headwaters	Boreal	13	3	3	7		
			<b>sum</b>	<b>293</b>	<b>117</b>	<b>54</b>	<b>75</b>	<b>13</b>	<b>34</b>
					<b>40%</b>	<b>18%</b>	<b>26%</b>	<b>4%</b>	<b>12%</b>

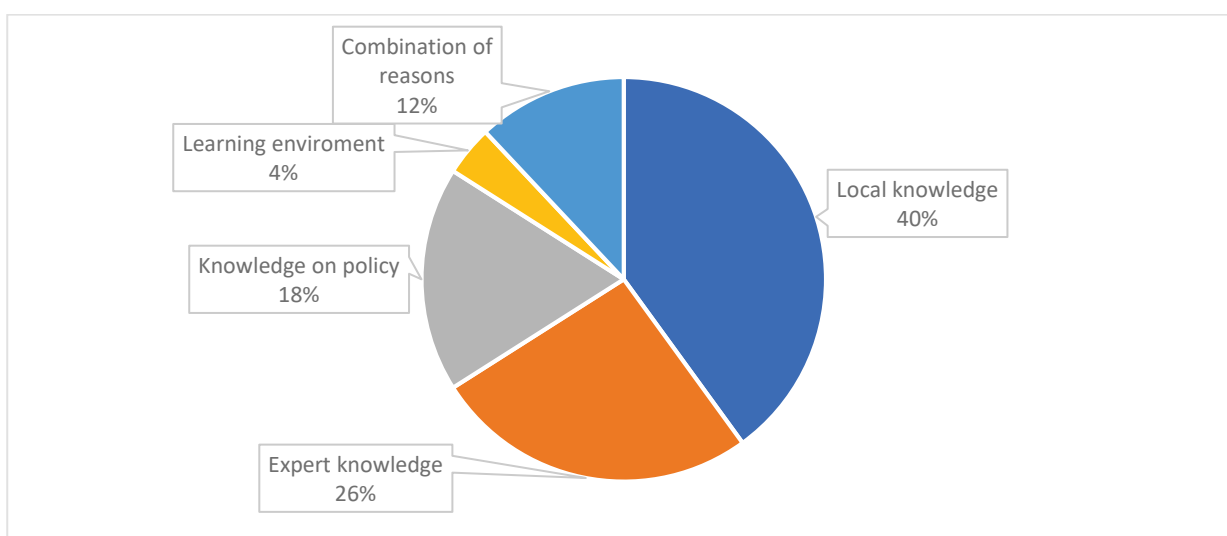


Figure 3. The CSL reasons to involve stakeholders in total.

### 3.3. Stakeholder benefits and interest

OPTAIN aims to include actors which both have high interest and high influence regarding NSWRM related topics. This is a project strategy for gaining access to data, and for involving stakeholders that will take part in co-creation of knowledge for uptake of NSWRM. This has been mapped by indicating stakeholders' expected interest and benefits. The influence of the stakeholders was not analyzed in this initial phase. It is anticipated that this will become clearer during the execution of the project. Regarding the stakeholder interest and benefits, the information added refers to the CSLs' expectations, not the stakeholders' own stated opinions. As the benefits were not predefined categories, this gave a broader range of inputs from the CSLs. Knowledge exchange, information sharing and learning were among the expected benefits listed. Some CSLs stated "new knowledge" as a benefit, while others would elaborate more on concrete activities and issues that would be of particular interest to the stakeholder in question. This sub-section presents a qualitative analysis of the expected benefits and expected level of interest for different types of stakeholders, i.e. farmers, authorities, agricultural advisors, private companies, NGOs, others / experts. This is seen in relation with the case study leaders' intention to inform, consult or engage the stakeholders in the study.

#### Local farmers

Several of the case studies mention that local farmers (either individually or organised in associations) are expected to have an interest in the subject as they are living and working within the case study area and potentially could be affected. "Local knowledge" was also an almost uniform reason for involving farmers across the case studies (see also chapter 3.2). Several cases also mention that farmers would benefit from being able to voice their opinions and be consulted, while a few cases included connecting with others as a benefit for farmers. That CSLs refer to possibilities of connecting with other actors as benefits, seems to reflect the social learning aspects of engagement processes emphasised by Lacroix and Megdal (2016). The case study leaders mainly considered the local farmers' interest as high or medium. A majority of the farmers listed as stakeholders were also intended to be involved in the MARGs, which indicates that farmers are considered key stakeholders to ensure impact of the project. Some of the farmers included would simply be consulted or informed, but these individuals were usually also considered to have low or medium interest.

#### Authorities

The quantitative analysis of the stakeholder categories mapped (chapter 3.1) showed that all case studies had included stakeholders representing environmental and/or agricultural authorities. Their interest in the project was mainly considered medium or high by the CSLs. The reasons for involving these authorities were either local knowledge, expert knowledge, or "policy".

Among the environmental authorities included as stakeholders, most were on a regional or national level. The few environmental authorities represented on a local level were often directly involved with water management. Similarly, there were mostly regional or national agricultural authorities, while the local authority stakeholders included were mainly agricultural advisors. Authorities on a local level were included to provide local knowledge, and their anticipated benefits were also related to receiving more

knowledge that could help resolving local issues that they were directly affected by. The same was the case for many regional authorities, but many of these were also expected to benefit in terms of recommendations for policy, projects or local partnerships.

The differences in reasons to involve and the expected benefits for the different regional authorities between cases may be related to differences between the governance systems and the role of authorities belonging to different levels of governance. When regional or national authorities were involved due to policy, this was reflected in what was considered the benefits of involving these authorities as stakeholders: Namely for the project to provide recommendations and documentation as basis for revising policies and legislation on both national and regional level. There seems to be some differences in the ambition level of CSLs when it comes to the impact on policy, but the majority of the cases had in some way included direct inputs to policy, legislation or management strategies as benefits on a regional or national level. Inputs or recommendations for local management plans were also mentioned, although less often included as benefits than national/regional policy and legislation.

### **Agricultural advisors, private companies**

The companies included as stakeholders were mainly on local or regional level, and they were usually involved for their local or “expert” knowledge. Their expected benefits were quite varied, from knowledge exchange and networking, information and tracking progress/trends, to water use efficiency/saving and tourism. The agricultural advisors have a key role as linking pin between both expert and authorities at one hand and the farmers at the other hand. The advisors are trusted by farmers for their expert knowledge but also their knowledge of policy developments and innovations. They may also serve as vehicles to explain policy and develop measures following certain policy and explain sentiments from the agricultural community to the authorities.

### **NGOs**

As seen in chapter 3.1, the NGOs included as stakeholders were relatively evenly distributed on local, regional and national levels. While the local NGOs were all involved because of their local knowledge, regional and national NGOs were also involved for expert knowledge, policy and learning environment, sometimes in addition to local knowledge. The selected NGOs are mainly working within the sectors agriculture (e.g. farmers associations and advisors), environment (e.g. WWF, landscape and nature conservation) and water (water associations, coordinators). Other NGOs were for example involved in education, entrepreneurship, hunting and fishing, and municipal interest organisations. The benefits considered for them to be involved were varied. Many considered the topic of the project to be in line with their interests, which could indicate that simply getting more information would be beneficial to these stakeholders. Knowledge exchange and networking were also often mentioned expected benefits. A number of these NGOs would either be informed or consulted by the project. Among the NGOs that the CSLs were planning to involve directly, several mentioned that it would be beneficial to them because they were locally engaged in the geographical area of the case study. Some also mentioned that the aims of the NGO were in line with the aims of OPTAIN, or that OPTAIN might “push forward their ambitions”.

### **Others / experts**

Among the stakeholders included in the category “others”, many had different types of knowledge that were listed as reasons to involve them. Here, we also see examples of how one actor can have several roles or that similar actors may be involved differently as stakeholders depending on the context, as described in chapter 2. For example, farmers associations were in some cases categorized in the role as farmers, while others included them in the role as NGOs or as providing expert scientific knowledge. As mentioned in chapter 3.1, a number of the stakeholders listed as “others” by the case studies were in fact research institutes and scientist, included to provide expert knowledge. Their benefit of participating would for example be to gain knowledge on developments in the field and better insights into future scenarios.

A few cases also included local residents that would be affected by changes in their environment as stakeholders in the category “others”. They were included to provide local knowledge, and the expected benefits were related to receiving more information, being directly affected by the project and the opportunity to voice their opinions about local management. As an objective is to reduce conflicts between agricultural water uses and other human and environmental demands for water, one might expect more local water users to be included overall. On the other hand, such interests might be represented by means of local authorities and or local NGOs.

### **Monitoring stakeholder benefits in the project**

The OPTAIN project aims to include stakeholders as co-producers of knowledge and practices on NSWRM. The degree that this can be successful depends on the degree that engagement is perceived to be beneficial. In the project we approach the concept of stakeholder’s benefit as meaningful engagement (Nesheim et al. 2021), which depends on the perception that, (i) stakeholders find the topic being discussed to be relevant in their case study area, (ii) when stakeholders find that their engagement provides added value, and (iii) when there is trust among stakeholders and the project case study leaders. Furthermore, and drawing on papers from McKnight and Chervany (1996) and Beratan (2007), stakeholder benefits, the perception of meaningful engagement cannot be seen as constant, rather this is a dynamic and evolving process. The causality between trust and participation is not unidirectional. To monitor and assess the situation of meaningful engagement, a brief questionnaire is provided to stakeholders after every MARG workshop. The questionnaire addresses the relevance of the project’s topic and approach as well as its added value and trust. The intention is to enable addressing the perspective of stakeholder benefits as a continuous effort through the project period from the perspective of the respective stakeholders. During the same time, an interview with the different CSLs is undertaken to discuss their perception of the same issues. Table 8 presents an overview of stakeholder benefits based on the information received from informants, both stakeholders and CSLs.

Table 8. Overview of expected stakeholder benefits

Stakeholder type	Benefits related to increased knowledge	Benefits related to networking / sharing experiences	Benefits related to influence and impact
<b>Farmers</b>	Insight into efficiency of water and nutrient retention measures, and optimal combination of measures, and potential financing mechanisms via networking with other MARG participants such as by means of direct contact with different levels of governance.	A platform for meeting and discussing challenges with other farmers, and with authorities, and experts. In many cases not only related to water retention.	By influencing the project by providing input and local knowledge, research results on the measures will be optimized and tailored to the farmers' situation, not just general suggestions.
<b>Local/ regional authorities</b>	Insight into local experiences and knowledge relevant for implementation of measures. The project modelling results may benefit local authorities who often need to solve issues with limited resources to investigate potential measures and placements.	A platform for discussing with actors from different sectors or within the sector on various levels.	By influencing the project to address and focus the modelling of measures of relevance and interest; and to influence the project to discuss current and potentially relevant policy mechanisms.
<b>National authorities</b>	Insight into local and regional knowledge relevant for national level planning through policy advice, insight into potential overlap or conflict with other agencies' goals/views. Locally optimised measures can benefit national governance as they will be more suitable to a specific area or region.	A platform for discussing issues across sectors, and even within the same agency there might not be close contact between relevant actors.	By influencing the project to address and focus the modelling of measures of relevance and interest; and to influence the project to discuss current and potentially relevant policy mechanisms.
<b>Agri-advisor / other consultants</b>	Local knowledge from stakeholders (not only farmers) of the situation, possibilities, constraints and expectations in the area. Better understanding of what measures works in their region/area may improve advisory services. Some advisors may also get "credits" or add the MARG to their CV as experience / training.	A platform for sharing knowledge and experience with other actors or advisors, as well as authorities, depending on how advisory services are organised (public / private / other).	By influencing the project to address and focus the modelling on measures of relevance and interest; and to influence the project to discuss current and potentially relevant policy mechanisms.
<b>Private companies e.g. consultancies</b>	Insight into farmers' needs and governance arrangements on different levels, potential market opportunities.	A platform for meeting potential partners, customers and other actors in the different sectors.	Private companies, consultancies may suggest the project to focus on addressing measures of interest for their later benefit. Private companies may contribute to the project impact by referring to, using the project result in their work.
<b>NGOs</b>	Insight into effects of measures for example on environmental issues, and potential conflicts or barriers, insight into policy arrangements.	A platform for sharing experiences and reach other stakeholders and governance actors on different levels.	NGOs may use the information received from the project and contribute to the project impact by advice on e.g. environment /

			biodiversity or other specific interests of the specific NGO.
<b>Politicians</b>	Insight into local constituents needs and interests, potential conflicts or opportunities. Locally optimised measures may benefit local stakeholders and constituents, and by providing inputs to measures conflicts may be avoided/reduced.	A platform for meeting constituents and networking with other actors across sectors and governance levels.	By influencing the project to address and focus the modelling on measures of relevance and interest; and to influence the project to discuss current and potentially relevant policy mechanisms.

### 3.4. Types of stakeholders to be engaged during different phases of the project

The different types of stakeholders to be engaged during the different phases of research in OPTAIN is presented in table 9. The table is prepared based on discussions with the different WP leaders in OPTAIN. The table is to be seen as a flexible representation of stakeholder types to be involved during the different phases of OPTAIN. A flexible approach is emphasised as the case study contexts differs with regard to stakeholder types being active, in particular at local level. The table is still seen as a useful guide to involvement and to ensure a comparable and harmonized approach across cases in the project.



Table 9. Types of stakeholders that should be addressed/targeted during different phases of the project. WP tasks are indicated by numbers in parenthesis.

Project phases, tasks and activities	Identifying NSWRM potentials and constraints					Modelling environmental and socio-economic performance of selected NSWRM						Modelling to identify optimal trade-off implementation schemes for NSWRM			Policy analysis		
	Interacting w. stakeholders to collect measures	Docum. NSWRM	Discuss data gaps	Survey: identify policy & govern. arrangement context (6.2)	Identify selected measures	Identify indicators	Scenario discussion	About socio-econ. analysis & set up of model	Survey to assess measures attractiveness (4.5)	Feedback survey results (4.5)	Feedback modelling results single measures (4.3-4.5)	Identify interactive tools to visualize optimization	Identification of preferred NSWRM	Feedback on optimization results	Consult. applicable measures, barriers, solutions (6.3)	Test appropri. viability of developed incentives (6.4)	Final promoting event (6.4)
Timeline	MARG 1	Field interact.	Engag. 1 <sup>st</sup> yr.	Month 14-16	MARG 2			MARG 3	Month 27-33	MARG 4		Months 41-52	Months 41-52	MARG 5	Months 52-53		Month 56
Farmers	X	X	X		X	X		X	X	X	X		X	X	x	x	x
Agro-environ. authorities local level	X	(X)	X	x	(X)	X	X	X	X	X	X		X	X	x	x	x
Agro-environ. authorities regional level	(X)	(X)	X	x		X	X	X	X	X	X	X	X	X	x	x	x
Agro-environ. authorities national level				x	X	X			X	X	X		X	x	x	x	
Scientific experts	X	X	X	x	X	X		X	X		X	X		X	x	x	x
Private companies						X		X							x	x	x
Policy advis.				x		X	X	X		X	X	X	X	X	x	x	x
NGOs	X	(X)	X	x		X			X					X	x	x	x

	Learning environment, - Communication, Dissemination, workshops	
	Series of 3 regional events	OPTAIN Summer School
Farmers	X	
Agro-environmental authorities local level	X	
Agro-environmental authorities regional level	X	
Agro-environmental authorities national level	X	
Scientific experts	X	X
Private companies	X	
Policy advis.	X	
NGOs	X	
Other		Students, young water/agriculture professionals

## 4. Final remarks

OPTAIN aims to directly involve local, regional and national stakeholders in all 14 case studies. Therefore, all case study leaders have been asked to identify these stakeholders in a stakeholder mapping exercise. The results combined with a brief discussion were presented in this report.

From the results, the overall first impression can be made that a large number of stakeholders have been identified covering a large range of stakeholder types. And it is expected that the number of stakeholders involved in each case study will increase during the project period and that the current stakeholders identified for participation in the MARGs may change.

Some final remarks on this exercise:

- We have made use of a format with predefined stakeholder categories. All case study leaders have used this format to select stakeholders and provide additional information on type, interests and benefits. One third of the selected stakeholders were categorised as “other”. This is significant and might debate the comprehensiveness of the categories in the stakeholder mapping format. It may also indicate that the explanation provided for filling in the table was insufficient. The use of terms, and the understanding of categories differed among the case study leaders.
- Since the case studies are spread over 13 countries, differences were also seen. For instance, in the stakeholder category “agricultural advisors” it was found that they operate on different geographical levels both as governmental/ municipal agencies or as commercial firms.
- The number of stakeholders and the differences in stakeholder category contribute to the impact of OPTAIN at the scale of the CS. During the lifetime of OPTAIN more effort will be put into the OPTAIN Learning Environment to also create a platform to create an impact beyond the scope of the case studies.
- Considering benchmarks for participation, the evaluation criteria have to fit the purpose and format of the engagement. While concrete ranges for involvement of stakeholder categories are suggested here, the aim is to achieve representation and involvement of relevant stakeholders and the actual numbers may vary across cases and over time.
- The logging template provided was also partly based on predefined categories and might also be further developed or adapted in order to be as consistent and comparable as possible.

This stakeholder mapping report is prepared prior to the actual engagement activities in the project. In that respect it is relevant to update this stakeholder mapping sheet to reflect actual situation in the case in about two years' time (~2023).

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## Annex

Annex 1: Stakeholder Mapping Sheet format

Annex 2: MARG calendar for engagement activities

## Annex 1: Stakeholder mapping sheet format



**OPTimal strategies to retAIN and re-use water and nutrients in small agricultural catchments across different soil-climatic regions in Europe**

### Stakeholder mapping sheet

**The purpose** of the stakeholder mapping activity is to identify possible and relevant stakeholders for the reference group, the MARG. More stakeholders can be identified than those to be included in the reference group. The various stakeholders may or may not be contacted as part of the mapping exercise. More relevant stakeholders are likely to be "appear" during the project period. Then, stakeholder information should be added to the this table for project record.

It is recommended to identify actors within each of the main listed stakeholder categories, and in particular for the categories: 1. local knowledge / expert knowledge, 2. policy, and for 3. the activity Learning environment (WP7). Identify stakeholders in consideration of the project's/case study's needs for information and feedback.

The majority of stakeholders need to be identified for local level, however, actors are also relevant for regional level /national level this concerns in particular policy issues.

It can be relevant to reflect on which stakeholders are relevant for an **"inner circle MARG"** (identified as a group of stakeholders who will follow the project development closely), and an **"outer circle"** stakeholders (identified as stakeholders being relevant for the project but stakeholders who will be loosely engaged in the project).

**Data validation** has been prepared for the columns, 1. stakeholder category, 2. Reasons to involve, 3. Interest to involve, and 4. Planning level of engagement, for the other columns input is flexible and according to what you find relevant.

*Remember to anonymize the stakeholder name before sending to WP1.*

Stakeholder name	Stakeholder category: farmer, private company, authority envir. sector, authority agric sector, politician, NGO, other	Local / regional/ national level	Reasons to involve (local knowledge /expert knowledge (Wp2 WP4) /policy (WP6)/ (learning environment)	Stakeholder benefits	Interest of stakeholder (High/ Medium / Low)	Planning level of engagement (inform/ consult / involve)	Comments, information regarding the actor of particular interest

## Annex 2: MARG calendar for engagement activities

Case study engagement activities (case leaders)										
2021 (months 5-16)			2022 (months 17- 28)		2023 (month 29- 40)		2024 (months 41-52)		2025 (53-60)	
<p><b>MARG Workshop 1</b> Jan.- March 2021</p> <p><b>Kick off</b> establish the engagement platform &amp; inform about project and expectations</p> <p><b>&amp;</b></p> <p><b>WP 2:</b> Local environmental issues, collecting “underutilized”/potential suitable measures, (pre-) selection of measures</p> <p><b>WP 7</b> (about the training environment for awareness of project activity – WP7 to provide template).</p>	<p><i>Engagement activities</i></p> <p><b>WP 6:</b> <i>semi-structure interviews governance and policy context (send out Jun. 2021, expected return Oct./Nov. 2021)</i></p> <p><b>WP3:</b> <i>Discuss possibilities to fill data gaps (where required)</i></p> <p><b>WP7</b></p>	<p><b>MARG Workshop 2</b> Oct.-Dec. 2021 (months 14-16)</p> <p><b>WP2:</b> Detailed discussion on measures and indicators, starting scenario discussion</p> <p><b>WP7</b></p>	<p><i>Engagement activities</i></p> <p><b>WP 6:</b> <i>semi-structure interviews governance and policy context (send out Jun. 2021; del. Aug. 2022)</i></p> <p><b>WP3:</b> <i>Discuss possibilities to fill data gaps (where required)</i></p> <p><b>WP4:</b> <i>(T4.5) Consulting to identify relevant persons to be surveyed</i></p> <p><b>WP7</b></p>	<p><b>MARG Workshop 3</b> Aug- Oct (months 25-28)</p> <p><b>WP4:</b> about socio-economic analyses and their setups &amp; presentation of <u>setups</u> of environmental models (+ very first results)</p> <p><b>WP7</b></p>	<p><i>Engagement activities</i></p> <p><b>WP4:</b> <b>Surveys</b> to assess measures’ attractiveness (<b>month 27- 33; del. month 40</b>)</p> <p><b>WP5:</b> <b>Smaller focus group meetings</b> discussing interactive tools to visualize and filter results of the optimization (del. month 48)</p> <p><b>WP7</b></p>	<p><b>MARG Workshop 4</b> Aug-Oct (months 35-38)</p> <p><b>WP4:</b> Feedback on results from environmental + economic modeling of single measures</p> <p><b>WP7</b></p>	<p><i>Engagement activities</i></p> <p><b>WP5:</b> Identification of preferred NSWRM solutions (method not decided) (month 50) <b>del. month 52</b></p> <p><b>WP6:</b> Survey on cross-catchment analysis (month 48 - Aug.; return month 50 – Oct.; MS month 52 – Dec. 2025)</p>	<p><b>MARG Workshop 5</b> Month 45-48)</p> <p><b>WP5:</b> Feedback on optimization results and interactive visualization /navigation tools</p> <p><b>WP7:</b> training</p>	<p><i>Engagement activities</i></p> <p><b>WP6:</b> Individual consulting to test incentives (month 52 – Dec. return month 53 – Jan.; del. <b>month 54 – Mar. 2025</b>)</p> <p>Public training event (May 2025; Del. Aug. 2025)</p>	<p><b>MARG final event</b> (months 56-58)</p> <p><b>WP6:</b> Policy aspects and recommendations for action</p> <p><b>WP7:</b> training</p>