

Created institutional cooperation network between the countries of EOG, countries of the Baltic Sea Basin and Ukraine

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REPUBLIC OF ESTONIA
GEOLOGICAL SURVEY



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HEXAGON



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Introduction

The EU-WATERRES project, at its core, recognizes the essential role of stakeholders and target groups in shaping and implementing effective strategies for sustainable groundwater use and protection in transboundary areas. Stakeholders in this context represent a broad spectrum of individuals, groups, and organizations involved in the management and outcomes of groundwater protection. Target groups are more specifically identified based on unique characteristics or needs, and are central to the project's communication and action strategies.

Given the complex and multidisciplinary nature of transboundary groundwater management, the EU-WATERRES project has dedicated substantial efforts to develop a comprehensive target group database. This database is not merely a collection of contacts, it represents a deeper understanding of the diverse roles and interests in groundwater management. The project's approach to identifying and engaging these groups is based on the principles of "user-centered design" and "participatory design". By involving target groups from the initial project stages (design phase) through to the testing of outcomes (training), the project ensures that its methodologies and results are not only scientifically credible but also practically relevant and cover gaps identified by the target groups.

During the EU-WATERRES project development phase the key target groups were identified including entrepreneurs, SMEs, students, scientists, the general public, and the environment itself. It was clear from the beginning that the project must cover a wide range of needs and outcomes must address various levels of knowledge and awareness of groundwater protection. Entrepreneurs and SMEs, for example, are crucial in translating research into practical solutions, while students and researchers play a pivotal role in advancing groundwater protection through innovation.

The EU-WATERRES project undertook a methodical process when developed a target group database involving identification and segmentation of target groups, meticulous data collection and categorization, and rigorous database structuring and management. This database serves as a dynamic tool, continuously updated to reflect changing stakeholder dynamics. A well-designed questionnaire allowed us to capture stakeholder awareness, concerns, and knowledge gaps in Norway, Estonia, Latvia, Poland and Ukraine. Results provided critical insights that refined the project's communication and outreach strategies. The questionnaire's strategic distribution, leveraging both personalized communication and social media outreach, ensured a broad and effective reach.

To sum up, the EU-WATERRES project demonstrates a comprehensive and collaborative approach to transboundary aquifer management. Its focus on understanding stakeholders and target groups to ensure cross border groundwater protection way beyond one project lifetime, and hopefully sets a standard an inspiration for future initiatives working on complex transboundary aquifer management and protection.

2. Development of a Target Group Database for Transboundary Groundwater Protection

2.1. The importance of engaging stakeholders and target groups

In the context of groundwater protection, particularly in transboundary aquifers, a **stakeholder** is defined as any person, group, or organization with an interest or role in the management and outcomes of these water resources. A **target group** refers to specific segments within the broader stakeholder base that are intended recipients of a particular message, policy, or intervention. Target groups are identified based on specific characteristics or needs and are the focus of targeted communication and action strategies.

In the specific case of groundwater protection in transboundary aquifers, both stakeholders and target groups are crucial. Stakeholders encompass all those affected by or involved in groundwater management, while target groups within this stakeholder base might be more narrowly defined, such as communities directly reliant on a specific aquifer for their water needs or ecosystems particularly sensitive to changes in groundwater levels.

To ensure sustainable groundwater protection in transboundary aquifers, the identification and comprehensive understanding of target groups and stakeholders is fundamental. Correct identification of target groups and their proper engagement in the project activities allow for reaching sustainable management goals way beyond one project lifetime. Unfortunately, many planning documents have been found to lack comprehensive stakeholder integration, particularly among economically vulnerable subgroups, leading to less effective protection of these groups' needs and interests. Integrating target groups into all stages of a project, from design through to the testing of the end product, is a strategy that can significantly enhance the project's success and relevance. This approach, often referred to as 'user-centered design' or 'participatory design', ensures that the project methodologies and data are not only credible and tailored to the needs of those it aims to serve, but also that these groups have a substantial role in shaping the outcomes.

In the context of environmental projects, such as those related to groundwater protection, this approach becomes even more crucial. Groundwater management, particularly in transboundary aquifers, involves a variety of stakeholders with diverse needs and perspectives. By involving target groups (like local communities, businesses, environmental organizations, and government bodies) from the outset, the project can ensure that different viewpoints and knowledge systems are integrated. This not only enhances the robustness of the data but also ensures that the methodologies developed are relevant and practical for those who will use them.

Involving target groups from the design phase allows for the identification and understanding of their specific needs and challenges. This information is invaluable in tailoring the project's approach to address real-world problems effectively. During the implementation phase, continuous engagement with these groups can provide feedback loops, ensuring that the project remains aligned with their evolving needs and expectations.

Furthermore, when target groups are actively involved in the testing of the final product, it not only validates the project's outcomes but also empowers these groups. They feel a sense of ownership over the results, which is crucial for the long-term sustainability and acceptance of the project. This sense of ownership often leads to a stronger commitment to the project's objectives and a higher likelihood of successful adoption and implementation of its outcomes.

It's crucial to recognize that identifying and engaging target groups in groundwater management projects is not a one-size-fits-all process. Each project presents unique challenges and opportunities, requiring tailored

approaches to stakeholder involvement. Different methods of identifying and engaging target groups come with their own sets of advantages and disadvantages, and the choice of strategy largely depends on the specific context of the project.

One key factor in this decision-making process is the balance between available resources and the project's ambitions. Resources such as time, funding, and personnel are often limited, and it's important to be realistic about what can be achieved within these constraints. Overambitious projects that aim to address all issues in groundwater management and protection can quickly become untenable if they fail to consider these limitations.

Moreover, the diversity of target groups in groundwater projects – ranging from local communities to international stakeholders in the case of transboundary aquifers – adds layers of complexity. Each group may have different priorities, levels of influence, and capacities to engage. Some strategies might be more effective with certain groups but less so with others. For instance, community workshops might engage local stakeholders effectively, but they may not be as suitable for engaging higher-level policymakers or international entities.

Ultimately, the key is to carefully assess the project's goals, the characteristics of the target groups, and the available resources to determine the most appropriate approach for stakeholder engagement. It is about finding a balance between ambition and practicality, ensuring that the project remains focused and effective without overreaching its capacities. This approach, while it may not solve all issues in groundwater management and protection, can lead to more sustainable and impactful outcomes within the scope of the project's resources.

2.2. EU-WATERRES target groups and values

The EU-WATERRES project, dedicated to transboundary groundwater protection, recognizes the importance of identifying and engaging with a diverse range of target groups. The project, in its initial phase, developed a preliminary target group table (Table 1). This table aimed to establish a foundation for an extensive target group database, acknowledging that the full spectrum of beneficiaries would become clearer as the project evolved. The pivotal target groups (defined during the project preparation phase) include entrepreneurs, small and medium-sized enterprises (SMEs), students, scientists, the general public and the environment itself (see Table 1). Each of these groups plays a unique and critical role in the stewardship of groundwater resources, necessitating tailored communication and engagement strategies. The following analysis delves into each identified target group, outlining their specificities and relevance to the project's objectives.

- Entrepreneurs play a crucial role in bridging the gap between research and practical application. Their involvement ensures that the project's findings are not only academically sound but also commercially viable and applicable in real-world scenarios.
- SMEs represent a significant portion of the European economy. Their adaptive strategies toward sustainable groundwater use can have a widespread impact, setting a precedent for larger corporations.
- Educating students about transboundary groundwater protection is fundamental for long-term sustainability. They will carry forward the knowledge and practices developed by the EU-WATERRES project into their future careers.
- Researchers are key to advancing the understanding of transboundary groundwater issues. Their work, supported by the project, will contribute to the development of new methodologies and solutions.

- Raising awareness among the general public leads to increased community engagement and support for policies aimed at sustainable groundwater management. Their role is pivotal in ensuring the long-term success of the project's objectives.

Table 1. EU-WATERRES target groups, their description and target values

Target Group	Specification	Target Value
Entrepreneurs	Corporations specializing in issues of environmental protection and water management. Specialized consulting companies providing services in the field of environmental protection.	50
SMEs	The final recipients will be companies, which implement legal regulations of water resources management in individual countries carrying out the project.	200
Students	Students in the field of earth sciences, specialization in geology, environmental protection, water engineering, spatial management.	1000
Researchers	EU-WATERRES will serve as primary source of data and bring scientific advances as researchers find new and efficient ways of working.	200
General public	Society needs groundwater resources to support home life, industry and business and it needs security in the face of natural hazards.	2000
Environment	Weakening of the impact of anthropopressure on the water environment. Recovery of natural states and resources of groundwater in the areas of anthropogenic impact. Optimization of water conditions of wetland. Improvement of the quality of groundwater.	60000

The EU-WATERRES project's initial target group table serves as a foundational tool for engaging with key stakeholders in the realm of transboundary groundwater protection. Each group, from entrepreneurs to the general public, plays a unique and crucial role in advancing the project's goals. As the project progressed, this database expanded and evolved, ensuring a comprehensive approach to stakeholder engagement and project dissemination. The involvement of these groups is not only beneficial for the project's success but also essential for the long-term sustainability of Europe's groundwater resources.

2.3. Approach to Creating a Target Group Database

The creation of a target group database was a systematic and rigorous process that took into account the following general steps:

1. **Target group identification and segmentation.** Initial steps involve delineating the target groups based on their relevance to groundwater protection in transboundary aquifers. This segmentation is crucial for tailoring communication and engagement strategies effectively.
2. **Data and categorization.** This data encompasses contact information, organizational roles, areas of expertise, and prior involvement in groundwater-related initiatives.
3. **Database structuring and management.** The collected data is meticulously organized in a structured database. This involves creating categories and subcategories for easy retrieval and analysis, ensuring data accuracy, and establishing protocols for data privacy and security.
4. **Continuous analysis and update.** The database requires regular updates and analysis to reflect changes in stakeholder dynamics and to incorporate new data (e.g. after large events and training). This ensures the relevance and usefulness of the database in ongoing and future groundwater protection efforts.

The development of the EU-WATERRES project's target group database was crucial for achieving effective transboundary groundwater protection and delivering project outcomes. Recognizing the complex and multifaceted nature of stakeholder engagement, the project team tried to include a wide range of fields that would facilitate comprehensive and targeted outreach and its analysis.

The initial framework of the database was methodically constructed to include the following key fields with predefined answers (to be chosen from a drop down list) in some of the categories:

- **Country** - This field records the national context of the stakeholders, acknowledging the transboundary nature of groundwater resources and the necessity for international collaboration. The possible fields were Norway, Estonia, Latvia, Poland and Ukraine.
- **Representative region** - capturing the specific regional affiliations of each target group allows for a nuanced approach to addressing local and regional groundwater challenges. The possible answers were the “whole country” or “transboundary area”.
- **Institution** - By identifying the institutions involved, the database delineates the organizational structures that influence or are influenced by groundwater protection policies.
- **Target group category** - This classification enables the project to tailor its strategies and communications to suit the varied needs and characteristics of different stakeholder categories. The answers could be chosen from a drop-down list: local, regional or national authorities, Higher education and research organizations, Sectoral agencies, Interest groups including NGOs, Enterprise (Consultants), General public, Managers of the protected areas, State enterprise.
- **Contact person** - Personalizing the database with contact names humanizes the project's engagement process, fostering direct and meaningful interactions.
- **Position** - Understanding the roles of individuals within their institutions allows for precise communication and the leveraging of decision-making capabilities.
- **Webpage** - Providing web links ensures immediate access to institutional profiles and relevant activities, thereby enhancing the depth of stakeholder analysis.

All fields were filled by the project consortium leading us to 231 records from Latvia, Estonia, Poland and Ukraine (see attached as Annex I.) Note that personal data has been removed). The answers were stored separately by Norway, thus the final database is larger.

2.4. Development of a questionnaire

The EU-WATERRES project recognized the importance of comprehensively understanding the awareness, concerns, and knowledge gaps among its stakeholders. A meticulously designed questionnaire became the cornerstone of this understanding, enabling the project to navigate the multifaceted challenges associated with groundwater issues.

The development of the questionnaire was guided by a series of objectives centered around stakeholder awareness and identifying barriers in the context of transboundary groundwater management. The survey was strategically structured to extract nuanced information regarding stakeholders' familiarity with groundwater management, their perception of transboundary impacts, and the extent of their interest in these critical environmental issues. At the same time, it was limited to 10 questions (14 in Norway, see the results in Annex III), to ensure time-resource efficiency to fill and analyze the data.

The questions designed for the survey were multifaceted, serving several key objectives:

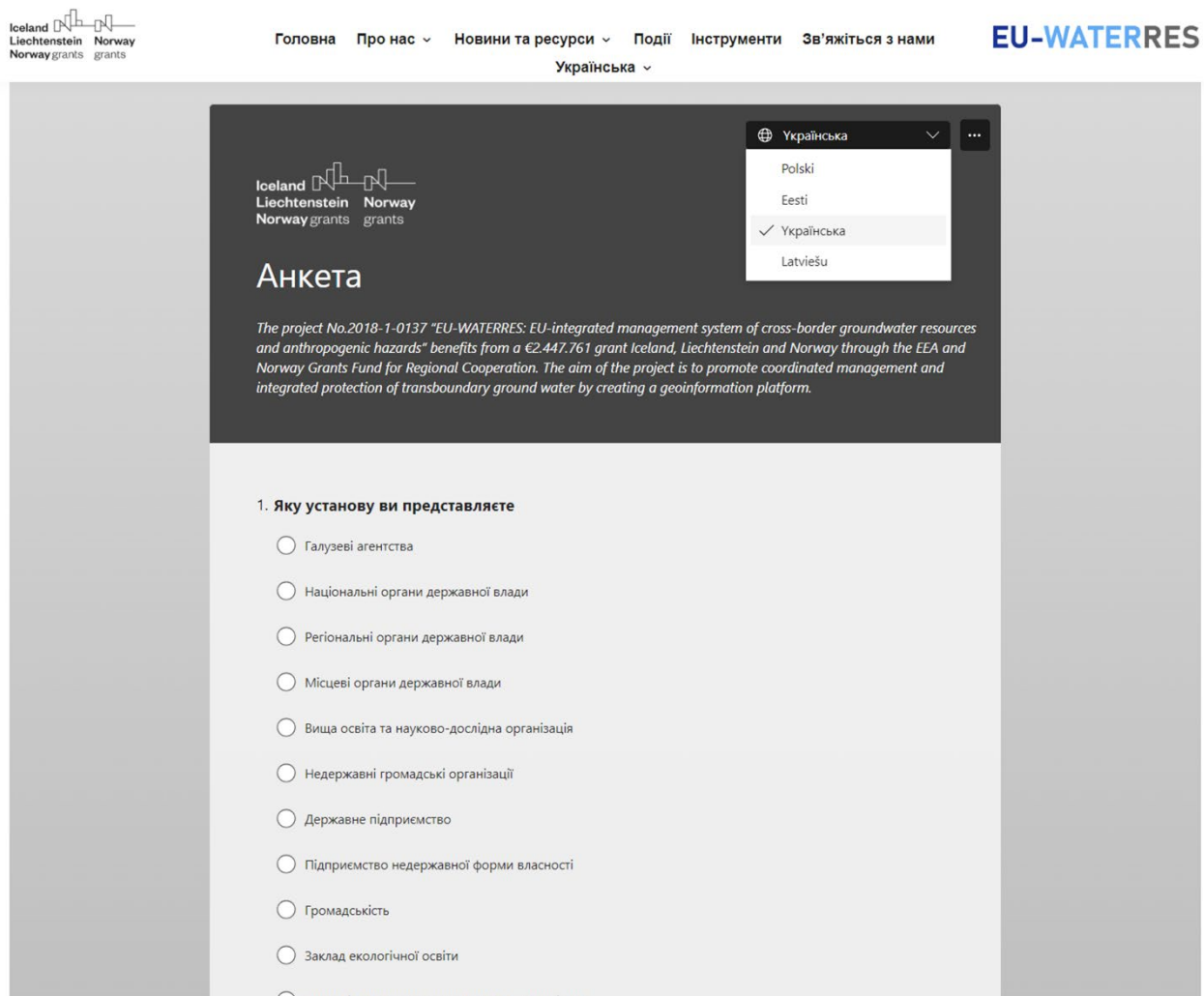
- **Assessing knowledge levels.** Determining the stakeholders' baseline understanding of groundwater management principles and the specific challenges posed by transboundary resources.
- **Identifying interest and concerns:** Gauging the level of stakeholder interest in groundwater issues, which is crucial for fostering active engagement and participation in the project's initiatives.
- **Highlighting knowledge gaps.** Uncovering areas where stakeholders felt they lacked information, which would guide the project's educational and outreach efforts.
- **Understanding information acquisition preferences.** Learning about stakeholders' preferred methods for receiving information enabled the project to tailor its communication strategies effectively.

To ensure inclusivity and accessibility, the questionnaire was translated into several languages: Polish, Ukrainian, Norwegian, Latvian, and Estonian. This multilingual approach facilitated engagement with a diverse group of stakeholders, reflecting the project's trans-European scope. The translation process was not merely linguistic but also cultural, ensuring that the questions resonated with the local context and were understandable to non-native English speakers.

The dissemination of the questionnaire was executed in two phases. In 2021, it was sent to Norwegian stakeholders, with the following year, 2022, seeing its distribution to those in Poland, Estonia, Latvia, and Ukraine. This phased approach allowed for the validation of the questionnaire and tailored analyses of responses over time and across different geographical regions.

A dual-channel distribution strategy was employed, consisting of personalized e-mails (using the developed target group database, see Annex I) and targeted social media outreach. Personalized e-mails ensured direct engagement with identified stakeholders, while social media leveraged the power of online networks to broaden the survey's reach. This hybrid approach aimed to maximize response rates and engage stakeholders in a dialogue that extended beyond the questionnaire.

Figure 1. Example of the stakeholder questionnaire in the Ukrainian language on the EU-WATERRES homepage.



The translated questionnaires are available here (except Norwegian): https://eu-waterres.eu/lv/anketa/?fbclid=IwAR3PZz6Hw_Y-7y64IW_RqKy7YPuJcv9EbsQiqm_nC_JacB9cTmNoaElvflw (the languages can be changed by the drop-down in the right corner). The questions in English are attached in Annex II.

The responses to the questionnaire illuminated the stakeholder awareness and engagement. It became clear who the real stakeholders were, which is essential for the project's targeted approach. The insights gathered were instrumental in refining the project's strategies for communication, education, and involvement, ensuring that the actions taken were aligned with the stakeholders' needs and preferences.

The questionnaire served as a critical tool in shaping the EU-WATERRES project's understanding of its stakeholder community. The thoughtful design, careful translation, and strategic distribution of the survey provided a wealth of data that would drive the project's efforts in protecting transboundary groundwater resources. By acknowledging and addressing the diverse perspectives and preferences of its stakeholders, the EU-WATERRES project laid a solid foundation for collaborative and effective groundwater management.

3. Results and analysis of the questionnaire

The questionnaire was sent out to the target groups in 2021 (Norway) and in 2022 (Poland, Estonia, Latvia, and Ukraine). In total, **141 responses** were collected with the largest activity from Norway (54 respondents), followed by Poland (39), Latvia (24) and Estonia and Ukraine (12).

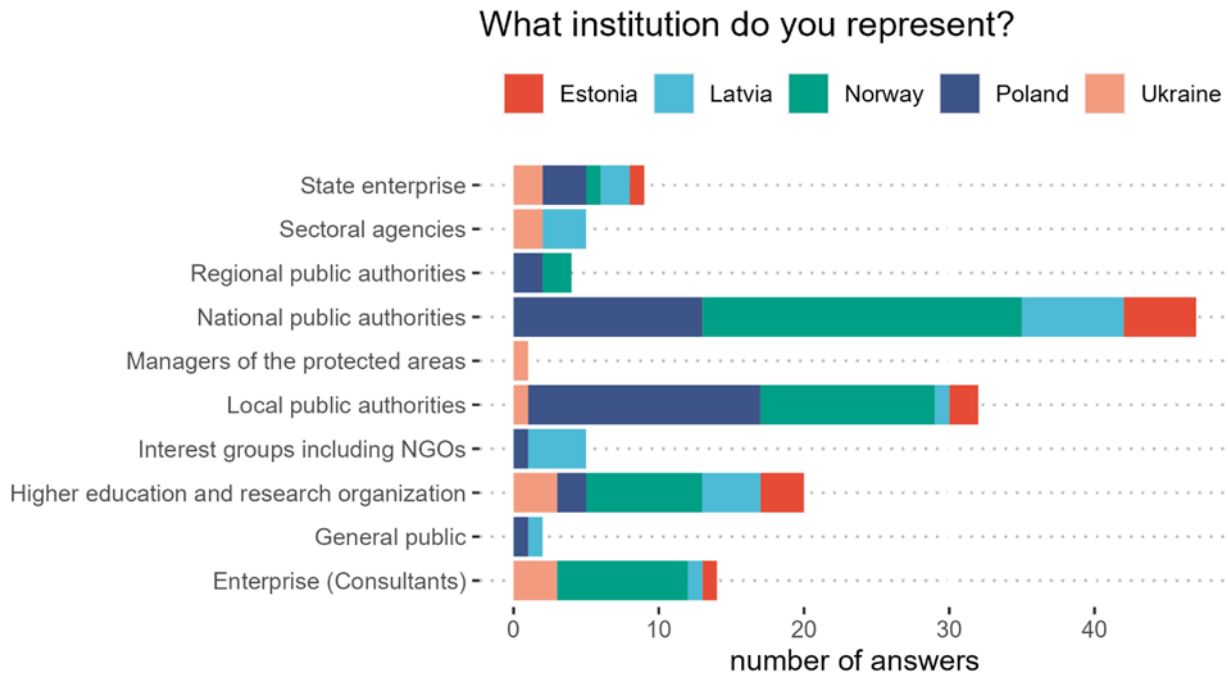


Figure 2. Distribution of questionnaire respondents by target group category and country

Figure 2 presents the distribution of respondents to the EU-WATERRES project questionnaire, categorized by the type of institution they represent and segmented by country. Each category of institution is listed on the y-axis, while the x-axis quantifies the number of answers received from each institution type. The countries represented in the survey are color-coded, with distinct colors assigned to Estonia, Latvia, Norway, Poland, and Ukraine. Half of all respondents represented either national (33.8% of all respondents) or local (23%) public authorities, while higher education and research organizations (14.4%) and enterprises/consultants (10.1%) also are well represented.

From Figure 2, it is evident that the most significant number of responses came from “National public authorities”, particularly in Ukraine, indicating a high level of engagement from governmental organizations at the national level in this country. This suggests that national authorities in Ukraine are highly invested in the issue of transboundary groundwater management, which is critical given the country's extensive groundwater resources and potential for cross-border environmental impacts. “Higher education and research organizations” also show substantial representation across the board, with notable participation from Poland. This highlights the active role that academia and research institutions are playing in the discourse on groundwater protection and management. “Interest groups including NGOs” have demonstrated their involvement as well, especially in Latvia and Poland, pointing to a strong civil society interest and the potential for these groups to influence policy and public opinion. The lower response rates from “Local public authorities”, “Managers of the protected areas”, and “Sectoral agencies” could reflect a varying degree of prioritization of groundwater issues at different administrative and operational levels. Notably, “State enterprise” responses are minimal or non-existent in the data set. This could signify a gap in engaging these entities or a possible lack of relevance to the specific focus of the EU-WATERRES project

questionnaire. Conversely, the “General public” category shows very limited engagement in all countries, which may indicate a need for increased public awareness and outreach efforts to ensure that the general population is adequately informed and involved in groundwater issues.

In conclusion, the distribution of questionnaire respondents by institution type and country provides valuable insights into the engagement levels of various stakeholders in the EU-WATERRES project. It underscores the need for targeted strategies to enhance participation across all institution types and countries, especially those with fewer responses, to ensure a comprehensive and inclusive approach to transboundary groundwater management.

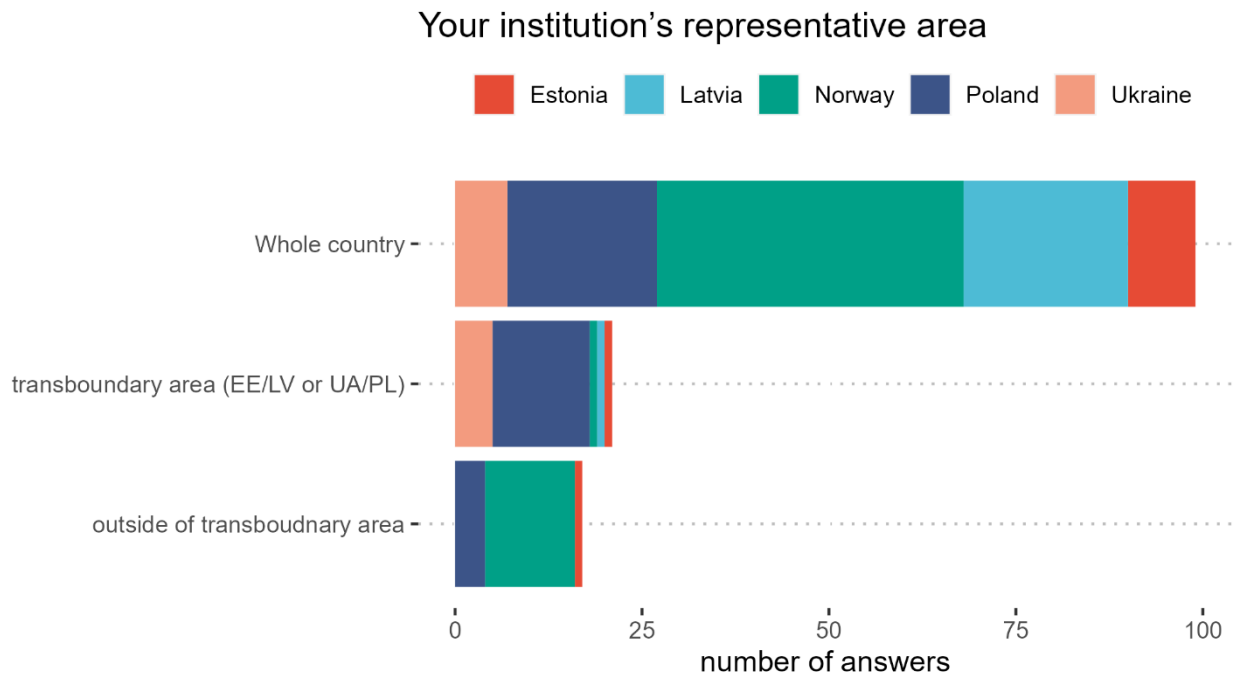


Figure 3. Geographic Scope of questionnaire respondents by country

The bar chart in Figure 3 displays the geographic scope of the institutions represented by respondents to the EU-WATERRES project questionnaire, categorized by the representative area and country. The y-axis lists the areas represented, specifically indicating whether the institutions operate within the whole country, transboundary areas (denoted as EE/LV or UA/PL), or outside of transboundary areas. The x-axis quantifies the number of responses from each area, with the total number of responses represented by the length of the bars, which are color-coded for Estonia, Latvia, Norway, Poland, and Ukraine. Most of the responders represent the whole country (72.3%), while 15.3% of respondents represent transboundary area of whom most answers came from the Polish-Ukrainian transboundary area (18 responses).

Figure 3 provides a clear visual representation of where the engaged institutions operate geographically. Most responses across all countries indicate that the institutions represent the whole country, which suggests that the issues addressed by the EU-WATERRES project resonate at a national level and are recognized as a priority across the broader geographical spectrum. The responses from transboundary areas are particularly significant since the EU-WATERRES project focuses on transboundary groundwater management. Institutions in these areas likely have a direct stake in the project outcomes due to their proximity to international borders and the shared nature of water resources.

Institutions operating outside of transboundary areas also participated in the survey, indicating that groundwater protection is also a concern for areas not immediately adjacent to borders. This suggests an acknowledgment of the interconnectedness of water systems and the broader environmental impact beyond administrative boundaries. An interesting observation is the distribution of responses from Estonia and Ukraine, which contrasts with other countries. Estonia's responses are primarily from institutions outside transboundary areas, while Ukraine has a significant representation from both transboundary and non-transboundary areas. It also could be explained by the size of the countries and the fact that in the Baltics groundwater management and protection is more centralized.

In conclusion, the responses highlight the varied geographic representation of engaged stakeholders, reinforcing the need for the EU-WATERRES project to consider regional specificities in its strategies. Also, the sizes of the countries have an impact as the larger countries have more scattered groundwater management. This geographical diversity underlines the widespread recognition of the importance of groundwater issues and the need for inclusive, cross-border collaboration for effective management and protection.

Is your institution related to groundwater management/exploration/research?

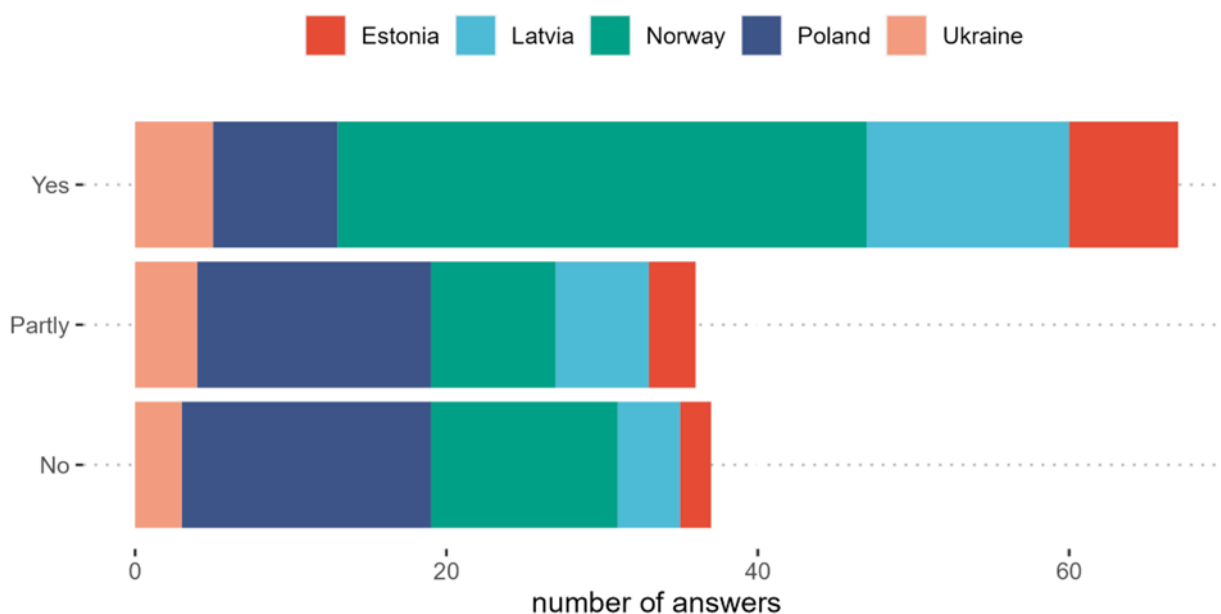


Figure 4. Involvement of institutions in groundwater management by country

Figure 4 is a bar chart illustrating the degree of involvement that institutions in various countries have with groundwater management, exploration, or research. The y-axis categorizes institutions into three levels of involvement: "Yes" for full involvement, "Partly" for partial involvement, and "No" for no involvement. The x-axis shows the number of answers from institutions within each category, broken down by country with a color code: Estonia, Latvia, Norway, Poland, and Ukraine. Most of the respondents are directly (47.9%) or partly (25.7%) related to groundwater management, exploration or research, while only 26.4% of respondents are not related to groundwater issues, indicating that the questionnaire has been properly disseminated.

Figure 4 reveals a significant number of institutions across all surveyed countries that are fully involved in groundwater-related activities, indicating that groundwater management is a prevalent concern within these regions. Notably, Ukraine shows the highest number of institutions fully engaged in groundwater management, suggesting a strong national emphasis on this issue.

Institutions that are partly involved represent those for whom groundwater management is likely one of several focus areas. This diverse involvement is crucial as it reflects a multidisciplinary approach to groundwater issues, bringing in perspectives from different sectors. The responses from Latvia and Norway are particularly evenly distributed across all three categories of involvement, highlighting a balanced mix of institutional engagement levels in these countries.

The “No” category, indicating no involvement in groundwater-related activities, is notably smaller compared to the other categories. However, the presence of these institutions in the survey suggests an interest or potential for future involvement in groundwater matters, or it may reflect the broad reach of the questionnaire, extending beyond the core groundwater community. Poland demonstrates a substantial proportion of institutions that are not involved in groundwater management, which may suggest opportunities for increased engagement and education in this area.

In summary, the data from the questionnaire paints a comprehensive picture of institutional involvement in groundwater matters across the surveyed countries. It underscores the importance of the EU-WATERRES project's efforts to engage a broad range of stakeholders, including those not traditionally associated with groundwater management, to foster a more integrated and holistic approach to this critical environmental issue.

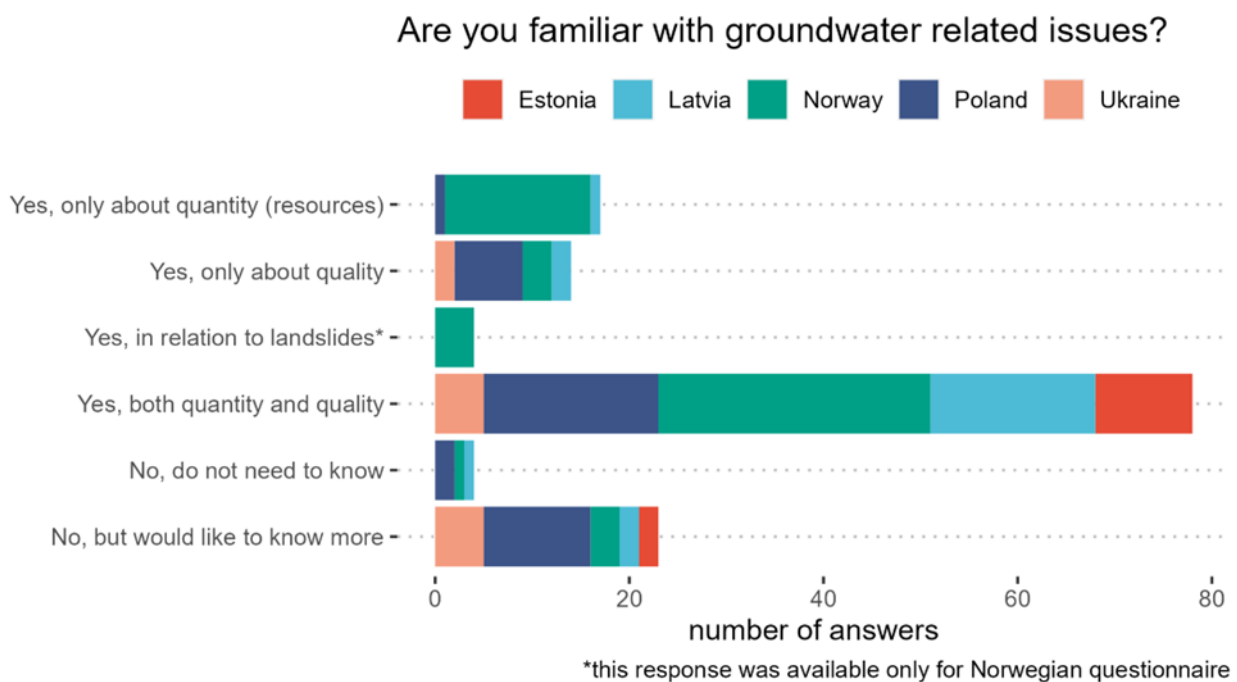


Figure 5. Stakeholder Familiarity with Groundwater Issues by Country

This figure is a bar chart that shows the level of familiarity with groundwater-related issues among respondents from different countries, based on the responses to the EU-WATERRES project questionnaire. The y-axis lists the types of familiarity, including knowledge of groundwater quantity, quality, relation to landslides, and both quantity and quality or lack thereof. It is important to note that the option "Yes, in relation to landslides" was only available to Norwegian respondents. The x-axis displays the number of responses for each category, with color-coded bars representing Estonia, Latvia, Norway, Poland, and Ukraine.

Most of respondents are familiar with both – groundwater quality and quantity issues (55.7%), while fewer respondents are familiar solely with groundwater quantity (12.1%) or groundwater quality (10%). Only 4 respondents (2.86%) are not familiar with the topic and do not want to know anything more, but 23 respondents, although unfamiliar with groundwater related issues, are willing to know more about the topic, thus supporting the necessity for projects like “EU-WATERRES”. The Norwegian respondents had a different questionnaire version, having an additional answer, indicating that 7.41% of Norwegian respondents were familiar with groundwater issues related to landslides.

Figure 5 indicates varied levels of groundwater issue familiarity across the represented countries. Most respondents possess a comprehensive understanding of both groundwater quantity and quality, with Ukraine showing the highest count in this category. This indicates a strong overall awareness and potentially reflects the importance of groundwater resources in Ukraine's national agenda.

Notably, the "Yes, in relation to landslides" category is unique to Norway, which suggests a specific interest or concern in Norway regarding the impact of groundwater on geological stability. This response underscores the country-specific environmental challenges and the importance of tailoring groundwater management strategies to address such localized issues.

The presence of respondents with knowledge limited to either groundwater quantity or quality suggests that there is a segmented understanding of groundwater issues, which may reflect the diverse professional backgrounds and focus areas of the stakeholders.

The categories "No, do not need to know" and "No, but would like to know more" are particularly insightful for the project's outreach and education efforts. The responses in these categories reveal a gap in knowledge or interest that the EU-WATERRES project could aim to fill. Especially in Poland, where the desire to know more is notably high, there is a clear opportunity for enhanced educational initiatives.

In conclusion, the Figure 5 illustrates the diversity of knowledge and awareness of groundwater issues among stakeholders in different countries. The EU-WATERRES project can utilize this data to develop targeted information campaigns and educational programs, aiming to raise awareness where it is lacking and to enhance the understanding where there is already some level of familiarity. This stratified approach to stakeholder engagement is crucial for the effective management and protection of transboundary groundwater resources.

How do you rate your knowledge about groundwater resources? (0-no knowledge; 5-excellent knowledge)

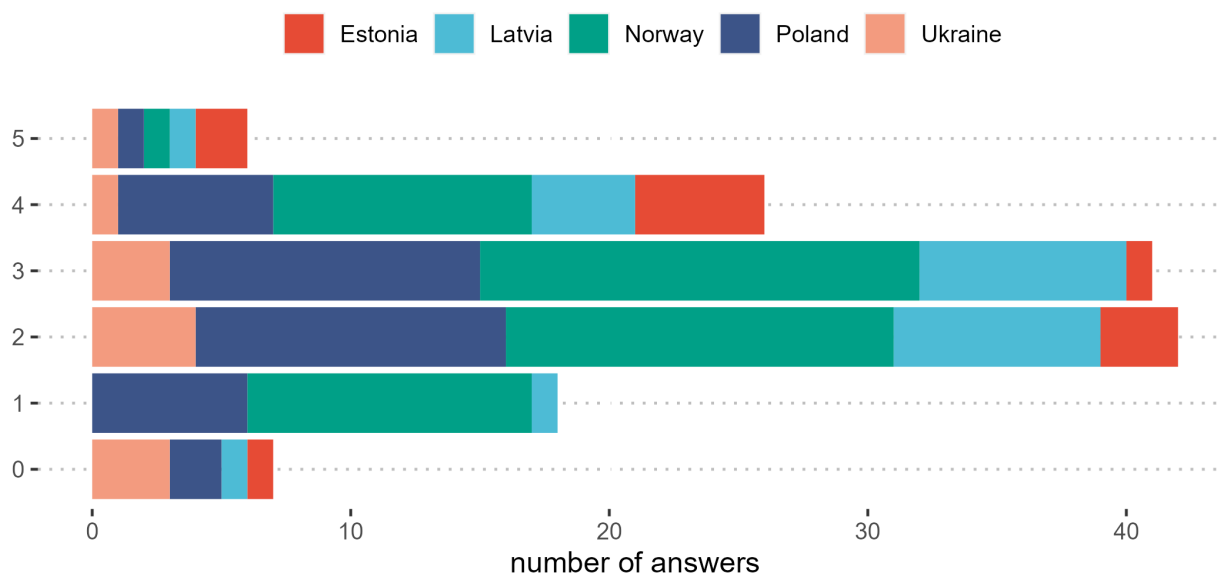


Figure 6. Self-assessment of groundwater knowledge among stakeholders by country

The figure 6 is a horizontal bar chart that displays the self-rated knowledge of groundwater resources among respondents from five countries: Estonia, Latvia, Norway, Poland, and Ukraine. Respondents have rated their knowledge on a scale from 0 (no knowledge) to 5 (excellent knowledge). Each bar's length represents the number of answers for each knowledge level, color-coded by country. Responders have critically evaluated their knowledge about groundwater resources since the average rating is 2.6 out of maximum rating of 5. Only few respondents rate their knowledge as excellent (4.3%) or as really no knowledge (5%). The most confident answers came from Estonia where 16.7% respondents rated their knowledge as excellent.

The distribution of responses across the knowledge scale suggests a varied self-perception of expertise in groundwater resources among the participants. Notably, there is a significant concentration of self-assessed knowledge at level 3, which could be interpreted as a moderate understanding of groundwater resources. This is consistent across all countries, indicating that while there may be a reasonable general awareness of groundwater issues, there is room for improvement in terms of depth and breadth of knowledge.

On the lower end of the scale (1 and 2), we see a modest number of respondents who acknowledge having basic to low knowledge. This candid admission provides an opportunity for the EU-WATERRES project to target educational initiatives and capacity-building programs. The absence of any respondents claiming no knowledge (0) across all countries is a positive indicator of at least a baseline awareness of groundwater issues among the stakeholders surveyed.

In summary, the self-assessment data provides valuable insight into the perceived knowledge levels of groundwater among stakeholders in the participating countries. The EU-WATERRES project could leverage this information to tailor its communication and training efforts, aiming to elevate the overall expertise from moderate to high levels, especially focusing on those who have self-rated in the lower knowledge brackets.

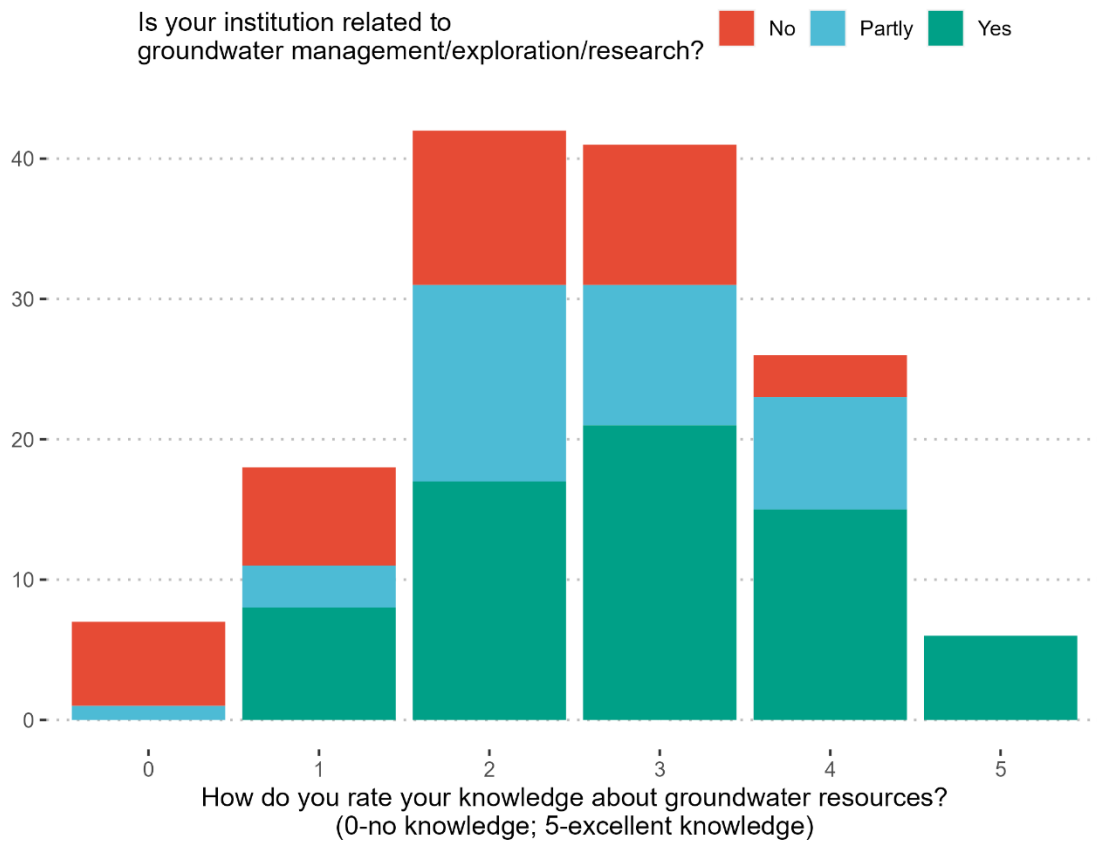


Figure 7. Correlation between institutional affiliation and self-assessment of groundwater knowledge

The figure 7 is a stacked bar chart that correlates the respondents' self-rated knowledge of groundwater resources with whether their institution is related to groundwater management, exploration, or research. The x-axis shows a scale from 0 (no knowledge) to 5 (excellent knowledge), and the y-axis represents the number of answers. The bars are segmented into three colors representing the respondents' institutional affiliation: "No" (red), "Partly" (blue), and "Yes" (green). By combining two answers into one graph we can see that all respondents who rate their knowledge about groundwater resources with the highest score are working concerning groundwater management, exploration, or research. On the contrary, 25 respondents are working in that field too, but rate their knowledge quite low (score 1 to 2). These results suggest that the knowledge about groundwater-related issues must be increased, especially in the institutions that work in the groundwater field.

Figure 7 provides an insightful view into how the affiliation of an institution with groundwater matters influences the self-perception of knowledge among its representatives. A noticeable trend is that individuals from institutions fully related to groundwater (Yes) generally rate their knowledge higher, with the majority falling into the 3 to 4 range on the knowledge scale. This suggests that direct involvement with groundwater issues corresponds with higher confidence in one's understanding of the subject matter.

Conversely, those who are not affiliated (No) or only partly affiliated with groundwater-related institutions tend to rate their knowledge lower, predominantly within the 1 to 3 range. Interestingly, there are still a significant number of respondents with no direct groundwater affiliation who rate their knowledge at level 3, indicating a moderate understanding. This could reflect a general awareness of groundwater issues that extends beyond specialized institutions, perhaps due to public discourse or cross-sectoral initiatives.

The distribution of self-rated knowledge levels among those partly affiliated with groundwater-related institutions is more spread out across the scale, reflecting varied levels of engagement and expertise. This group may consist of professionals whose roles intersect with groundwater management but are not solely focused on it. The data indicates that while there is a clear correlation between institutional affiliation and self-rated knowledge, there is still a breadth of understanding across the spectrum. This diversity highlights the potential for cross-sectoral learning and the importance of inclusive educational programs that cater to a range of expertise levels.

In conclusion, the Figure 7 underscores the need for tailored approaches in capacity-building initiatives. For the EU-WATERRES project, understanding this correlation is vital for designing targeted interventions to enhance groundwater knowledge and management practices across all types of institutions and levels of prior knowledge.

Do you know what the term “transboundary groundwater” means?

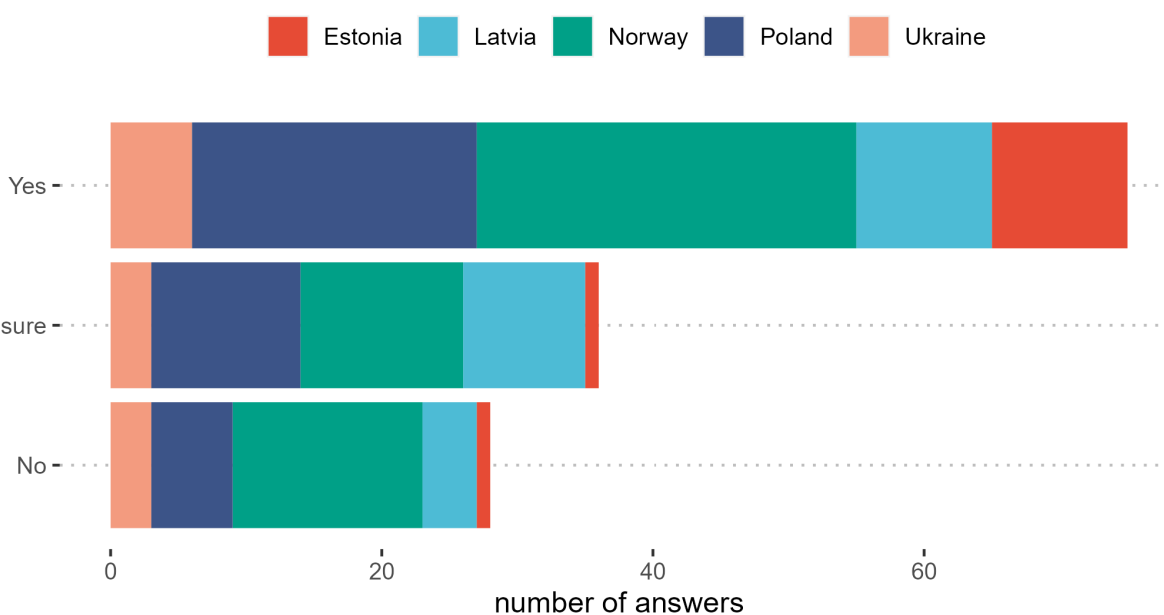


Figure 8. Awareness of the term "Transboundary Groundwater" among survey respondents by country

Figure 8 is a horizontal bar chart showing the number of respondents from various countries who are aware of the term "transboundary groundwater." The responses are categorized into "Yes," "Not sure," and "No," indicating the level of familiarity with the term. The number of answers is displayed on the x-axis, while the y-axis lists the response categories. The bars are color-coded for each country: Estonia, Latvia, Norway, Poland, and Ukraine. More than half of the respondents (54%) know what the term “transboundary groundwater” means with the highest fraction of knowers among Estonians (83.3% of Estonian respondents know the term). However, 25.9% are not sure what this term means and 20.1% of respondents admits lack of knowledge about the “transboundary groundwater” term therefore lessons or workshops about transboundary groundwater issues are welcomed.

Figure 8 suggests that most respondents, particularly in Ukraine, claim to understand the term "transboundary groundwater," indicating a high level of awareness or exposure to this concept. This is a positive sign for the EU-WATERRES project as it implies a foundational level of knowledge among stakeholders that can be built upon through further educational and collaborative initiatives. The "Not sure" category shows a moderate number of responses, which signals an opportunity for clarification and education. This uncertainty may stem from a lack of direct experience with transboundary water issues or a

need for more precise and context-specific information. It could also reflect the complexity of transboundary groundwater management and the challenges in understanding its legal, environmental, and socio-economic dimensions.

A significant number of respondents, particularly from Poland, indicated that they do not know what "transboundary groundwater" means. This highlights a potential knowledge gap that the project needs to address. Ensuring that all stakeholders have a clear understanding of key terms and concepts is crucial for effective communication and collaboration in managing shared groundwater resources.

In summary, the data from Figure 8 is crucial for the EU-WATERRES project as it helped to identify the current state of awareness regarding a central term relevant to the project's scope. While there is a reassuring level of recognition of the term, the project had to also address the lack of understanding in certain areas and countries. By doing so, the project ensured a more informed and inclusive approach to transboundary groundwater management.

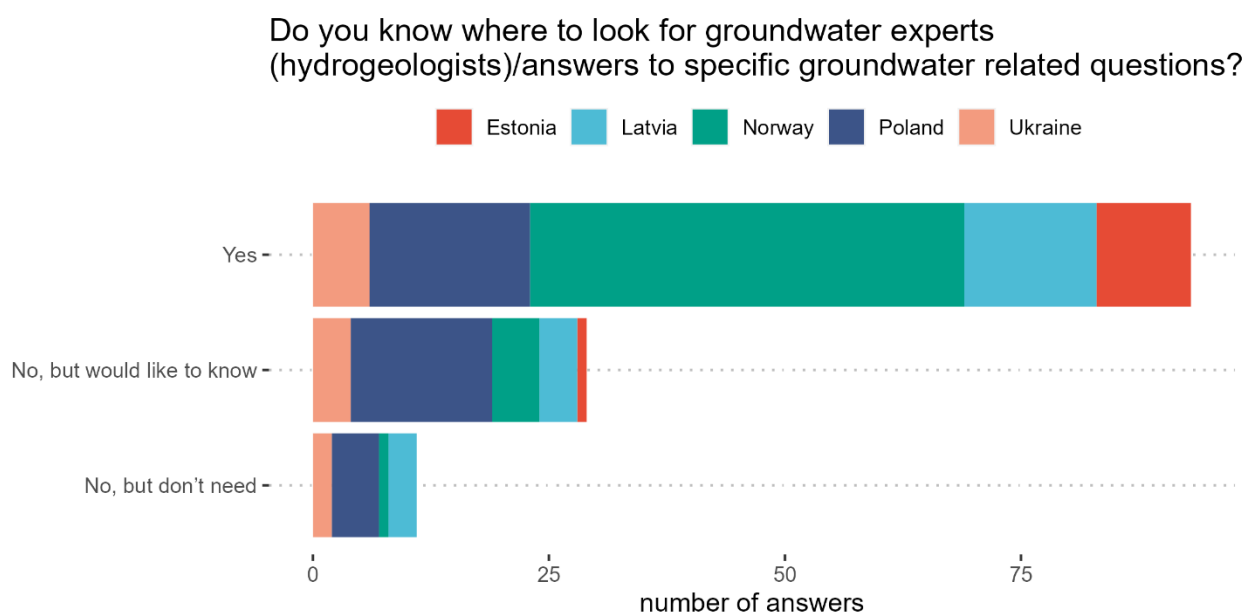


Figure 9. Knowledge of groundwater expertise accessibility among respondents

The figure 9 presents a horizontal bar chart that illustrates the respondents' knowledge of where to find groundwater experts (hydrogeologists) or answers to specific groundwater-related questions. The chart categorizes responses into three distinct groups: "Yes," indicating respondents who know where to look for experts; "No, but would like to know," indicating respondents who are currently unaware but wish to gain this knowledge; and "No, but don't need," indicating respondents who do not know and do not see a need for this information. The colors represent different countries: Estonia, Latvia, Norway, Poland, and Ukraine, with the number of answers on the x-axis.

Figure 9 indicates that a majority of respondents (69.9%) across all countries are aware of where to seek expert advice on groundwater issues. This is particularly true for respondents from Ukraine, which suggests that these stakeholders are well-connected within the groundwater community or have sufficient resources to obtain the necessary information. The number of respondents who are not aware of where to find groundwater experts but express a desire to know indicates an opportunity for the EU-WATERRES project to provide guidance or to create a network that facilitates connections between stakeholders and experts. This could involve developing a directory of resources that are stored in the project homepage <https://eu->

waterres.eu/ or organizing and attending various networking events (like conferences, trainings, summits etc.).

The "No, but don't need" category is the smallest group, indicating that most stakeholders either already have the information they need or are interested in acquiring it. This group's lack of interest in seeking out experts could be due to their role not directly involving groundwater management or they may have sufficient in-house expertise. In conclusion, the chart reveals that while there is a strong existing network for accessing groundwater expertise, there is still a significant portion of the stakeholder community that could benefit from additional resources or support in this area. The EU-WATERRES project can play a crucial role in bridging this gap by facilitating knowledge exchange and providing access to expert contacts.

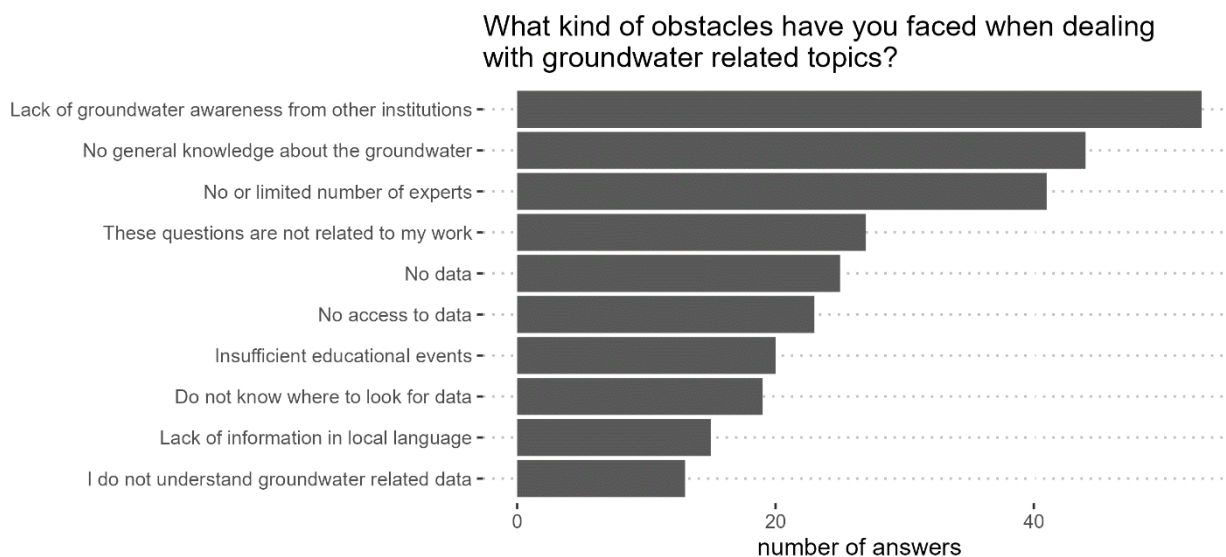


Figure 10. Challenges encountered in groundwater management: stakeholder perspectives

The figure 10 is a horizontal bar chart that displays the variety of obstacles stakeholders have faced when dealing with groundwater-related topics. The y-axis lists potential challenges, such as lack of awareness from other institutions, no general knowledge about groundwater, limited number of experts, and issues with data access or understanding, among others. The x-axis quantifies the number of responses that identified each obstacle, with the length of the bars indicating the frequency of each challenge encountered.

Figure 10 highlights several key challenges, with "Lack of groundwater awareness from other institutions" being the most frequently reported obstacle. This suggests that while individual stakeholders may recognize the importance of groundwater issues, there is a broader challenge in ensuring institutional awareness and prioritization across the board. Another significant challenge identified is the "No general knowledge about groundwater," which points to a fundamental gap in understanding that could impede effective management and decision-making related to groundwater resources. A substantial number of stakeholders also report a "No or limited number of experts" as a barrier, which underscores the need for more trained professionals in the field of hydrogeology and related disciplines.

Issues surrounding data, including "No data," "No access to data," and "Do not know where to look for data," reflect challenges in the availability, accessibility, and dissemination of groundwater information. This highlights the importance of developing robust data-sharing platforms and enhancing transparency in groundwater data management (like the MapPortal created by EU-WATERRES project).

The obstacles of "Insufficient educational events" and "Lack of information in local language" suggest that there are significant opportunities for improvement in stakeholder education and localized resource

availability. Notably, the least reported challenge is "I do not understand groundwater related data," which may indicate that when stakeholders have access to data, they generally possess the competency to comprehend it.

In conclusion, the Figure 10 outlines a clear set of challenges that stakeholders face in the realm of groundwater management. Addressing these issues requires a multifaceted approach by the EU-WATERRES project, including enhancing inter-institutional awareness, improving general knowledge through educational programs, increasing the number of groundwater professionals, and improving data availability and accessibility.

Table 2. Reported obstacles faced in dealing with groundwater-related topics by Norwegian respondents.

Obstacle	Summary of Norwegian Partners' Responses
Lack of Interdisciplinary Cooperation	There is a lack of cooperation between hydrologists, hydraulic engineers, and hydrogeologists.
Limited Expertise in Simulation Tools	A need for expertise in simulation tools that integrate surface water and groundwater; free software options are available but not widely utilized.
Data Access and Management	Limited access to data on public platforms like NGU; no regional or national strategy to publish or pass on data from completed projects.
Insufficient Educational Opportunities	Educational offerings are fragmented, with no specific post-qualifying education focused on groundwater.
Lack of Understanding in Water Directive	Groundwater's importance is not well understood in the Water Directive at national and local levels; data exist but are not well-integrated into management systems.
Municipal Management and Guidelines	Insufficient competence and resources at the municipal level, leading to insufficient internal focus on groundwater.
Invisibility of Groundwater Issues	Groundwater is out of sight and therefore often out of mind.
Fragmented Responsibility	Groundwater responsibility is spread across multiple institutions, making it a marginal discipline for each.
Need for Specific Data	Data is needed for stormwater management planning, including groundwater levels and infiltration capacity.
Limited Focus on Groundwater	Groundwater has not been a focus area, due to assumptions about its condition and lack of knowledge.
Groundwater in Urban Development	Lack of information and expertise on the impact of construction on groundwater and vice versa in urban development.
Shortage of Hydrogeologists	There is a great need for hydrogeologists, but not enough are being educated.
Groundwater as a "Problem"	Groundwater is often dealt with as a problem, such as in the context of construction or landslide management.
Lack of Public Information	There is a lack of clear guidelines for municipalities on managing groundwater and insufficient funds for assessment.
Interdisciplinary Nature of Groundwater	Groundwater issues intersect with many disciplines and practical areas, requiring broad knowledge.

Obstacle	Summary of Norwegian Partners' Responses
Unregistered Groundwater Wells	Many wells are not registered, leading to uncertainty in permits and management.
Unclear Roles and Responsibilities	There is a lack of cross-sectoral and institutional cooperation in groundwater management.
General Lack of Knowledge	A widespread lack of knowledge hinders the ability to effectively manage groundwater.
Fragmentation and Data Quality	Data sets related to groundwater are fragmented and occasionally suffer from quality issues.
Lack of Funding for Research	There is insufficient funding for research and collaboration between relevant entities.
Absence of a Comprehensive Database	No centralized database for wells and groundwater sources, leading to gaps in ownership and management information.
Data Timeliness and Reliability	Challenges with the timeliness and reliability of groundwater data.
Misunderstanding of Groundwater	Confusion between groundwater and surface water among the general public and policymakers.

Main conclusions are:

- **Interdisciplinary cooperation.** There is a critical need for enhanced cooperation between various professionals dealing with water to effectively integrate surface and groundwater management.
- **Data management.** The responses call for improved strategies for data availability and accessibility, including the development of a comprehensive database for groundwater wells and the standardization of data collection.
- **Education and awareness.** There is a significant demand for specialized educational programs in groundwater management, as well as improved public information to raise awareness at all levels of governance.
- **Funding and research.** The need for more funding for research and collaboration is clear, pointing to the requirement for investment in groundwater as a crucial resource and area of study.
- **Groundwater visibility.** The invisibility of groundwater contributes to its marginalization; therefore, strategies to increase its profile in environmental management and policy are needed.
- **Comprehensive strategy.** The responses underscore the necessity of a holistic and nationally coordinated strategy for groundwater management, emphasizing the integration of groundwater considerations into broader water resource directives and local planning processes.

These findings highlight that despite Norway's abundance of water resources, there are significant challenges in the management and understanding of groundwater, necessitating concerted efforts to improve knowledge, cooperation, and data management in this vital area. More elaborated Norwegian stakeholder analysis is available in Annex III.

What type of information would ease the daily work on groundwater issues?

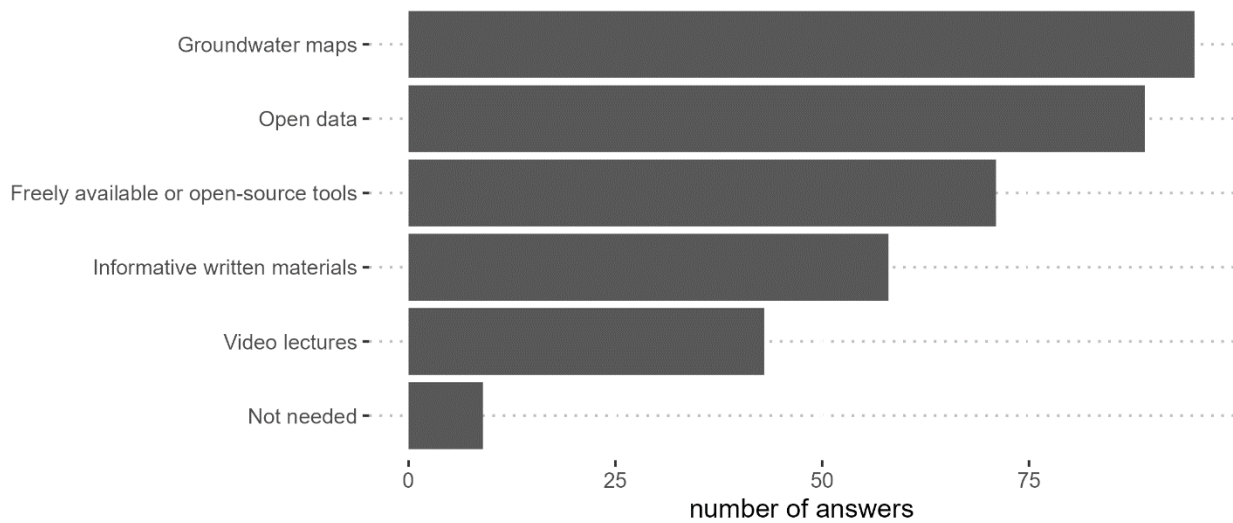


Figure 11. Preferred information resources for groundwater management as indicated by stakeholders

The figure 11 is a horizontal bar chart displaying types of information resources that stakeholders believe would facilitate their daily work on groundwater issues. The resources listed include groundwater maps, open data, freely available or open-source tools, informative written materials, video lectures, and a category for those who do not need additional information. The x-axis represents the number of responses that correspond to each type of information resource.

Figure 11 shows that groundwater maps are the most desired resource, suggesting that visual representations of groundwater data are crucial for stakeholders to understand and manage groundwater effectively. The preference for maps indicates a need for spatially explicit information that can be used for planning, management, and communication purposes. Open data is the second most requested resource, highlighting the importance of accessibility to groundwater data. Stakeholders require data that is not only available but also easily accessible to support decision-making processes and promote transparency. Freely available or open-source tools are also highly valued, pointing to the need for cost-effective solutions for data analysis and management. These tools could help in modeling, predicting, and visualizing groundwater-related phenomena, making complex data more understandable and actionable.

Informative written materials and video lectures are less frequently indicated but still represent important educational resources. These could be instrumental in building capacity, enhancing understanding, and updating stakeholders on the latest developments in the field of groundwater management. The category "Not needed" has the fewest responses, which suggests that most stakeholders recognize the benefit of additional information resources in their work with groundwater issues.

In conclusion, the data from the Figure 11 underscores the need for a multifaceted approach to information resource provision in the field of groundwater management. Stakeholders are looking for practical, accessible, and visual resources to aid in their work. Addressing this need could lead to more informed decision-making, better management practices, and ultimately, the sustainable management of groundwater resources.

Summary of “open questions” on groundwater management information needs:

- **Centralization of groundwater management.** There is a call for moving the responsibility for groundwater management to the Norwegian Water Resources and Energy Directorate (NVE) to ensure better organization and alignment with the Water Directive's requirements.
- **Professional guidelines.** Stakeholders request the development of professional guidelines for managing groundwater-related issues to standardize practices and improve problem-solving.
- **Resource platform.** The creation of a common resource platform is suggested to consolidate information and tools relevant to groundwater management.
- **Increased attention by public agencies.** There is a need for public agencies to give more focus to groundwater issues, enhancing the resource's visibility and importance in public policy and management.
- **Groundwater consciousness.** Enhancing awareness about groundwater issues and challenges is crucial, both for advisors in the field and for clients commissioning groundwater-related projects.
- **Information exchange events.** Regular events for exchanging information on EU water management news are desired to help organize research and address the country's specific needs.
- **Impact of peat extraction.** Informative material based on research is needed to address speculation and provide clear information on the impact of peat extraction on groundwater and adjacent surface waters.
- **Ownership database.** A database detailing the ownership of groundwater wells would be beneficial for management and regulatory purposes.
- **Monitoring data.** Comprehensive monitoring data regarding groundwater quantity, quality, and potential threat sources are critical for effective management and protection strategies.

These responses highlight a significant demand for more structured management, better access to information, increased awareness, and regular updates on research and regulations in the field of groundwater management. Stakeholders emphasized the need for centralized efforts, standardized guidelines, and specific research to inform policies and practices.

Conclusions

- Stakeholder Engagement. Engaging with stakeholders and target groups is critical for the success of transboundary groundwater protection projects. A comprehensive understanding of these groups is essential for sustainable management and for the project's outcomes to be relevant and impactful beyond its lifespan.
- Integration of Stakeholder Needs. Projects often lack comprehensive stakeholder integration, which can lead to less effective protection of their needs and interests. Integrating target groups into all stages of the project ensures that methodologies and data are tailored to the groups it aims to serve.
- User-Centered Design. A “user-centered design” approach in environmental projects ensures the integration of various viewpoints and knowledge systems, enhancing data robustness and the relevance of methodologies.
- Identification and Engagement of Target Groups. Careful identification and continuous engagement of target groups allow for a tailored approach to address real-world problems effectively. Active involvement of these groups in the testing phase empowers them and fosters a sense of ownership, crucial for the long-term acceptance and sustainability of the project outcomes.
- Approaches to Stakeholder Involvement. There is no one-size-fits-all process for identifying and engaging target groups. Projects require tailored strategies that consider the specific challenges and opportunities presented.

Recommendations

- Develop Professional Guidelines. Create professional guidelines for managing groundwater-related problems to standardize and improve management practices. For this purpose, the EU-WATERRES project prepared a set of reports regarding hydrogeological data harmonization, groundwater vulnerability assessment, development of hydrodynamic models etc. All reports are available in project homepage <https://eu-waterres.eu/>.
- Create a Common Resource Platform. Develop a common resource platform to consolidate tools and information pertinent to groundwater management, facilitating easy access for all stakeholders. For this purpose, the project created an open access MapPortal consisting of 17 different data layers for two transboundary groundwater pilot areas (Poland-Ukraine and Latvia-Estonia). The MapPortal is available at <https://eu-waterres.eu/web-app/>.
- Increase Public Agency Involvement. Encourage public agencies to pay more attention to groundwater to enhance its visibility in public policy and management. This was done through targeted communication via project organized events (i.e. final event) and through disseminating project progress via Newsletters.
- Boost Groundwater Consciousness. Enhance awareness of groundwater issues and challenges among all stakeholders, including advisors and clients, to foster active engagement in groundwater projects. The general awareness of groundwater protection was increased by active communication through project homepage and social media accounts as well as the participation in large worldwide events (i.e. first Groundwater Summit in Paris 2022). To improve awareness of transboundary groundwater protection within scientific community we attended several international scientific conferences (EGU23 in Vienna, IAH23 in Cape Town and AGU23 in San Francisco) and published project results in joint scientific peer-reviewed articles.
- Organize Information Exchange Events. Hold regular information exchange events to discuss updates in EU water management, allowing stakeholders to organize research and address country-specific needs effectively. To reach national stakeholders a dedicated events were held in all project partner countries.
- Enhance Monitoring Data Accessibility. Ensure comprehensive monitoring data on groundwater quantity, quality, and potential threats are widely available for effective management and protection. This issue was addressed through the developed reports, common hydrodynamic models and created MapPortal.

By addressing these recommendations, projects like EU-WATERRES can significantly improve the management and protection of groundwater resources, particularly in the context of transboundary aquifers. This, in turn, will contribute to the overall sustainability of water resources and compliance with environmental directives.

Annex I - Target group database

No.	Country	Representative region	Institution	Target group category
1	Latvia	Transboundary area	Alūksne Municipality	Local public authorities
2	Latvia	Transboundary area	Ape Municipality	Local public authorities
3	Latvia	Transboundary area	Beverīna Municipality	Local public authorities
4	Latvia	Transboundary area	Burtnieki Municipality	Local public authorities
5	Latvia	Transboundary area	Gulbene Municipality	Local public authorities
6	Latvia	Transboundary area	Kocēni Municipality	Local public authorities
7	Latvia	Transboundary area	Mazsalaca Municipality	Local public authorities
8	Latvia	Transboundary area	Naukšēni Municipality	Local public authorities
9	Latvia	Transboundary area	Pārgauja Municipality	Local public authorities
10	Latvia	Transboundary area	Rūjiena Municipality	Local public authorities
11	Latvia	Transboundary area	Salacgrīva Municipality	Local public authorities
12	Latvia	Transboundary area	Smiltene Municipality	Local public authorities
13	Latvia	Transboundary area	Strenči Municipality	Local public authorities
14	Latvia	Transboundary area	Valka Municipality	Local public authorities
15	Latvia	Transboundary area	Aloja Municipality	Local public authorities
16	Latvia	Transboundary area	Limbaži Municipality	Local public authorities
17	Latvia	Transboundary area	Riga Planning Region	Regional public authorities
18	Latvia	Transboundary area	Vidzeme Regional Environmental Board	Regional public authorities
19	Latvia	Whole country	Ministry of Environmental Protection and Regional Development	National public authorities
20	Latvia	Whole country	Ministry of Agriculture	National public authorities
21	Latvia	Whole country	Ministry of Agriculture	National public authorities
22	Latvia	Whole country	Institute of Biology (University of Latvia)	Higher education and research organisation
23	Latvia	Whole country	Riga Technical University	Higher education and research organisation
24	Latvia	Whole country	Latvian State Forest Research Institute "Silava"	Higher education and research organisation
25	Latvia	Whole country	Latvia University of Life Sciences and Technologies	Higher education and research organisation
26	Latvia	Whole country	Latvian Environment, Geology and Meteorology Centre	Sectoral agencies
27	Latvia	Whole country	Nature Conservation Agency	Sectoral agencies
28	Latvia	Whole country	Latvian Fund of Nature	Sectoral agencies
29	Latvia	Whole country	Latvian State Forests	Sectoral agencies
30	Latvia	Whole country	The Administration of Latvian Environmental Protection Fund	Sectoral agencies
31	Latvia	Whole country	Farmers Parliament (Zemnieku Saeima)	Interest groups including NGOs
32	Latvia	Whole country	The Latvian Association of Local and Regional Governments	Interest groups including NGOs
33	Latvia	Whole country	Homo Eco	Interest groups including NGOs
34	Latvia	Whole country	SIA "Estonian, Latvian & Lithuanian Environment"	Enterprise (Consultants)
35	Latvia	Whole country	Baltic Environmental Forum Latvia	Interest groups including NGOs
36	Latvia	Whole country	Institute "BIOR"	Higher education and research organisation
37	Latvia	Whole country	Latvian Institute of Aquatic Ecology	Higher education and research organisation
38	Latvia	Whole country	Institute for Environmental Solutions	Higher education and research organisation
39	Latvia	Whole country	Latvian Rural Advisory and Training Centre	Enterprise (Consultants)
40	Latvia	Whole country	Daugavpils University	Higher education and research organisation
41	Latvia	Whole country	SIA "VentEko"	Enterprise (Consultants)
42	Latvia	Whole country	SIA "GeoConsultants"	Enterprise (Consultants)
43	Latvia	Whole country	SIA "Vides Konsultāciju Birojs"	Enterprise (Consultants)
44	Latvia	Whole country	SIA "Firma L4"	Enterprise (Consultants)
45	Latvia	Whole country	SIA "Vides eksperti"	Enterprise (Consultants)
46	Latvia	Whole country	Green Liberty (Zaļā Brīvība)	Interest groups including NGOs
47	Latvia	Whole country	Latvian Geography Association	Interest groups including NGOs
48	Latvia	Whole country	Environmental Protection Club	Interest groups including NGOs
49	Latvia	Whole country	Latvian Peat Association	Interest groups including NGOs
50	Latvia	Transboundary area	Vidzeme Planning Region	Regional public authorities
51	Latvia	Whole country	Rezekne Academy of Technologies	Higher education and research organisation
52	Latvia	Whole country	Latvian Geospatial Information Agency	Sectoral agencies

No.	Country	Representative region	Institution	Target group category
53	Latvia	Whole country	Vidzeme University of Applied Sciences	Higher education and research organisation
54	Latvia	Whole country	State Environmental Service	National public authorities
55	Latvia	Transboundary area	North Vidzeme Biosphere Reserve	Managers of the protected areas
56	Estonia	Whole country	Maves OÜ	Enterprise (Consultants)
57	Estonia	Whole country	Maves OÜ	Enterprise (Consultants)
58	Estonia	Whole country	Estonian Environment Agency, Data Management Department	National public authorities
59	Estonia	Whole country	Ministry of the Environment of Estonia, Water Department	National public authorities
60	Estonia	Whole country	University of Tartu, Department of Geology	Higher education and research organisation
61	Estonia	Transboundary area	Häädemeeste Municipality	Local public authorities
62	Estonia	Transboundary area	Häädemeeste Municipality	Local public authorities
63	Estonia	Transboundary area	Saarde Municipality	Local public authorities
64	Estonia	Transboundary area	Mulgi Municipality	Local public authorities
65	Estonia	Transboundary area	Tõrva Municipality	Local public authorities
66	Estonia	Transboundary area	Valga Municipality	Local public authorities
67	Estonia	Transboundary area	Viljandi Municipality	Local public authorities
68	Estonia	Transboundary area	Otepää Municipality	Local public authorities
69	Estonia	Transboundary area	Antsla Municipality	Local public authorities
70	Estonia	Transboundary area	Rõuge Municipality	Local public authorities
71	Estonia	Transboundary area	Võru Municipality	Local public authorities
72	Estonia	Whole country	Environmental Board	National public authorities
73	Estonia	Whole country	Environmental Board	National public authorities
74	Estonia	Whole country	Environmental Board	National public authorities
75	Estonia	Whole country	Estonian Environment Agency, Data Management Department	National public authorities
76	Estonia	Whole country	Estonian University of Life Sciences, Institute of Forestry and Rural Engineering	Higher education and research organisation
77	Estonia	Whole country	Ministry of the Environment of Estonia, Water Department	National public authorities
78	Estonia	Whole country	Estonian Fund for Nature	Interest groups includin NGOs
79	Estonia	Whole country	Estonian Naturalists' Society	Interest groups includin NGOs
80	Estonia	Whole country	Estonian University of Life Sciences, Institute of Agricultural and Environmental Sciences	Higher education and research organisation
81	Estonia	Whole country	Tallinn University, Institute of Ecology	Higher education and research organisation
82	Poland	Whole country	Ministry of Climate and the Environment	National public authorities
83	Poland	Whole country	State Holding "Polish Waters"	State enterprise
84	Poland	Whole country	State Holding "Polish Waters"	State enterprise
85	Poland	Transboundary area	Regional Water Management Authority in Warsaw	Regional public authorities
86	Poland	Transboundary area	Regional Water Management Authority in Lublin	Regional public authorities
87	Poland	Transboundary area	Regional Water Management Authority in Rzeszow	Regional public authorities
88	Poland	Whole country	Ministry of Infrastructure Department of Water Management and Inland Navigation (DGWiZS)	National public authorities
89	Poland	Whole country	Chief Inspectorate for Environmental Protection	National public authorities
90	Poland	Transboundary area	Chief Inspectorate for Environmental Protection, Regional Department of Environmental Monitoring in Lublin	Regional public authorities
91	Poland	Whole country	General Directorate for Environmental Protection	National public authorities
92	Poland	Transboundary area	Association "Polish Bug Valley (NGO)"	Interest groups includin NGOs
93	Poland	Region outside transboundary area	University of Warsaw	Higher education and research organisation
94	Poland	Transboundary area	County Office in Włodawa	Local public authorities
95	Poland	Transboundary area	County Office in Chełm	Local public authorities
96	Poland	Transboundary area	County Office in Hrubieszów	Local public authorities
97	Poland	Transboundary area	County Office in Tomaszów Lubelski	Local public authorities
98	Poland	Transboundary area	County Office in Lubaczów	Local public authorities
99	Poland	Transboundary area	County Office in Lubaczów	Local public authorities
100	Poland	Transboundary area	County Office in Lubaczów	Local public authorities

No.	Country	Representative region	Institution	Target group category
101	Poland	Transboundary area	County Office in Jarosław	Local public authorities
102	Poland	Transboundary area	County Office in Przemyśl	Local public authorities
103	Poland	Transboundary area	East European State College in Przemyśl	Higher education and research organisation
104	Poland	Transboundary area	County Office in Ustrzyki Dolne	Local public authorities
105	Poland	Transboundary area	Jarczów Municipality Office	Local public authorities
106	Poland	Transboundary area	Lubycza Królewska Municipality	Local public authorities
107	Poland	Transboundary area	Telatyn Municipality	Local public authorities
108	Poland	Transboundary area	Tyszowce Municipality	Local public authorities
109	Poland	Transboundary area	Ułhówek Community Office	Local public authorities
110	Poland	Transboundary area	Hańsk Municipality	Local public authorities
111	Poland	Transboundary area	Włodawa Community Office	Local public authorities
112	Poland	Transboundary area	Wola Uhruska Community Office	Local public authorities
113	Poland	Transboundary area	Białopole Community Office	Local public authorities
114	Poland	Transboundary area	Chełm Community Office	Local public authorities
115	Poland	Transboundary area	Dorohusk Community Office	Local public authorities
116	Poland	Transboundary area	Dubienka Community Office	Local public authorities
117	Poland	Transboundary area	Kamień Community Office	Local public authorities
118	Poland	Transboundary area	Ruda-Huta Community Office	Local public authorities
119	Poland	Transboundary area	Sawin Community Office	Local public authorities
120	Poland	Transboundary area	Dołhobycz Community Office	Local public authorities
121	Poland	Transboundary area	Horodło Community Office	Local public authorities
122	Poland	Transboundary area	Hrubieszów Community Office	Local public authorities
123	Poland	Transboundary area	Mircze Municipality	Local public authorities
124	Poland	Transboundary area	Trzuszczany Community Office	Local public authorities
125	Poland	Transboundary area	Uchanie Community Office	Local public authorities
126	Poland	Transboundary area	Werbkowice Community Office	Local public authorities
127	Poland	Transboundary area	Chełm City Council	Local public authorities
128	Poland	Transboundary area	Chełm Community Office	Local public authorities
129	Poland	Transboundary area	Tyszowce Municipal Office	Local public authorities
130	Poland	Transboundary area	Cieszanów Town and Commune Office	Local public authorities
131	Poland	Transboundary area	Horyniec-Zdrój Community Office	Local public authorities
132	Poland	Transboundary area	Czarna Łącka Municipality	Local public authorities
133	Poland	Transboundary area	Lutowiska Community Office	Local public authorities
134	Poland	Transboundary area	Ustrzyki Dolne Municipality	Local public authorities
135	Poland	Transboundary area	Laszki Community Office	Local public authorities
136	Poland	Transboundary area	Radymno Municipality	Local public authorities
137	Poland	Transboundary area	Łaszczów Municipal Office	Local public authorities
138	Poland	Transboundary area	Lubaczów Community Office	Local public authorities
139	Poland	Transboundary area	Cieszanów Town and Commune Office	Local public authorities
140	Poland	Transboundary area	Oleszyce Town and Commune Office	Local public authorities
141	Poland	Transboundary area	Wielkie Oczy Municipality	Local public authorities
142	Poland	Transboundary area	Fredropol Community Office	Local public authorities
143	Poland	Transboundary area	Krasieczyn Community Office	Local public authorities
144	Poland	Transboundary area	Medyka Community Office	Local public authorities
145	Poland	Transboundary area	Orły Community Office	Local public authorities
146	Poland	Transboundary area	Przemyśl Community Office	Local public authorities
147	Poland	Transboundary area	Stubno Community Office	Local public authorities
148	Poland	Transboundary area	Radymno Municipal Office	Local public authorities
149	Poland	Transboundary area	Ustrzyki Dolne Municipal Office	Local public authorities
150	Poland	Transboundary area	Ustrzyki Dolne Municipal Office	Local public authorities
151	Poland	Transboundary area	Lubaczów Municipal Office	Local public authorities
152	Poland	Transboundary area	Żurawica Community Office	Local public authorities
153	Poland	Transboundary area	Żmudź Community Office	Local public authorities
154	Poland	Transboundary area	Intercommunal Union "Ziemia Lubaczowska"	General public
155	Poland	Transboundary area	Przemyśl Economic and Social Convention	General public
156	Poland	Transboundary area	Carpathian Development Foundation	General public
157	Poland	Transboundary area	Local Action Group "Przemyska Land"	General public
158	Poland	Transboundary area	Association Changing-Przemyśl	General public
159	Poland	Transboundary area	League of Nature Protection - Chelm Regional Council	General public

No.	Country	Representative region	Institution	Target group category
160	Poland	Transboundary area	Partnership and Cooperation Foundation	General public
161	Poland	Transboundary area	Association for Cross-Border Integration "Łączy nas Bug"	General public
162	Poland	Transboundary area	Local Action Group "Roztocze Tomaszowskie"	General public
163	Poland	Transboundary area	Ecological Association „Clean Ustrzyki Dolne"	General public
164	Poland	Transboundary area	Association „EKO-KARPATY	General public
165	Poland	Transboundary area	Bieszczady Local Government Association	General public
166	Poland	Transboundary area	Association of Polish Local Governments Co-operating with National Parks and Local Governments having other legally protected areas in their territory	General public
167	Poland	Transboundary area	Foundation for Lubelskie Development	General public
168	Poland	Transboundary area	Rzeszów University of Technology Environmental Engineering	Higher education and research organisation
169	Poland	Whole country	RSK Polska	State enterprise
170	Ukraine	Whole country	State Service of Geology and Subsoil of Ukraine	Sectoral agencies
171	Ukraine	Region outside transboundary area	Private joint-stock company "National joint-stock company "Nadra Ukrainy"	Sectoral agencies
172	Ukraine	Whole country	Institute of Renewable Energy of the NAS of Ukraine	Higher education and research organisation
173	Ukraine	Whole country	Institute of Geological Sciences of the NAS of Ukraine	Higher education and research organisation
174	Ukraine	Whole country	Ukrainian Research Hydrometeorological Institute under the Ministry for Emergencies of the NAS of Ukraine	Higher education and research organisation
175	Ukraine	Whole country	Carpathian branch of Subbotin Institute of Geophysics Sciences of the NAS of Ukraine	Higher education and research organisation
176	Ukraine	Whole country	State Agency of Water Resources	Sectoral agencies
177	Ukraine	Transboundary area	Department of Ecology and Natural Resources of the Lviv Regional State Administration	Sectoral agencies
178	Ukraine	Transboundary area	Sector in the Lviv region of the State Agency of Water Resources	Sectoral agencies
179	Ukraine	Transboundary area	State Ecological Inspectorate in Lviv Region	Sectoral agencies
180	Ukraine	Transboundary area	Basin management of water resources of the Western Bug and San rivers	Sectoral agencies
181	Ukraine	Transboundary area	Dniester Basin Department of Water Resources	Sectoral agencies
182	Ukraine	Transboundary area	Ivan Franko National University of Lviv, Faculty of Geology	Higher education and research organisation
183	Ukraine	Transboundary area	Ivan Franko National University of Lviv, Faculty of Geography	Higher education and research organisation
184	Ukraine	Transboundary area	Lviv City Municipal Enterprise «Lvivvodokanal»	Enterprise (Consultants)
185	Ukraine	Transboundary area	Municipal Enterprise "Sokalvodokanal"	Enterprise (Consultants)
186	Ukraine	Transboundary area	Municipal Enterprise "Radekhiv City Water Sewerage"	Enterprise (Consultants)
187	Ukraine	Transboundary area	Municipal Enterprise "Chervonogradvodokanal"	Enterprise (Consultants)
188	Ukraine	Transboundary area	Municipal Enterprise "Zhovkva Production Department of Housing and Communal Services"	Enterprise (Consultants)
189	Ukraine	Transboundary area	Municipal Enterprise "Novoyavorivskvodokanal"	Enterprise (Consultants)
190	Ukraine	Transboundary area	Municipal Enterprise "Vodokanal" Mostyska	Enterprise (Consultants)
191	Ukraine	Transboundary area	Novokalynivske "Production Department of Housing and Communal Services"	Enterprise (Consultants)
192	Ukraine	Transboundary area	Sambir "Production Department of Housing and Communal Services"	Enterprise (Consultants)
193	Ukraine	Transboundary area	Municipal Enterprise "Starosambir city water supply and sewerage economy"	Enterprise (Consultants)
194	Ukraine	Transboundary area	Municipal Enterprise "Horodok Water Supply and Sewerage"	Enterprise (Consultants)
195	Ukraine	Transboundary area	Yavoriv district council	Local public authorities
196	Ukraine	Transboundary area	Yavoriv District State Administration	Local public authorities
197	Ukraine	Transboundary area	Mostyska District State Administration	Local public authorities
198	Ukraine	Transboundary area	Starosambir District State Administration	Local public authorities

No.	Country	Representative region	Institution	Target group category
199	Ukraine	Transboundary area	Starosambir district council	Local public authorities
200	Ukraine	Transboundary area	Sambir district council	Local public authorities
201	Ukraine	Transboundary area	Horodok City Council	Local public authorities
202	Ukraine	Transboundary area	Pustomyty District State Administration	Local public authorities
203	Ukraine	Transboundary area	Kamianka-Buzka District State Administration	Local public authorities
204	Ukraine	Transboundary area	Radekhiv District State Administration	Local public authorities
205	Ukraine	Transboundary area	Yavoriv National Nature Park	Managers of the protected areas
206	Ukraine	Region outside transboundary area	«Hydrogeological Enterprise «Ukrheokaptazhminvod» private joint stock company «Ukrprofzodorovnytsia»	Enterprise (Consultants)
207	Ukraine	Transboundary area	MME "Yavorivvoda	Enterprise (Consultants)
208	Ukraine	Transboundary area	Geotechnical Institute, Private Joint Stock Company	Enterprise (Consultants)
209	Ukraine	Transboundary area	Belz City Community	Local public authorities
210	Ukraine	Transboundary area	Dobrotvir village council	Local public authorities
211	Ukraine	Transboundary area	Velykomostivska City Council	Local public authorities
212	Ukraine	Transboundary area	Zhovkva City Council	Local public authorities
213	Ukraine	Transboundary area	Mostyska City Council	Local public authorities
214	Ukraine	Transboundary area	Kamyanka-Buzka City Council	Local public authorities
215	Ukraine	Transboundary area	Sokal City Council	Local public authorities
216	Ukraine	Transboundary area	Rava-Ruska City Council	Local public authorities
217	Ukraine	Transboundary area	Sosnivka City Council	Local public authorities
218	Ukraine	Transboundary area	State enterprise Lvivvughiliya	State enterprise
219	Ukraine	Region outside transboundary area	Ecological College Lviv National Agrarian University	Higher education and research organisation
220	Ukraine	Transboundary area	Lviv Regional Center for Hydrometeorology	State enterprise
221	Ukraine	Transboundary area	"GIX BUR" Limited Liability Company	Enterprise (Consultants)
222	Ukraine	Transboundary area	"KVARTS" Limited Liability Company	Enterprise (Consultants)
223	Ukraine	Transboundary area	Department of Ecology and Natural Resources of the Volyn Regional State Administration	Sectoral agencies
224	Ukraine	Transboundary area	Regional Office of Water Resources in Volyn region	Sectoral agencies
225	Ukraine	Transboundary area	Shatsk National Nature Park	Managers of the protected areas
226	Ukraine	Transboundary area	Enterprise "Novovolynskvodokanal"	Enterprise (Consultants)
227	Ukraine	Transboundary area	Department of Water and Sewerage of the City of Volodymyr-Volynskyyi	Enterprise (Consultants)
228	Ukraine	Transboundary area	Volyn Regional Center for Hydrometeorology	Sectoral agencies

Annex II – Questionnaire template

1) What institution do you represent?

[Single option from the list:

Sectoral agencies; National public authorities; Regional public authorities; Local public authorities; Higher education and research organization; Interest groups including NGOs; State enterprise; Enterprise (Consultants); General public; Environmental education centre; Managers of the protected areas]

2) Your institution's representative area (It would be beneficial to have a small image to indicate EE-LV and PL-UA pilot areas for the reader)

[Single option from the list:

Whole country; {pilot area} transboundary area; Outside {pilot area} transboundary area / {pilot area} – “Estonian-Latvian” or “Polish-Ukrainian” according to the target audience/]

3) Is your institution related to groundwater management/exploration/research?

[Single option from the list: yes/no/partly]

4) Are you familiar with groundwater related issues?

[Single option from the list:

Yes, only about quality; Yes, only about quantity (resources); Yes, both quantity and quality; No, but would like to know more; No, don't need to know;]

5) How do you rate your knowledge about groundwater resources? (0-no knowledge; 5-excellent knowledge)

[Single option from rating number list: 0-5]

6) Do you know what the “transboundary groundwater” term means?

[Single option from the list: Yes/No/Not sure]

7) Please describe in your own words how do you understand the term “transboundary groundwater”.

[Open question]

8) Do you face any obstacles dealing when considering groundwater issues?

[Multiple options from the list:

No general knowledge about the groundwater; Lack of groundwater awareness from other institutions; Lack of information in {local} language /{local}-we can point to specific language, e.g. Latvian according to the audience/; No or limited number of experts; Don't know where to look for data; No access to data; No data; I don't understand groundwater related data; Insufficient educational events; These questions are not related to my work; Other /Open question option/]

9) What type of information would ease the daily work on groundwater issues?

[Multiple options from the list:

Informative written materials; Video lectures; Groundwater maps; Open data; Freely available or open-source tools, Not needed; Other /Open question option/]

10) Do you know where to look for groundwater experts (hydrogeologists)/answers to specific groundwater related questions?

[Single option from the list:

Yes; No, but don't need; No, but would like to know; Other /Open question option/]

Annex III – The results from Norwegian questionnaire

English summary:

The EU-WATERRES survey conducted among Norwegian stakeholders emphasize ongoing challenges in groundwater management in Norway. Respondents identified several key issues:

- Groundwater management in Norway is fragmented.
- There's a need for increased knowledge in groundwater management and across society.
- Open, user-friendly databases are necessary.
- More funding resources are required for mapping.
- Improved collaboration between various governmental agencies is essential.

These points collectively suggest that while strides have been made in unified water management due to the EU Water Framework Directive and The Water Convention, substantial work remains, particularly in the realm of groundwater management and inter-agency cooperation.

NGU RAPPORT

2021.027

EU-WATERRES - Spørreundersøkelse om forvaltning
av grunnvann i grensetraktene



RAPPORT

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Tittel: EU-WATERRES - Spørreundersøkelse om forvaltning av grunnvann i grensetraktene					
Forfatter: Belinda Flem, Guri Venvik, Malin Andersson			Oppdragsgiver: The EEA and Norway Grants, Norway Grants Fund for Regional Cooperation		
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Feltarbeid utført:			Rapportdato:		Kartbilag:
Feltarbeid utført:		Rapportdato:		Prosjektnr.:	Ansvarlig:
Sammendrag: Gjennom det EØS finansierte prosjektet « <i>EU-integrated management system of cross-border groundwater resources and anthropogenic hazards (EU-WATERRES)</i> » ledet av det polske geologiske institutt (PGI) er det gjennomført en spørreundersøkelse om forvaltning av grunnvann i Norge og med fokus på grensetraktene Norge - Sverige. Spørreundersøkelsen ble sendt ut elektronisk og svarene ble returnert anonymt. I løpet av de to månedene undersøkelsen lå ute ble det mottatt 54 svar. I hovedtrekk gjenspeiler svarene at forvaltningen av grunnvann i Norge er fragmentert, at det er behov for mer samarbeid og økte ressurser for kartlegging av grunnvann slik at kunnskapsnivået økes. Det påpekes også at det er behov for å øke det faglige nivået innen hydrogeologi/hydrologi i forvaltningen.					
Emneord:		Spørreundersøkelse		Grunnvann	
Forvaltning					

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1. INTRODUKSJON

Kartlegging av grunnvann og datautveksling mellom naboland i Europa går sakte og er lite harmonisert. Det polske geologiske instituttet (PGI) har derfor, i samarbeid med partnere fra Estland, Latvia, Norge og Ukraina, tatt initiativ til å harmonisere data om **grenseoverskridende grunnvannsforekomster** og dets tilstand i prosjektet «*EU-integrated management system of cross-border groundwater resources and anthropogenic hazards (EU-WATERRES)*». Prosjektet er finansiert ved hjelp av EØS-midler i programmet «Norway Grants Fund for Regionalt samarbeid» (prosjekt No.2018-1-0137).

Lederen for prosjektet er PGI, mens NGU som giverland er såkalt ekspertpartner. I tillegg deltar: the University of Latvia, the Latvian Environment, Geology and Meteorology Centre (LEGMC), the Geological Survey of Estonia, the Institute of Geology and Geochemistry of Combustible Minerals of National Academy of Sciences of Ukraine og the Subsidiary enterprise-Ukrainian geological Company (SE UGC).

Prosjektet fokuserer på to områder i Baltikum og Øst-Europa; den latvisk-estiske grensen og den polsk-ukrainske grensen som er den østlige grensen til EU. I tillegg blir det satt søkelys på grenseoverskridende grunnvannsforekomster mellom Norge og Sverige, for å undersøke hvordan samarbeidet er organisert og om det er rom for forbedringer.

Prosjektet EU-WATERRES er det første initiativet for å harmonisere de romlige hydrogeologiske dataene mellom et EU-medlem-land og Ukraina. Gjennomføringen av prosjektet dekker årene 2020 t.om 2023.

De spesifikke målene for prosjektet er:

- å lage en geoinformatisk plattform for integrert databehandling som definerer forholdene for grenseoverskridende akviferer og deres numeriske simulering.
- gi støtte for beslutningstakere ved å lage løsninger for koordinert bruk og integrert beskyttelse av grenseoverskridende grunnvann.
- skape grunnlag for koordinering av prosedyrer for overvåking av grenseoverskridende grunnvann.
- øke troverdigheten til vurderingen av tilstanden til grenseoverskridende grunnvann ved å harmonisere data.
- teste løsninger i tre case -studier innen EU og en case -studie i Ukraina.

Prosjektet har som mål å forbedre koordineringen og effektiviteten i internasjonalt samarbeid om harmonisering av kartlegging, kartfremstilling, forurensning, datautveksling, forvaltning og kontroll

av kvaliteten og kvantiteten av grenseoverskridende grunnvann. Mer informasjon om prosjektet finnes på hjemmesiden; <http://eu-waterres.eu/>.

I forbindelse med prosjektet har det blitt gjennomført en spørreundersøkelse for å kartlegge behovet for kunnskap om grunnvann i ulike sektorer, både på nasjonalt, regionalt og på lokalt nivå. Spørreundersøkelsen hadde også som hensikt å belyse om måten EUs vanddirektiv blir implementert administrativt er funksjonelt og om grunnvann blir administrert på en hensiktsmessig måte i Norge. Tilsvarende undersøkelser blir også gjort i de andre prosjektlandene for å sammenligne om behovene er sammenfallende eller ikke. For å være sikker på at GDPR regler ble fulgt bestemte NGU at spørreundersøkelsen i Norge skulle sendes ut separat for å unngå deling av adresselister, mens de øvrige landene sendte ut sin som en felles undersøkelse.

Dette gav også mulighet for å inkludere ekstra spørsmål som er spesifikke for Norge.

Denne rapporten presenterer alle dataene fra den norske undersøkelsen. Egen rapport vil bli tilgjengelig på prosjektets hjemmeside som presenterer de samlede resultatene av de spørsmålene som er felles for alle prosjektlandene.

2. METODIKK

Spørreundersøkelsen ble gjennomført ved hjelp av Microsoft Forms, som er tilgjengelig gjennom Office 365. Med Microsoft Forms kan man lage skjema, for eksempelvis en undersøkelse eller quiz. Invitasjon til deltakere til å svare på undersøkelsen kan sendes ut ved bruk av nesten hvilken som helst nettleser eller mobilenhet. Sanntidsresultater fra deltakerne, når de sendes inn, er også tilgjengelig i tillegg til innebygd analyse for å evaluere svar. Besvarelsene kan enkelt eksporteres til Excel for ytterligere analyse (<https://www.microsoft.com/nb-no/microsoft-365/online-surveys-polls-quizzes>).

Det ble utformet 15 spørsmål for den norske spørreundersøkelsen hvorav seks var identisk med de som ble sendt ut i de øvrige prosjekt landene (spørsmål 1,3, 6, 8, 9 og 10; senere merket felles), tre spørsmål var like de som ble sendt ut i Polen, Estland, Latvia og Ukraina, men svaralternativene var ikke identiske (spørsmål 2, 4 og 5; senere merket felles, men med ulike svaralternativ) samt seks spørsmål som bare ble sendt ut i Norge (spørsmål 7, 11, 12, 13, 14 og 15; senere merket Norge). Den norske undersøkelsen ble sendt ut 1. juni 2021 og var aktiv frem til 1. august 2021. Spørreundersøkelsen ble distribuert via ngu.no, NGUs Twitter, LinkedIn og Facebook sider samt lagt ut på IAH's facebook side. I tillegg ble den sent til NFG (Nasjonalt Fagforum Grunnvann) medlemmer, kontaktpersoner innen NVE, Fylkeskommuner og kommuner med oppfordring om å videresende til aktuelle interessenter.

3. RESULTAT

Spørsmålene i spørreundersøkelsen og svarene som ble gitt er presentert fortløpende under. I gjennomsnitt brukte deltakerne 15 minutter på besvarelsen.

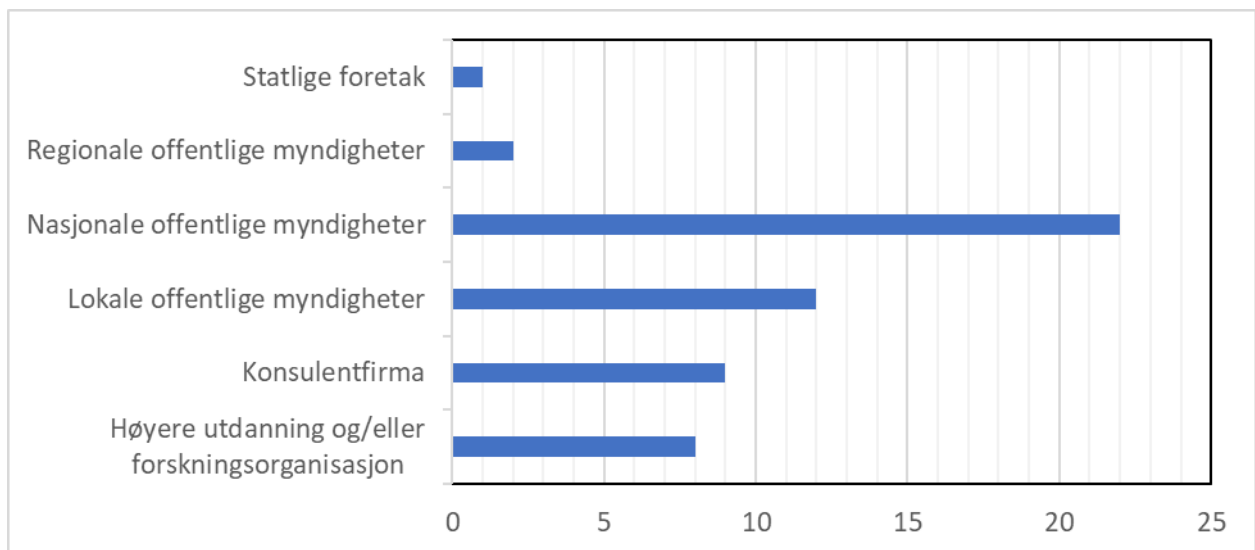
Spørsmål 1 (felles)

Hvilken type bedrift/institusjon representerer du?

Ett enkelt alternativ fra listen:

Instituttsektor; Nasjonale offentlige myndigheter; Regionale offentlige myndigheter; Lokale offentlige myndigheter; Høyere utdanning og/eller forskningsorganisasjon; Interessegrupper inkludert frivillige organisasjoner; Statlige foretak; Konsulentfirma; Allmennheten; Leder av verneområde; annet

Totalt 54 svar ble mottatt.



Figur 1 Grafisk fremstilling av antall svar i hver kategori. Nærmere 41 % av deltakerne i spørreundersøkelsen tilhører «Nasjonale offentlige myndigheter». Ingen har valgt alternativene: *Instituttsektor, Interessegrupper inkludert frivillige organisasjoner; Allmennheten; Leder av verneområde eller annet fra valglisten.*

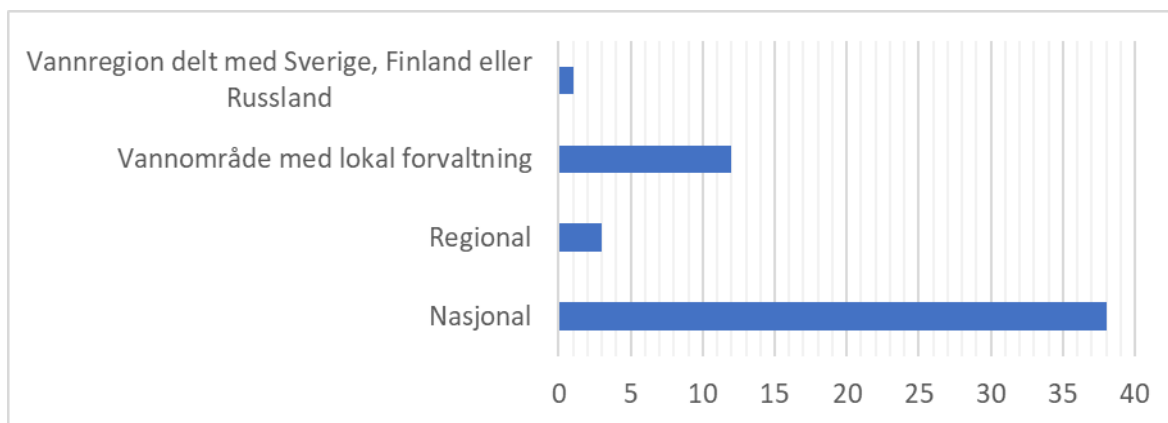
Spørsmål 2 (felles, men med ulike svaralternativer)

Institusjonens ansvarsområde

Ett enkelt alternativ fra listen:

Nasjonal; Regional; Vannregion; Vannregion delt med Sverige, Finland eller Russland; Vannområde med lokal forvaltning

Totalt 54 svar ble mottatt.



Figur 2. Grafisk fremstilling av antall svar i hver kategori. Nær 70 % av deltakerne i spørreundersøkelsen er tilknyttet en institusjon med et nasjonalt ansvarsområde.

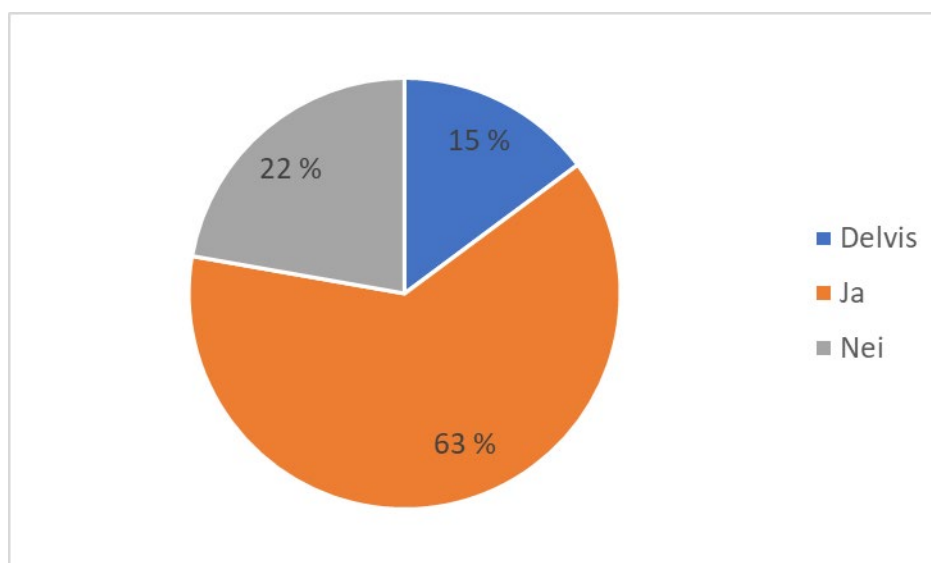
Spørsmål 3 (felles)

Er din institusjon relatert til grunnvannsforvaltning / kartlegging / forskning?

Ett enkelt alternativ fra listen:

Ja; Nei; Delvis

Totalt 54 svar ble mottatt.



Figur 3. Prosentvis fordeling i hver kategori presentert som kakediagram.

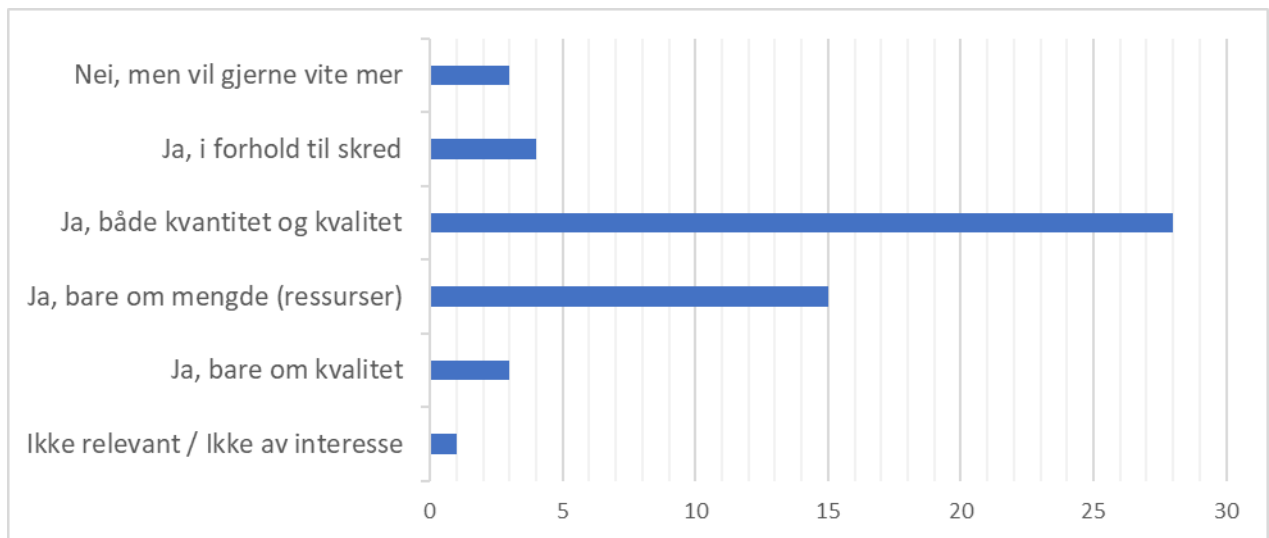
Spørsmål 4 (felles, men med ulike svaralternativer)

Er du kjent med grunnvannsrelaterte problemstillinger?

Enkelt alternativ fra listen:

Ja, bare om kvalitet; Ja, bare om mengde (ressurser); Ja, både kvantitet og kvalitet; Ja, i forhold til skred; Nei, men vil gjerne vite mer; Ikke relevant / Ikke av interesse

Totalt 54 svar ble mottatt.



Figur 4. Grafisk fremstilling av antall svar i hver kategori.

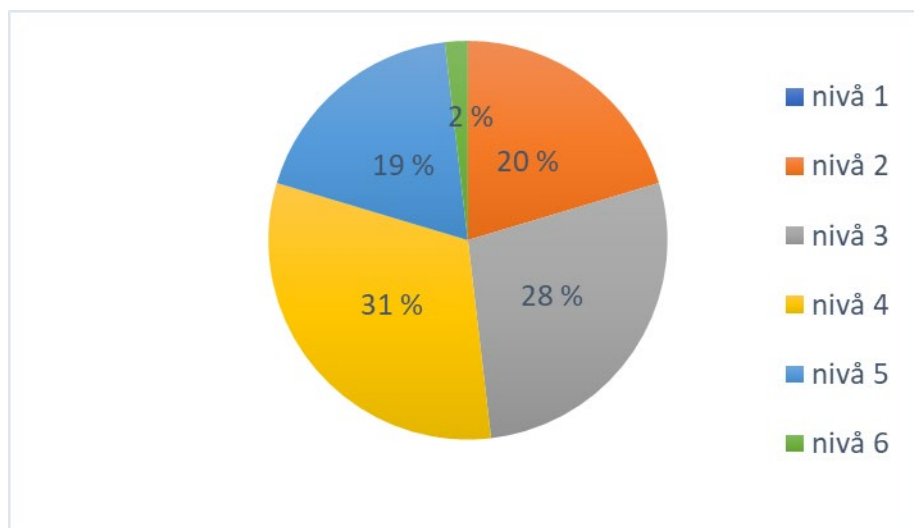
Spørsmål 5 (felles, men med ulike svaralternativer)

Hvordan vurderer du ditt kunnskapsnivå om grunnvann?

Ett enkelt alternativ fra rangeringsliste: 1-6

Vurdering fra 1-6 hvor (1-ingen kunnskap; 4 – god kunnskap; 6-utmerket kunnskap)

Totalt 54 svar ble mottatt.



Figur 5. Prosentvis fordeling i hver kategori presentert som kakediagram. Majoriteten av spørreundersøkelse deltakerne anser å ha god kunnskap om grunnvann. Ingen har valgt nivå 1, ingen kunnskap. I gjennomsnitt ligger deltakerne på et nivå lik 3.5

Spørsmål 6 (felles)

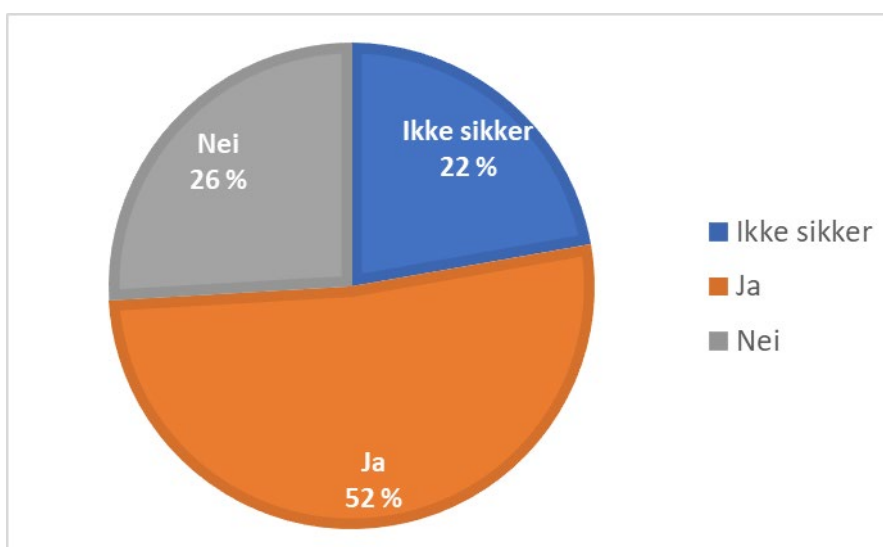
Spørsmål 6 del,1

Vet du hva begrepet "grenseoverskridende grunnvann" betyr?

Ett enkelt alternativ fra listen:

Ja; Nei; Ikke sikker

Totalt 54 svar ble mottatt.



Figur 6. Prosentvis fordeling i hver kategori presentert som kakediagram. Mer enn halvparten av deltakerne svarer at de vet hva som ligger i begrepet "grenseoverskridende grunnvann"

Spørsmål 6, del 2

Beskriv med dine egne ord hvordan du forstår begrepet "grenseoverskridende grunnvann".

Åpent spørsmål

Totalt 50 av 54 deltakere har svart utfyllende, svarene er gjengitt i tabell 1.

Tabell 1. Utfyllende svar på spørsmål 6

ID	Deltakernes forståelse av begrepet "grenseoverskridende grunnvann"
1	Grunnvannsressurser og / eller tilhørende nedbørs som går over to eller flere landegrenser.
2	Grunnvannsforekomster som befinner seg på tvers av internasjonale grenser som betyr at utvinning eller annen påvirkning på en side av grensen kan ha konsekvenser for forekomsten på andre siden av grensen.
3	Forstår ikke hvilken grense den overskrider. Er det mengder? Er det for høyt grunnvannsnivå eller for lavt grunnvannsnivå man snakker om?
4	Grunnvannsforekomster som krysser eller befinner seg på grensen mellom to eller flere stater
5	At grunnvannet passerer/strekker seg over flere eiendomsgrenser i form av tomter kommuner, fylker og land
6	En grunnvannsforekomst (akvifer) som er delt av to eller flere land. Forurensning eller vannuttak i et land kan potensielt påvirke grunnvannet i nabolandet.
7	En grunnvannsressurs som ligger innenfor flere land, dvs. at forvaltning av ressursen i ett land kan påvirke minst ett annet lands ressurs kvalitativt/kvantitativt.
8	Grunnvannsressurser som deles mellom nasjoner (som ligger i grensetraktene)
9	Jeg tolker det som grunnvann som påvirker/påvirkes av tiltak utenfor en byggesak, plansak, kommune, region eller landegrense.
10	Grenseoverskridende grunnvann er grunnvannsforekomster som strekker seg over en eller flere landegrenser
11	Grunnvannsforekomster som ligger slik at de krysser grenser mellom land.
12	Grunnvannsreservoar som er delt mellom nasjoner.
13	Jeg tenker på tverrfaglighet innenfor problemstillinger om grunnvann.
14	Grunnvannsforekomster som er delt mellom to eller flere nasjoner.
15	Grunnvannsmagasin som ligger i flere land.
16	Grunnvann som strekker seg over to landegrenser.
17	Grunnvannsforekomst som arealmessig ligger i flere land.
18	Grunnvannsforekomster som krysser internasjonale grenser
19	Grunnvann som befinner seg på hver side av nasjonal grense mellom to eller flere land.
20	Har ikke hørt begrepet før.
21	Grunnvannsakvifer som strekker seg inn i to eller flere land.
22	Grunnvannsforekomster som ikke stopper ved landegrensene eller andre administrative grenser.
23	Grunnvann som kan strømme mellom to ulike land
24	Grunnvann som har tilsig fra flere land/utbredelse i flere land
25	Transboundary groundwater body is a continuous volume of rock that hosts groundwater and its area crosses more than one country.
26	Grunnvannforekomster som finner sted i flere enn et land / dekker et område som krysser geopolitiske grenser.

ID	Deltakernes forståelse av begrepet “grenseoverskridende grunnvann”
27	Jeg antar at dette betyr grunnvannsforekomster og tilhørende nedbørfelt/infiltrasjonsområder som administrativt deles av landegrenser.
28	Grunnvannsforekomster som ligger på begge sider av en grense.
29	når et grunnvannforkomst strekker seg over landsgrensen. Dvs. hvis et land tapper mye grunnvann, får det andre land mye mindre. Eller hvis den ene forurenses, forurenses det også på andre sida av grensen.
30	Grunnvann som strekker seg utover nasjonale eller regionale grenser
31	Grunnvannsforekomst som krysser landegrenser.
32	At grunnvann ikke kjenner politiske grenser og at man derfor kan påvirke "naboens" grunnvann ved tiltak på "eget" grunnvann.
33	Grunnvann som krysser flere stater, eller ligger ved. Oppheves når grenseskridende grunnvann renner ut i havet.
34	Vet ikke
35	Akvifer som har romlig utbredelse på tvers av internasjonal grense. Mating og uttak til/fra grunnvannet på en side av grensen vil dermed (kunne) ha innvirkning på kvalitet og mengde av grunnvannet også på den andre siden av grensen
36	Grunnvann på tvers av landegrenser?
37	Muligens grunnvannsforekomster som har utbredelse over kommune- og/eller landegrenser
38	Grunnvannsressurs(er) som i sin geografiske utstrekning berører flere land, og bør dermed ha samkjørt forvaltning.
39	Grunnvannsforekomst som er i flere land
40	Overgang mellom forskjellige grunnvann
41	Grenseoverskridende grunnvann er akvifere som krysser nasjonale grenser. Spesielt innenfor vanddirektivet er dette et viktig begrep, da forvaltningen av vannforekomster, også grunnvann skal være helhetlig og omforent hvor god kvantitativ og kjemisk tilsand er målet.
42	En grunnvannskilde som deles av flere land
43	Om grunnvannsstanden overgår det jorden klarer å absorbere
44	Grunnvannsressurser som ikke følger landegrenser
45	Grunnvannsforekomster som «krysser» landegrenser. F.eks Norge/Sverige
46	Grunnvannsreservoar som krysser riksgrensen
47	Vannforekomster som krysser nasjonale/statlige grenser
48	Grunnvann som befinner seg på i mer enn ett land, men deles av begge to.
49	Antar at det betyr at grensen for vannkvalitet eller kvantitet er overgått, og at grunnvannet dermed ikke lengre kan sies å være i god tilstand.
50	Grunnvann som ligger i grenseområder og/eller mulige påvirkningskilder på begge sider av grensen

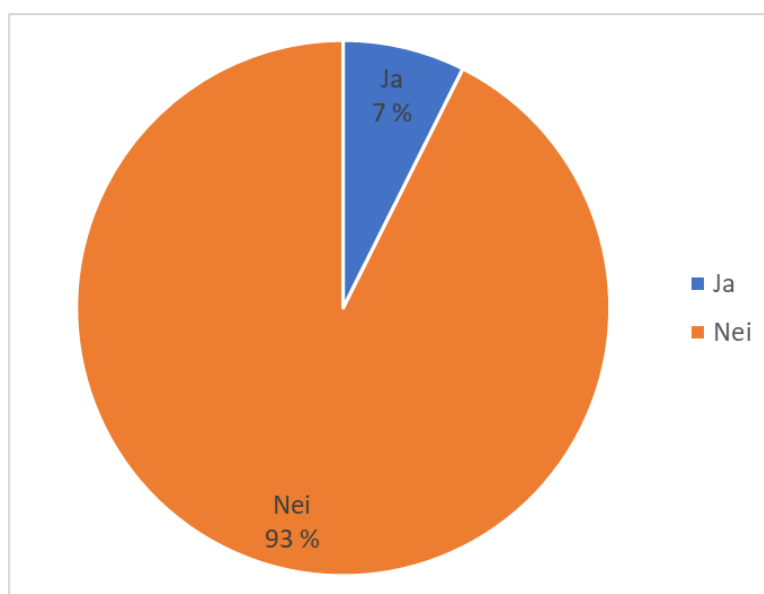
Spørsmål 7 (Norge)

Kjenner du til hvilke prinsipper det norsk-svenske samarbeidet følger ved forvaltning av grenseoverskridende grunnvannsforekomster?

Ett enkelt alternativ fra listen:

Nei; Ja; dersom Ja, åpent spørsmål

Totalt 54 svar ble mottatt.



Figur 7. Prosentvis fordeling i hver kategori presentert som kakediagram. Over 90% kjenner ikke til hvordan Norge og Sverige samarbeider om grenseoverskridende grunnvannsforekomster.

Tre av de som svarte JA utdypet svaret som vist i tabellen under.

Tabell 2 Utfyllende svar på spørsmål 7

	Prinsippene det norsk-svenske samarbeidet følger ved forvaltning av grenseoverskridende grunnvannsforekomster.
1	Forholdet er regulert av internasjonale konvensjoner, som vanndirektivet, vannkonvensjonen og en egen konvensjon fra 1929
2	Det ble startet opp et samarbeidsprosjekt mellom SGU og NGU om felles kartlegging og harmonisering av arbeidet med grunnvannsforekomster i grenseområdene.
3	Det som har vært gjort er samarbeid mellom län i Sverige og fylker i Norge, hvor ansvaret for karakterisering og klassifisering av grunnvann har ligget. Arbeidet har ikke vært prioritert i Norge, men det har vært kontakt.

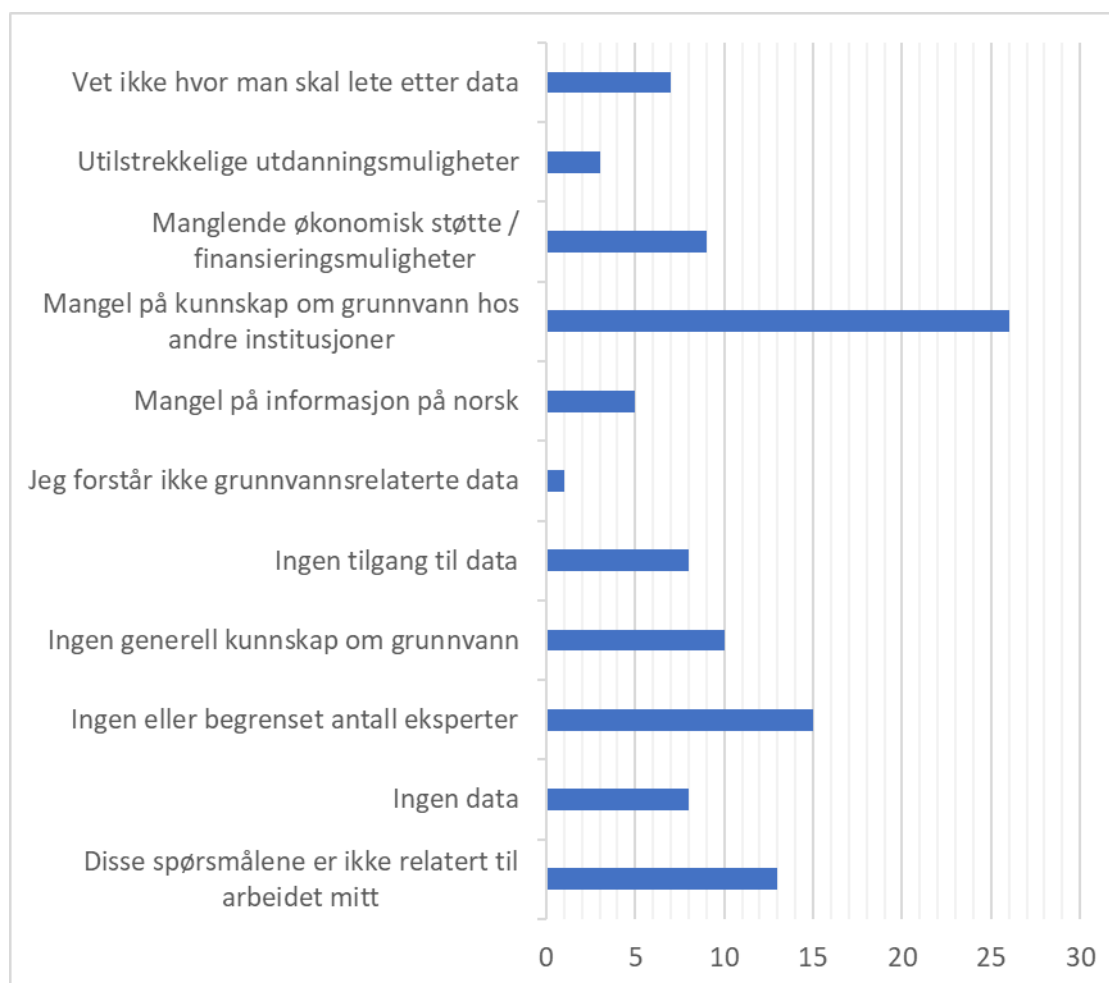
Spørsmål 8 (felles)

Hva slags hindringer har du møtt når du arbeider med grunnvannsrelaterte problemstillinger?

Flere alternativer fra listen:

Ingen generell kunnskap om grunnvann; Mangel på kunnskap om grunnvann hos andre institusjoner; Mangel på informasjon på norsk; Manglende økonomisk støtte / finansieringsmuligheter; Ingen eller begrenset antall eksperter; Vet ikke hvor man skal lete etter data; Ingen tilgang til data; Ingen data; Jeg forstår ikke grunnvannsrelaterte data; Utilstrekkelige utdanningsmuligheter; Disse spørsmålene er ikke relatert til arbeidet mitt; Annet-Åpne spørsmålsmulighet

Totalt 53 av 54 deltakere har svart og 105 valgmuligheter ble krysset av.



Figur 8. Grafisk fremstilling av antall svar i hver kategori. Det var her mulig å gjøre flere valg. Kategorien «mangel på kunnskap hos andre institusjoner» er valgt av mer enn 50% av deltakerne..

Det var mulig å utdype svaret i spørsmål 8 (Annet-Åpen spørsmålsmulighet). Av 54 deltakere valgte 26 deltakere å gjøre det. Svarene er gitt i Tabell 3.

Tabell 3 Utfyllende svar på spørsmål 8

	Hindringer ved arbeid med grunnvannsrelaterte problemstillinger
1	-Mangel på samarbeid mellom hydrologer, hydraulikere og hydrogeologer. - Mangel på kompetanse om simuleringsverktøy som tas hensyn til både overflatevann og grunnvann (finnes flere muligheter for gratis programvarer utviklet av USGS, HEC (USACE), osv.) - Begrenset data tilgjengelig på NGUs / offentlig kart, f.eks. GRANADA mangler borelogg og det er ikke en funksjon for å filtrere for ulike parametere
2	Avhukingsmulighetene ovenfor var unyanserte. Det finnes informasjon på norsk, men det er lite sammenlignet med total mengde litteratur om temaet. Det finnes eksperter, men de er få (og litt utilgjengelige). Det finnes også utdanningsmuligheter, men dette tilbudet er fragmentert og fordelt på flere studier. Etter det jeg har erfart er det heller ikke tilbud om f.eks etterutdanning som gå spesifikt på temaet.
3	Data er gjemt og glemt i enkelte saker. Data gjøres tilgjengelig i enkelte saker/utbygginger men det finnes ikke noen regional eller nasjonal strategi for å sikre å videreforme data etter endt prosjekt. Mangel på nasjonale standarder gjør det vanskelig å sammenstille data fra ulike prosjekter i en og samme database.
4	Det er en manglende forståelse av hvor viktig grunnvann er i vanddirektivet, både på overordnet og lokalt forvaltningsnivå. Det er ikke fokus på dette fra direktorater, og det er ikke fokus på grunnvann lokalt. Data finnes, men de må registreres i Vann-Nett for at vi skal kunne få en oversikt over påvirkningsbilde, kvantitativ og kjemisk tilstand, risiko og eventuelle tiltak.
5	Det er lite fokus på grunnvann, lite ressurser/tid som kan brukes på det internt i kommunen. For lite kompetanse hos ledere og dermed for lite fokus/ressurser. Når ikke kommunen krever det (pga. kunnskapsmangel) og er engstelig å kreve for mye fra forslagsstiller/tiltakshaver, så blir det ikke ivaretatt. Kommunene bør få bedre veiledere til hva de skal kreve og når i sin saksbehandling både når det gjelder infiltrasjon av overvann og grunnvannsproblematikk. Samt forurensning.
6	Det er vanskelig å se grunnvannet. Det er jo under overflaten og blir lett glemt
7	Et av problemene i Norge er at ansvaret for grunnvann er fordelt på veldig mange institusjoner samtidig som grunnvann er et marginalet fagområde for hver av institusjonene - enten det er NGU, NVE, Mattilsynet, Miljødirektoratet eller de regionale vannforvaltningsmyndighetene (EUs vanddirektiv).
8	Fragmentert forvaltning på området og lite prioritert i Norge.
9	Har behov for data/kartlegging i forbindelse med planlegging av overvannshåndtering i kommunen, grunnvannstand og infiltrasjonskapasitet
10	Har jobbet svært lite med grunnvannsrelaterte problemstillinger. Grunnvann har generelt hatt lite fokus. Både på grunn av at man antar at de fleste grunnvannslokalitetene er i god tilstand og at man har lite kunnskap om tilstanden i de grunnvannsforekomstene som kanskje kan være påvirket. Fokuset har dermed vært mer på de vannforekomstene man vet er påvirket og det er gjerne overflatevann.
11	Hvordan oppfører grunnvannet seg i forbindelse med byggesaker og bruk av lokal overvannsdiskonering (LOD) der infiltrasjon er ønskelig. Hvor dypt ligger grunnvannet?
12	I forvaltning av byutvikling som jeg jobber med er det både manglende tilgjengelig informasjon om grunnvannsnivåer og installasjoner som på virker grunnvannet samt manglene fokus og kompetanse på hvordan bygging påvirker grunnvann og vis versa.
13	Jeg opplever at det er et stort behov for hydrogeologer, men at det ikke utdannes nok
14	Jobber ikke med dette direkte nå, pga lederoppdrag.

	Hindringer ved arbeid med grunnvannsrelaterte problemstillinger
15	Jobber med grunnvannskvalitet, og finner lite eksperter innenfor dette feltet i Norge. Også lite kunnskap i andre institusjoner jeg kommer i kontakt med, typisk kommuners tekniske avdeling, om dette emnet.
16	Jobber primært med grunnvann som "problem", ikke som ressurs, dvs. unngå at gw1 senkes som følge av tiltak i undergrunnen, samt som stabilitetsforringende element i bergskjæringer og som drivende mekanisme for skred.
17	Jobber veldig lokalt, der det ikke finnes data
18	Lite kunnskap om grunnvann og lite kunnskap om hvordan arealinngrep kan påvirke grunnvannsforekomster
19	Manglende kunnskap og ressurser
20	Manglende offentlige informasjon til hvordan kommuner i praksis skal forvalte grunnvann og manglende gjennomføring og midler til å bestemme utstrekning og økologisk tilstand til grunnvannsforekomster.
21	Problemstillinger knyttet til grunnvann dekker mange fagområder: geologi, ingeniørgeologi, kjemi, geoteknikk, VA, hydrologi, hydrogeologi samt mange problemstillinger (skred, vann som ressurs, vannkvalitet, vannhåndtering, utbygging av tunneler og undergrunnsanlegg, mm)
22	Svært mange grunnvannsbrønner er ikke registrert, og ingen data foreligger. Det skaper usikkerhet ved utlippstillatelser.
23	Uklare roller og ansvarsområder rundt forvaltning av grunnvann. Mangel på samarbeid på tvers av sektor og institusjoner.
24	Vanskelig å si så mye om grunnvann hvis en har manglende kunnskap
25	Vi har ansvaret for LGN - kvantitative grunnvannsdata og bruker disse i vår saksbehandling, men jeg er leder og gjennomfører ikke analyser selv.
26	Vi ønsker forskningsprosjekter velkommen, både for vurderinger av metodikk, hvordan grunnvannskilder avgrenses romlig, kvaliteten på grunnvann, utveksling med overflatevannkilder, påvirkning og robusthet etc.

Spørsmål 9 (felles)

Hvilken type informasjon vil lette arbeidet der grunnvann inngår?

Flere alternativer fra listen:

Informativt skriftlig materiale; Videoforelesninger; Grunnvannskart; Åpne data; Fritt tilgjengelige verktøy eller åpen kildekode, Ikke nødvendig; Annet-åpent spørsmål

Totalt svarte 53 av 54 deltakere på spørsmålet, hvor fem også svarte utdypende.

Tabell 4 Respons til spørsmål 9

Informasjon som lette arbeid der grunnvann inngår	Antall
Grunnvannskart	43
Åpne data	35
Informativt skriftlig materiale	21
Fritt tilgjengelige verktøy eller åpen kildekode	19
Videoforelesninger	12
Ikke nødvendig	2

Annet-åpent spørsmål
Arbeidet med grunnvannforvaltning må legges til NVE. Det må organiseres bedre og settes i gang i tråd med kravene i vanndirektivet.
Faglige veiledere for håndtering av grunnvannsrelatert problematikk
Felles ressursplattform
Mer oppmerksomhet rundt grunnvann fra offentlige instanser.
Økt bevissthet om grunnvann (hvilke problemstillinger / utfordringer man bør ta hensyn til som rådgiver - også viktig for de som bestiller oppdrag)

Spørsmål 10 (felles)

Vet du hvor du kan kontakte fagfolk med grunnvannsekspertise (hydrogeologer) eller få svar på spesifikke grunnvannsrelaterte spørsmål?

Enkelt alternativ fra listen:

Ja; Nei, men trenger ikke; Nei, men vil gjerne vite; Annet-åpent spørsmål

- JA 46
- NEI, men vil gjerne vite 5
- NEI, men trenger ikke 1

Annet: Kommunen må bruke konsulenter, eller ansette hydrogeologer.

Spørsmål 11 (Norge)

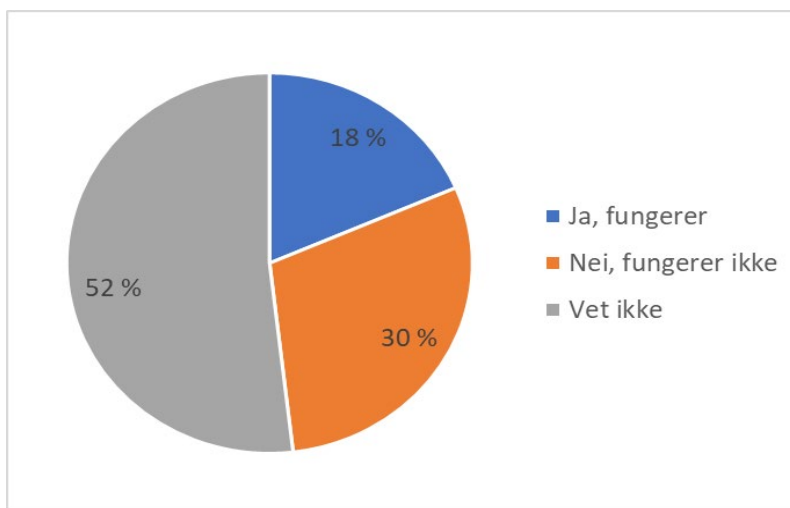
Fire lover fordelt på 3 departement regulerer grunnvann i Norge 1) Forurensningsloven og 2) Naturmangfoldloven (Klima- og miljødepartementet), 3) Lov om vassdrag og grunnvann (vannressursloven) (Olje- og energidepartementet) og 4) Plan- og bygningsloven (Kommunal- og moderniseringsdepartementet). Myndighet for grunnvann er fordelt på flere institutter/direktorater bl.a Norges vassdrags- og energidirektorat (NVE), Miljødirektoratet og Norges geologiske undersøkelse (NGU).

Synes du dagens forvaltning og ansvarsfordeling fungerer eller har du forslag til endring/ forbedring?

Enkelt alternativ fra listen:

Ja, fungerer; Nei, fungerer ikke; Vet ikke; Åpen tekst - Utfyllende svar

Totalt 54 svar ble mottatt. Av de 54 deltakerne i spørreundersøkelsen valgte 22 å gi et utfyllende svar på spørsmål 11.



Figur 9. Prosentvis fordeling i hver kategori presentert som kakediagram. Mer enn halvparten av spørreundersøkelsens deltakere har svart vet ikke.

Tabell 5 Utfyllende svar på spørsmål 11

	Synes du dagens forvaltning og ansvarsfordeling fungerer eller har du forslag til endring/ forbedring?
1	Uklare roller og forvaltningsområder fordelt på ulike nasjonale institusjoner gjør ansvaret for og arbeidet utfordrende. Bruker blir også forvirret av mange aktører.
2	Fungerer ikke for overvann heller. Overvannshåndtering er svært viktig for grunnvannet, men avsetning av arealer til dette styres av PBL og ser ikke så detaljert på andre forhold. Til og med veilederen som NVE nå lager for overvannshåndtering ikke vil ta hensyn til hele spekteret, tror jeg. Det er kompliserte temaer, så hvis ikke myndighetene klarer å samordne seg, kan i hvert fall ikke kommunene det. I tillegg er ras/kvikkleire o.l. koblet til overvann og grunnvann. Dette er også viktig.
3	Det er manglende kunnskap og eller kapasitet/vilje til å prioritere grunnvann hos flere myndighetsinstanser som jobber med disse spørsmålene - særlig Miljødirektoratet
4	Det er bra at grunnvann kommer inn i ulikt lovverk og forvaltning. Problemet er at fagmiljøene blir for små og grunnvann blir betraktet som et marginalt problem i Norge i forhold til alt det andre institusjonene primært skal drive med
5	Jobber ikke tett nok på forvaltning til å kunne uttale meg.
6	Dette tror jeg bør undersøkes og vurderes.
7	Forvaltning av grunnvann skiller seg ikke fra forvaltning av andre vannressurser i Norge, og det er bra, men det er generelt dårligere kunnskap om grunnvann i forvaltningen og dårligere samarbeid på dette området.
8	Fungerer, men er avhengig av ressurser. Grunnvannsmodellering er f.eks. omfattende og tidkrevende, men sikkert påkrevet oftere enn det faktisk gjennomføres.
9	Er ikke kjent med alle lovene, men jobber med utbyggingsprosjekter hvor PBL og vannressursloven er gjeldende regelverk. Har inntrykk av at dette regelverket ikke følges opp godt nok i disse prosjektene, med krav til tetting og maks trykkreduksjon ift omgivelsene.

	Synes du dagens forvaltning og ansvarsfordeling fungerer eller har du forslag til endring/ forbedring?
10	Dagens forvaltning og ansvarsfordeling for grunnvann følger de samme prinsippene som forvaltningen av overflatevann. Fordelingen bør være som i dag da grunnvann berører mange ulike fagfelt med svært mange og ulike problemstillinger.
11	Fragmentert forvaltning er utfordrende. Har ikke full oversikt over kompetansen på grunnvann hos alle som er nevnt i teksten over, men mitt inntrykk er at den er begrenset. Hvor mange kommuner kjenner til at tiltakshaver skal søke etter pbl om å etablere grunnvannsbrønner for prøvepumping? I tillegg er det lite kunnskap om annen grunnvannspåvirkning enn grunnvannsuttak, som for eksempel tunnelboring. Det er heller ikke så veldig godt kjent at boring av energibrønner skal rapporteres inn til NGU.
12	Utfordrende når ansvaret ligger i ulike institutter. NVE har ikke lenger grunnvannsekspert-team som jobber med relevante temaer
13	A water authority should be defined in Norway (like in the EU countries where the EU water directive is in place) where the Norwegian groundwater bodies are mapped and characterized, and the groundwater quality and quantity monitoring data is easily accessible.
14	Når ansvar sitter hos flere departementer, er det fort gjort at noe blir oversett. Det kan bli utfordrende å ta stilling til alle regler når det ikke finnes en veileder.
15	Kategoriske spørsmål uten rom for nyanser - gir det et riktig bilde av situasjonen? Spørsmålet "Kunne det ha fungert bedre" mangler.
16	Vet ikke
17	Den eksisterende oppsplitting av organisasjoner/etater illustrerer hvilken omfattende betydning livsviktige komponenter i miljøet har for mennesker og for hele økosystemet, og vann er blant de tre viktigste komponentene på kloden
18	Lovverket er kanskje godt nok, men bruken må økes i forvaltningen.
19	Det skjer lite. All fokus er på overflatevann. Slikt var det også for 5-10 år siden. Registreringsplikt for brønnboring fungerer ikke med dagens forskrift (ngu). Brønnboring bør omfattes av matloven med registreringsplikt når det er til vann som næringsmiddel (vannforsyning til bolig, fritidsbolig mm.), og forvaltes av Mattilsynet. Brønner til energi, industri mm. bør forvaltes av Statsforvalteren. Mattilsynet bør ha innsigelsesrett. Etablering av brønn må være i tråd med plan. Etablering av brønner, enkeltvis bør bli meldepliktig tiltak i plan og bygningsloven. Etablering av flere brønner bør blir søknadspliktig. Kommunen trenger oversikt.
20	I dag har miljødirektoratet ansvaret for grunnvann innenfor vanddirektivet (vannforskriften). Dette fungerer ikke da miljødirektoratet ikke har kunnskap om dette, og ikke forvalter vannressursloven. NVE skulle hatt det formelle ansvaret, da NVE har ansvaret for vannressursloven, har hydrogeologer, og at grunnvann er en del av det totale vannkretsløpet som vannressursloven skal beskytte. Forvaltningen må også delta i EU-møter om grunnvann innenfor vanddirektivet, og ikke NGU, da det er forvaltningen som er competent authority.
21	Bør kanskje samles et sted?
22	Regelverket og organisasjon av arbeidet er på plass. Forvaltning, oppfølging og prioritering mangler.

Spørsmål 12 (Norge)

Norge har implementert EUs vanndirektiv (EUs Water Framework Directive (WFD)) gjennom Vannforskriften (Forskrift om rammer for vannforvaltningen; FOR-2006-12-15-1446). For å oppfylle WFDs krav om en helhetlig forvaltning basert på vannregioner, har Norge etablert nye administrative enheter. Norge er delt inn i 11 vannregioner (RBD) (pluss seks distrikter som er delt med Sverige, Finland eller Russland). De 11 vannregionene er videre delt inn i 105 vannområder (SD). Om mulig, følger grensene til vannregionene nedbørsfeltområdene, dermed kuttes RBD og SD-ene grensene til kommuner, fylker og land.

Opplever du at denne sekundære nettverksbaserte vannforvaltningsstrukturen, som ble lagt til den allerede eksisterende sektorbaserte vannforvaltningsstrukturen, fungerer når motstridende politiske / økonomiske spørsmål blir reist?

Åpent spørsmål

Totalt 30 av 54 deltakere svarte på dette spørsmålet

Tabell 6 Utfyllende svar på spørsmål 12

	Opplever du at denne sekundære nettverksbaserte vannforvaltningsstrukturen, som ble lagt til den allerede eksisterende sektorbaserte vannforvaltningsstrukturen, fungerer når motstridende politiske/økonomiske spørsmål blir reist?
1	I dag blir overflatevann prioritert i Norge. Grunnvann er ikke tilstrekkelig forvaltet / overvåket.
2	Nei. Vannforskriften er kun rettet til vannkvalitet. Jeg ville gjerne at den også skulle relatere seg mer til vannmengder, både på overflaten (overvann, vassdrag) og få vann til grunnvannet (vannets kretsløp). Altså være helhetlig. Jeg foreslo i et utredningsprosjekt "Nasjonalt kompetansesenter for overvann og flom" at de nedbørsbaserte vannforvaltningsenhetene bør få utvidet mandat og fungere som regionale nettverk med kunnskapsspredning om alt dette, utveksling av informasjon, planer, rutiner, o.l.
3	Det kjenner jeg ikke nok til
4	vet ikke
5	Tja, hvis det virkelig var problemer med knapphet på vann av en brukbar kvalitet i Norge, ville man antakelig ha funnet en mer slagkraftig måte å organisere arbeidet på. Sann som den naturgitte situasjonen er, fungerer det jo på et vis.
6	Vet ikke
7	Dette har jeg ikke kunnskap til å vurdere.
8	Har ikke erfaring med dette.
9	Ikke alltid
10	vet ikke
11	Er ikke kjent med problemstillingen, men mener at vannforekomstene må forvaltes uavhengig av landegrenser, fylkesgrenser, kommunegrenser.
12	Vet ikke.
13	Ikke tilstrekkelig innsikt til å kommentere
14	Jeg har ikke vært borti denne problemstillingen når det kommer til grunnvann. Jeg forvalter vannressursloven for grunnvannsuttak og berører derfor ikke sakene etter at det er fattet vedtak.
15	Jeg kjente ikke til EUs vanndirektiv og er ikke i befatning med dette i min jobb.
16	Jeg vet ikke

	Opplever du at denne sekundære nettverksbaserte vannforvaltningsstrukturen, som ble lagt til den allerede eksisterende sektorbaserte vannforvaltningsstrukturen, fungerer når motstridende politiske/økonomiske spørsmål blir reist?
17	Er ikke kjent med problemstillingen.
18	antar ikke det
19	"Opplever du at denne sekundære nettverksbaserte vannforvaltningsstrukturen, som ble lagt til den allerede eksisterende sektorbaserte vannforvaltningsstrukturen, fungerer når motstridende politiske / økonomiske spørsmål blir reist?" Ha ha! Dere må jobbe litt med å korte ned spørsmålene, dette ble litt svevende.
20	Syntes det er mer logisk og dele det inn i nedbørfelt enn kommunegrenser
21	Det har jeg liten erfaring med. Jeg opplever imidlertid at forvaltningen kan ha for svak geofaglig/naturfaglig kompetanse, og til tider er presset til å ta avgjørelser på for svakt beslutningsgrunnlag (gjerne på grunn av manglende økonomiske ressurser)
22	Nei
23	Ikke helt. Det er mye forvirring knyttet til hvem som har ansvar og hvordan ting skal gjøres og hva det faktisk betyr for den enkelte sak/plan i kommunene, og hvem som skal betale for kostnadene knyttet til overordnet vannkunnskap og vedtatte tiltak i vannforvaltningsplanene.
24	Det er ikke 11 vannregioner! Det er 16 vannregioner. Det er svært viktig at dette blir riktig. Det er 10 som drenerer til norsk kyst, to til Finland og fire til Sverige. Torneå er delt i to av disse, en på svensk side og en på finsk. Det er 9 vannregionkoordinatorer (competent authority) som har ansvaret for vannregionene. Vannregionene er delt inn i 107 vannområder, som IKKE er offisielle forvaltningsområder i hverken vanddirektiv eller den norske forskriften. Vannregionene følger alltid vannskillet. Andre administrative grenser har ingen betydning. Når det gjelder deling mellom land så skal de internasjonale vannregionene koordineres landene i mellom. Kravet er enten en felles internasjonal plan, eller en del per land som skal koordineres. Dette gjelder selvfølgelig også innen fylker og kommuner i Norge.
25	Skjønner ikke hva dere spør om...
26	Nei
27	Nei mht. politikk og økonomi. Delvis mht. forvaltning, men fortsatt dårlig innarbeidet, særlig i regionale statsetater.
28	Delvis
29	Jeg har ikke jobbet før forvaltningsstrukturen ble endret og finner det derfor utfordrende å sammenligne om dagens praksis fungerer noe bedre eller dårligere. Generelt sett tror jeg at dagens struktur fungerer, men kanskje det forrige systemet fungerte bedre. Tung formulering på spørsmålet, har ikke hørt om sekundære nettverksbaserte vannforvaltningsstrukturen før nå.
30	Nei, ikke tilstrekkelig. Økonomi og samfunnsproblemstillinger trumfer som oftest økologiske utfordringer, som gjør at vannmiljøet blir skadelidende.

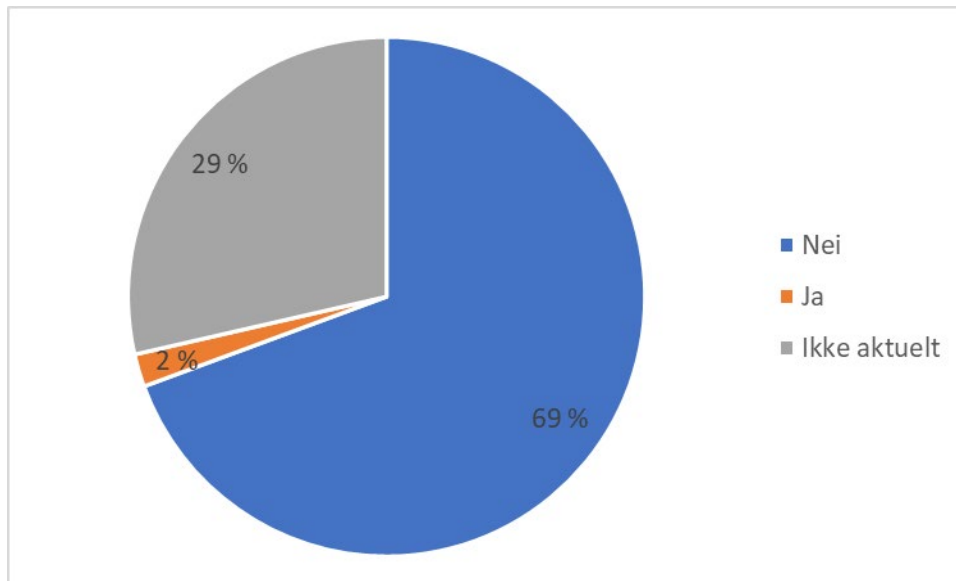
Spørsmål 13 (Norge)

Synes du de økonomiske rammene er tilstrekkelige for grunnvannsovervåking?

Enkelt alternativ fra listen:

Ja; Nei; Ikke aktuelt; Annet- Åpen tekst - Utfyllende svar

Totalt 49 svar ble mottatt. Ingen av de 54 deltakerne i spørreundersøkelsen valgte å gi et utfyllende svar på spørsmål 13.



Figur 10. Prosentvis fordeling i hver kategori presentert som kakediagram. Mer enn en tredjedel mener at de økonomiske rammene for grunnvannsovervåking er for lave. Bare 2% mener at det er tilstrekkelig.

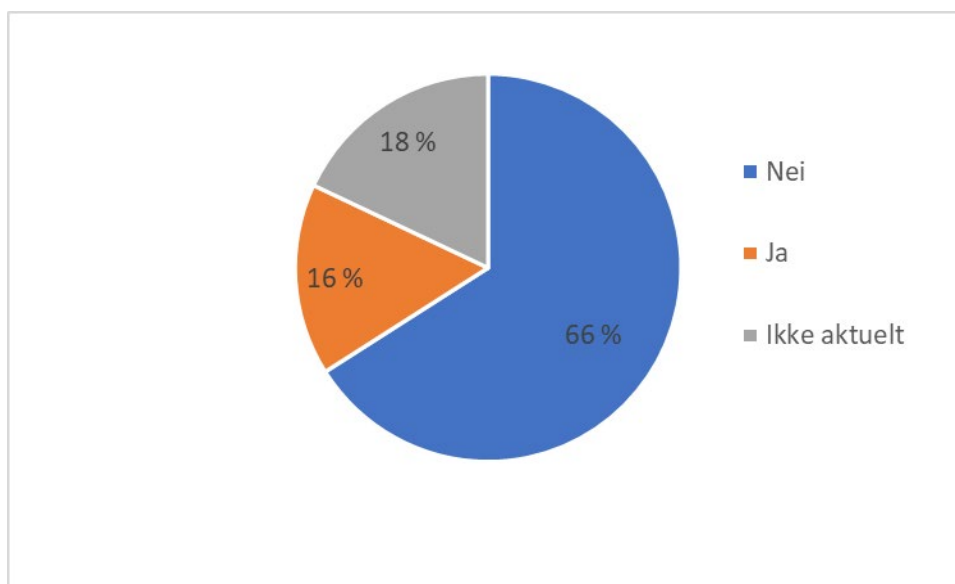
Spørsmål 14 (Norge)

Synes du at nødvendig politisk prioritering blir gitt til grunnvannsovervåking?

Enkelt alternativ fra listen:

Ja; Nei; Ikke aktuelt; Annet-Åpent svarmulighet

Totalt 50 svar ble mottatt. Ingen av de 54 deltakerne i spørreundersøkelsen valgte å gi et utfyllende svar på spørsmål 14.



Figur 11. Prosentvis fordeling i hver kategori presentert som kakediagram. Mer enn en tredjedel mener at grunnvannsovervåking ikke blir høyt nok prioritert.

Spørsmål 15 (Norge)

Har du forslag til hvordan forvaltningen av grunnvann i Norge kan forbedres?

Åpent spørsmål

Totalt 28 deltakere svarte på dette spørsmålet.

Tabell 7 Respons til spørsmål 15

	Har du forslag til hvordan forvaltningen av grunnvann i Norge kan forbedres?
1	Klarere roller og grenser mellom NVE, MilDir og NGU. Mer ansvar over til NGU når det gjelder grunnvann siden NGU sitter med brønndatabasen og kompetansen.
2	nettverk av "live" overvåkningsbrønner i sammensetning med relativt god kunnskap om løsmasseforhold.
3	Bedre kart, data - myndighetene bør bevilge penger til grunnundersøkelser slik at vi sikrer omgivelsene mot farer som skred. Lære av Gjerdrum (grunnvannsmetning kan ha påvirkning på skred). Veiledning for kommunene, samordnet med hvordan vi skal håndtere overvann og vassdrag (alt vann) - både med vannmengder (gi plass, grønstruktur) og vannkvalitet. Gjerne både som

	Har du forslag til hvordan forvaltningen av grunnvann i Norge kan forbedres?
	brukervennlig dokument eller internettside, og med videoer/opplæring. Nettverk for overføring av kunnskap, måte å bruke all kunnskapen på mellom kommunene som myndighet. Kommunene må lede arbeidet, stille krav. De må hjelpes til å stille riktige krav (ha kunnskap). Særlig små kommuner har ikke ressurser til å lage alle rutinene selv og må lene seg på de store i et nettverk. Oslo lager en overvannsveileder der vi forsøker å stille krav til målinger av infiltrasjon, grunnvann tidlig i reguleringsplanarbeidet (ikke først på byggesak) og benytte dem til planlegging og avsetting av arealer (grønt) og overvannstiltak. Vi laget også utkast til sjekklister for dette. Det er langt igjen, men en helhetlig syn på alt dette, lagt i sjekklister/utredning ved nybygginger er også en bit av det.
4	Øke kunnskapen om grunnvann særlig i offentlig forvaltning Kartlegge grunnvannsforekomster i samsvar med kravene etter grunnvannsdirektivet
5	Samarbeid med kommuner i byggesonen. Her er kunnskap om grunnvann avgjørende viktig. Informasjon fra grunnvannsbrønner kan med fordel legges inn på nasjonale databaser. Det betyr målinger gjort i forbindelse med privat og offentlig utbygging, selv om de er av kort varighet. Met.no har gradert nedbørstasjonene sine etter viktighet og evne til å gi gode data. Slikt kan vel også NVE og NGU også gjøre?
6	Siden så mange ulike fagmiljøer er involvert, burde man bli flinkere til å anerkjenne hverandres kompetanse og mandat og basere samarbeidet på komplementære kvaliteter. Miljødepartementet burde hatt et klart overordnet ansvar for å bevilge det som er nødvendig for å innfri kravene i Vannforvaltningsforskriften (som implementerer EUs vanddirektiv og EUs grunnvannsdirektiv).
7	Økt krav til hydrogeologisk kompetanse i beslutningsprosesser.
8	Felles ressursbank - sikre samarbeid på tvers av relevante sektorer og institusjonstyper,
9	1) Nasjonal database for grunnvann 2) Lovpliktig å levere data fra utbygging 3) Bedre kunnskap om regelverket 4) At regelverket tillempes lokalt 5) Sikkert en masse mer - dette må vurderes i et eget prosjekt.
10	Økt fokus på kartlegging av grunnvannsressurser og bedre hydrogeologisk kunnskap i vannforvaltning på nasjonalt og regionalt forvaltningsnivå.
11	Bedre samarbeid mellom kvantitativ og kvalitativ forvaltningsmyndighet (NVE og Miljødirektoratet) og faginstitusjon (NGU) for kompetanseheving innen stats- og kommuneforvaltningen og konsulentbransjen vil gi økt fokus og bedre forståelse av grunnvannsspørsmål.
12	Mer kunnskap om grunnvannsforekomstene, og hvordan inngrep påvirker både kvantitet og kvalitet. Grunnvann er en begrenset ressurs, som stadig flere aktører ønsker å utnytte.
13	Det bør prioriteres mer penger til forskning og overvåking av grunnvann. Slik vil offentlige myndighet få uavhengige data som kan brukes av forvaltningen.
14	- Økt bevissthet (generelt). - Oversikt over aktuelle veiledere, og utarbeidelse av veiledere hvor noen problemstillinger ikke har dokumenter som rådgivere kan forholde seg til (og myndighetene kan kreves eller anbefales for de som bestiller oppdrag).
15	Øke den generelle kunnskapen om grunnvann og betydningen av og behov for grunnvann, slik at temaet kan gis mer vekt i forvaltning og politiske avgjørelser.
16	Øke kunnskapen om hydrogeologi i alle ledd
17	Nei, dessverre.
18	Ansette flere hydrogeologer, og arbeide mer på tvers av bedrifter/forvaltninger.
19	Bedre kartlegging, høyere kvalitet på borerigger. GRANADA kan oppgraderes og gjøres mer brukervennlig.
20	Kunnskapen som finnes på større institusjoner, må ned til de utøvende på plannivåer hvor arealplanlegging utføres. Tilsyn til riktige institusjoner og bevilgning av øremerkede midler, samt innsigelser til planer gir økt fokus og tvinger gjennom bedre løsninger.

	Har du forslag til hvordan forvaltningen av grunnvann i Norge kan forbedres?
21	Delt ansvar mellom statsforvalteren og Mattilsynet, samt meldepliktig og søknadspliktig tiltak ovenfor kommunen.
22	Grunnvannsforvaltningen må overføres til NVE, som forvalter vannressursloven, og det må bli forvaltningsmessig og politisk fokus på grunnvann. Grunnvann blir viktigere i Norge over tid, både som vannforsyning og som termisk energikilde.
23	Følge rådene i Gunnhild Storbekkrønning sin PhD-avhandling <i>*Forfatterne har her valgt å oppgi referanse til avhandlingen i referanselisten</i>
24	Det hersker en forestilling om at grunnvann er en "utømmelig og ren ressurs". Populærvitenskapelige artikler, kronikker, intervjuer og seminarer/orienteringer kan hjelpe mht. oppmerksomhet. Forvaltningen kan gå sammen om prosjekter i noen utvalgte områder i hver vannregion.
25	Gi tilstrekkelig kunnskap til vannområdekoordinatorer, som igjen kan gi god informasjon til lokale myndigheter og sørge for lokal medvirkning.
26	Skulle gjerne hatt bedre kontroll over grunnvannet innenfor mitt vannområde. Føler det mangler kunnskap om hvordan vi skal forvalte disse ressursene, eller så finnes kunnskapen fra før av, men jeg har ikke lært meg hvordan bruke dem.
27	Er for ny i arbeidet og har for lite kunnskap per nå til å komme med gode forslag.
28	Bedre kunnskap om tilstanden i grunnvannsforekomster, spesielt i bynære eller andre områder med mulig påvirkning.

4. KONKLUSJON

Flere landsomfattende spørreundersøkelser om vannforvaltning og implementering av EUs vanndirektiv ble gjennomført i 2013 og 2015 i et samarbeid mellom NIBR, HiOA, NMBU og Miljødirektoratet, Hanssen et al, 2016. Hovedkonklusjonen på deres spørsmål: «Sammen om vannet?» var at «Vi er på god vei» og at «Vi er i langt større grad sammen om vannet etter innføring av EUs vanndirektiv enn vi noen gang har vært tidligere, men har et stykke igjen».

Den enkle spørreundersøkelsen vi har gjort nå gjennom prosjektet EU-WaterRes viser at det fortsatt er en vei å gå spesielt når det gjelder grunnvann. Deltakerne av undersøkelsen har også foreslått hva som kan gjøres for å bedre forvaltningen av grunnvann i Norge.

Gjennomgående påpeker de som har svart på undersøkelsen at bl.a:

- forvaltningen av grunnvann i Norge er fragmentert
- det er behov for økt kunnskap både i forvaltningen og ellers i samfunnet
- det er behov for åpne databaser som er mer brukervennlige
- det er behov for økte ressurser til kartlegging
- det er behov for bedre samarbeid mellom etater i forvaltningen.

Takk til:

Prosjektet Nr.2018-1-0137 "EU-WATERRES: EU-integrated management system of cross-border groundwater resources and anthropogenic hazards" som er bevilget € 2.447.761 fra Iceland, Liechtenstein og Norway over EØS-midler i programmet «Norway Grants Fund for Regional Cooperation».

Takk til Kjartan Hendriksen, seksjon for geomatikk og IT ved NGU, som på utrolig effektivt vis laget spørreundersøkelsen i Microsoft Forms. Vi takker også Rune Eian, ved seksjon for kommunikasjon og formidling ved NGU, som publiserte undersøkelsen via ulike nettløsninger og sosiale medier. Vi takker også alle andre som hjelp til med å distribuere spørreundersøkelsen.

Ikke minst takker vi de som tok seg tid til å svare på undersøkelsen, uten dem hadde vi ikke hatt noen data.

Referanser

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