



KINDRA DELIVERABLE 4.7

REPORT ON END USER REQUIREMENTS

Summary:

This deliverable summarises the needs and requirements of potential project end-users. Task was carried out via an online survey and work also included the identification of potential project stakeholders and the development of a corresponding database that could be used later for making contacts. The survey, realized by the Google Survey tool included five groups of questions; 161 responses received, starting from a mailing list of about 650 contacts (obtaining about 25% of replies). Results confirmed the interest on the activities previewed in the KINDRA project, giving information useful for a fruitful development of the project, with significant consequences on WP1, WP2 and WP3.

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Abbreviations

CIS WG-C	CIS Working Group Groundwater
DoW	Description of Work
ECHN	Early Career Hydrogeologist Network
EFG	European Federation of Geologists
EIP on Water	European Innovation Partnership on Water
GWP	Global Water Partnership
ICT4water	Cluster of ICT and water management projects
JPE	Joint Panel of Experts
IAH	International Association of Hydrogeologists
WSSTP	Water supply and sanitation Technology Platform

1. Introduction

This deliverable, D4.7 assesses the needs and requirements of potential end-users of KINDRA. The Grant Agreement requires this deliverable at the early phase of the project (M6) in order to ensure an impact throughout the whole implementation.

The work under this task (Task 4.3 of WP4) included:

- i) the identification of potential project stakeholders and the development of a corresponding database that will be used later for project dissemination activities;
- ii) creating a suitable method (a survey) to assess their requirements in the context of KINDRA and
- iii) compiling end-user requirements into a report with the objective to finalise the initial approach.

The stakeholder groups initially included in the KINDRA contact database were as follows:

- CIS-WG C Groundwater: the WG is a technical institution of the EC and its activity is relevant to professionals, public authorities and the academic world. EFG is member of this WG;
- EuroGeoSurveys Water Resources Expert Group;
- European Federation of Geologists Panel of Experts on Hydrogeology
- Attendants of the Hydrogeology Workshop on European Water Policy: Challenges for Hydrogeologists, organized by EFG, 22-23 November 2013 in Brussels;
- EFG's contacts through geological associations;
- IAH - International Association of Hydrogeologists: European National Chapter contacts and ECHN (Early Career Hydrogeologist Network);
- National Association delegates of EFG;
- EFG's contacts through other National Associations;
- KINDRA project network: relevant EU projects;

We reviewed the different contact lists to avoid double use of the same contact. In total, the KINDRA database used for the survey included 644 contacts. The database could filter information by country, stakeholder group and area of professional interest. This improves communication and the data base; This function enables KINDRA to identify main groups of interest and to establish regular communication via tailored messages during the project period. All persons that responded to the questionnaire will receive a summary of the results of the survey.

The main mean of communication to reach out potential stakeholders was via a google survey link sent by a personalised email to each contact. The survey /calls for participation in the survey were also made available via a series of newsletters of relevant organisations and via social media such as Twitter and Facebook (see Annex 3).

The survey started with the introduction of KINDRA's project objectives followed by a short description of the related task, the survey itself (Annex 3). The questionnaire included three main set of questions as follows:

- three questions related to personal data to further refine the project contact database;
- end users questionnaire: ten questions related to key project outputs (of WP1, WP2 and WP3);
- and communication information.

As a surveying platform Google Forms were used. The raw survey data and the automatically generated summary can be found at the following links:

Survey Results:

<https://docs.google.com/spreadsheets/d/1KZw0UF-FslatRjx1gFXdjsFEuslFEmLq0noP3lOAtzU/edit?usp=sharing>

Automatically generated summary of the responses:

https://docs.google.com/forms/d/1ToDcmZ_ZYKpjBNfr2zxvgHahI4L3Rcw0nPt5e77sokw/viewanalytics

This report compiles the end-user requirements based on the responses received. The objective is to improve and finalise the initial approach of KINDRA WP2 and WP3.

2. Survey population

In total, we received 161 responses to the survey during the period 20th of May and 24th of June .2015. Figure 1 shows the dynamics of the daily responses. The main peaks correspond to the first deadline related to the first shipment sent via personal emails, while the second peak corresponds to second shipping and second deadline, disseminated via newsletters.

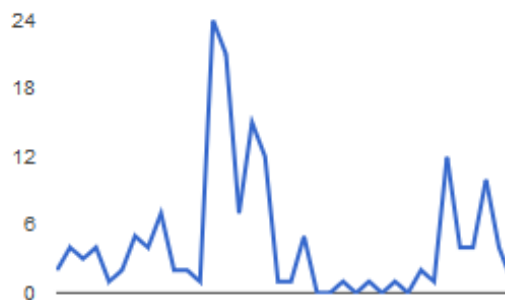


Figure 1: Dynamics of daily responses (Number of responses for period: 20th of May to 24th of June 2015).

Information on the survey/Call for participation in the survey was published in the following newsletters:

- EFG Newsletter: GeoNews, April? and June 2015;
- IAH newsletter: May 2015;
- EIP on Water Newsletter;
- EFG National Association member's newsletter.

3. KINDRA database improvement

The information collected at the end of the survey in a form of questions on personal data and communication information will be used to improve and complete the KINDRA contact data base. As a result, the project contact database has 644 members at the moment (as of end of July 2015), from which 70 new members directly derives from the end-user survey.

We requested information about:

- Organizations: 132 have participated in the survey (full list can be found in see Annex 1 of the deliverable);
- Country: the survey responses originate from 22 different countries. Figure 2 shows the number of participants by country;
- Professional area: this has been divided among the six main project stakeholder groups, as identified by the DoW of KINDRA These are:
 1. Interest groups & bodies (EU & International level)
 2. Researchers & academic staff
 3. Associations representing Industry & Agriculture
 4. Environmental NGOs (EU + national level)
 5. Public bodies & funding agencies (EU + national level)
 6. Other (including Consultancy)

Figure 3 indicates the percentage of participants by professional areas.

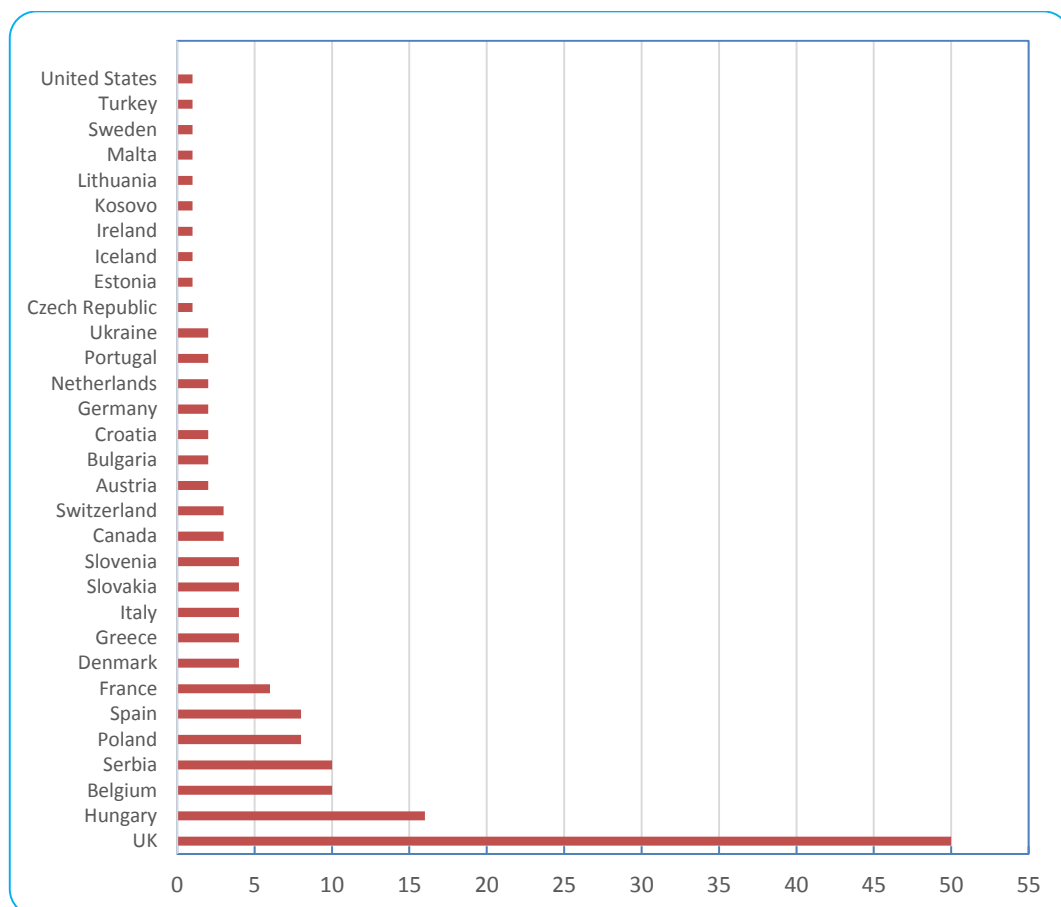


Figure 2: Countries represented in the survey (received answers)

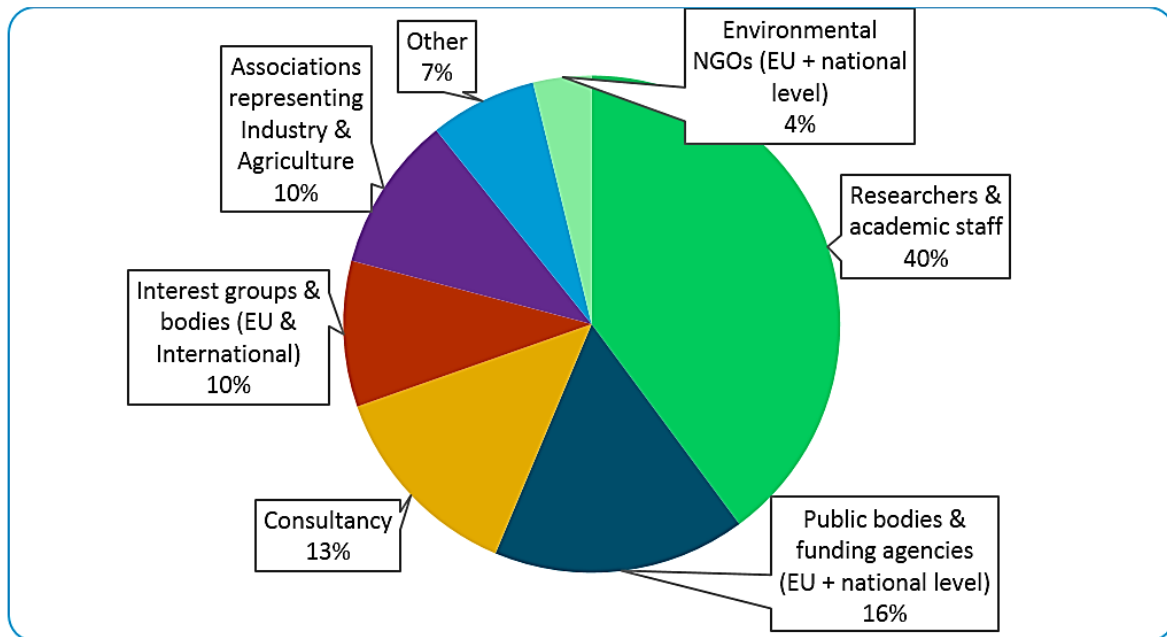


Figure 3: Percentage of participants by professional areas

4. KINDRA end-user questionnaire

The questions of the survey were divided into the following five groups:

- 1) Geographic scope of work area;
- 2) Questions on the need for EU-harmonised Hydrogeological Research Classification System, HRC-SYS (WP1);
- 3) Questions about the need to harmonise categorisation approaches/terminologies for reporting groundwater research and assessment of knowledge, (WP1 and WP2)
- 4) Questions related to the need for an European Inventory on Groundwater Research and Innovation, EIGR (WP2);
- 5) Questions on the need on define research gaps (WP3).

1) Geographic scope of the work area of survey participants

The geographic scope of the work area was divided into the following four groups: regional, national, European, and international. The participants were allowed to choose more than one option (multiple choice).

Figure 4 shows that half of the survey participants work only at a national level, 14%-14% work at regional or European level, while 18% are active at an international level. Only 4% of the responders indicated more than one geographic scope.

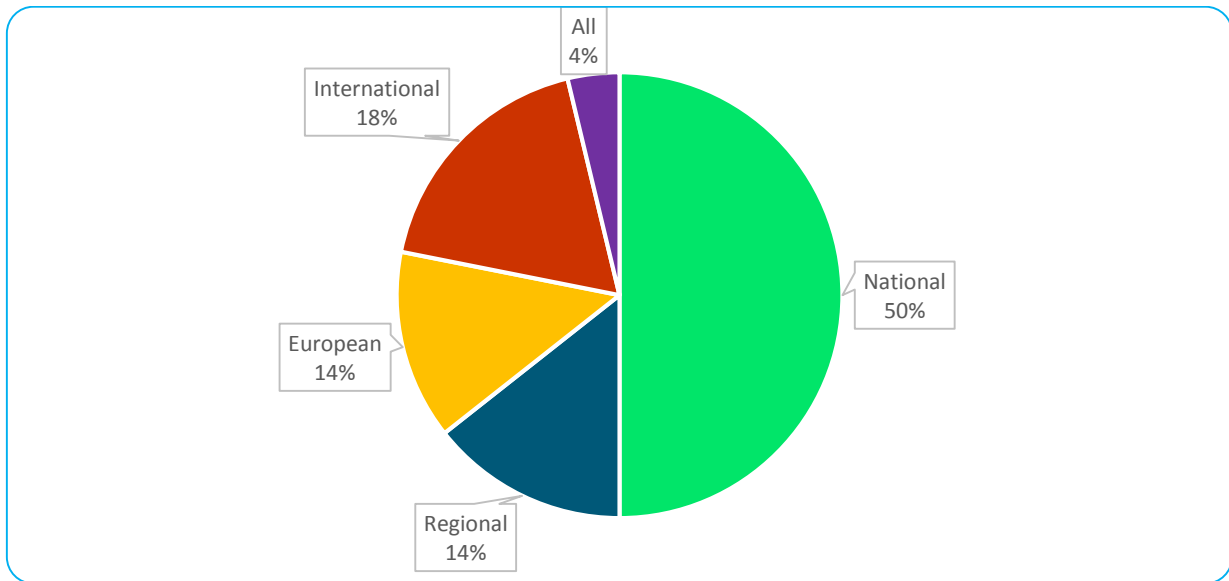


Figure 4: Geographic scope of the work area of survey participants

2) Questions on the need for EU-harmonised Hydrogeological Research Classification System (HRC-SYS)

The questions were addressed to end users of reports and authors of reports on Hydrogeology. From the end users we collected information on the classification system and sources of information.

Firstly we have tried to identify the frequency of use of reports on groundwater research. The results show that 82% of the participants use reports on groundwater research. This result indicates that the participants of the questionnaire were well selected and those that responded have a high interest in the project objectives.

Those participants that use groundwater reports were further requested to:

- identify the type of groundwater research information they use;
- specify the classification system (if any) they use to find such information;
- and to indicate the three main sources of information they regularly use.

Respect to the type of groundwater research information they use, the responses were classified according to the most frequent keywords: mapping and monitoring were the more frequent answers. Other frequent keywords used are research on geological information, modelling, hydro chemical, stratigraphic, groundwater level, quality, assessment result and aquifer parameters including borehole data. The activity of risk and geophysical information were also mentioned. Figure 5 highlights the number of hits of the most frequent keywords.

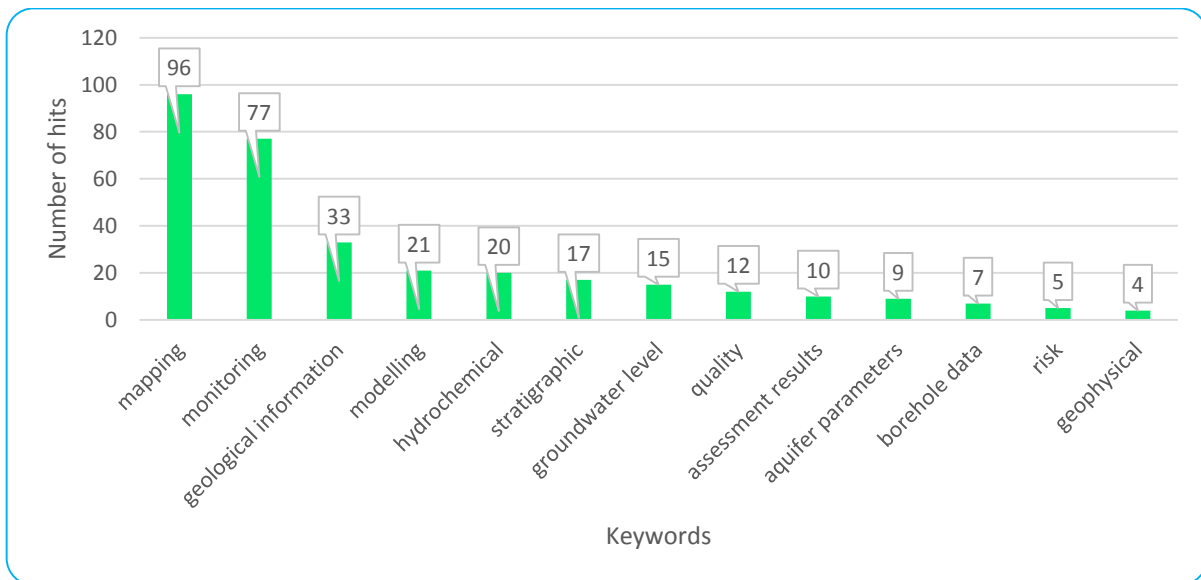


Figure 5: Groundwater research information used by survey participants (Total number of responders = 161)

The answers received in relation to the classification system used by the participants range from the use of all classifications to the use of no classification. Annex 2 presents the variation of classification criteria and systems used by the participants of this survey. The variety of responses indicates a lack on common understanding on what the classification system means, as well as the range/variety of different classification systems used by the responders.

This result justifies the need for creating a uniform, EU-harmonised categorisation approach / terminology for reporting on groundwater research, a Hydrogeological Research Classification System – HRC-SYS.

The responses to the question on the three main sources of information most regularly used at work were grouped as follows:

- Internet information,
- Internal database;
- National database;
- Public organizations database such as environmental agencies and geological surveys,
- Publications in papers: journal, library.

Figure 6 illustrates that the most frequent sources of information used by survey responders is internet search and publications in papers. For this last group, the information sources are mostly obtained in libraries.

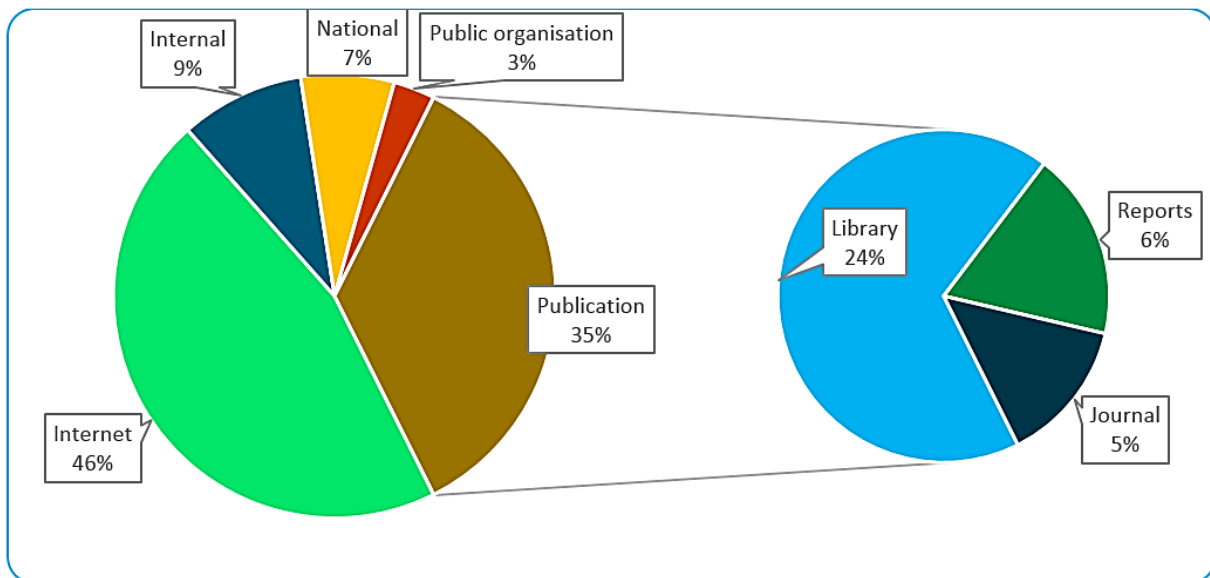


Figure 6: Source of information used by survey participants

We asked if a more harmonised categorisation approach/terminology for reporting groundwater research could improve the accessibility of this information at the work. The result of the questionnaire illustrates that 88% of the participants are in favour to have a more harmonised categorisation approach/terminology for reporting groundwater research.

It is important to draw the attention to the opinion of those, 12% of the survey responders, who disagree with this approach. We find 6 groups of arguments, these arguments provide important insights for the KINDRA project (WP1):

I. The main argument points against European classifications:

- *“It would also be useful to upgrade the EIP Water Thesaurus, based on the EEA Water Thesaurus”;*
- *“Working intensively in the field of hydrogeology for many years and for very different topics and many clients state of the art based on the experiences is relatively clear and topics needed as a background can be find relatively easily if data sources are available, however this is not always the case. Such classification can be useful for people not directly from the field of hydrogeology”;*
- *“What we see as problem is hydrogeological terminology, at national level and also internationally (English), not for the reporting research results but for the communication between professionals”;*
- *“In last ten years since the implementation of WFD intrusion of terminology from legal acts change perception of certain basic hydrogeological terms and cause confusion to professionals not directly involved into WFD activities. Recent discussions at national level have shown that for certain important terms there is no agreement”.*

II. Responses against based on existing national classifications:

- *“UK on-line information is compliant with the EU groundwater directive”;*
- *“Currently the information in Spain has an acceptable degree of categorization”;*

III. Responses highlighting the difficulty to harmonize classification on Hydrogeology:

- *“Uniformity will never exist, all sources are interesting and it is better to know from the starting point of research which type of information we are looking for”;*
- *“Artificial harmonisation would seriously impair the conceptual understanding of the interaction of man, climate, surface water, soil, drift and rock that is hydrogeology”; The natural environment does not comprise a number of pigeon holes.*
- *“Not necessarily. Such a system relies on people committing to use the system in a consistent manner. There may also be language barriers to overcome”.*

IV. Potential problems stressed by the participants:

- *“Many of the hydrogeological terms are likewise weak or inherently contradictory”;*
- *“Very much oriented to the academic sector and not the private sector”;*
- *“The scope of the research is too wide to systematise in the way suggested”;*
- *“Hydrogeological interpretation is an art and a science and it is very easy to draw incorrect conclusions if the context is not evident. This applies to opening up access to data it is very easy to misinterpret”.*

V. Proposals made by participants on potential solutions:

- *“A central place on the internet, where one can expect to find relevant reports”;*
- *“The status of knowledge in each country is very different. Most important is the easy access to georeferenced data which can then be combined with Remote sensing data and Digital Elevation models which are all freely available from Internet”;*
- *“The most important factor is knowing where to find the information, and having a summary in English”;*
- *“Work on access to stratigraphic records has been great but our experience in other areas has been less positive. One area we have great challenges with is the different forms of reporting of water quality data. If the resource is put into uniformity and standardisation and cleaning of historic data sets that would be great but it is the context of the monitoring point that then has to be drilled into. The cross-linking of data sets to sample point location - construction - sampling methodology - point usage is a challenge and something we often have to unpick in order to evaluate the quality of the data. Some gauge of database quality is always essential”.*

VI. Finally, a limited number of participants doubt on the need a harmonization system in the time of google search.

We also try to identify the % of producer of reports on groundwater research between the respondent population. 62% are involved in the production of reports on groundwater research Those participants who answer positively to the question were further interviewed to indicate the kind of groundwater research information they produce (e.g. mapping, monitoring, etc.).

The responses are classified by the most frequent keywords used. The majority of the responses mentioned monitoring mapping, reports and assessment, and modelling as a main “product of their research”(Figure 7).

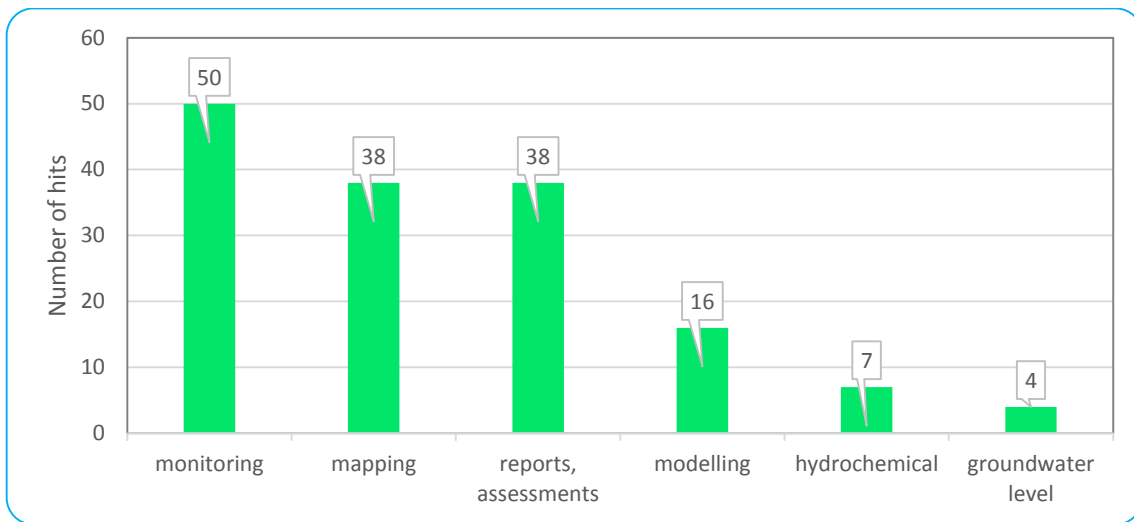


Figure 7: Type of groundwater research information produced by the survey participants (Total number of responders = 161)

3) Questions about the need to harmonise categorisation approaches/terminologies for reporting groundwater research and assessment of knowledge. (WP1 and WP2)

The participants were requested to assess how useful an EU-harmonised categorisation approach/terminology would be for reporting on groundwater research. The responses were graded on a scale 1-5, where 1 was = not at all and 5 was = absolutely. Figure 8 indicates the positive interest on the EU harmonised approach.

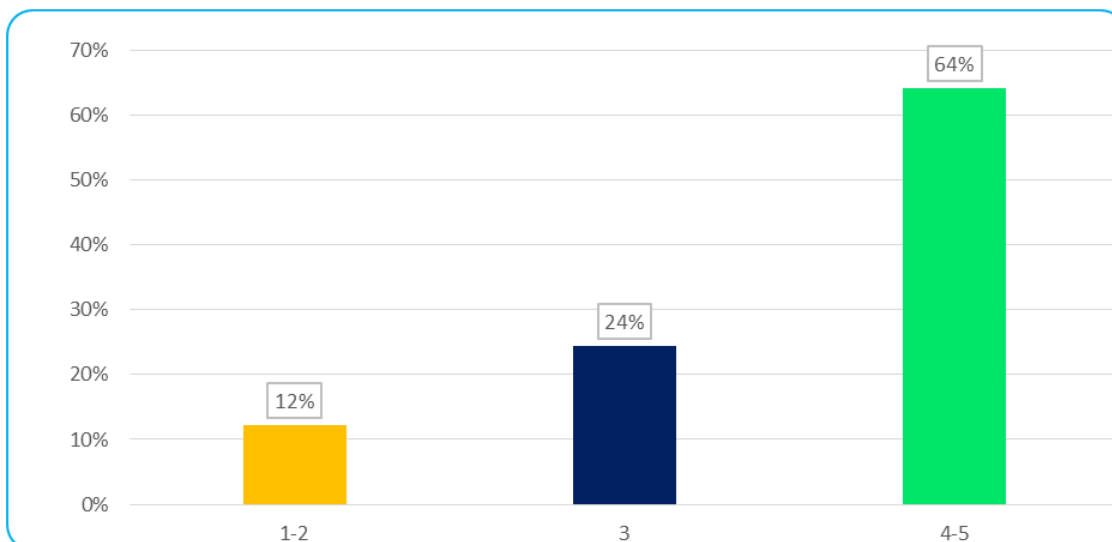


Figure 8: Assessment in the value of EU-harmonised categorisation approach/terminology for reporting on groundwater research

Participants were further invited to provide a reason(s) for their choice. The answers can be grouped as follows:

- I. Facilitate the comparability between Europe, countries, regions, and stakeholders:

- *“As there is no uniform categorisation approach/ terminology for reporting groundwater research, it is very difficult to report and compare ongoing research activities, agendas and strategies. A more integrated community of researchers and users extending across disciplines, countries, organisations and sectors is urgently needed;”*
- *“Harmonisation helps as long as legal requirements of the Community legislation require. But should give a space for its further development;”*
- *“S&T cooperation is also easier if harmonization is at an advanced state”;*
- *“A harmonisation approach will save me considerable time in the search for the required information”;*
- *“Allows consistent interpretation”;*
- *“We are still far away of a common international terminology, even within one language, thus I would like to suggest at least an English one”;*
- *“Enables comparability with regions with similar conditions”;*
- *“To compare the results of research in different countries”;*
- *“Possibility and facilitation of Internacional cooperation”;*
- *“Harmonisation is important for cross-border, continental and global applications”;*
- *“It could be definitely useful to have harmonised terminology, mainly for international and transboundary cooperation”;*
- *“Having harmonised information all over Europe should be mandatory”;*
- *“Due to common understanding of interpretations within the EU”;*

II. Facilitate cooperation between professionals

- *“It facilitates the opportunity to make contacts and develop cooperation”;*
- *“It is very important for as Geologist - Hydrogeologist to communicate with the same language which is harmonised categorisation terminology for reporting groundwater research in region, and especially in Europe”;*

III. Improve quality: standardization arguments

- *“It could help greatly for systematisation of data and meta data research”;*
- *“Should be the only standardized approaches for geological study of subsoil, including underground water”;*
- *“I supposing that after EU-harmonizing categorization will be much easier to provide necessary data for reporting in groundwater researching”;*
- *“If we wish to compare and contrast data across regions we need to be confident we are doing it in the same way and to similar standards”;*
- *“Standardized approach would help a strict protocol would not”;*
- *“The water management is a major issue, it should be based on data”;*
- *“Easier way to find the data you are looking for”;*

IV. Reduce confusion:

- *“It would reduce confusion among experts and general public on results and time needed to find relevant information”;*
- *“Availability of data and avoidance of confusion and loos of Knowledge”;*

- *“The other, even more important, fact is that it may give a geologist an opportunity to introspect the wider area through the same level of information”;*
- *“To better share the information”;*
- *“Unique categorisation and terminology would help in better understanding of various problems and their solutions could be suggested from different experts from different countries”.*

V. Quantitative status assessment, data assessment:

- *“EU-harmonised categorisation approach/terminology is important in groundwater quantitative status assessment process on national and EU level”;*
- *“A harmonisation system or categorisation will not solve all problems but it would be extremely useful to know that when you search in a particular category you got everything in that category and you knew that all who used that category knew what it meant”;*
- *“From the point of geometry and hydraulic properties of (hydro)geological units there is a need to harmonize interpretations, maps and models along the border with neighbouring countries. At this stage interpretation, maps and models differ between neighbouring countries which causes problems for project carried out in the border regions”;*
- *“It could be relevant to find more easily information about unpublished reports (grey data) but also at EU level thesis about hydrogeology”;*
- *“Consistency when reviewing information before applying”;*
- *“This could help to have a more concrete idea about the causes, problems, terminology, methodology and possible solutions”;*
- *“Free and easy access to high quality data, which means data which can easily be introduced, analyzed and further developed in a GIS”;*
- *“Specially in Greece a harmonised categorisation will ensure the quality of the offered services as well as the participation of geology in ground water research”.*

VI. Avoid double work:

- *“It would be great to be able to get info on hydrogeological works and research just by entering keywords. Now, it is lots of work and lots of spared time”;*
- *“It would enhance accessibility and avoid double work, it is easier to identify gaps for further research”;*
- *“Improved visibility in coherent, consistent format Confidence that search results would deliver focussed outputs”.*

VII. Problems encountered:

- *“Even between agencies in Scotland there are different terminologies used, this becomes particularly difficult when discussing GWDTEs where ecologists have completely different view on 'groundwater'. Scale that up to Europe and it is even more challenging”;*
- *“I am not sure what a harmonized terminology should be...terminology is different in each language? Streamline terminology - results and reports from different sources”.*

have to be compared and converted due to different standards and terminology. This loss of time can be avoided”;

- *“I think that the most important issue is the categorisation concerning each country as an independent state. The reason is that the EU directive gives some major guidelines but each country has different needs and has to be taken seriously under consideration”.*

VIII. Proposals for improvement:

- *“To be efficient while researching ground water means following rules, general ones and specific ones, like - up to a certain point- performing a cooking recipe. You have to define hydrogeological conditions, type of equipment and material to be used, the way of using, the results control and interpretation and also the maintenance and training conditions”;*
- *“The categorization should therefore help in 1) better recognizing what groundwater research is all about, 2) why it is so relevant for society, and 3) who is responsible for what in sustainable use and effective protection of groundwater resources. It is also important to highlight the diversity of groundwater resource types across Europe, suggesting that monitoring practices and protection strategies have to be adapted according to the prevalent environment (for example, alpine aquifers vs. alluvial plain aquifers”.*

We also requested to the participants if an ‘EU-wide assessment of existing practical and scientific knowledge from hydrogeology research and innovation in Europe’ be relevant to the work. The vast majority, 89% of the participants considered that it would be relevant for the professional activity

Those responders who answered positively to the question were required to identify the most relevant geographical levels) to their work (it was a multiple choice question). Results (Figure 9) show that the national level is the most relevant when assessing existing practical and scientific knowledge from hydrogeology research and innovation (around two-third of the responders ticked this option as relevant). The second most relevant level according to the participants is the European level. Regional and International levels are also considered relevant.

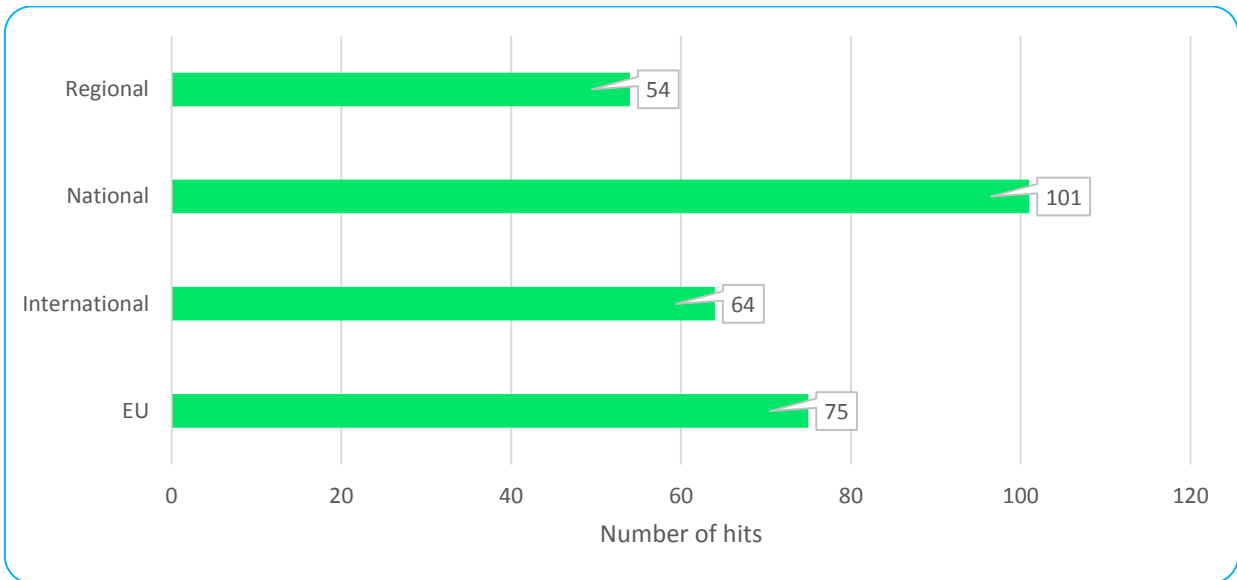


Figure 9: Most relevant geographical level for assessing existing practical and scientific knowledge from hydrogeology research and innovation (total number of responders = 161).

4) Questions on the need for an European Inventory on Groundwater Research and Innovation (EIGR)

The participants were requested to answer how useful would the European Inventory of Groundwater Research and Innovation (EIGR) be for they work. The answers to this question (Figure 10) show a very relevant interest in the EIGR: 58% of the respondents considered EIGR as relevant/very relevant (marked 4-5 on a scale), 27.4% as neutral (scale 3) and only 14.7% as not or less relevant (marked 1-2 on scale).

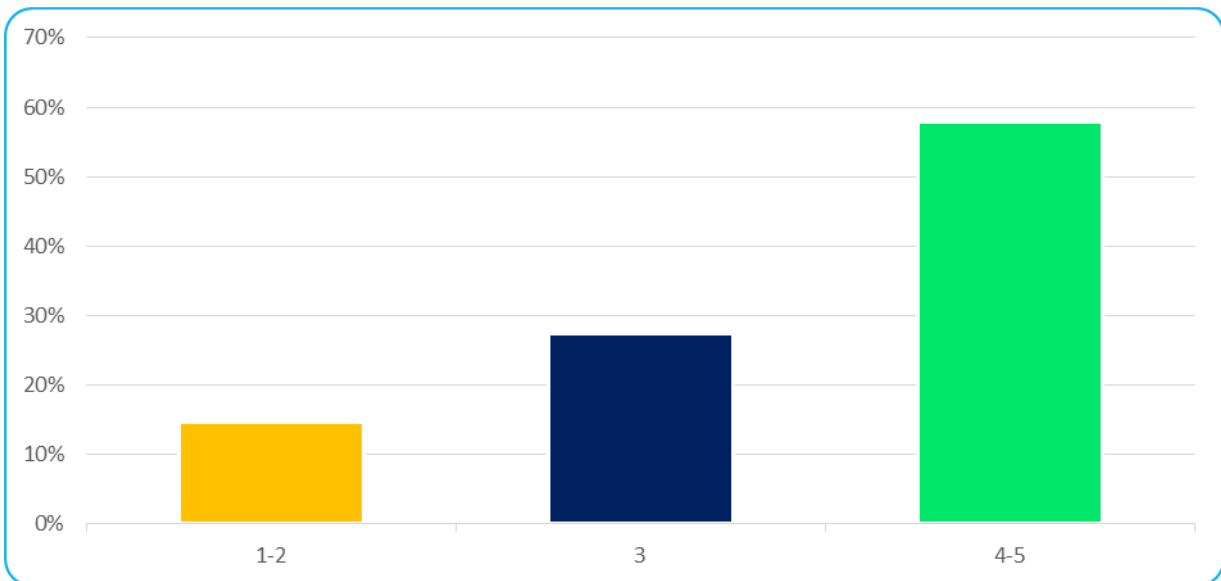


Figure 10: responders' interest towards EIGR

We also requested to the participants to indicate how they would like to access such information. This aimed at identifying the most relevant ways to access the information in the inventory, WP3 activity (Figure 11). It was a multiple choice question and the following pre-defined options were provided: “Through a catalogue”; “Key word search”; “Via maps”; “By geographical name”, and “Other”.

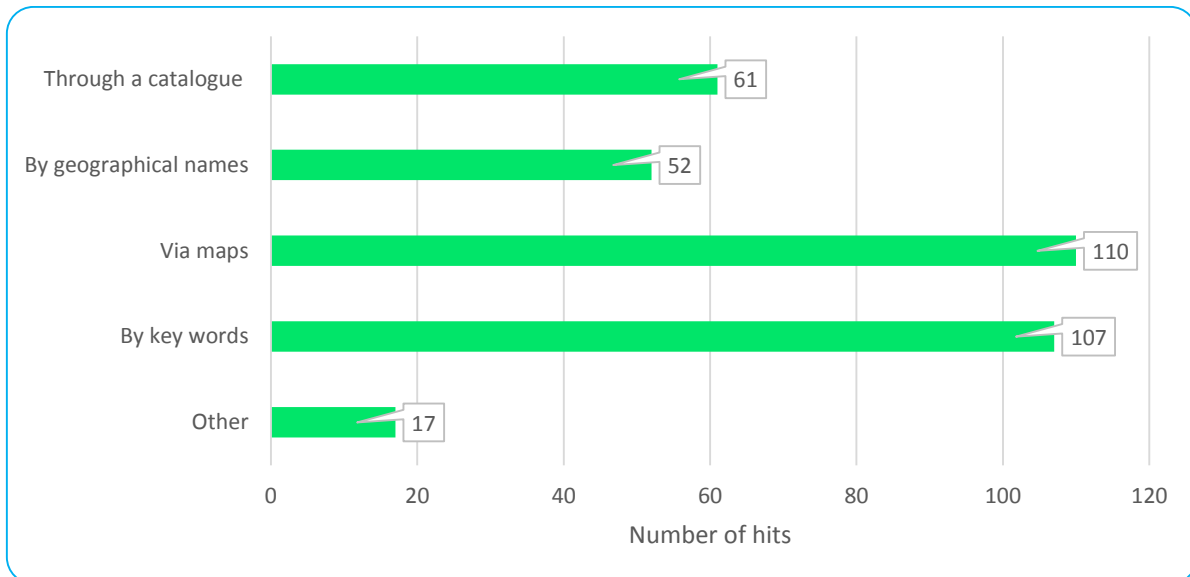


Figure 11: Preferred ways to access information in the EIGR (Total number of responders = 161)

Converting these responses into percentages, it reveals that the access “via maps” was selected by more than 70% of the participants in this survey. “Using key words” is also very important, 68.6%. 39% of the respondents stated that they accessed information “through a catalogue”, while 33% used “geographical names”. Only 10% selected “Other” ways, meaning that these four options cover the majority of the expectation for the inventory.

5) Questions on the need on define research gaps

The participants were requested to answer how useful would a European report on research gaps related to hydrogeology research be for they work, indicate on a scale 1-5, where 1 = not at all and 5 = absolutely” (Figure 12). If we classify the answers 4 and 5 as positive replies, 55% of the participants considered that a report on research gaps is useful, while 26.6% gave neutral reply (marked 3 on a scale), and only 18.4 % considered that such a report is not or less needed (marked 1-2 on a scale)

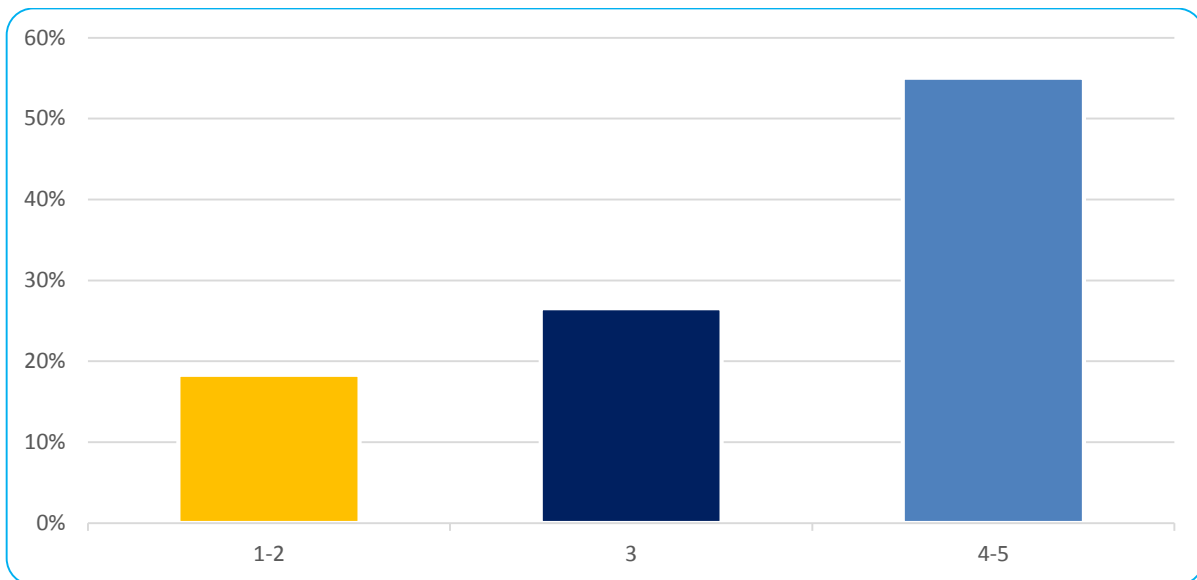


Figure 12: Need for/Relevance of a European report on research gaps related to hydrogeology research

5. Conclusions

The survey, realized by the Google Survey tool between 20th of May and 24th of June 2015, included five set of questions; in total, out of the about 650 people contacted, 161 persons filled in the questionnaire, (this obtains about 25%). Results confirmed the interest on the activities previewed in the KINDRA project, giving information useful for a fruitful development of the project, with significant consequences on WP1, WP2 and WP3.

According to the results 82% of the respondents use reports on groundwater research during their work, this indicates that the population responding to this questionnaire was well selected and have a high interest towards the project objectives.

The most frequent type of groundwater research information from reports used by the survey participants are *mapping and monitoring* (31% and 23,6 % of the responders). Other frequent keywords used are *research on geological information, modelling, hydro chemical, stratigraphic, groundwater level, quality, assessment result and aquifer parameters*, including *borehole data*.

The most frequent groundwater reports produced by survey participants include activities on *monitoring, mapping, reports and assessment, and modelling*.

The variety of responses on the question about the used Hydrogeological Research Classification indicates that there is a lack of a common understanding on what a classification system means as well as the use the range/variety of different classification systems used by the responders. This result justifies the need for KINDRA that primary objective is to create a uniform, EU-harmonised categorisation approach/terminology for reporting on groundwater research: a Hydrogeological Research Classification System – HRC-SYS.

The vast majority, 88% of the participants were in favour of a more harmonised categorisation approach/terminology for reporting groundwater research. Some of the reasons for this election were:

- Comparability between Europe, countries, regions, and different stakeholder groups;
- Cooperation between professionals;
- Standardisation arguments;
- Reducing confusion;
- Quantitative status assessment, data assess;
- Avoiding double work;

Immense proportion, 89% of the respondents were convinced that the EU-wide assessment of existing practical and scientific knowledge from hydrogeology research and innovation in Europe' would be relevant for their professional activity.

58% of the participants would consider a European Inventory of Groundwater Research and Innovation (EIGR) useful for their work. As far as accessing information in the inventory more than 70% of the participants selected "via maps". "Using key words" is also very significant, with 68.6%. 39% of the participants stated that they would like to access "through a catalogue", while 33% used "geographical names". Only 10% selected "Others", meaning that these four options cover the majority of the expectations for the inventory.

55% of the survey responders consider a European report on research gaps related to hydrogeology research (main outcome of WP3) relevant/useful for their work.

In order to improve & refine the communication towards the selected stakeholder groups, participants of the survey were interviewed (asked to grade the main project results on a scale 1-5 (where 1 = not at all and 5 = absolutely) which outcome of KINDRA would be the most relevant for them . As a result, the different stakeholder groups and individuals will be sent tailored messages in the future. (Figure 13 shows the detailed analysis).

The information and knowledge obtained by this end-user's survey will influence the implementation of all main technical WPs (such as as WP1 - see D1.2, WP2 and WP3) and will be seriously taken into account in order to achieve the best results possible.

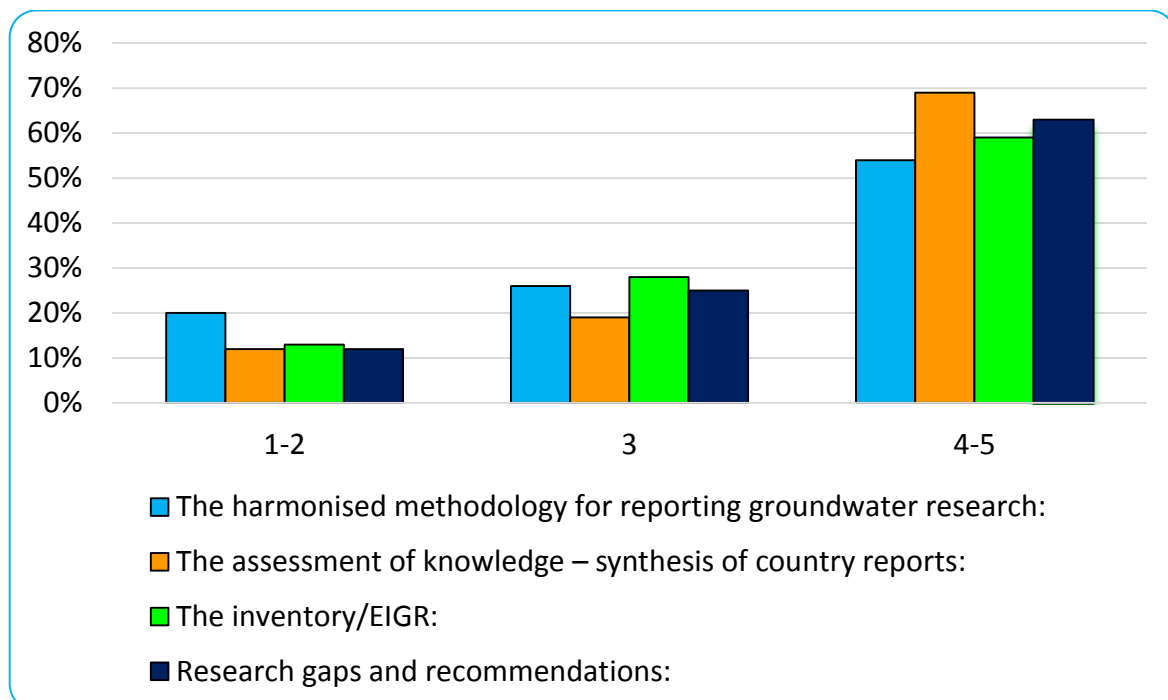


Figure 13: Information follow-up (% of the participants where Total = 161)

Annex 1: Organisations participated in the survey

- AGG
- Amec Foster Wheeler
- Applied Geology
- AQUASSISTANCE & GsF
- AquaTerra.pl
- Aristotle University of Thessaloniki
- Associação Portuguesa de Geólogos
- Atkins Ltd.
- Atmos Consulting
- BRGM
- Imperial College, London
- CEMEX
- Citizen
- City of Gothenburg, City planning office
- Comité Français d'Hydrogéologie Consultant
- CRIRSCO
- Croatian Geological Survey
- Czech Geological Survey
- CSIC
- Defra
- DELTARES
- Earth Science Partnership
- EIP Water
- EnviroCentre Ltd.
- Environment Agency
- Environment and Water Agency. Regional Ministry of Environment and Spatial Planning
- Environmental Agency of Iceland
- Environmental protection Agency Canton Valais
- Eötvös Loránd University
- EREF
- EurEau
- European Federation of Geologists
- Faculdade Ciências Lisboa
- Faculty of Mining and Geology, University of Belgrade
- Fracture Systems Ltd
- Geenwich University
- Geological and Geophysical Institute of Hungary
- Geological Survey of Serbia
- Geological Survey of Slovenia
- Geologische Bundesanstalt
- Geolys
- Geotechnics Limited
- Gesellschaft für Geologie mbHGmbH
- GEUS
- Ghent University
- Governmental
- Graz University of Technology
- Hungarian Geological Society
- Hungarian Office for Mining and Geology
- I2M Associates LL
- IAH Irish group
- IGME, Geological Survey of Spain
- Instit Géotechnique SA
- Instituto Geológico y Minero de España
- Jagiellonian University
- JH Groundwater Ltd
- Klohn Crippen Berger
- LLWR Ltd
- Magnox
- MEERI PAS
- Mineral and Energy Economy Research Institute of Polish Academy of Sciences
- Ministry of Environment and Water, Bulgaria
- Ministry of Interior, Hungary
- Ministry of Mining and Energy, Serbia
- MIRO
- Mission Risques Naturels
- Mott MacDonald
- MWH
- National Research Council of Italy
- Natural Resources Wales
- Norfolk County Council
- Nottingham Trent
- OneGeology
- Opus international
- Orio consultancy
- OVAM
- Parsons Brinckerhoff
- PAS MEERI
- Polish Academy of Sciences
- RSK
- RWC "Hidromorava" JVC
- Scharek and Co.
- Serbian Geological Society
- SEWCU
- Skapto bvba
- Slovak Water Research Institute
- Slovenian Environment Agency
- Spanish Ministry of Agriculture, Food and Environment
- Spanish Official Professional Association of Geologists

- SPW
- Geological Survey of Slovak Republic
- Suleyman Demirel University
- Swiss Humanitarian Aid
- University of Szeged
- SZIE UNIVERSITY
- TerraConsult Ltd
- TNO Geological Survey of the Netherlands
- UGent
- Union geologists Ukraine
- Università degli Studi di Milano
- Università degli Studi Federico II di Napoli
- Université Lille1
- University of Ljubljana, Department of Geology, Natural Sciences and Engineering Faculty
- University in Bratislava, Dept. of Hydrogeology, Faculty of Natural Sciences, Comenius.
- University of Belgrade, Faculty of Mining and Geology, Department of Hydrogeology
- University of Debrecen
- University of Liege, Hydrogeology and Environmental Geology
- University of Mining and Geology "St. Ivan Rilski"
- University of Miskolc
- University of Nottingham
- University of West Hungary, Szombathely Campus
- VDC Milieu
- Vrije Universiteit Brussem
- Water company
- Water Harmony: "Vandens harmonija"
- Water research institute
- WorleyParsons
- Wroclaw University of Technology
- WSP
- WSP/PB

Annex 2: Classification system used by the participants

- Using all classifications
- World-wide inventory on groundwater monitoring - IGRAC
- Common Implementation Strategy for the Water Framework Directive (2000/60/EC)
- Groundwater risk assessment report
- Executive Summary Report Risk Assessment Comparison Study – NICOLE
- Company library and Internet sources of professional papers and reports
- Web based search, keywords, published papers Internet maps
- Central Base of Geological Data, HYDRO Bank
- Aquifer designations WFD designations for designated water bodies
- Only classification for chemical interpretation of groundwater (Piper, Durov, Alekin...)
- Google Scholar + other search tools.
- Circa
- EA WEBSITE
- Internal data - wims and quality monitoring data, BGS
- Topic Groundwater/Hydrogeology Thematic: quantitative or qualitative aspects
Precise research with specific keywords Search after a particular region of interest (for example "Alps")
- Precambrian crystalline Basement
- Spanish public (Administration) agencies: Plenty a good quality information: -Ministry of Agriculture, Food and Environment. Biodiversity División. -General Direction of Water -Geological Survey of Spain -Studies carried out by the different River Basin Districts -Universities -Research organizations (Centre for Hydrographic Studies)
- Identification, delineation and classification of groundwater bodies
- Stratigraphic unit, word of mouth, Google and guess
- Electronic literature search for each project
- Stratigraphic and hydrostratigraphic classification systems (old and new)
- Existing reports (thesis, new & old reports from Public Water Agencies, National Geological Survey, Private Companies)
- Keywords, authors, titles, toponames
- Google Scholar / Science Direct as don't have access to Web Of Science
- Location, keywords, titles, metadata Library catalogues, personal experience, colleagues experience
- Main sources are the websites of the British Geological Survey and the Environment Agency
- Sensibility of the ground water
- Scopus, Google Scholar
- National legislation and standards
- Environment Agency library
- Searching procedure is based on own knowledge and no particular classification system is applied.
- I don't use classification systems to find my methods
- HCOV (hydrogeological encoding underground of Flanders) reports made by specialists
- Old classification system in category reserves A, B, C
- Key words, geographical names
- HCOV data base
- GIS from ICMM of Kosovo , different NGO in Kosovo and region , we use and different websites for this kind of research , different archive of municipalities , governments , and other institutions

- Internal and other national databases, web of knowledge, scopus, google
- Depth, chemical composition
- Search engines like web of science and google scholar as well as subscribing to relevant journal alerts
- Intern GIS data
- My personal classification is organized as following: 1) geological, geometrical data of the aquifer (maps, cross-sections, ...); 2) parameters/properties of the aquifer: hyd. conductivity, storage coeff., dispersivities, effective porosity, ...; 3) stress factors applied to the studied system: recharge, pumping, drainage, ... 4) historical data: piezometric and concentration measured data of the past (results of monitoring).
- we use and create classifications focused on the problem to be solved
- Company inventory, library and internet search (i.e. google)
- Internally produced data and reports.
- Google scholar as well as word of mouth to compile information on relevant research.
- Thermal water, mineral water, groundwater
- SEPA Vulnerability mapping, water body classification, SPRI water releases
- Published reports, articles
- Time variation curve of groundwater table rainfall especially heavy rainfalls lowering of groundwater by mining
- Groundwater bodies and River Basin
- My experience of such operations, the results of these studies and reports on them in the archives of the Ukrainian Government Enterprise "Geoinform"
- Journals in hydrogeology, hydrogeochemistry and isotope geochemistry
- Agency archive - BGS borehole scans - on line material - modelling out put standard forecasts
- 1. groundwater 1.1 quality/quantity 1.1.1 monitoring/mapping/modelling results
- Nor quite sure what the question is related to. Probably the answer will be: geographical classification, scale of data, source of information etc.
- Publicly available information resource - WOS (web of science), SCOPUS, scientific, expert (books)
- No classification

Annex 3: Survey on end-user requirements screenshots



Subject line of the contact email:

KINDRA H2020 project: end-user survey

Introductory email text:

Dear Sir/Madam,

KINDRA (Knowledge Inventory for hydrogeology research, Grant Agreement No. 642047 – www.kindraproject.eu) is funded by the European Commission's HORIZON2020 Framework Programme. **Its overall objective is to take stock of Europe's contemporary practical and scientific knowledge of hydrogeology research and innovation** by taking an inventory of research results, activities, projects and programmes, and then using the inventory to identify critical research challenges and gaps. This approach takes into account the implementation of the Water Framework and Groundwater Directives, enabling future correct management and policy development of groundwater Europe wide.

As part of our work, we are carrying out a survey to weigh up our potential end-users' needs and requirements in relation to our project outcome. **You have been selected to take part in this survey as a member of the groundwater stakeholder group.** Groundwater is the hidden component of the water cycle which is difficult to assess, evaluate and communicate. KINDRA seeks to help achieve a better understanding of the groundwater topic by providing an overall view of the scientific knowledge that exists across Europe.

Your opinion as a potential end-user of the project is very important, your responses will help us to shape our work accordingly. In this link: <http://goo.gl/forms/fSniqYDVb5> you will find a questionnaire of 10 questions, which will take 10 to 15 minutes to complete.

If you have any questions, please do not hesitate to get in touch with us.
Many thanks for your time!

KINDRA project – Survey on end-user requirements

Knowledge Inventory for Hydrogeology Research, KINDRA, is a European project funded by the European Union's Horizon 2020 research and innovation programme, under the call Water 2014, Coordination and Support Action. The call aims to ensure the wide applicability of research results, to facilitate the translation of knowledge into use by various stakeholders, to reduce unnecessary duplication of efforts and to raise public awareness of water-related issues as well as promote innovation & business development.

The overall objective of our project is to create an inventory of this knowledge base and then use the inventory to identify critical research challenges in line with the implementation of the

Water Framework Directive - / the Groundwater Directive and new innovation areas. Project work includes:

1. A uniform EU-harmonised classification approach for reporting groundwater research (a Hydrogeological Research Classification System – HRC-SYS) is currently developed by the KINDRA project partly based on groundwater related keywords extracted from EU directives and scientific journals. Since such uniform classification does not exist at the moment, ongoing research activities, national/European hydrogeological research activities, agendas and strategies are difficult to report and even more difficult to compare.
2. During the second phase, based on the developed classification, an EU-wide assessment of existing practical and scientific knowledge focusing on EU, national, regional, international and EU-third party scientific activities will be carried out.
3. As a core project element, a European Inventory of Groundwater Research and Innovation (EIGR) will be created based on the outcome of the work carried out during the first two phases. This register will be supported by a web-service that will be searchable by selected keywords and will support users with query functions for statistics, diagrams, and others concise data elaboration.
4. Finally, the data in this register, and the most common science databases (Web of Science, Scopus and Google Scholar) and the Scopus analytical tool SciVal will be used to assess the performance of hydrogeological scientific and innovation activities and results of research institutions across Europe. As an overall outcome, research gaps and recommendations for research agendas of relevance to Horizon 2020 and to the implementation of the Water Framework and Groundwater Directives will be defined.

The following survey is designed to collect your opinion and feedback concerning all the above mentioned outputs of KINDRA

Personal data:

Organization:

Country:

Professional area:

I belong to the following stakeholder group (please select the most relevant):

- Interest groups & bodies (EU & International)
- Researchers & academic staff
- Associations representing Industry & Agriculture
- Environmental NGOs (EU + national level)
- Public bodies & funding agencies (EU + national level)
-

Other:

.....

1) What is the scope of your work area?

(You can select more than one option)

- Regional
- National
- European
-

Other:

.....

2) Do you use reports on groundwater research?

- Yes
- No. Please go to question 3.

Please indicate below the type of groundwater research information you use (e.g. mapping, stratigraphic, monitoring, etc.):

.....

.....

.....

.....

Please indicate here any classification systems that you use to find the information mentioned:

.....

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.....

Which are the 3 main sources of information most regularly used at your work (e.g. internet, library, etc.)?

.....

.....

.....

.....

3) Do you agree that a more harmonised categorisation approach/terminology for reporting groundwater research could improve the accessibility of this information at your work?

- Yes
- No

If no, please indicate why:

4) Do you produce reports on groundwater research?

- Yes
- No

If your answer was 'yes', please indicate below the kind of groundwater research information you produce (e.g. mapping, monitoring, etc.):

.....

.....

.....

5) How useful would you consider an EU-harmonised categorisation approach/terminology for reporting groundwater research? Please indicate on a scale 1-5, where 1 = not at all and 5 = absolutely.

- 1
- 2
- 3
- 4
- 5h

Please give reasons for your choice:

.....

.....

.....

.....

6) Would an 'EU-wide assessment of existing practical and scientific knowledge from hydrogeology research and innovation in Europe' be relevant to your work?

- Yes
- No

If your answer was 'yes', please indicate below what level(s) would be the most relevant to your work (you can select more than one option):

- EU
- National
- Regional
- International

7) How useful would the European Inventory of Groundwater Research and Innovation (EIGR) be for your work? Please indicate on a scale 1-5, where 1 = not at all and 5 = absolutely.

- 1 2 3 4 5

8) Please indicate below how you would like to access such information: (You can select more than one option)

- Through a catalogue
- Key word search
- Via maps
- By geographical name
-

Other:

.....
.....

9) How useful would a European report on research gaps related to hydrogeology research be for your work? Please indicate on a scale 1-5, where 1 = not at all and 5 = absolutely.

- 1 2 3 4 5

10) Which part of our work would you like to receive more information on? Please indicate on a scale 1-5, where 1 = not at all and 5 = absolutely.

The harmonised methodology for reporting groundwater research:

- 1 2 3 4 5

The assessment of knowledge – synthesis of country reports:

- 1 2 3 4 5

The inventory/EIGR:

- 1 2 3 4 5

Research gaps and recommendations:

- 1 2 3 4 5

Any comments

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.....

If you would like to receive more information about KINDRA's activities, please leave us your name and contact details (your data will only be used to send you information strictly related to KINDRA a few times/year):

Name:

Email:

Alternatively, you may follow us on:

- Facebook: KINDRA project
- Twitter: @kindraproject.eu
- Our join to our LinkedIN group: KINDRA project

Find more information on our project website: www.kindraproject.eu

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!