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## Water Innovation through Dissemination Exploitation of Smart Technologies

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4.3: Stakeholder Participation Report 2<sup>nd</sup> Version

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<b>Abstract (for dissemination)</b>	This report focuses on describing the approaches followed to contact stakeholders and providing some measurements of the level of involvement of the stakeholders in its role of providing information. The main aim of the stakeholders contact has been to get the feedback about what the IWO should provide to them, feedback regarding the roadmaps (WP2), where thematic surveys have been created to check alignment with thematic roadmaps, and finally, contents for the portfolio.
<b>Key words</b>	Stakeholders , IWO, Survey, Requirements

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## List of Acronyms

<b>D1.2</b>	Deliverable 1.2: Report in Smart Water Community Group monitoring
<b>D1.3</b>	Deliverable 1.3: Reports containing Literature reviews 1 <sup>st</sup> release
<b>D1.4</b>	Deliverable 1.4: Reports containing Literature reviews 2 <sup>nd</sup> release
<b>D1.5</b>	Deliverable 1.5: Reports containing Literature reviews 3 <sup>rd</sup> release
<b>D1.6</b>	Deliverable 1.6: Reports containing Analysis of Commercial developments and technology trends 1 <sup>st</sup> release
<b>D1.7</b>	Deliverable 1.7: Reports containing Analysis of Commercial developments and technology trends 2 <sup>nd</sup> release
<b>D1.8</b>	Deliverable 1.8: Reports containing Analysis of Commercial developments and technology trends 3 <sup>rd</sup> release
<b>D2.1</b>	Semantic Interoperability and Ontologies topical roadmap
<b>D2.2</b>	Smart City Connection topical roadmap
<b>D2.3</b>	Smart Water Grid topical roadmap
<b>D4.1</b>	Methodology for Portfolio Development
<b>EC</b>	European Commission
<b>H2020</b>	Horizon 2020 EU Framework Programme for Research and Innovation
<b>ICT</b>	Information and Communication Technologies.
<b>IWA</b>	International Water Association
<b>IWO</b>	ICT for Water Observatory
<b>WFD</b>	Water Framework Directive
<b>WP1</b>	ICT for Water Observatory (IWO)
<b>WP2</b>	Topical Roadmaps
<b>WP3</b>	Overall Roadmap
<b>WP4</b>	ICT for Water management technologies portfolio
<b>WP5</b>	Dissemination and communication channels
<b>WssTP</b>	Water Supply and Sanitation Technology Platform

## Executive Summary

This report is part of WIDEST ([www.widest.eu](http://www.widest.eu)), a H2020 funded project – Coordination and Support Action (Ref. Number 642423). Deliverable “D4.3 Stakeholder Participation Report 2<sup>nd</sup> Version” focuses on the reporting of the stakeholder’s involvement at this stage of the project.

The goal of this deliverable is to report the methods followed to contact stakeholders and provide some quantitative information of the level of involvement of the stakeholders in its role of feeding the ICT for Water Observatory (IWO) with information. Also, stakeholders have been contacted to gather information about their vision of some thematic areas (Smart City connection and Smart Water Grids). These contacts have been formalized in the shape of surveys that have been used to check alignment of topical roadmaps (WP2), and also encourage stakeholder participation in the roadmap definition.

A first approximation to IWO’s requirements has been carried out during several events where WIDEST has participated by informal meetings and talks. After this first contact, WIDEST has formalized these contacts by sending a survey in order to collect the stakeholder’s opinion about desired requirements in a more quantitative way. This will be the basis of the analysis performed in order to define the IWO requirements that better meet the stakeholder’s needs. Additionally, a second contact has been carried out with the thematic surveys. These two surveys have been done to check alignment with the roadmaps by getting direct feedback from stakeholders.

Finally, and as one of the main factors for the success of the project will be the quantity and quality of contributions from stakeholders, different data sources have been used to full fill the portfolio, serving as an example the contributions of different partners of WIDEST consortium, the members of the ICT4Water Cluster, and the different contacts and iterations taken place in the organized events.

To understand this document the following deliverables have to be read.

Number	Title	Description
D4.1	Methodology for Portfolio Development	The present document contains the proposed methodology to develop, execute and update the ICT for Water Management Technologies Portfolio including the contact strategy, the portfolio structure and the information interchange protocol. The portfolio will be developed as a knowledge management system using principles and methodologies inspired in collective intelligence in order to achieve the vision of a global ICT for Water Management Portfolio.
D4.2	Stakeholder Participation Report 1 <sup>st</sup> Version	This report focuses on quantify the level of involvement of the stakeholders in its role of feeding the ICT for Water Observatory (IWO) with information. WIDEST has sent a survey in order to collect the stakeholder’s opinion about desired requirements in an objective way. This will be the base of the analysis performed in order to define the IWO requirements that better meet the stakeholder’s needs.

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## 1. Introduction

Detect and link stakeholders related with ICT for water, in order to obtain their direct opinion, support and participation, is the main objective of this deliverable, which through the methodology described in the deliverable D4.1, and using surveys, as support, has been able to contact and extract valuable information for the development of the platform and for ensure its later usability, as a reference tool for people involved in the field.

Although it is true that many contacts have been done at the events, mostly in an informal talks way, the surveys have allowed formalizing those contacts, obtaining quality data by planning firstly, the fields of the survey to make them attractive to be completed, but also to provide valuable information, specially focusing on Water Companies and Universities, with the clear objective, that the repository-generated tool was a tool with value, both for its contents and for its functionalities, to generate the best representative portfolio of solutions.

After following the analysis of the first survey, it was necessary to carry out more iterations on the methodology described to improve content. Certain conclusions were obtained to feedback and improve the IWO platform, at those points and functionalities with greater weakness, or greater potential for improvement towards later usability.

In the same way, in order to proceed with the acquisition of more quality content data, custom surveys were done through IWA stakeholder's network, to check the alignment of the first draft of the topical roadmaps (WP2). The topical surveys, Smart City Connection and Smart Water Grid, have had a positive result, with respect to the participation, although it was known beforehand that it would be difficult to achieve high participation due to some conditioning factors, as the high specificity of the topics, and the fact that WIDEST stakeholders have been already contacted in a previous survey.

Anyway, an action plan had to be enabled through the contributions of the different members of the consortium, members of the ICT4Water, in order to generate a representative portfolio of solutions because the aim is to incorporate more solutions to the portfolio database, especially in those thematic areas where is still no representative number of solutions. On the same way an alternative approach to go further with the development of the portfolio will be to continue detecting potential contacts between people that belong to Technological Centers and Companies through the EIP Water Online Market Place, where it will be possible to contact people along their expertise, combining by search, topics or sectors.



## 2. Contributions to Define Desired Functionalities of IWO

This section describes the contacts carried out by WIDEST with stakeholders to meet the stakeholders' needs. This contact has been done by means of a survey that has been spread among stakeholders using digital means such as newsletters and emails. The aim of this surveys is to provide a more quantitative information than the one received during informal meetings established during WIDEST activities. So, the vision of these surveys is a formalization of the already done informal contacts during first year. The main objective is to have a good analysis of the specific stakeholders' requirements for the IWO.

According with the results obtained, the interfaces, functionalities and contents of the IWO have been reviewed trying to meet the requirements specified by stakeholders. So the final tool of the ICT For Water Observatory can be a valuable tool, not only for the content that it has but also for the functionalities that it provides to the stakeholders.

Firstly, the survey is explained, providing an insight of the questions proposed. This will have an impact on both the participation and quality of the results. An effort has been done to keep the simplicity that encourages stakeholders to participate but provides enough formalization to generate valuable results that later can be used to enhance IWO functionalities. To this end, the specific questions about IWO functionalities are accompanied of Entity to which stakeholders belong and also contact information. This later information will be used to populate WIDEST database and can be used for further contacts with specific information.

The following subsections contain the description of the survey. At the end of the section an analysis of the results obtained is provided.

### 2.1 Stakeholder's Survey Definition

In order to implement a knowledge platform, it is essential to take into account the desired requirements of its users in order to: (i) maximize its usability and, (ii) maximize the number of users. By maximizing both usability and number of users the contributions received and the dissemination of knowledge contained in the platform can be increased.

For this reason, a survey requesting the opinion about the IWO requirements has been sent<sup>1</sup> to 437 stakeholders through the IWA and WssTP, in order to acquire this knowledge and allow defining the platform and addressing in this way their needs. In this regard, the more information is collected a better and more robust analysis can be done that ultimately can provide concrete specifications to be applied

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<sup>1</sup> <https://docs.google.com/forms/d/e/1FAIpQLSfvJGBS75xXUuCuAbLnWxuJB9V4Z9ljAfA61OCKdBUxSAWD7A/viewform>

to the platform. In addition, the amount of contributions and its representativeness will affect the quality of the features added to the platform. Therefore, the contributions must be numerous and must have enough representation of different types of stakeholders to be targeted. To summarize, ideally a lot of information from many different users should be collected. This affirmation must be put into context, because it should be noted that the major contributions to the platform will come from Water Technology Companies and Universities, in the shape of market solutions and publications. Therefore, the priority of WIDEST is to obtain representativeness of these two sectors. This prioritization is motivated by the need to collect relevant information as a claim for the rest of sectors.

In addition, must be noted that, in general, the participation rate in this kind of surveys usually is quite low. The common rate is approximately of 25%, and this rate is a consequence of the lack of time to freely contribute to an initiative that, at first view, cannot provide benefits to the stakeholder's organization, so in many cases it can be seen as a waste of time. Since, WIDEST partners are aware of the rate of participation, the effort has been twofold: (i) to disseminate as much as possible and encourage the participation of the stakeholders, and (ii) to create a survey that can be attractive to the respondents. Additionally other decision have been taken into account, as for example to provide a kind and attractive text attached to the surveys, also to commit to disseminate the results among the participants and to select the days and hours that people is more prone to answer these kind of surveys (commonly Wednesdays and Fridays).

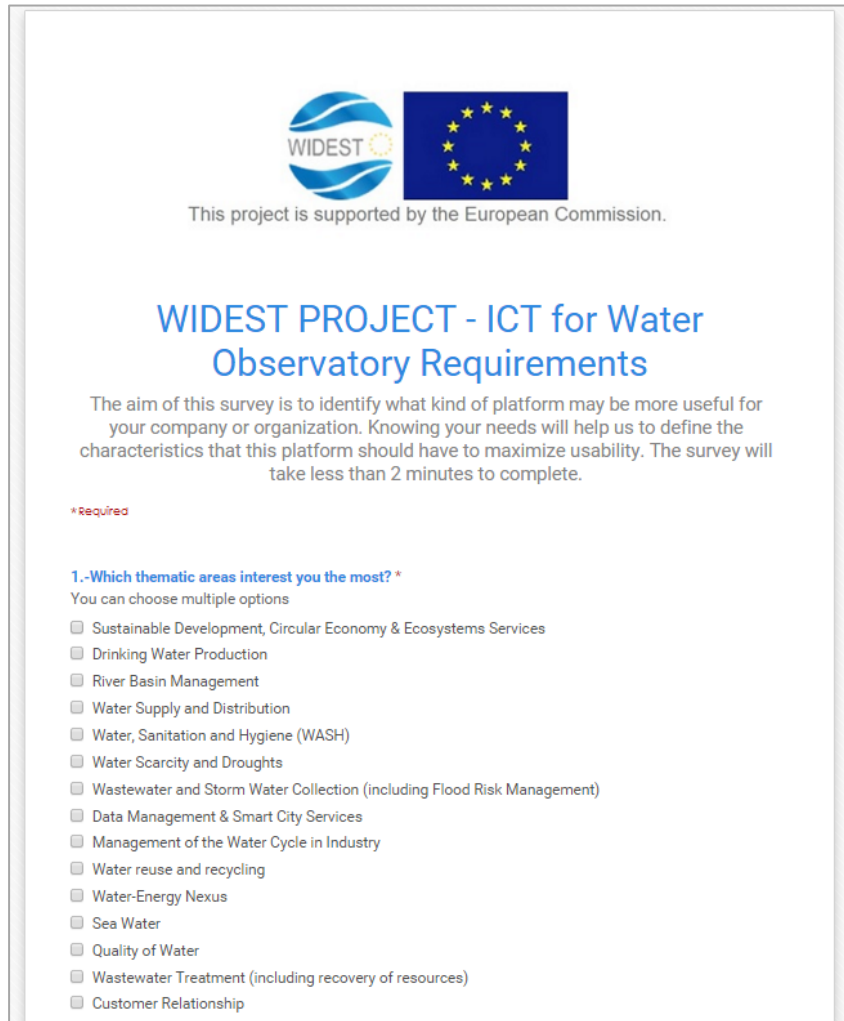
A big effort has been devoted to obtain a good trade-off between the amount of information required to the stakeholder and the amount of time spent to complete the survey. To do so, a small set of questions regarding the main options of possible functionalities and thematic areas to be covered has been defined. The type of information requested can be classified into three categories:



- **IWO requirements information:** Almost the 75% of the information requested can be allocated within this category. In this group, the type of information that can be useful for the stakeholder and the main features of the platform are requested. This category is the only one which is mandatory to complete the survey.
- **Entity information:** Some questions about the type of organization represented by the user are requested in order to verify the representativeness of each market segment.
- **Contact information:** This information is requested in order to feed the database of WIDEST's stakeholders.

In following subsections the information requested in each category is described.

### 2.1.1 IWO Requirements Information

In this section, the information that WIDEST needs to define the characteristics and requirements of the IWO is analysed. Figure 1 shows a screenshot of the survey published using Google Forms.



This project is supported by the European Commission.

## WIDEST PROJECT - ICT for Water Observatory Requirements

The aim of this survey is to identify what kind of platform may be more useful for your company or organization. Knowing your needs will help us to define the characteristics that this platform should have to maximize usability. The survey will take less than 2 minutes to complete.

\* Required

**1.-Which thematic areas interest you the most? \***

You can choose multiple options

- ☐ Sustainable Development, Circular Economy & Ecosystems Services
- ☐ Drinking Water Production
- ☐ River Basin Management
- ☐ Water Supply and Distribution
- ☐ Water, Sanitation and Hygiene (WASH)
- ☐ Water Scarcity and Droughts
- ☐ Wastewater and Storm Water Collection (including Flood Risk Management)
- ☐ Data Management & Smart City Services
- ☐ Management of the Water Cycle in Industry
- ☐ Water reuse and recycling
- ☐ Water-Energy Nexus
- ☐ Sea Water
- ☐ Quality of Water
- ☐ Wastewater Treatment (including recovery of resources)
- ☐ Customer Relationship

*Figure 1 Screenshot of header and first question of the survey*

Within this category, four questions with multiple options and another one with a comment box for free comments have been asked to the stakeholders. The asked questions are the following:

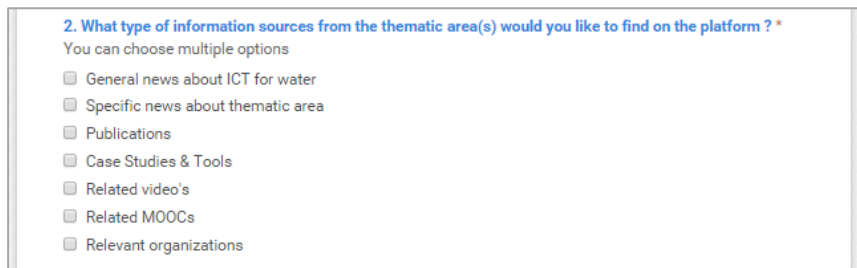
- 1) **“Which thematic areas interest you the most?”** The objectives of this question are twofold. On the one hand, WIDEST will be able to check if previously defined classification of thematic areas are covering all the interesting areas of the stakeholders. On the other hand, WIDEST will be able to know which thematic areas are more interesting for different market sectors and therefore, it will be a first guide to focus the reviews of relevant academic references and will ease in this way the correct adaptation to the different target profiles of stakeholders. The following choices are allowed:
  - Wastewater and Storm Water Collection (including Flood Risk Management)
  - Water Supply and Distribution
  - Water, Sanitation and Hygiene (WASH)
  - Sustainable Development, Circular Economy & Ecosystems Services

- Water Reuse and Recycling
- Water Scarcity and Droughts
- Wastewater Treatment (including recovery of resources)
- Management of the Water Cycle in Industry
- River Basin Management
- Water-Energy Nexus
- Customer Relationship
- Data Management & Smart City Services
- Sea Water
- Quality of Water
- Drinking Water Production

A complete description of each choice can be consulted in D4.1.

- 2) **“What type of information sources from the thematic area(s) would you like to find on the platform?”** Figure 2 shows a screenshot of this second question of the survey. The objective of this question is to define the type of information that it is useful for the purposes of different stakeholders. This type of information may vary among stakeholder’s sectors. In any case, the answers will be evaluated in order to know the type of information sources that address the needs of most users. The available options are:

- General news about ICT for water
- Specific news about thematic area
- Publications
- Case studies & tools
- Related video’s
- Related MOOCs
- Relevant organizations



2. What type of information sources from the thematic area(s) would you like to find on the platform ? \*

You can choose multiple options

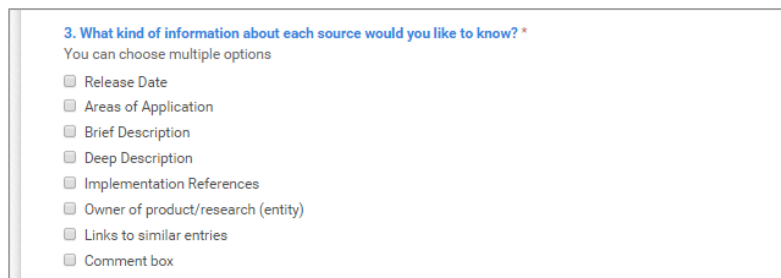
- ☐ General news about ICT for water
- ☐ Specific news about thematic area
- ☐ Publications
- ☐ Case Studies & Tools
- ☐ Related video's
- ☐ Related MOOCs
- ☐ Relevant organizations

*Figure 2 Screenshot of the second question of the survey*

- 3) **“What kind of information about each source would you like to know?”** Figure 3 contains a screenshot of the third question of the survey. The objective of this question is to define the amount of information that it is useful for the purposes of different stakeholders. An excess of information

can result in rejection by stakeholders and reduced usability motivated by the time that the user spend to find the information that is relevant from its point of view. Moreover, a lack of relevant information may cause the platform to be useless. Once again, there is a need to reach a trade-off between these two extremes. For this reason, the answers will be evaluated in order to know the amount of information that maximizes the usability of the platform. The following choices are allowed:

- Release Date
- Areas of Application
- Brief Description
- Deep Description
- Implementation References
- Owner of product/research (entity)
- Links to similar entries
- Comment box



3. What kind of information about each source would you like to know? \*

You can choose multiple options

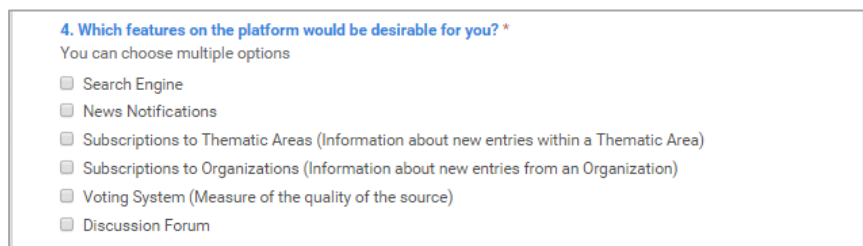
- ☐ Release Date
- ☐ Areas of Application
- ☐ Brief Description
- ☐ Deep Description
- ☐ Implementation References
- ☐ Owner of product/research (entity)
- ☐ Links to similar entries
- ☐ Comment box

Figure 3 Screenshot of the third question of the survey

- 4) **“Which features on the platform would be desirable for you?”** Figure 4 shows a screenshot of this fourth question. While previous questions were focused on the information contained in the platform, this question focuses in the technological advances that the platform should implement in order to ease the access to this information. The following choices are allowed:

- Search Engine
- News Notifications
- Subscriptions to Thematic Areas (Information about new entries within a Thematic Area).
- Subscriptions to Entities (Information about new entries from an Organization)
- Voting System (Measure of quality of the source)

The idea behind the subscriptions is the reception of an automatic notification when a new entry is posted.



4. Which features on the platform would be desirable for you? \*

You can choose multiple options

- ☐ Search Engine
- ☐ News Notifications
- ☐ Subscriptions to Thematic Areas (Information about new entries within a Thematic Area)
- ☐ Subscriptions to Organizations (Information about new entries from an Organization)
- ☐ Voting System (Measure of the quality of the source)
- ☐ Discussion Forum

Figure 4 Screenshot of the fourth question of the survey

- 5) **“Do you have any further comments or suggestions for the platform development?”** Figure 5 contains a screenshot of the fifth question of the survey. The objective of this question is being aware of possible missing concepts not covered in previous questions. Therefore, a comment box will be available in order to allow free contributions and suggestions. This question is not required to complete the survey.



5. Do you have any further comments or suggestions for the platform development?

Figure 5 Screenshot of the fifth question of the survey

All these questions can be found in the first page of the survey. These questions will complement the analysis performed in D1.1 to define a platform that better meet the needs of the stakeholders. It has to be taken in consideration that WIDEST is not a development project, and there are no resources to develop a new knowledge base tool to support the IWO. However, as it was described in D4.6, the intention of WIDEST consortium is to provide a knowledge repository, or contribute to the definition of the marketplace of WaterInnEU project, apart from feeding other existing sources. In that terms, and after realise of how difficult homogenise information between Water Data Portals is, a new collaboration with WaterInnEU project team, including 52<sup>o</sup> North and UAB, EIP Water marketplace creators (Semantic Web), and WIDEST project, has started. This collaboration focuses in defining a common Water Data Portals format, to simplify exchange of information and homogenise data catalogues.

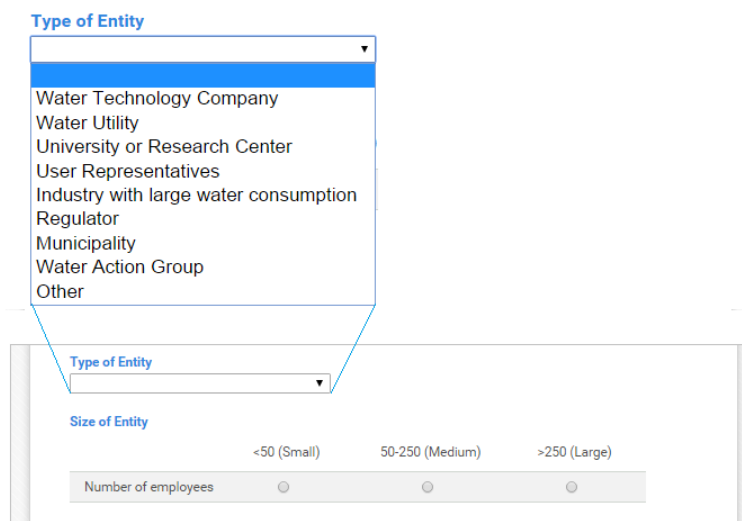
## 2.1.2 Entity Information

This information is collected in order to verify the representativeness of each market segment. Also the different contributions will be analysed from the point of view of each market segment. The information requested is regarding the type and size of the organization represented by the user.

- **Type of Entity:** The different options of type organization follows the classification performed in D4.1. The following options are allowed:

- Water Technology Company
  - Water Utility
  - University or Research Centre
  - User Representatives
  - Industry with large water consumption
  - Regulator
  - Municipality
  - Water Action Group
  - Other
- **Size of Entity:** Depending of the type of entity, different measures of its size could be more representative of its impact over the water market than others. Nevertheless, in order to simplify the complexity for the user, in this occasion only three options are allowed:
    - Small: Organizations with less than 50 employees.
    - Medium: Organizations with more than 50 and less than 250 employees.
    - Large: Organizations with more than 250 employees.

Figure 6 shows a screenshot of the survey requesting the statistical information with a zoom in the options available for type of entity.

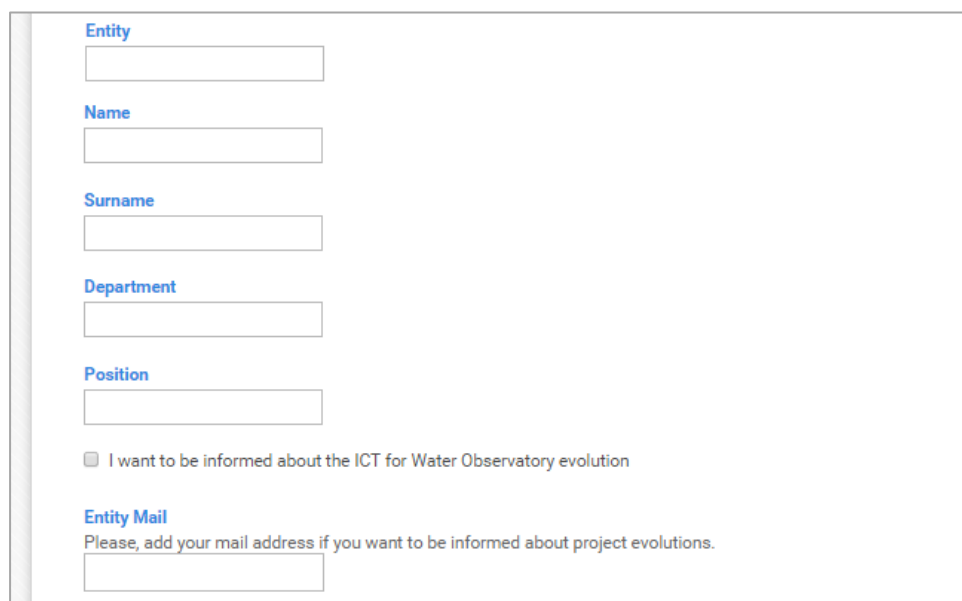


The screenshot displays a survey form. At the top, there is a dropdown menu labeled 'Type of Entity' with a list of options: Water Technology Company, Water Utility, University or Research Center, User Representatives, Industry with large water consumption, Regulator, Municipality, Water Action Group, and Other. Below this, there is a section titled 'Size of Entity' which includes three radio button options: '<50 (Small)', '50-250 (Medium)', and '>250 (Large)'. The 'Number of employees' label is positioned above the radio buttons.

Figure 6 Screenshot of statistical information requested in the survey

### 2.1.3 Contact Information

The contact information has been requested in order to feed the database of contacts of WIDEST. The main purpose of this information is that WIDEST has its own database of contacts with proven interest in the initiative. For this reason, in addition to contact information, a confirmation of its interest in kept informed about the evolution of the platform has been requested. In the Figure 7 a screenshot of the survey asking for the contact information is shown:



*Figure 7 Screenshot of contact information requesting in the survey*

## 2.2 Stakeholder's Survey Dissemination

As it was mentioned, the survey has been implemented using Google Forms. In order to send the link to the stakeholders the flow diagram of information described in D4.1 has been followed. The intention of WIDEST consortium members is to have a stakeholder network as big as possible; therefore the idea is to merge their own stakeholder networks to reach the maximum number of stakeholders in their communications. However, most of consortium members are private entities with private interests that can enter in conflict between each other. For this reason, it is necessary to keep confidentiality of the stakeholder network of every member of the consortium. Given that the stakeholder list of each member can't be shared to guarantee the confidentiality, another way to drive the messages without duplicating communication to the same stakeholder must be found.

Taking into account that IWA and WssTP are organisms that do not have any conflict of interest of this kind, the rest of consortium members will share their stakeholder list with them and they will be in charge of select which stakeholder is directly contacted by each member of the consortium. In such manner WIDEST will not duplicate the communication to any stakeholder. To do so, IWA and WssTP will verify that each stakeholder of each consortium member is not in the list of stakeholders of another member.

Once the definitive list of stakeholders was collected, two ways to disseminate the survey was performed:

- **WssTP Newsletter.**

WssTP included in its Members' Newsletter a section requesting the participation in the survey in November 2015. In Figure 8 this section is shown.



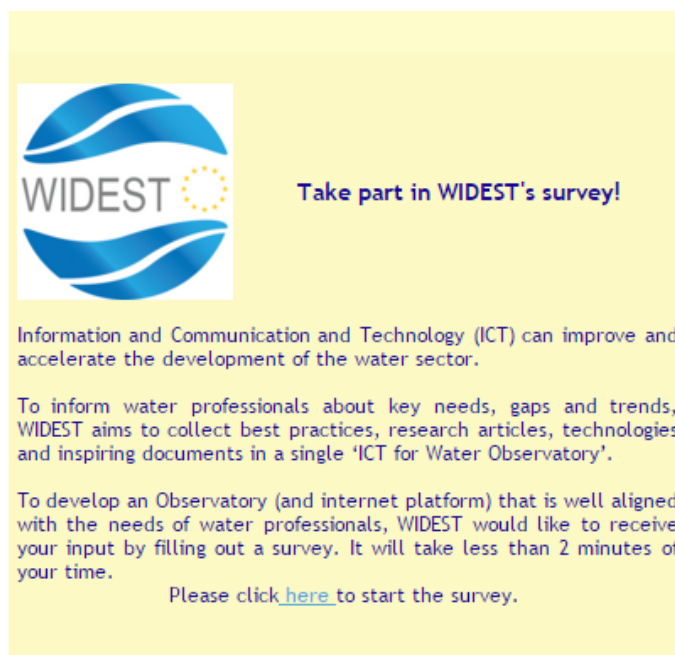


Figure 8 Section of WssTP Members' Newsletter requesting contributions to the survey

- **Direct e-mail contact by IWA.**

IWA sent an email to all its stakeholders and the stakeholders provided by the rest of the consortium (except WssTP's stakeholders). The objective of the e-mail sent is requesting its feedback about IWO desired functionalities.

After the sending of both requests, a total of 97 contributions for stakeholders have been received (22% of total approximately). Taking into account that the participation rate of this kind of survey is usually quite low, this result can be considered as a success.

## 2.3 Stakeholder's Survey Results

This section contains a first analysis of the results obtained with the surveys. The analysis performed is focused on extracting the main interests that can be applicable to the IWO to obtain better functionalities that meet stakeholders' needs.

Section 2.1 described how the information requested can be classified into three categories. Following subsections describe the results obtained in each of these categories.

### 2.3.1 IWO Requirements Information

As it was introduced previously, within this category there are four questions with multiple options and one more of free writing. The results for each question are shown below of a total amount of 87 respondents on the survey:

- 1) **“Which thematic areas interest you the most?”** Figure 9 shows a horizontal bar plot with the percentage of stakeholders that consider each thematic area as highly interesting.

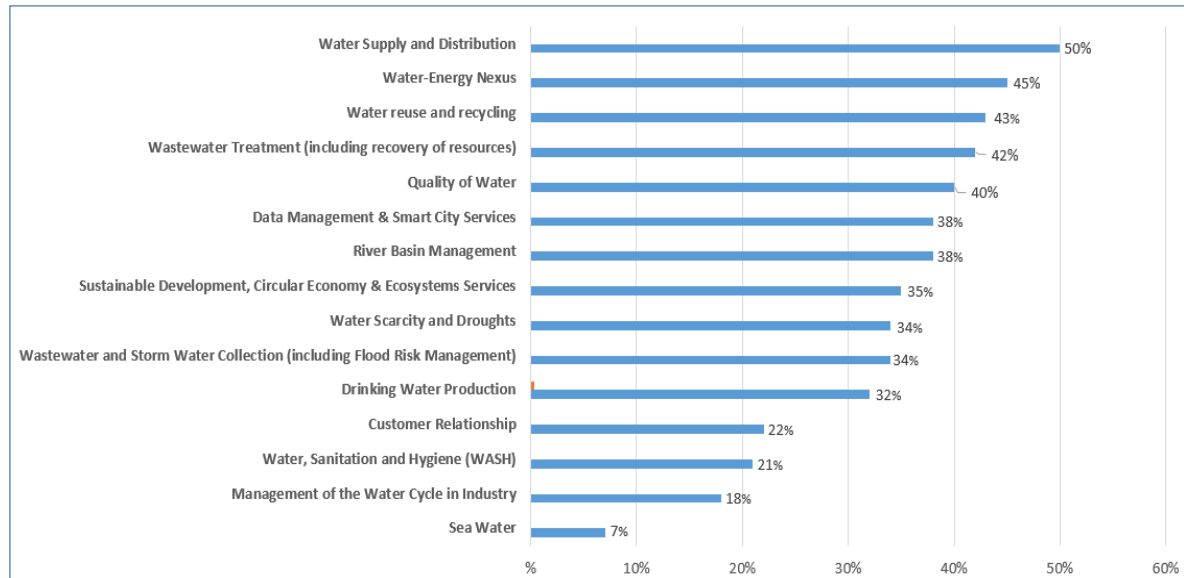


Figure 9 Survey's results about highly interesting thematic areas

The thematic areas are sorted from most to least interesting. It can be seen how traditional areas like wastewater treatment and water supply are prioritized firstly. It can be noted that the areas less related to traditional operation of integrated water cycle are mostly considered as less interesting.

- 2) **“What type of information sources from the thematic area(s) would you like to find on the platform?”**

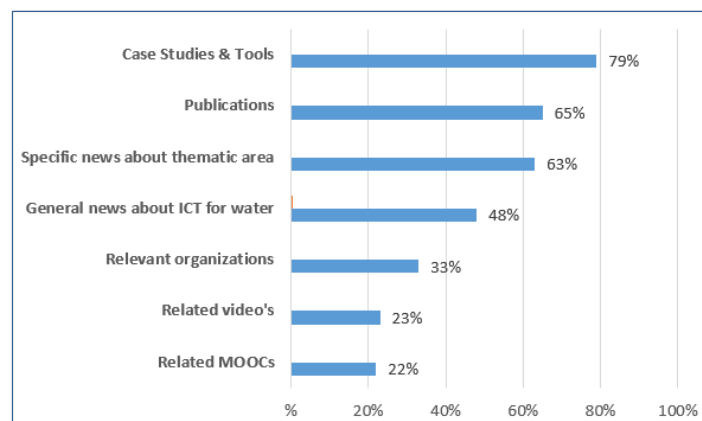
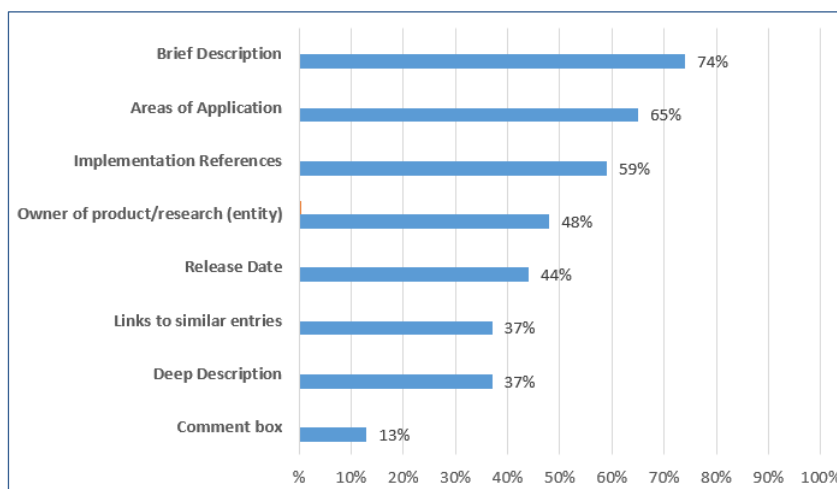


Figure 10 Survey's results about desired information sources

As can be seen in Figure 10 Case studies & tools, Publications and Specific news about thematic area are the type of information sources desired for most of stakeholders consulted, which means that the efforts must be oriented towards these types to maximize diffusion.

- 3) **“What kind of information about each source would you like to know?”**

Figure 11 shows a bar plot with interests regarding the information contained in the platform:

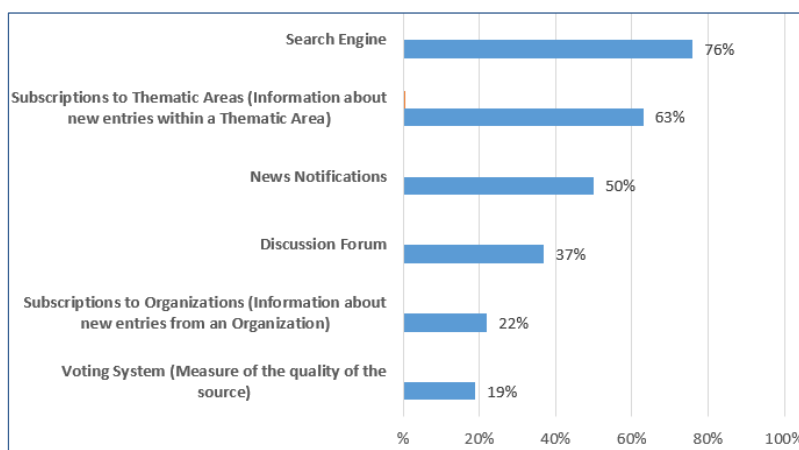


*Figure 11 Survey's results about the kind of information preferred.*

As can be seen, most of stakeholders desire key but brief information, examples of application and implementation references to focus on what really matters. Any other information will not be appreciated as valuable information, definitely will not be considered in the same way as useful or valid information.

#### 4) “Which features on the platform would be desirable for you?”

This question, unlike the previous, is not related to the information contained. Figure 12 shows the desired features of the knowledge base platform:



*Figure 12 Survey's results about the desired features of the platform.*

Surprisingly, the quality system proposed has been prioritized only by the 19% of the stakeholders consulted. The most interesting feature is the search engine that should be good enough to find the information that the stakeholder may search.

### 5) “Do you have any further comments or suggestions for the platform development?”

Despite this field is optional there are some relevant comments that must to be taken into account. The typology of the comments is basically twofold:

- **Comments regarding missing thematic areas:** Despite the classification of thematic areas cover all the areas related to water, some stakeholders would like to include a specific category addressing Irrigation, Urban Water Cycle topic and/or Climate Change issues.
- **Suggestions about desired features:** Most of comments pay attention in the accessibility of the platform that should be as easy as possible. Other suggestions have been the inclusion of links to other similar platforms, or the possibility of customizing the way how the user receives its notifications (e-mail, twitter, LinkedIn...).

### 2.3.2 Entity Information

The aim behind collecting this information is to be aware of the representativeness of the answers received. There are two factors that measure the accurateness of the data:

- The margin of error: This factor tries to measure the deviation between the opinions the stakeholders contributing in the survey and the entire population.
- Confidence level: This factor indicates the percentage of responses that really fit with the real opinion of the respondents. This not necessary mean that the respondent lies in the survey but several factors, like misunderstanding the questions or the lack of time, may cause an error in the responses.

Some standards in the literature describe methods to guarantee the accuracy of the surveys (Caltrans (2015), Supan & Elsner (2004)), but for the purposes of the project, having an idea of the representativeness is enough to weight the impact of the survey's results in the platform requirements definition. In Figure 13 can be seen the distribution of type of organizations contributing the survey.

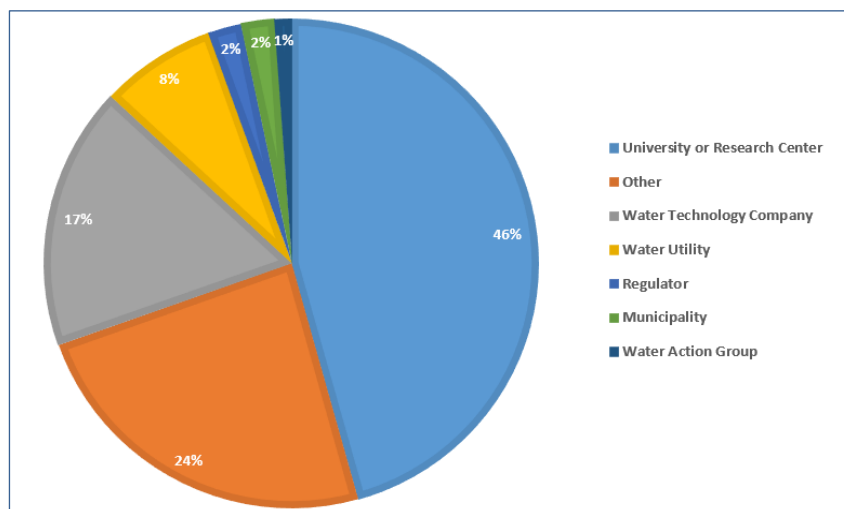


Figure 13 Type of entities contributing to the survey

It can be seen how most of contributions come from “Universities or Research Centres” followed by “Water technology companies”. A great percentage of respondents have classified their organization as “Other”. After a brief analysis of these respondents can be seen how many of them are companies that do not have the water sector as core of its business but provide solutions related to water. According to “Water Technology Companies” definition in D4.1, this kind of organizations should be associated within this group.

As Figure 13 shows, there are some sectors with low number of responses and even other sectors like “User Representatives” and “Industries with large water consumption” have not perform any contribution. Nevertheless, as it was introduced before, the key sectors whose contribution is more expected are “Water technology companies” and “Universities or Research Centres”, so the results obtained meet WIDEST’s expectations.

Regarding the size of the organizations, Figure 14 shows the distribution of the participation between organizations of different sizes. It was already pointed how, in order to reduce the time spent to complete the survey, the classification of size of entity was defined independently from the type of organization. This means that instead of asking for a variable which in each case show the size of the organization, the question is related to the number of employees. This can be misleading because for example, in the case of “Universities or Research Centres”, the important data to reflect the impact of a research group is the number of researchers on the subject area in particular and not the number of employees throughout the university. In addition, the explanations of each category of type of organization were removed.

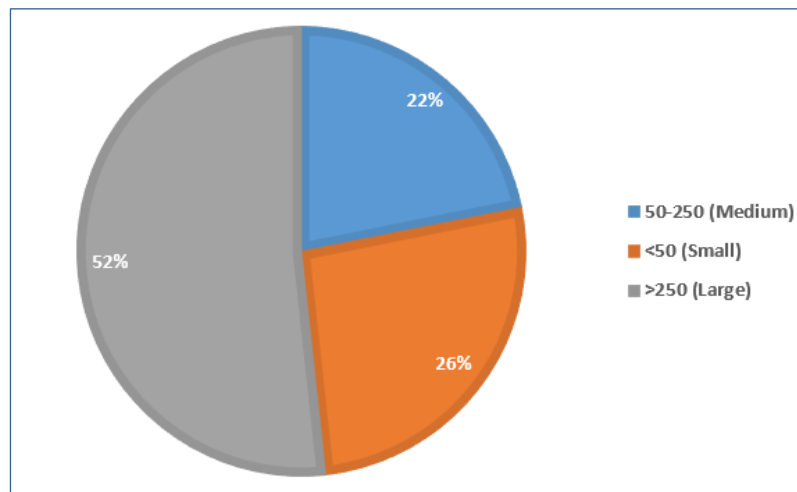


Figure 14 Size of entities contributing to the survey

Figure 15 shows the percentage of “Small”, “Medium” and “Large” organizations in each type of entity. It can be seen how all the “Municipalities” that have made a contribution to the survey are considered by themselves as “Small” organization and all the “Regulators” as “Large”.

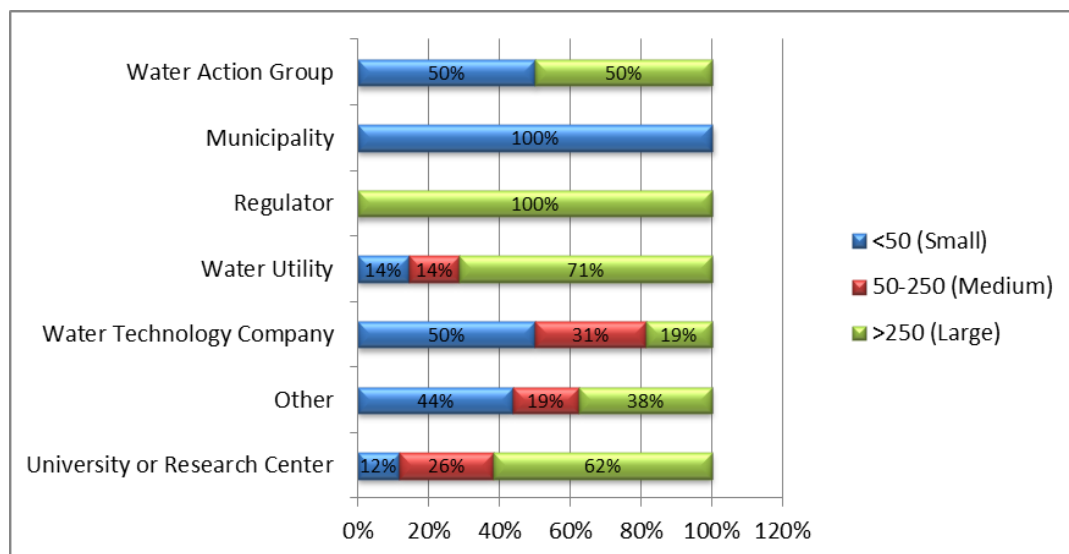
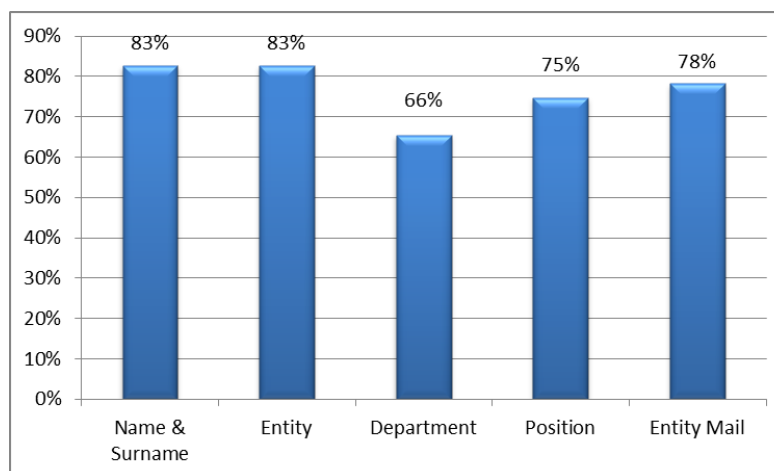


Figure 15 Distribution of sizes of each type of entities contributing to the survey

### 2.3.3 Contact information

The contact information has been requested in order to feed the database of contacts of WIDEST. The main purpose of this information is that WIDEST has its own database of contacts with proven interest in the initiative. In order to maximize the number of responses this information is not mandatory to complete the survey. Figure 16 shows the percentage of users that have provided their contact information broken down into each field requested.



*Figure 16 Percentage of contact information provided by stakeholders*

83% of users have no concern in share their name and surname. At the same time, 83% of users have shared the name of their entity. Despite the percentage is the same, it must be noted that some users have decided sharing their name but not their entity's name and vice versa. Probably the most important information to WIDEST is the email of the stakeholders. In this regard, can be seen how 78% of users have provided their email address. Surprisingly, some users decided to share their email but did not check the box demanding to keep informed about the platform evolution. Therefore, only 71% of the stakeholders consulted, directly requested further information during project life.

The description of this deliverable in the project proposal was focused in providing the list of stakeholders that have contributed to WIDEST portfolio. All the contact information obtained from the events and workshops organized, has been collected manually in a local portfolio which has been published in the IWO, running since February 2016.

The table below shows the department of the organizations that have contributed completing the survey.

Entity	Department <sup>2</sup>
ADASA Sistemas	EU Innovation Programmes Area
ADASA Sistemas	Product & Solutions
ADEvice solutions sl	
AGBAR (Sociedad General de Aguas de Barcelona)	Innovation Department
Agencia de Medio Ambiente y Agua de Andalucía	Research and Innovation Management
Aguas de Alicante	IT

<sup>2</sup> Not completed gaps are in left blank

Entity	Department <sup>2</sup>
Air Products	R&D
Aquagri	Irrigation and Drainage Design
AQUALIA	Innovation and Technology Department
AQUATEC proyectos para el sector del agua	energy efficiency
ASTURAGUA SICA, S.A.U.	
Baur Technology	
Beijing University of Technology	Municipal Engineering
BM-Change	
Cardiff University	School of Engineering
Centre for Action Research-Barind (CARB)	Centre for Action Research-Barind
Cetaqua (Centro Tecnológico del Agua)	Digital Technologies
Consorti Costa Brava	Technical
Consulting Engineer	International Water & Wastewater
DTES (Departamento de Territorio y Sostenibilidad)	RDI
Eco-TIRAS	n/a
Emilia-Romagna Region	Water Protection Unit
Engineer	PUBLIC HEALTH
Envirab	engineering
Evides Industriewater BV	Process & Technology
FAMIFE Consulting Ltd.	
Federal University of Parana	Hydraulics and Sanitation
Fundació CTM Centre Tecnològic	Environmental Technology
GOST srl	
HYDS (Hydro meteorological Innovate Solutions)	
ICRA (Instituto Catalán de Investigación del Agua)	Technologies and Evaluation
IDSIA_(Istituto Dalle Molle di Studi sull'Intelligenza Artificiale)	
INCLAM S.A.	ICT
Institute for nuclear and energy research -IPEN-SP	Center for Environmental Chemistry



Entity	Department <sup>2</sup>
Inter-Ministerial Water Council	
IPSE, SA DE C V (Ingeniería y Proyecto en Sistemas Energéticos)	
IREC (Instituto de Investigación en Energía de Cataluña)	Lighting
JOAT	
LABAQUA (Consultoría Medioambiental)	R&D+i
LEQUIA-Universitat de Girona	LEQUIA
LGRain	Management
METEOSIM	RD
NMBU (Norwegian University of Life)	IMT
NTUA (National Technical University of Athens)	Hydrology and Water resources Management
Organisation	
OSIsoft	Industry
Politécnica University of Madrid	Ecology
Pontificia Universidad Católica de Chile	Water Law and Management Center
Redknee	Utility
Research Institute	Ecological Systems
Royal HaskoningDHV	Water
Sapienza University	Earth Sciences Department
SMS	
SOMAGEP	DIRECTION
Southern Illinois University	Environmental Resources & Policy
Staffordshire University	Faculty of Arts and Creative technologies
Technological Laboratory of Uruguay	Environmental Projects, R&D&I
TZW (Water Technology Center- Technologiezentrum Wasser)	Distribution
Umwelt- und Fluid-Technik Dr. H. Brombach GmbH	R&D
UNICEF (United Nations International Children's Emergency Fund)	WASH
Universidad EAN	Environmental Engineering

Entity	Department <sup>2</sup>
University of Bologna	Department of Agricultural Sciences
UNIVERSITY OF CANTABRIA	
University of Cyprus	
University of Sheffield	Civil Engineering
University of the West Indies, CERMES	CERMES
University of Trento	
University of Udine	Chemistry, Physics and Environment
Welthungerhilfe	WASH

*Table 1 Organizations contributing to the survey*

### 3. Functionalities added to the IWO

After the analysis performed in section 2.3 and taking into account the responses received through the surveys, the following decisions have been taken to improve the IWO functionalities according to the proposed questions:

- **“Which thematic areas interest you the most?”**

An effort has been placed to prioritize “Water supply and distribution” information in the IWO tool. At the current moment, a 32.63% of the information contained in the IWO is under this Topic. The next iteration in the Literature Review done in *“D1.5 Reports containing Literature reviews 3rd release”* will provide more than 3000 documents, and again the prioritization has been to retrieve “Water supply and distribution” related documents.

- **“What type of information sources from the thematic area(s) would you like to find on the platform?”**

At the current moment, most of the contents in the IWO are publications, which is the second preferred content type by stakeholders. As already mentioned, the next iteration of the IWO population will contain more than 3000 publications, most of them Journal Publications. Additionally, the IWO will be populated with the contents of the portfolio and also the commercial developments analysed in *“D1.8 Analysis commercial developments and technologies”*

- **“What kind of information about each source would you like to know?”**

This question motivated that the resource searcher developed to populate the IWO placed an extra effort to find resources with short descriptions and abstracts. At the current moment, more than a 98% of the resources contained in the IWO provide an abstract to the user, so she can know more about the resource before downloading or visiting it. Moreover, the acquisition of abstracts motivated the automatic Topic assignment developed in the IWO to place a proper tag to each resource.

- **“Which features on the platform would be desirable for you?”**

The IWO contains a search form that has extra capabilities. In order to provide a full search experience to the user, the IWO searcher has been modified to provide a specific search in a subset of the metaparameters of the resource. Therefore, the user can search keywords in the title, abstract, tags or topics.

- **“Do you have any further comments or suggestions for the platform development?”**

Regarding this question and its answers, the IWO is ready to accept any kind of resource under almost any Topic. However, at the current stage of the WIDEST project, the topics are strongly adapted to the project development so it is not easy to provide more Topics. In fact, this discussion suggests a broader analysis.

Regarding the accessibility of the resources, a big effort has been placed to provide a good user interaction and a connection with social media such as Facebook, Google+ and Twitter.

## 4. Additional Surveys

Along WIDEST development and more concretely during first year, many contacts have been done to gather the impressions of many stakeholders about the gaps and issues regarding the development of ICT in the Water Community. One specific objective during first year was to collect the basis of what later in the second year would become the three topical roadmaps. These initial contacts with stakeholders during WIDEST activities were formalized in the second year in the shape of surveys. The aim of these surveys were to check the alignment of the first draft of the topical roadmaps (WP2).

As stated in the DoA, the three topical roadmaps are: “D2.1 *Semantic Interoperability and Ontologies topical roadmap*”, “D2.2 *Smart City Connection topical roadmap*” and “D2.3 *Smart Water Grid topical roadmap*”. For the first topical roadmap D2.1 the outputs of iWidget project were used thanks to the collaboration provided in the framework of the ICT4WATER Cluster. However, for the rest of topical roadmaps D2.2 and D2.3, custom surveys were done to check the alignment of the contents of the roadmaps with stakeholder’s opinions and motivations.

Regarding the participation, it was known beforehand that it would be difficult to retrieve a good participation due to various facts: (i) the high specificity of the topics, (ii) they were two separate surveys and, (iii) WIDEST already contacted stakeholders for consultation. However, it was worth to contact stakeholders as despite the fact that the topics were specific, maybe only really interested people would answer. The result was positive as high quality responses were received. The approach was to send the surveys through IWA stakeholders network by email.

This section provides a description about Smart City connection and Smart Water Grids surveys, as it has been a relevant contact with the stakeholders aligned with one of the main outcomes of WIDEST project.

### 4.1 ICT for Water Roadmap Smart Water Grids

This survey was used to check the alignment of the draft of Smart Water Grids topical roadmap. The survey is hosted in the following URL: <https://docs.google.com/forms/d/e/1FAIpQLSdRtgJlr4mfpHSyVNn90YSARhFy-fiHz4P276UDK1AcuroBnQ/viewform>. Figure 17 shows a screenshot of the survey published using Google Forms and its result of a total among of 27 participants.

## WIDEST – ICT for Water Roadmap: Smart Water Grids

In order to manage water scarcity and water conservation, a smart water network is needed. Smart water systems integrated with sensing technologies give water utilities advanced tools to measure water consumption more efficiently and provides water customers with information to help them monitor their water usage and reduce costs. Leak detection and identification of non-water revenue are also key benefits of smart water meters and a smart water network.

The objective of this survey is to identify key-challenges and recommendations that can improve the evolution of water distribution networks into a Smart Water Grid.

We would be grateful if we could get your expert opinion for the development of a roadmap. This provides policy and decision makers from municipalities and utilities an overview of the main aspects that need to be considered to effectively design and integrate ICT for Water solutions and strategies.

This survey will take less than 3 minutes to complete. The information provided will be used only in the WIDEST framework and all data provided will be treated anonymously.

Figure 17 Screenshot of header and first question of the survey

### 1) “Which fields do you think that are most important in the development of Smart Water Grids?”

The main objective of this question is to know which the main factor is considered to the development of Smart Water Grids. The following choices are allowed:

- Data Transmission and Power
- Sensing Devices
- Smart Pumps and Valves
- Automated Meter Reading (AMR)
- Advanced Metering Infrastructure (AMI)

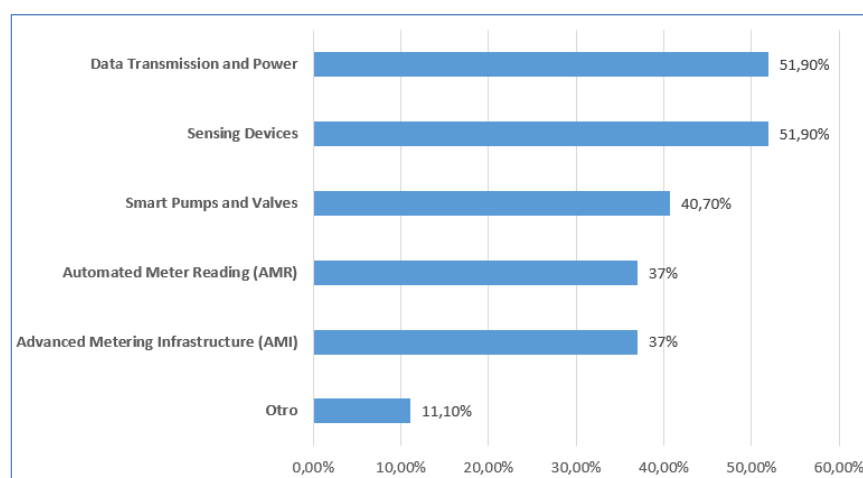


Figure 18 Survey’s results about the most important key for Smart Water Grids

**2) Which challenges and issues ICT has to face to overcome the current status of Smart Water Grids?** In this multiple option question, the following choices are allowed:

- Increase the service life of existing assets
- Adapt to the severe consequences of asset failure
- Provide remote and autonomous inspection
- Provide real time health monitoring of critical components
- Provide an effective use of data analysis for asset integrity management
- Provide decision support and decision making tools
- Be able to provide emergency responses
- Cost of the development of the Smart Water Grid
- Cyber security
- Lack of funding and incentives
- Produce useful information about all the components of the grid

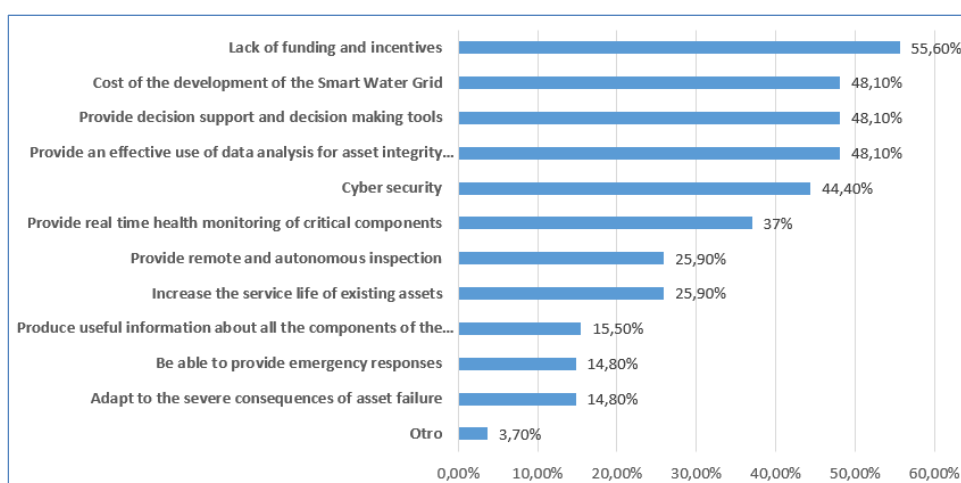


Figure 19 Challenges and issues ICT

**3) For citizens, which issues and challenges do you think are most important?** In this question, the main objective is to explore which are and how citizens perceive these factors. The following choices are allowed:

- Need for raise the awareness of a change in water use behaviours
- Acceptance of the changes of the Smart Water Grid (reutilization of water, use of real time data, etc.)
- Quality and reliability tests before installation
- Provision of interesting services and applications that encourage the final costumer to use them

- Provide security and assure the anonymity of data of citizens using the Smart Water Grid
- Provide protection to the citizen in front of disasters, such as example severe droughts or floods
- Education and dissemination actions to advice of about the benefits of using the Smart Water Grid
- Costs aspects of implementation of equipment

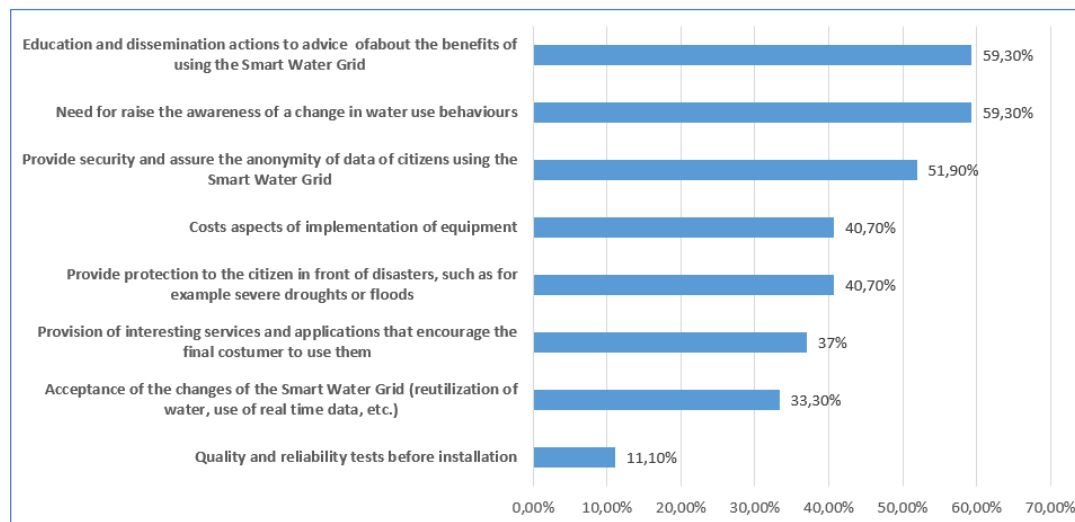


Figure 20 Issues and challenges for important for citizens

**4) In your opinion, are citizens mature enough to use the Smart Water Grid and its services and applications in their day-to-day life?**

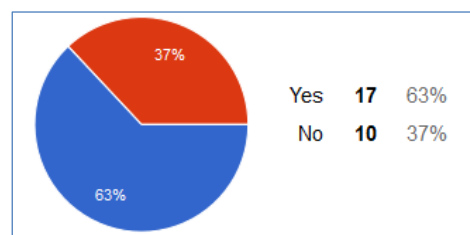


Figure 21 Are Citizens mature enough to use Smart Water Grid

63% of participant on this survey considered that citizens are mature enough in order to use the Smart Water Grid and its services and applications in their day-to-day life. It is completely assumable due to nowadays people live surrounded by technology, so it is the natural way of understanding the immediately future of new processes and services.

## 4.2 ICT for Water Roadmap Smart City Connection

This survey was used to check the alignment of the draft Smart City Connection topical roadmap. The survey is hosted in the following URL: <https://docs.google.com/forms/d/e/1FAIpQLScBZ0RvPbhXs4fT7PLc-2HJKye5VV0VKfKmSNfSomVxD1MOwQ/viewform>. The following figure shows a screenshot of the survey published using Google Forms and its result of a total among of 35 participants, and which have been the most relevant questions to improve portfolio.

### WIDEST – ICT for Water Roadmap: Smart City Connection

A city's water distribution and management system should have the network and capacity to obtain and monitor information on how they are performing and affecting each other. Communication with citizens about possible shortages and other information is a key factor. Smart water strategies enable effective supply and demand management, and improve the management of infrastructure of utilities and businesses.

The aim of this survey is to identify key challenges and recommendations to drive the development of ICT solutions for Water in Smart Cities.

We would be grateful if we could get your expert opinion for the development of a roadmap. This provides policy and decision makers from municipalities and utilities an overview of the main aspects that need to be considered to effectively design and integrate ICT for Water solutions and strategies.

This survey will take less than 3 minutes to complete. The information provided will be used only in the WIDEST framework and all data provided will be treated anonymously.

*Figure 22 Screenshot of header and first question of the survey*

- 1) **Which technologies are most important for the development of Water and Smart City Connection?** The main objective of this question is to know which technologies are considered the most important for the development of Water and Smart City. The following choices are allowed:
- Cyber Physical Systems(CPS)
  - Spatial Data Infrastructures (SDI)
  - Cloud Computing
  - Smart Water Networks (SWN)
  - Machine to Machine (M2M)
  - Geographic Information Systems (GIS)
  - Systems of Systems (SoS)
    - Smart Meters
    - Internet of Things (IoT)
    - Big Data and Data Analytics



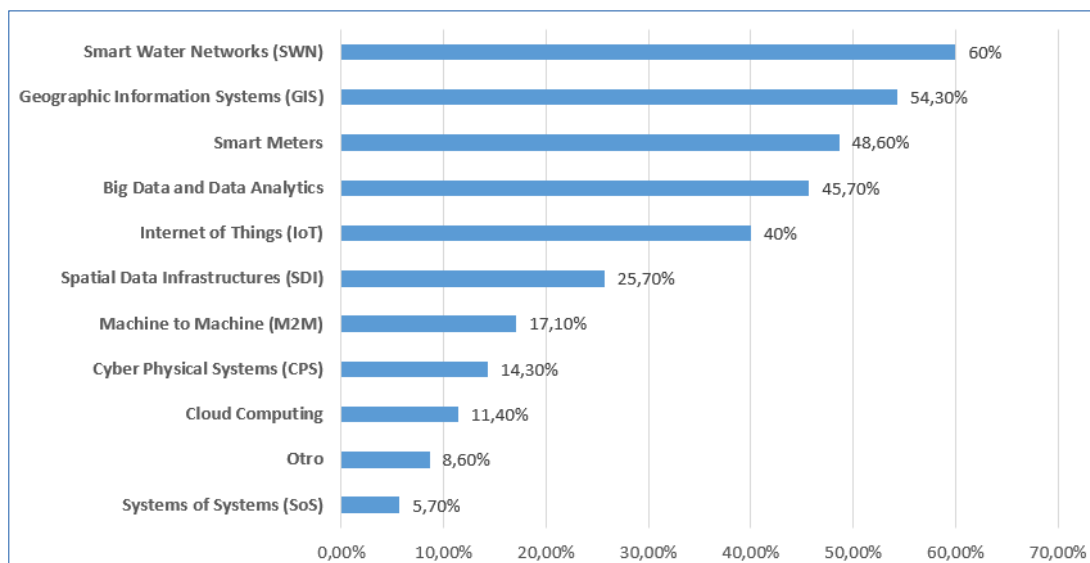


Figure 23 The most important technologies for Water and SmartCity connection

2) **Which challenges and issues have to be overcome to implement ICT for water solutions resulting in Smart City Connections?** In this multiple option question, the following choices are allowed to determine which are the real challenges and issues:

- Lack of standardization
- Lack of policies
- Lack of awareness
- Proper ICTs governance
- Old existing infrastructure
- Real-Time Data Integration
- Improving Customer Satisfaction
- Accurately Forecasting Demand
- Cyber Security

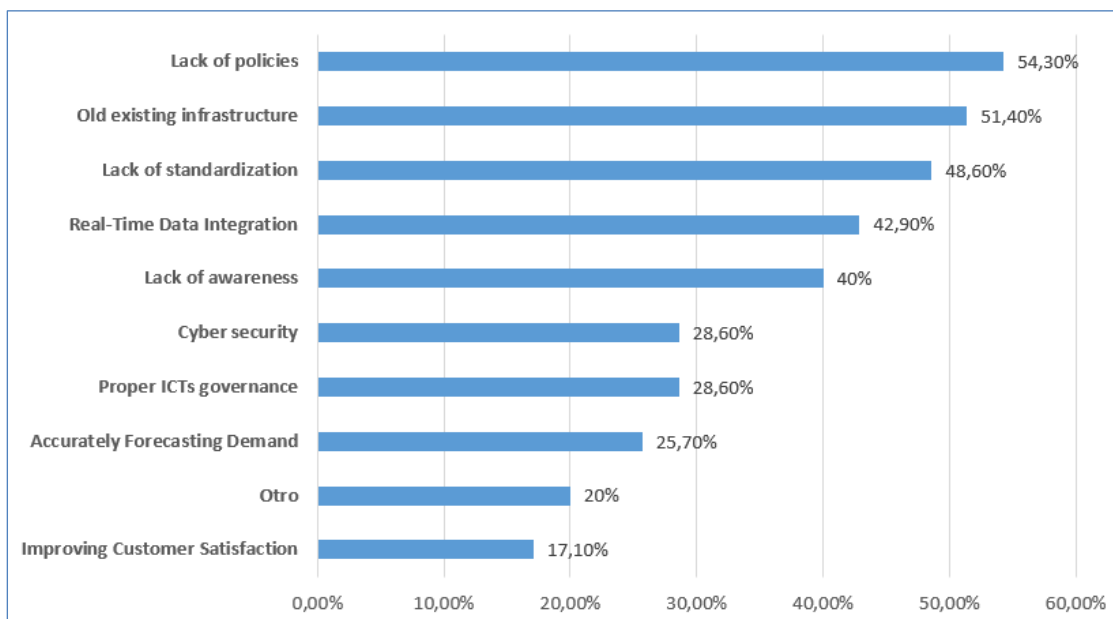


Figure 24 Real challenges and issues to implement ICT for water

3) **Which applications are of interest to citizens?** In this question, there is relevant information about how citizens, on their own perception of technology, are going to accept future technologies changes involving ICT for water. The following choices are allowed:

- Real time water consumption for efficient water usage
- Recommendations for water saving based on water usage patterns
- Asset management
- Advices during natural disasters
- Information about water quality and properties
- Others

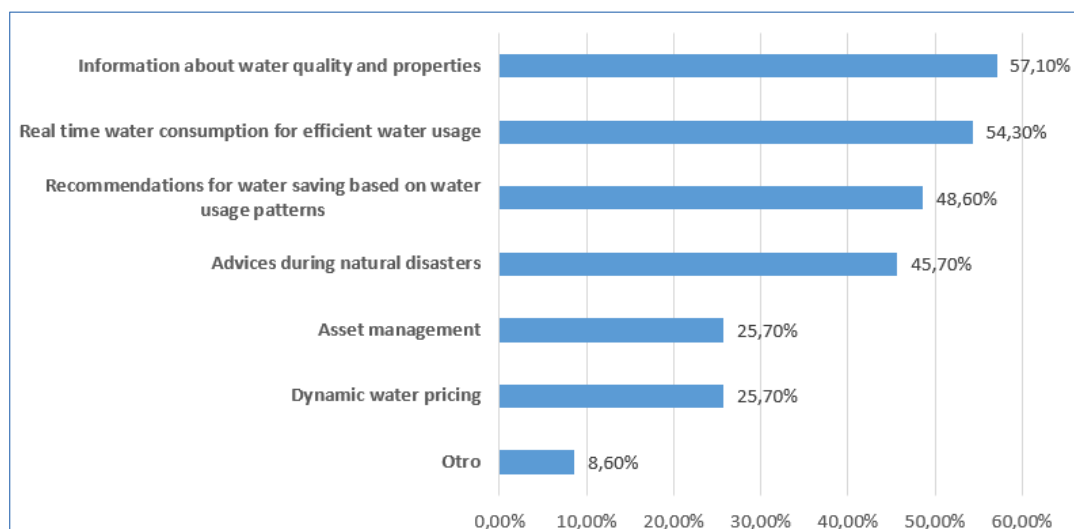
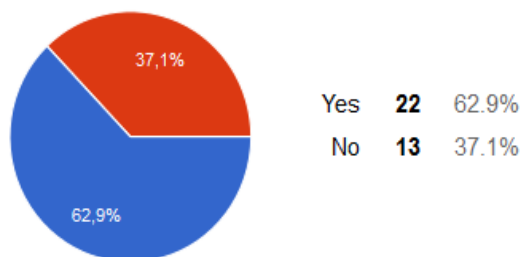


Figure 25 Applications of interest for citizens

**4) Are citizens mature enough to integrate these technological changes in their day-to-day life?**



*Figure 26 Are Citizens mature enough to integrate changes for Water Smart City*

Analysing the data of the surveys above, there is a common point between them, and it is the lack of information and dissemination of new technologies and their benefits in water field, so it would be necessary a better understanding by the citizen of the integrated water cycle challenges and issues, giving value to water and convincing the public by decent solutions and real advantages. This could be improved empowering the citizens to collaborate in water management.

On the other hand, with almost 63% of the participants agree with the idea that citizens are mature enough in order to use these technology changes, the same as the fourth point in the survey before, it is completely assumable due to nowadays people live surrounded by technology, so it is the natural way of understanding the immediately future of new processes and services.

## 5. Portfolio

In this second stage, a broadest dissemination has been performed in order to maximize the stakeholder's participation and their level of involvement. Although some contributions from stakeholders has been collected, other data sources have been used to full fill the portfolio with even more contents, following the methodology described in D4.1, as the contributions of different partners of WIDEST consortium, the members of ICT4Water Cluster, and the different contacts and iterations taken place in the organized events.

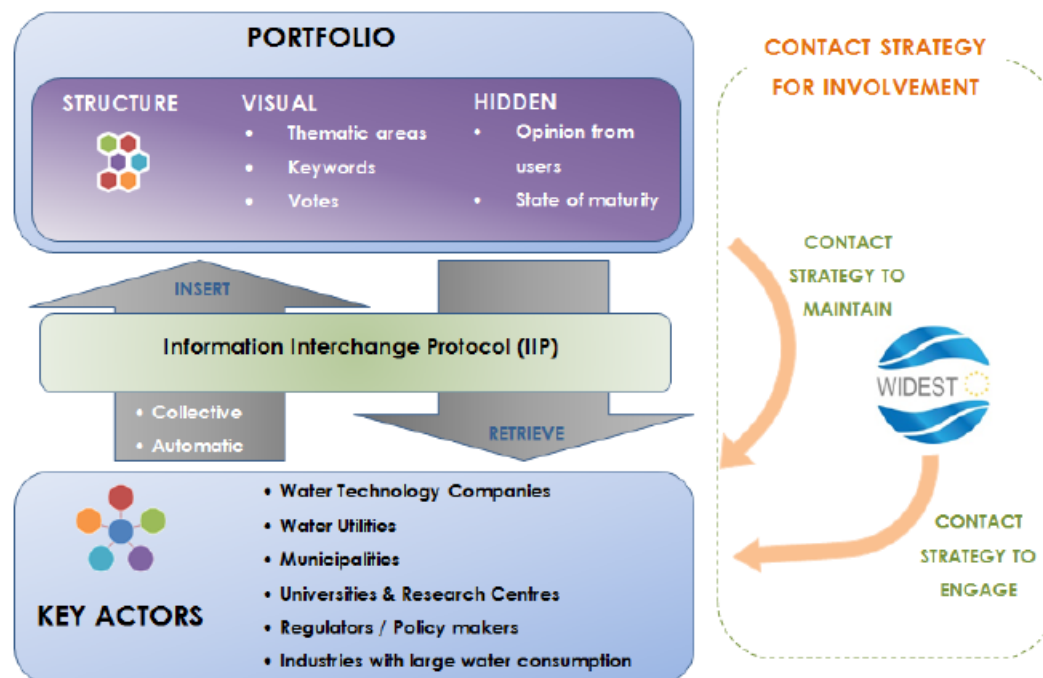


Figure 27 Broad vision of the methodology described in D4.1

To fill the portfolio, several items have been collected and some actors approached in different thematic areas. See Figure 28 Thematic area distribution solutions in (%), to understand the weight of each area in terms of representativeness in the portfolio.

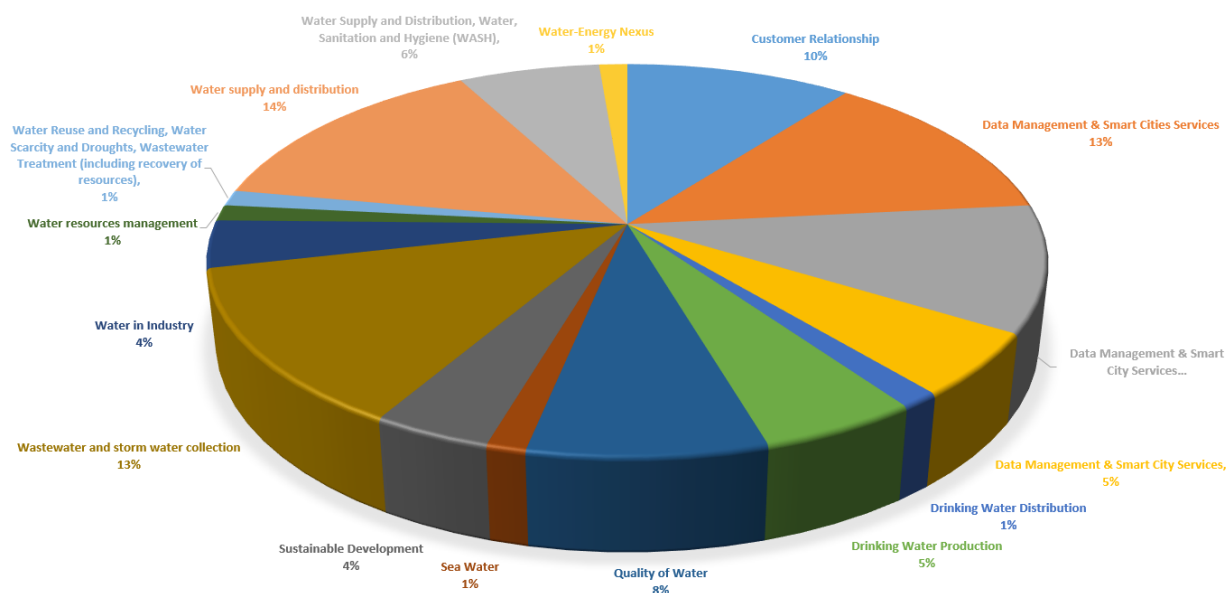


Figure 28 Thematic area distribution solutions in (%)

Analysing the updated data in the portfolio by thematic area distribution, Water supply and distribution, Data Management & Smart Cities Services, and Wastewater and storm water collection are the most representative. The aim is to continue working to incorporate more solutions to the portfolio database, especially in those thematic areas where is still no representative number of solutions, with percentages below 4%.

An alternative to go further with the development of the portfolio will be to continue detecting potential contacts between people, that belongs to Technological Centers and Companies through the EIP Water Online Market Place, hosted in the following URL: <http://www.eip-water.eu/my-market-place/how-it-works> where it will be possible to contact people along their expertise, combining search by topics or sectors represented in figure 29 with less participation.

## 6. Conclusions

The goal of this deliverable is focused to explain how stakeholders have been contacted and the results that have been obtained. In this regard, it is important to put into context that there have been two stages for this deliverable during the project. The first one, in which WIDEST was focused in the designing of the methodologies to be followed, in order to reach the objectives of the project and in the performance of the first contacts with the stakeholders to find out their needs, and a second one where to disseminate the benefits of WIDEST and maximize interactions. However in the second stage, the broadest dissemination performed to maximize stakeholder's participation, has had a lower impact than expected, reducing the chances to return to interact, and forcing to have direct contact to them in order to get new data to update the portfolio, and finally the IWO database.

With this context in mind, this deliverable shows the interactions with the stakeholders requesting their direct contribution, almost all, by survey or direct email contact. After the first survey, data was still needed, so it was necessary to conduct more focused surveys. In addition, Smart City Connection and Smart Water Grids surveys have been considered as an alternative way to improve portfolio quality data, following the methodology described in D.4.1, taking advantage of the fact that they were already published in the scope of topical roadmaps development, with the objective to align the roadmaps with stakeholder's opinions. In addition, in its final phase, another data sources have been used to full fill the portfolio, following the methodology described in D4.1, as the contributions of different partners of WIDEST consortium, the members of ICT4Water Cluster, and the different contacts and iterations taken place in the organized events.

In conclusion, the project have received several contributions and positives feedbacks from stakeholders, where it can be said, that the involvement of stakeholders in the first iteration of the project was low, but despite the low participation in the surveys, another mechanisms have been activated, as action plan, following the previous designed methodology, as the contributions of different partners of WIDEST consortium, the members of ICT4Water Cluster, and the different contacts and iterations taken place in the organized events. Definitely, WIDEST has an important role to know the main needs, concerns and desired requirements of the stakeholder's ideal knowledge platform.

## 7. References

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