FREEWAT

Free and Open Source Software Tools for Water Resource Management

EU HORIZON 2020 Project

FREEWAT

FREE and open source software tools for WATer resource management

Final Report on the Focus Groups integrating the participatory approach to technical modelling activities

Deliverable No	8.10
Version	2.0
Date	22/12/2017
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Dissemination Level	Public
Status	Final
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The FREEWAT project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement n. 642224.

Contents

Abstract

The present document sums up the conduction of the Focus Group Sessions and the main outcomes, conclusions and results obtained. During the lifetime of the project, 96 Focus Group sessions were conducted in the 14 case-study areas attracting more than 1000 participants.

The findings from the Focus Groups show that the methodology has been successful yielding inputs into the further enhancement of the FREEWAT model as well as further suggestions on the application and future development of the Groundwater Framework Directives and other Water Directives.

All the material produced is attached in **Appendix 1 – Focus Group material**. This Appendix consists in a compressed archive *Appendix_1_Focus_Group_material.zip* . There, seven folders (fg_1, fg_2, etc.) contain the material of each partner related to that Focus Group. Minimum in each folder, the following documents may be found:

- participant list with signatures;
- minutes oft he Focus Group.

Because the file is larger than 50 Mb, it is not stored in EC SYGMA platform, but it can be retrieved from the B2Drop dedicated folder D8_10_Focus_group.

1 Introduction

The FREEWAT project aims at promoting water resource management by simplifying the application of the Water Framework Directive and other related Directive though the use of ICT tools. H2020 FREEWAT presents an integrated and innovative approach based on the use of new open source and public domain software tools through the involvement of key stakeholders at a national and international level.

This deliverable D8.10 presents the outcomes of *Task 6.2 Local Focus Groups on ICT innovation for water management: Stakeholders involvement in running case studies* (Task leader: PRN, all partners involved in case studies) by analysing the participatory approach's process in the modelling of the technical activity. It outlines the practical applications of ICT innovative tools to deal with the water-related problems experienced at the various Case Study areas and their relationship with the WFD and GWD and other water-related Directives.

1.1 Objectives of the Focus Group Sessions and the Participatory Approach

In summary, the **main objective** of the Focus Group sessions was primarily to encourage active participation of a wide base stakeholder group in dealing with water management issues using ICT tools and to test if such use could have been beneficial in finding shared solutions. The specific objectives were to: a) demonstrate the benefits of applying the FREEWAT platform also to both a technical and non-technical audience; b) ensure and boost a wider FREEWAT adoption; c) support and increase the numbers of FREEWAT users not only among scientists, but also among the technical and non-technical stakeholders; d) ensure enhanced science- and participatory approach evidence-based decision making by using the results of the FREEWAT application.

The Focus Groups provided a common platform across the case study areas for discussions where stakeholders with different backgrounds exchanged their points of view and made suggestions on the technical model of FREEWAT and its application to provide water management solutions for the particular case study. This methodology not only helped in ensuring familiarisation with the tool, thus ensuring the widest possible usage, but also create a common space for gathering a shared knowledge on the value of water.

2 Methodology

The methodology adopted to run the aforementioned Focus Group Sessions was the following:

- deliverable *D6.2 Guidelines for effective Focus Group running* for the organisation of the FOCUS GROUP sessions were drafted by the Task Leader (PRN) and circulated to WP6 Leader (METCENAS) and the Coordinator (SSSA);
- following internal review and corrections it was then forwarded to all partners;
- partners organised their Focus Group Sessions according to the guidelines principles.

The main structure of the Guidelines for Focus Group (D6.2) consisted of the following sections: i) Context ; ii) Aim of Focus Groups; iii) Target Audience ; iv) Time Schedule and Working Group Topics; v) Format of the FG Sessions and Possible Questions to be Discussed; vi) Main Output and achievements.

In order to ensure a full understanding by the local audiences, hence to achieve the planned results, the Focus Group sessions were held in the national languages and the session minutes translated according to the Template for Minutes (and submitted to the Task Leader, PRN) for analysis. The aforementioned analysis lead to seven (7) Policy Briefs (please refer to D6.3 Policy Briefs).

Each Focus Group Session followed the same structure. First an introduction, then presentation of the thematic area by the FREEWAT project team, discussion and feedback from the audience. Each session lasted about half-day, upon their arrival at the meeting, participants were invited to sign a participants' list to report their affiliation and background. In order to comply with ethic requirements they were also provided with an Information sheet and with a Consent form. The latter had to be given back to the FG organiser duly signed.

Each Focus Group session had a specific topic, described below:

- Focus Group 1: Introduction
- Focus Group 2: FREEWAT conceptual Mode
- Focus Group 3: Data and Modelling of Data
- Focus Group 4: Modelling Procedures and Fine Tuning of Model
- Focus Group 5: Application of FREEWAT model to different Scenarios
- Focus Group 6: Focus Group methodology in water resource management

- Focus Group 7: Conclusions, Testing and Discussions on Future Developments

Though participants discussed these topics, there were instances, were the development of the model implied further discussions on the tool and its application to the case study identified in each of the partner countries. Thus, some minor and not significant deviations were experienced from the original plan. The Focus Group minutes were transcribed by each group and collated in one file by the task leader. Following this, the task leader proceeded with the analysis of the individual group discussions using content analysis technique. Content analysis, is a common analytical tool used in qualitative research. It foresees the systematic analysis of text and the identification of main themes resulting from the individual discussions or interviews that the researcher has with his/her informants.

All the material produced is attached in **Appendix 1 – Focus Group material**. This Appendix consists in a compressed archive *Appendix_1_Focus_Group_material.zip* . There seven folder (fg_1, fg_2, etc.) contains the material of each partner related tot hat Focus Group. Minimun in each folder the following documents may be found:

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3 Facts and Figures

The Focus Group sessions took place between March 2016 and September 2017. The plan for the FG sessions extended beyond the original dealines since the sessions were conducted in tandem with the application of the technical model developed in WP4 and WP5. As the technical part running was extended up to Month 25 and beyond, also Task 6.2 activties extended. Thus, they were essential in providing the necessary input and feedback to the further development of the tool. Project partners found this technique very useful as they could incorporate the feedback as well as changes suggested by the participants into application of the tool. Table 1 below shows the dates of each session.

Partner	FG1	FG2	FG3	FG4	FG5	FG6	FG7
SSSA	Sept 2016	Oct 2016	Dec 2016	Jan 2017	Feb 2017	April 2017	June 2017
UNESCO	July 2016	Sept 2016	Mar 2017	Mar 2017	May 2017	May 2017	May 2017
RT	July 2016	Sept 2016	Oct 2016	Jan 2017	Feb 2017	April 2017	May 2017
METCENAS	June 2016	Sept 2016	Oct 2016	Dec 2016	Jan 2017	May 2017	May 2017
AMALTEA	April 2016	Sept 2016	Dec 2106	Feb 2017	April 2017	May 2017	May 2017
IEI	July 2016	Aug 2016	Oct 20 16	Mar 2017	May 2017	May 2017	June 2017
ERU	July 2016	Nov 2016	Feb 2017	Feb 2017	Mar 2017	May 2017	May 2017
NTUA	Mar 2016	April 2016	Feb 2017	Feb 2017	April 2017	May 2017	May 2017
INHGA	Nov 2016	Feb 2017	Feb 2017	Mar 2017	May 2107	June 2016	June 2016
UTARTU	Aug 2016	Oct 2016	Dec 2016	Feb 2017	April 2017	N/A*	N/A*
TSNUK	Mar 2016	Oct 2016	Dec 2016	Feb 2017	April 2017	May 2017	May 2017
PRN	Sept 2016	Nov 2016	Dec 2016	Mar 2017	April 2017	May 2017	June 2017
BUGS	Mar2016	Oct 2016	Nov 2016	Dec 2016	Mar 2017	May 2017	June 2017
SUPSI	Sept 2016	Dec 2016	Feb 2017	Mar 2017	April 2017	May 2017	Sept 2017

Notes: * Partner UTARTU did not conduct the last two sessions since they have completed their full analaysis of the model by FG5.

Table 1. Month of Focus Group Sessions of the FREEWAT Partnership April 2016 – Sept 2017.

To ensure the largest involvement of stakeholder groups, some partners opted to hold sessions of their Focus Groups in various parts of their own country, these included amongst others AMALTEA (Spain), INGHA (Romania); METCENAS (Czech Republic), ERU (Turkey). This approach enabled participants to obtain a more 'grounded' approach and

feedback from those stakeholder groups that eventually will be using and applying the tool.

In total 96 focus groups sessions were organised in the 14 case-study areas representing 15 countries members of the FREEWAT partnership. These sessions attracted a total of 1128 participants from 8 EU member countries and 5 non-EU member countries. These numbers are in line with average attendance of 10 stakeholders per FG. It must be noticed that the seven FGs schedule has generally be intensive and as defined in some of them, participants had difficulties to take part in all the seven sessions. Participants taking part in these sessions hailed from a broad spectrum of the stakeholder group targeted by the FREEWAT project. Table 2 below identifies the country of origin of participants, whilst Table 2 outlines the number of stakeholders attendances in each Focus Group session in all partner countries.

As reported in the Focus Groups' minutes, there was great interest and fruitful discussions among the participants that contributed actively to the success of these meetings. The aforementioned behaviour, is a testimonial of the efficacy of the approach used in unifying the technical part to the social one in water management and its relevance (Focus Group methodology). The participants of the Focus Group also became primary contributors to the most efficient and user-friendly development of the FREEWAT platform, as they actively contributed through their experiences on the ground.

EU – Member Countries	Name of Country
	Spain
	Italy
	Germany
	Malta
	Greece
	Estonia
	Czech Republic
	Rumania
	Slovenia
Non-EU Member Countries	Ukraine
	Turkey
	Switzerland
	Bostwana
	Namibia
	South Africa

Table 2. Country of origin of stakeholders participating in the Focus Group sessions.

Focus Group Session	Number of Attendendance across the Partnership
Focus Group 1	175
Focus Group 2	148
Focus Group 3	173
Focus Group 4	156
Focus Group 5	138
Focus Group 6	186
Focus Group 7	152
TOTAL	**1128**

Table 3. Number of stakeholder attendances in each Focus Group session.

4 The Focus Group Sessions in detail

The following section outlines the main observations generated from the participants in each of the Focus Group Sessions.

Focus Group 1

The first Focus Group consisted in an introductory session, whereby the experts in charge of the case study areas, outlined the project objectives, discussed the application of FREEWAT model and its expected outcomes and outlined how the FREEWAT tool could be applied to the WFDs. In most cases, following the presentations by the project partner, the stakeholder group members expressed appreciation for a methodology to be built on sharing of information. Participants also highlighted certain lacunae in exisiting models and so started to identify the benefits of the FREEWAT platform. Especially since it was perceived from the outset that FREEWAT could provide more realistic answer for the needs and requirements of the different water scenarios.

As far as the FREEWAT platform, the first Focus Group also identified that participants were already conversant and have used modelling tools for water and water management issues as well as GIS techniques. Moreover, during the first session, stakeholders identified some possible adaptations that could be included in the model for the different water scenarios. Finally, as often happens when introducing new applications, stakeholders also indicated possible challenges for the use of the FREEWAT software. These were the accuracy of data (either because it is not as yet collected or because it may be difficult to obtain, especially if it involves self-reporting procedures); availability of historic data for model building (especially, in situation were data collection was not done periodically).

Focus Group 2

The second Focus Group was, in most cases, also of an exploratory nature. It focused mainly on the conceptual model of the case study where FREEWAT was going to be applied, the availability of data to be input and its source, data collection and archiving procedures. Partners had started to pose questions on further sourcing of the data requirements.

In this session discussions were more collaborative, with stakeholder group participants starting to provide suggestions for development and improvement, new data sources as well as offer proposals for possible uses of FREEWAT model. The collaborative process started to become somewhat more evident across all case study partners.

Focus Group 3

During the third Focus Group, it was clear that participants had a better understanding of the FREEWAT tool and its relevance to the individual case studies. The following points were raised and discussed.

- Continuation of discussions on water management and water supply issues within the case study area. This point was remarked particularly in geographical areas new to the FREEWAT project or in the city/region where the case study was being held (Slovenia, Spain, Romania, Turkey);

- In some cases (please see the above point) participants welcomed the platform since at the outset of the project, there was no opportunity to analyse and plan groundwater availability;

- Although data has been collected for years, the FREEWAT platform, being integrated in QGIS, can support data archiving and sharing;

- Different stakeholder groups could identify different uses for the data generated through the FREEWAT model;

- Refinement of who is the factual user of FREEWAT – i.e.: it is the advisor of the farmer, not the farmers themselves;

- Identification of existing data and/or where it is missing – or where there are gaps. In some cases, this discussion led to to identify new data and also to agree on data sharing within different stakeholder groups;

- The application of the FREEWAT platform to the different climatic scenarios, in particular, the agricultural sector, and FREEWAT's potential in addressing the Nitrates Directive (Spain, Turkey); another scenario referred to in this particular FG was different climate scenarios (Bremen, Germany); and the mountainous areas of the Lugano area;

At this stage of the process, participants started to ask questions on how the modelling was being applied to the case study area. This provided the partners with the opportunity to explain further the data modelling activity and how this was rationalised. This process was useful for the further development and refinement of the model in specific case study areas, including hydrostratigraphic units, boundary conditions and time discretisation.

Focus Group 4

This FG session, continued to explore the modelling procedures and the further fine tuning of the model. In same countries, such as Turkey, new stakeholder groups were invited to join the discussion. In some other partners' countries, this session continued

to further identify more experts that could be invited to contribute to the development of the model. The most relevant issues arising out of this FG were:

- further discussions of the model and its use in the specific case study areas and the respective stakeholder groups participating to the Focus Group session;
- checking the model to address its applicability to flooding conditions;
- scenario identification;
- re-evaluation of the groundwater resource, taking into consideration the future impact of climate change, in order to better plan the exploitation of the water resource; demographic changes and the delineation and further protection of the water catchment areas;
- further testing of the model to determine whether deviations to measurements were the result of the software or data input;
- the way the model responds to further modifications or different scenarios such as drainage, climate change; changes in irrigation patterns;
- compensation for missing data;
- the use of FREEWAT model in transboundary water resource management and how this would lead to transboundary collaborative process in the sustainable management of this scarce resource.

Focus Group 5

The fifth FG brought a more meaningful collaboration between the various stakeholder groups, valuable discussions across the various professional bodies and stakeholder groups; how the various stakeholder groups have a different level of knowledge of data and perspectives and when these are put together, a resultant new body of knowledge and perspectives emerged. When these diverse perspectives where then applied to the FREEWAT model, further developments could be observed. In particular, at this stage of the development of the tool, participants were selecting and addressing the impact of the FREEWAT model on different scenarios, that were perceived to be pertinent to the case study area. Main conclusions from this FG are reported below:

- practical consideration of the FREEWAT model, namely analysing the model's application to the more pertinent scenarios within the respective case study areas;
- post-project use of the FREEWAT model and what additional funding opportunities are available for further training and diffusion of the tool amongst stakeholder groups;

- technical modifications of the current model for its further fine tuning;
- discussion of results of data modelling;
- further scenarios identified;
- FREEWAT platform sustainability and its market uptake.

Focus Group 6

In the sixth session of the FGs, simulations, using the FREEWAT model for different scenarios were conducted by the project partners. The original and planned thematic for this FG was FREEWAT and its application within climate change contexts. However, as stated earlier, participants were also given the freedom to discuss/ develop topics that were deemed more pertinent to their respective case study. Thus, partners and the respective Focus Group participants worked on more focused and jointly agreed topics for the various territories themselves. This led to applying the FREEWAT methodology to very specific situations within the case study areas, reinforcing that the methodology is one that is flexible but also one that is useful for the diverse water environments covered by the WFD and the GFD. For this session, some of the partners invited and involved representatives from environmental groups or other water/territory related organisations. Main outcomes of the sixth Focus Group session were:

(i) Climate Change

- The relevance of the FREEWAT model in simulations and climate scenarios to address the climate change challenges, in a context of increasing water demand for agriculture and tourism;
- FREEWAT is an opportunity for smart groundwater management, especially in an insular region with historical water scarcity, excarbated by climate change; this is a very relevant to the Mediterranean island contexts and it was addressed by AMALTEA in the Spanish context as well as in Malta in the Gozo case study;
- Modelling to assess the impact of decreased recharge on the aquifers and therefore the measures that water authorities could use to better manage the resource.

(ii) Water Management in Insular areas

- To show FREEWAT as an opportunity to improve insular hydrological plans under a unified technology platform relevance of model, simulations and climate scenarios to address the climate change challenges, in a context of increasing water demand for agriculture and tourism.

(iii) Farmers' Association

- FG 6 for the METCENAS partner revisited the farmers' community with whom they worked in FG2. The session focused in particular on the attractiveness of FREEWAT for the farmers – hence how it could be used in the region Vysočina.

Focus Group 7

The final session dealt with a wrap up and conclusions of the FGs sessions, testing, discussions on Future Developments. During this session, FG participants looked at the main points discussed and identified further issues for the FREEWAT tool. Some more pertinent points emerging from this last Focus Group were:

(1) FREEWAT application was considered a very useful tool for different scenarios, taking into consideration all the modules developed within, which cover the most part of the hydrological cycle and of the issues that can be faced by the water authorities and other decision makers in the water field;

(2) The success of FREEWAT depends on the collaboration that exists between the various parties involved in the discussions – in some countries, the established collaborations are the basis for more solid, long term initiatives, although as this particular phase, there are intentions for stronger and longer term support infrastuctures;

(3) Training through formal courses (degree or certificate) and/or informal courses for farmers, water management users etc was considered by a number of FG participants as a logical and needed step to encourage the further uptake of the FREEWAT tool;

(4) In assessing FREEWAT as a Risk Management tool, participants commented that a free and open source software is the best way to give everyone the possibility to calculate predictions for own areas of interest in detail and to manage risks such as increase in salinity and contamination. It is however imperative to communicate detailed results back to the respective authorities to get the best model for environmental risk predictions as possible. The merits of FREEWAT in assessing risk management, were summarised as first – it is a tool that is excellent to represent territory for spatial presentation of critical points, thanks to updated monitoring data and a groundwater flow model that tracks particles, could lead to better sustainable water supply.

(5) Through modelling scenarios, alternative good sources of water recharge and water usage, salinization and impact on the surrounding environment were identified.

5 Main Outcomes and Impact

The main outcomes and impact of this activity are summarised below:

- The FG methodology, through its approach of brainstorming and round table open discussions, has proved successful, in fact it has the potential to develop strong collaborative spirit across a wide range of stakeholder groups. The FG methodology has enabled partners to enlarge the stakeholder groups and in certain case study areas, involve additional experts;

- The approach allowed the identification of new data and sharing of existing data between the stakeholder groups, and a general appreciation on data value at all the different case study areas;

- The different stakeholder groups brought to the discussion table a variety of experiences that helped project partners to understand better the possible wider applications of the tool. The iterative process resulted in serious and responsible discussions of water management implications applied to different scenarious across the 15 partner countries;

- The FGs sessions involved also climate change activists, such as Legambiente (Italy), very active throughout Europe and beyond, and other environmental organisations such as AVSO (Slovenia); which were given the possibility to understand how the FREEWAT open source platform is beneficial for the water management and hence for the environment.

- Following the FGs sessions there was a general agreement that entities involved could visualise better and consequently had a better understanding of how groundwater within their respective regions behaves.

Table 3 below outlines the main scenarios that emerged as a result of the discussions held within the partnership during the FGs sessions

Scenarios	Partners using this scenario
Climate Change	INGHA, PRN, BUGS
Rural water management	SSSA; ERU
Nitrate Directive	AMALTEA, INGHA
Land Use and Land Cover	TSNUK
Trasboundary water resource management	UNESCO, SUPSI
Ground Water Directive	METCENAS
MAR (coastal and central); Malta island	PRN

Table 3. List of scenarios in which FREEWAT model was used in its application to the various case studies.

6 Conclusions and Considerations

1. *Possible uses of the FREEWAT Model* partners identified several ways in which the FREEWAT model can be applied to the management of groundwater, these were elaborated, expanded and tested also within the different case studies;

2. The FREEWAT tool is a ***free of charge***, open software which makes it easily accessible for a variety of users as well as making it an accessible teaching tool which can be used by universities and training institutions. Furthermore, FREEWAT is also able to handle a database making it a better tool. Besides the capability of storing the data there is also the capability of presentation data in different ways and also the possibility of usage in modeling questions for the case study area;

3. The ***accessibility*** of the FREEWAT tool, and its ***comprehensive*** approach was highly appreciated by all stakeholder groups and any initial doubts expressed at the outset of the sessions were dispelled when the tool was seen in action and across the different case studies;

4. *Future collaborations and initiatives* as a result of the FG sessions. Partners mentioned additional inititiatives that could materialise as a result of the FREEWAT Focus Group Sessions. These were:

- Collaboration initiatives between Mediterranean islands (Amaltea)

- Life+ project addressing a hydrological model covering the area of České středohoří (Central Bohemian Uplands);

- Funding and supporting initiatives for other organisations within partner countries (Amaltea);

- Further training courses (INGHA and ERU);

- Preparation of Webinars for training of an extended stakeholder group (UNESCO)

- Use of the FREEWAT platform as a demo for training the students in preparation for their future professional and technical careers in water resource management or environment protection (INHGA);

5. There is the need to develop ***new supporting financial instruments*** that deal with water management, training and the implementation of the measures required to address further the water framework directives;

6. The FG methodology proved to be an approach that catalysed an ***intensive collaborative process*** that led to testing of an innovative technology and the further

development of a tool, which was evidence- based and grounded within the context where it will be utilised and applied;

7. The methodology identified that certain ***water management practices*** currently undertaken in various countries, whether they are related to water abstraction, water governance, farming practices etc., need to be ***reviewed, changed or managed better*** since they are having a major impact on the quantity or quality of ground water;

Overall, these FGs were very *positive and successful*, not only in terms of high level audience participation but also for the participants' active involvement, fruitful discussions that led to an improvement of the FREEWAT platform hence its wider adoption for the benefit of all actors involved and the environment.

6 Deviation from Work Plan

No relevant deviation to mention. It must be noticed that running Focus Groups is a complex activity that involves inclusion capacity. Some conflicts among stakeholders could not be avoided during some meetings – although then they were moderated and reassorbed. Another issue has been related to the fact that it was practically impossible to run 14 Focus Group with the same time schedule. Finally, partner UTARTU decided not to run FG 6 and 7 as they thought that in 5 FGs they completed the task along with the modelling activities.

Document History

30.06.2017 Release of v0.1 first draft prepared by Nadia Theuma

01.09.2017 Release of v0.2 after Coordinator's revision

30.09.2017 Release of v0.3 after Giovannas Calabrò review

30.11.2017 Release of v1.0 after Steering group review

22.12.2017 Release of v2.0 after Coordinator's review

List of Appendixes

Appendix I – Focus Group material