



```
D2.3 - V1.0
```



beAWARE

Enhancing decision support and management services in extreme weather climate events

700475

D2.3

Pilot Use Cases Setup for the First Prototype

Dissemination level:	Public	
Contractual date of	of Month 15, 31 March 2018	
delivery.		
Actual date of delivery:	Month 15, 31 March 2018	
Work package:	WP2 Climate disaster management requirements	
Task:	T2.4 – Pilots set up	
Туре:	Report	
Approval Status:	Initial Version	
Version:	1.0	
Number of pages:	64	
Filename:	D2.3_beAWARE_pilotusecasessetupforthe1prototype_v1.0.docx	

Abstract

This document describes the pilot use cases set up for the 1st prototype, as intended for implementation and demonstration as part of the first prototype (M18). The general approach defined in Barcelona meeting and revised in this deliverable. Each scenario use case and user requirements were analysed. In addition, a detailed description of the scenario time-lapse protocol, the demonstration sites the equipment and participants were made. Finally, an evaluation procedure for all scenarios is presented.

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 700475



The information in this document reflects only the author's views and the European Community is not liable for any use that may be made of the information contained therein. The information in this document is provided as is and no guarantee or warranty is given that the information is fit for any particular purpose. The user thereof uses the information at its sole risk and liability.



Co-funded by the European Union

History

Version	Date	Reason	Revised by
0.1	1.2.2018	Temple of Contents structure	HRT
0.3	10.2.2018	Temple of Contents revise	HRT
0.5	06.3.2018	First contribution	AAWA - PLV
0.6	14.3.2018	Second contribution	AAWA
0.7	15.3.2018	Second contribution	FBBR
0.7	23.3.2018	Second contribution	PLV
0.7	27.3.2018	First Review	CERTH - MSIL – UPF
0.8	28.3.2018	Third contribution	AAWA – FBBR
1.0	30.3.2018	Final Version	HRT

Author list

Organisation	Name	Contact Information
HRT	losif Vourvachis	projects@hrt.org.gr
HRT	Miltiadis Meliadis	m.meliadis@hrt.org.gr
AAWA	Michele Ferri	Michele.ferri@adbve.it
AAWA	Daniele Norbiato	Daniele.norbiato@adbve.it
AAWA	Francesca Lombardo	Francesca.lombardo@adbve.it
PLV	Ruben Fernandez	proyectosplv@valencia.es
FBBR	Sefik Muhic	sefmu@fbbr.dk

Reviewer list

Organisation	Name	Contact Information
CERTH	Anastasios Karakostas	akarakos@iti.gr
MSIL	Yaniv Mordecai	yaniv.mordecai@motorolasolutions.com
UPF	Stamatia Dasiopoulou	stamatia.dasiopoulou@upf.edu

beAWARE^①

Executive Summary

This deliverable reports on the initial setup of the pilot use cases, of beAWARE's P1 (P1), due M18 (June 2018), based on a thorough analysis of operational scenarios for the three different pilots:

- Flood for which the system will be demonstrated in Vicenza, Italy
- Fire Valencia, Spain
- Heatwave Thessaloniki, Greece¹

In the first chapter the general approach is presented. In the three following chapters the 3 scenarios structure is presented, which is:

- Pilot Operational Scenario
- Use case analysis with a detailed time-lapse table with step actions.
- Demonstration sites, necessary equipment and participants (including partner members, volunteers and observers)

The final chapter is the evaluation methodology for all the 3 pilots use cases for P1.

More analytically, the first steps taken for this deliverable is analysis of the initial table agreed at Barcelona Meeting. Then, with the help of telcos and direct contact between the members of the consortium, the future steps were finalized. Each end-user responsible for his scenario has recorded and analyzed the methodology to be followed for the pilot operational scenario. Initially the user requirements for each pilot were recorded separately, and then each Case to be used in P1 was analyzed.

The next step is to create a time-lapse protocol table for each scenario separately. These charts analyzed in chronological order the steps that will be taken to successfully complete P1. It is important to note that each scenario, flood, fire and heatwave has its own approach with its own unique characteristics and there has been made a separate analysis for each one. All user requirements of each operational scenario were presented in an analytical table with the User Requirement code, name and description. In addition, the Scenario Demonstration Sites (SDSs), the proposed equipment as well as the participants were presented.

Last but not least Pilot Evaluation is presented. Despite the different scenarios, the approach of the evaluation for all of them is common. For this reason, the User Interface (UI) approach

¹ The first prototype will be demonstrated and tested in Valencia for the fire pilot. In this deliverable, we also describe the full settings for the flood and heatwave pilots for the first prototype. The first prototype will be demonstrated and tested virtually for flood and heatwave pilots.



is the most appropriate approach for the subjective evaluation of P1 for all use cases for the three scenarios.

The selected evaluation methodologies, which are analyzed in Pilots Evaluation chapter, are:

- Questionnaires
- Interviews
- Hot debriefs
- Cold debriefs
- Debriefing forma and
- Written feedbacks

To sum up, in this deliverable, the approach to each operational scenario, flood, fire and heatwave is presented, with a specific and clear structure. Because the first prototype for all use cases is the first approach, correct steps, possible errors and concerns will be observed and analyzed through the evaluation so that appropriate corrections and adjustments can be made in the future based on the desired result.



Abbreviations and Acronyms

The following abbreviations have been used in this document:

P1	Prototype 1 / First Prototype
SDS	Scenario Demonstration Site
сос	Command Operational Center
PSAP	Public Safety Answering Point
ASL	Above Sea Level
UI	User Interface

Partner Names and Acronyms

AAWA	Alto Adriatico Water Authority		
CERTH	Center for Research and Technology Hellas		
FBBR	Frederiksborg Fire & Rescue Service		
FMI	Finnish Meteorological Institute		
HRT	Hellenic Rescue Team		
IBM	IBM Israel – Science and Technology Ltd		
IOSB	Fraunhofer Institute of Optronics, System, Technologies and Image Exploitation		
MSIL	Motorola Solutions Israel Ltd		
PLV	Valencia Local Police		
AAWA	Alto Adriatico Water Authority		
CERTH	Center for Research and Technology Hellas		



Table of Contents

T.	TABLE OF CONTENTS		
LI	ST OF F	IGURES	
1	INTR	ODUCTION9	
2	APPR	ROACH	
3	FLOC	DD SCENARIO	
	3.1	Flood Pilot Operational scenario13	
	3.2	Flood Pilot Use Case User Requirements15	
	3.3	Description of Flood Scenario Use Case17	
	3.3.1	Use Case 101: Declaration of the attention status and continuous monitoring of flood	
	forecas	sting17	
	3.3.2	Use Case 102: Management of new flood emergencies18	
	3.4	Scenario time-lapse protocol19	
	3.5	Description of Flood Demonstration site24	
	3.6	Equipment and participants of Flood Scenario26	
4	FIRE	SCENARIO	
	4.1	Fire Pilot Operational scenario28	
	4.2	Fire Pilot Use Case User Requirements29	
	4.3	Description of Fire Scenario Use Case31	
	4.3.1	Use Case 204: Evacuation management during an emergency31	
	4.4	Scenario time-lapse protocol32	
	4.5	Description of Fire Demonstration site	
	4.6	Equipment and participants of Fire Scenario	
5	HEAT	WAVE SCENARIO	
	5.1	Heatwave Pilot Operational scenario	
	5.2	Heatwave Pilot Use Case User Requirements	
	5.3	Description of Heatwave Scenario Use Case44	
	5.3.1	Use Case 305: Management of Places for Relief44	
	5.4	Scenario time-lapse protocol45	
	5.5	Description of Heatwave Demonstration site48	
	5.6	Equipment and participants of Heatwave Scenario49	
6	6 PILOTS EVALUATION		
7	7 CONCLUSIONS		
8	8 REFERENCES		



List of Figures

Figure 1.Block Diagram of the UC_10117
Figure 2.Block Diagram of the UC_10218
Figure 3.The Bacchiglione Catchment closed at Vicenza24
Figure 4. a) The 2010 flood event: a) Cumulative precipitation b) Bacchiglione River levels at Ponte degliAngeli Bridge in Vicenza25
Figure 5.Levee breach upstream of Vicenza (a) and flooding of Vicenza City (b) during the 2010 flood25
Figure 6.Flooded area in Vicenza after the 2010 flood compared with the 2012 (a) and the 2013 (b) floods26
Figure 7. Block Diagram of the UC_20431
Figure 8.La Devesa de L'albufera
Figure 9.La Devesa de L'albufera (Maps)35
Figure 10. Proposed buildings for the evacuation during the last fire episode and aerial
Figure 11. Block Diagram of the UC_30544
Figure 12. Map of Thessaloniki48
Figure 13. Visualization of the status of places of relief in the city

List of Tables

Table 1. Incident timetable guideline according to flood scenario	12
Table 2. Flood Pilot User Requirements	16
Table 3.Flood scenario time lapse protocol.	20
Table 4. Fire Pilot User Requirements	29
Table 5. Fire scenario time-lapse protocol	32
Table 6. Heatwave Pilot User Requirements	41
Table 7.Heatwave scenario time-lapse protocol	46
Table 8. Debriefing forma	54



1 Introduction

The first beAWARE prototype (P1) has been designed to cover use cases that are relevant for the three operational scenarios: flood, fire, and heatwave. The goals of P1 are to create and monitor beAWARE platform's initial steps and to reveal any weaknesses and shortcomings in order to improve them into the next stages of the project, to implement the collaboration between technical partners and end users.

This report provides the Use Cases set up for P1 from the end users' perspective and needs. In addition, is worth mentioning that all scenarios complement each other, because the methodology that will be followed is similar for all of them with slight changes. Those changes present different aspects of the system functionalities thus offering a complete overall picture and abilities of it. This gives the ability to the system to be used in different cases and in different scenarios with similar features. To sum up, the selected scenarios complement each other, thus enabling to test, on one hand, conformance and fulfilment of respective user requirements, and, on the other hand, to test and assess all P1 developments.

In Section 2, the approach of the pilot set up for all the use cases is presented. A general approach for use case setup definition was agreed by the beAWARE consortium in Barcelona meeting, and is discussed in this section. Additionally, follow-up discussions were conducted for the implementation of P1 in each operational scenario. This initial approach is essential because is the basis for the methodology for the successful completion of each use case according to an obvious distinction of roles and procedures and was imprinted in a table. Each step in this table has a specific time, an input, an action based on which output is produced and who is responsible for each action. This time-stamped steps/actions sequence log that is presented in this table, are part of AAWA's procedural protocol.

In the 3rd, 4th and 5th sections flood, fire and heatwave scenarios are analysed respectively. Firstly, a small introduction for each operational scenario is presented. Each scenario has some differences and is very important to mention the needs and the approach that will be taken for each one. Secondly, a general presentation of all User Requirements is presented according to the Use Cases that will be tested in the P1. Thirdly, the proposed story line of each operational scenario is presented. A block diagram for each use case analyzes the steps that will be followed. The visualization offered by the block diagram gives the opportunity to present all the steps which will be performed and the result of each. Followed up, are the Scenario Demonstration Sites (SDSs) for each operational scenario where the completion of the P1, which will be demonstrated in Valencia, as also the equipment and the participants of each scenario.

In the 6th section the evaluation methodology is presented. Although it is the P1, the process of the evaluation is essential. Its structure consists of interviews and how these will be done, hot and cold debriefs after the completion of the P1, how these will be done, and what the



approach will be for everyone and finally, questionnaires that can be given after the completion of the P1 for each operational scenario. The questions of the questionnaires have different approaches to each other so that it is possible to record the different views of the respondents but also to show possible mistakes and problems that occurred in the process of completing the P1 for each use case.

The evaluation methodology builds upon the metrics and techniques described in the deliverable D2.2 [1], and as described in the following, include:

- Interviews with participants and observers
- Hot and cold debriefing sessions after the P1, and
- Questionnaires to be filled by the participants.
- Written feedbacks

To sum up, it is important to mention that the test of those modern technologies, such as weather analysis, visualization of emergencies incidents, filtering and analysis of social media and informing rescuers and citizens, for all use cases will test the performance of the beAWARE system in multitasking. It will also track the strategy that will be followed in the next steps and finally any potential corrective steps that will be taken that are needed in the scenario timetable.

All the advantages and disadvantages that will be displayed and recorded thanks to the comprehensive evaluation that will be made will guide the consortium minimize the problems, to take corrective actions and to continue the development of the platform on the basis of the requirements as those were described in D2.1 [2].



2 Approach

beAWARE system focuses on supporting/assisting authorities in management and decision making during a natural disaster. More specifically as will be demonstrated with the three operational scenarios it intends to provide various services before, during and after that disaster. For this reason, it is important to note down all steps of P1 for all use cases.

- pre-emergency
- during the emergency
- post-emergency

The procedural framework to be followed for the implementation has been agreed by the beAWARE consortium during its plenary meeting in July 2017 in Barcelona, and one of its tools is Table 1. This table describes a pre-emergency and during the emergency phase according to the flood scenario.

According to AAWA's protocol and procedures management knowledge for floods this initial table was created. This table has 5 major columns and its baseline and guides can implement for all use cases. Those columns are:

- time of each event,
- input, for example the forecast, a notification or a message,
- action that will take place, for example, the warning that will be send to the authority, or to push the confirm button
- output of each action, for example, a notification, a message etc
- actor which is responsible for the action.

Based on Table 1 and according the scenario use cases, corresponding tables for the P1 were created which are presented in the following chapters. In addition, several steps have taken place since the meeting in Barcelona and technical partners in collaboration with end users have created a time-based methodology based on the scenario and user requirements of each Use Case. More specifically, there were discussions during telcos among the partners as well as bilateral discussions between technical partners and end users in order to clarify and be more precise for future moves.

Additionally, as defined in D2.1, those tables are the set of user requirements for each scenario and only part of these will be used in the P1. From the set of user requirements only part of these will be used in P1 pilot. Then, the scenario time-lapse protocol for each operational scenario is presented. This Protocol will be the guide for the successful completion of P1, but will also be the basis for any shortcomings and errors in the methodology. Next, SDSs are presented as well as the equipment and the participants for each scenario.



Finally, the evaluation to be followed based on D2.2 will allow monitoring and evaluating the measures that have been taken if changes are required and where and what corrective actions are need to be taken in the next stages of beAWARE.

TIME	INPUT	ACTION	OUTPUT	ACTOR	Definition of Actors
0.00	Forecast in the next 30h, max. water level in the river	Check with thresholds	Crisis Classification	beAWARE System	
	Crisis Classification	Send warning to the Authority	Notification	beAWARE System	
	Notification	Activate Crisis Management (CMO) Standard Protocols - beAWARE	Decision to mobilize resources (Flood: Control room opened)	Authority	
12.00	Decision of the Authority	Activation of first responders - PSAP through beAWARE	Activation message: "be ready for the next 24h" to all first responders	Authority	
12.05	Message received from authority to first responders	Push "CONFIRM" to declare availability in beAWARE app.	YES/NO Availability of first responders Classification	First responders	
	Crisis Classification	Through beAWARE app./System inform citizens/Media	Messages: "We are in emergency 1"		



3 Flood Scenario

The pilot set-up for the flood scenario is designated in such a way so as to demonstrate the capabilities and features implemented in the P1 with respect to alerting the citizens of the imminent emergency and to supporting the Decision Maker by improving their knowledge about the crisis.

Moreover, this pilot also will allow reflecting about what really has happened during that flood event and how the presented system may have helped to improve the Civil Protection chain. More specifically, in this demonstrative event, the flood forecasting system AMICO will simulate a real flood (1st November 2010), which will trigger the entire beAWARE platform. Then, the UC101 and UC102, as described in D2.1, will be reproduced, with the current features implemented in the P1.

This information, together with all comments and suggestions provided during this demonstration, will help the optimization of the beAWARE system in the next prototype.

The description of the story line of the pilot is the main argument of the first section of this chapter; then a list of the user requirements for the flood Use Cases implemented in the P1 is presented in the second section; in the third section are briefly described the UC101 and UC102, then is provided the time lapse of the pilot set up and the description of the flood in Vicenza, which will be simulated during the demonstration.

Finally, in the last section, the criteria for the flood pilot evaluation are presented.

3.1 Flood Pilot Operational scenario

During the demonstration of the beAWARE features implemented in P1, a hypothetical storyline is assumed, taking example from the great flood of November 2010, which will be reproduced by the forecasting system AMICO.

The main objective of the storyline is to highlight that, in every phase, the beAWARE technology implemented in P1 is able to provide a detailed and updated outline of the situation, with the incident reports, physical sensor measurements, forecasts and additional available information. Thus, it offers a great decision support tool to the Authority. Finally, it also helps the rapid diffusion of public alert to all citizens.

As P1 delivers basic functionalities, in accordance with the three-stages incremental development, stakeholders won't be involved actively in the demonstration and a hypothetical story line is being adopted.



The hypothetical storyline starts when AMICO produces a forecast indicating a possible flood event in the next day, with predicted water level above all the thresholds in the section of Bacchiglione river near the Bridge 'Ponte degliAngeli'. Promptly the beAWARE platform informs the Decision Maker about the situation indicated by this forecast.

Then the Decision Maker activates the COC (Command Operational Centre), thus all the proper pre-emergency management measures are taken and a general alert is sent through beAWARE platform to the public.

After this point, the situation is constantly monitored by the Decision Maker by the PSAP, which now shows the real time measures taken by the water level sensors along the Bacchiglione River in Vicenza.

The next day, as forecasted, the flood is starting and the level in Bacchiglione River at Vicenza is constantly growing higher. When the water level at Ponte degliAngeli river section exceeds the first threshold, the PSAP will show a yellow light in this section. Thus, by the beAWARE platform, the Decision Maker sends alert to citizen and the proper measures defined for the specific level of alert are taken.

Some hours later, the beAWARE platform detects that the water level at Ponte degliAngeli section has exceeded the second threshold, so now the PSAP will show an orange light replacing the previous yellow one. New alert is sent to citizen and the pre-alert measures are taken.

After some hours, the water level has increased over the highest threshold, so the PSAP will show a red light and the alert phase starts, with a public advice given by the authorities using the PSAP and distributed to the citizens through the mobile app.

Shortly after the exceeding of the third threshold, the Bacchiglione River starts overtopping at Angeli Bridge, with the flooding of the nearby areas of the city. The first incident report by mobile app is provided by a citizen in Matteotti Square, with an image attached about some cars in the area. The incoming data is analysed by the beAWARE image analytics, text analysis, and knowledge-base services. Incident updates are sent to the PSAP and then the Decision Maker is able to see the incident location and details (e.g., severity level) on the map in PSAP.

Some minutes later, another citizen in Matteotti Square sends an incident report through the mobile app, now attaching a video showing people in danger. The data is analysed like the previous, now also employing the video analytics, and PSAP updates the visualization of the incident with additional information.



In the meantime, the beAWARE social media analytics collects and analyses tweets about the current crisis from the Twitter Social Network, and the information is summarized and reported to the Authority as incidents in PSAP.

The Decision Maker is now aware of the details about the incidents and can send the proper rescue team if the incidents are real.

Finally, the Decision Maker decides to send, through the beAWARE platform, a global alert to Citizen about the latest developments of the emergency.

3.2 Flood Pilot Use Case User Requirements

Several User Requirements have been implemented in the P1 for the flood Use Case. Firstly, the possibility to provide authorities with real time flood forecasts made by AAWA predictive model (AMICO) and sensor measurements for the urban area of Vicenza. Furthermore, the capability to detect the location of possible incidents from mobile app reports, including text, audio, images, or videos) sent by citizen from mobile phones and from Twitter messages concerning the flood event. All these features perform a key role in helping the authorities to have a global overview and understanding of the event and the incidents occurring in different parts of the city, in order to let a more efficient management of the available resources.

The User Requirements for the flood Use Case implemented in P1 are shown in Table 2, for the full tables of flood Scenario Use Case see the Deliverable 2.1:





User Requirement	Requirement name	Requirement description
UR_101	Type of visualization	Display information to authorities in a web-GIS platform (citizen and first responders reports by calls, apps, social media)
UR_102	Map of the AMICO Flood EWS results	Display reliable and trustful flood forecasts, potential dangerous situations and the forecasted level of risk to the authorities, based onthe results of the Early Warning System AMICO (improved with the assimilation of Satellite data (snow cover, soil moisture, etc.) and Meteorological forecasts data with a finer spatial resolution provided by FMI)
UR_103	Flood warnings	Provide authorities/citizens with automatic warnings on river levels overtopping some predefined alert thresholds, based on forecast results
UR_104	Send/receive emergency reports	Allow citizens to send text, images, audio and video messages from their mobile phone (for the different operative systems) and from their social media account.
UR_107	Localize video, audio and images	Provide authorities with the ability to localize videos, audio and images sent by citizens from their mobile phones
UR_109	Localize tweets	Provide authorities with the ability to localize Twitter messages concerning a flood event
UR_111	Detect flooded elements from video	Provide authorities with the ability to detect and count flooded elements(e.g. cars and people inside the river)from video and images sent from mobile phones and social media
UR_112	Detect element at risk from reports	Provide authorities with the ability to detect the number of element at risk and the degree of emergency from text sent by the mobile app and by social media
UR_128	Evaluation of the level of risk	Provide authorities with the ability to evaluate the forecasted level of risks (based on all the available dataset)

Table 2. Flood Pilot User Requirements



3.3 Description of Flood Scenario Use Case

The proposed story line for the pilot set up of P1 covers mainly two of the User Cases defined for the flood scenario: the UC101 and UC102. In Figure 1.Block Diagram of the UC_101 and in Figure 2.Block Diagram of the UC_102 are presented schematic descriptions of both.

3.3.1 Use Case 101: Declaration of the attention status and continuous monitoring of flood forecasting

The Use Case 101 concerns the declaration of the "ATTENTION" status and the continuous monitoring of the forecasted level of risk.



Figure 1.Block Diagram of the UC_101

Current Status (initial phase of the scenario)

• Before and during the flood

What is known to the beAWARE system already

• Weather forecast

What is happening

• Weather forecasts feed the Flood Early warning system AMICO (EWS), whose results can be visualized in the Platform

Outcome



- The results of the EWS (river level) can be visualized in the Platform and show potential dangerous situations
- The authority (e.g. Decision Maker), based on these results, declares the "ATTENTION" status and convenes in formal way the members of the "COC - Operative Center", that will be engaged in monitoring the situation and in the management of the emergency thanks to the Public Safety Answering Point(PSAP) platform.
- The authority, based on these results, can continuously monitor the evolution of the forecasted flood and evaluate the forecasted level of risk.

3.3.2 Use Case 102: Management of new flood emergencies

This Use Case concerns the management of new emergencies reported by citizens and first responders.



Figure 2.Block Diagram of the UC_102

Current Status (initial phase of the scenario)

• During the flood

What is known to the beAWARE system already

- Weather forecast
- Location of the flooded area



What is happening

- A first responder (rescue service) is recording a video of a flooded street in another location in the city
- Tweets and phone calls are mentioning flooded areas in another location in the city
- Citizens are sending reports on floods with images and text in another location in the city

Outcome

- The authority (e.g. Decision Maker) move forces to the new location
- The authority (e.g. Decision Maker) sends notifications to citizens approaching the dangerous areas and suggests alternative ways
- The system defines a new crisis level based on the available data

3.4 Scenario time-lapse protocol

The time lapse scenario table for flood Use Case is analyzed below. The protocol created for P1 pilot set-up can be divided in three phases.

Firstly, the Protection System chain and the entire beAWARE platform are triggered by the detection of possible incoming flood by the analysis of the latest AMICO result (more specifically, by the comparison of the predicted water levels in Vicenza against predefined risk thresholds). This occurs several hours before the flood itself and activates the COC (Operational Centre).

The second phase starts on the day of the flood, when the level in BacchiglioneRiver at Vicenza is growing higher. The focus is now on the measurements of water level taken by weather station placed near Angeli Bridge ('Bacchiglione a Vicenza'), which, within few hours, exceeds gradually all of the three predefined thresholds. Every threshold exceeding is promptly detected by the beAWARE platform and generates public alert to citizen by the mobile app; after the alert, the proper emergency management measures are taken.

The third phase starts with the first incident report by mobile app. Then, in the next hour, more incident reports arrive, with metadata attached; the beAWARE platform also collects relevant posts from social media, analyses them and provides a report of them to the Decision Maker.

In every phase, the beAWARE technology implemented in P1 is able to give the Decision Maker a detailed and update outline of the situation, with the incident reports and all the available information; it also provides help to the rapid diffusion of global alerts to all citizen. In Table 3 the Time lapse protocol for flood scenario is presented.



Table 3.	.Flood s	cenario	time la	apse (protocol.

TIME	INPUT	ACTION	OUTPUT
DAY 0	New flood forecast provided by AMICO	Crisis classification checks for threshold exceeding	Crisis classification detects that there will be an exceeding of the highest threshold (red alert) in Vicenza in the next 24h, located at 'Ponte degliAngeli' river section of Bacchiglione river
DAY 0	Crisis classification associates a 'very high' crisis level to latest AMICO forecast	Trigger of beAWARE platform, send the information to PSAP	PSAP shows to Decision Maker red alert at Ponte degliAngeli river section
DAY 0	Crisis classification associates a 'very high' crisis level to latest AMICO forecast	Under Decision Maker's request, send notification	a notification of alert for very high level of crisis forecasted is sent to all citizen
DAY 0	Crisis classification associates a 'very high' crisis level to latest AMICO forecast	Decision Maker activates COC, starting of the standard security protocol in Vicenza	COC is activated
05:00	New water level measure provided by weather station 'Bacchiglione a Vicenza'	Crisis classification checks for threshold exceeding	Crisis classification detects that the measure is between threshold 1 and 2 (yellow, medium alert)
05:01	Crisis classification associates a 'medium' crisis level to the latest measure of weather station 'Bacchiglione a Vicenza'	Send the information to PSAP	PSAP shows to Decision Maker yellow spot at 'Bacchiglione a Vicenza' weather station (Ponte Angeli Bridge)
05:02	Crisis classification associates a 'medium' crisis level to the latest measure of weather station	Under Decision Maker's request, send notification; starting of security protocol in Vicenza	A notification declaring state of attention for flood in Vicenza is sent to all citizen



	'Bacchiglione a		
	Vicenza		
	New water level		
	measure		Crisis classification detects that the
09:45	provided by	Crisis classification checks for	measure is between threshold 2 and
	weather station	threshold exceeding	3 (orange, high alert)
	'Bacchiglione a		
	Vicenza'		
	Crisis		
	classification		
	associates a 'high'		PSAP shows to Decision Maker
09:46	crisis level to the	Send the information to PSAP	orange spot at 'Bacchiglione a
	latest measure of		Vicenza' weather station (Ponte
	weather station		Angeli Bridge)
	'Bacchiglione a		
	Vicenza'		
	Crisis		
	classification		
	associates a 'nign'	Under Decision Maker's	A notification declaring state of pre-
09:47	crisis level to the	request, sent notification;	alert for flood in Vicenza is sent to all
	latest measure of	starting of pre-alert security	citizen
	Weather station	protocol în vicenza	
	Bacchiglione a		
	Now water lovel		
	measure		
	nrovided by	Crisis classification checks for	Crisis classification detects that the
14:00	weather station	threshold exceeding	measure is over threshold 3 (red, very
	'Bacchiglione a		high alert)
	Vicenza'		
	Crisis		
	classification		
	associates a 'very		
	high' crisis level		PSAP shows to Decision Maker red
14:01	to the latest	Send the information to PSAP	spot at 'Bacchiglione a Vicenza'
	measure of		weather station (Ponte Angeli Bridge)
	weather station		
	'Bacchiglione a		
	Vicenza'		
	Crisis		
	classification		a notification declaring state of alert
	associates a 'very	Under Decision Maker's	for flood in Vicenza is sent to all
	high' crisis level	request, sent notification;	citizen, with a list of safe places, areas
14:02	to the latest	starting of alert security	for distribution of sand packs and
	measure of	protocol in Vicenza	general safety measures for Citizen
	weather station		(e.g. 'if unnecessary, avoid leaving
	'Bacchiglione a		home')
	Vicenza'		



15:00	Incident report from mobile app with image attached arrives to beAWARE system	beAWARE system analysis of the incident report	PSAP shows incident report's location on a map (Matteotti Square). Decision Maker is aware that an incident has occurred in Matteotti square
15:02	Incident report from mobile app with image attached has arrived to beAWARE System at 15:00	beAWARE system analysis of the image. Flood involving a vehicle is detected. High priority is assigned.	PSAP updates visualization. Priority level is shown. Incident report is sent to Decision Maker: 'Matteotti Square is Flooded, vehicles at risk'. Decision Maker is now aware of the details about the incident in Matteotti square and can send here the proper rescue team.
15:20	Incident report from mobile app with video attached arrives to beAWARE System	beAWARE system analysis of the incident report	 PSAP shows incident report's location on a map (Near Matteotti Square, different location from the previous incident report). Decision Maker is aware that there are still flooded areas nearby Matteotti Square
15:25	Incident report from mobile app with video attached has arrived to beAWARE System at 15:20	beAWARE system analysis of the video. Presence of people is detected. High priority is assigned.	PSAP updates visualization. Priority level is shown. Incident report is sent to Decision Maker: 'Matteotti Square is still Flooded, people at risk'. Decision Maker is now aware of the details about the incident in Matteotti Square andcan send here the proper rescue team.
15:35	A batch of 17 tweets having hashtags related to the flooding is collected by the Social Media Module of beAWARE.	beAWARE system analysis of the tweets. Relevant tweets identified. Detection of these information: 1) Matteotti square flooded 2) river overtopping near Angeli Bridge 3) river breach near Angeli Bridge 4) Bridge is collapsing and there are families isolated. Priority is assigned to every relevant tweet. Reports created.	PSAP shows location of incident reports from tweets with their priority. Decision Maker receives reports with details about the incidents and can, if needed, see the text of the tweets. Decision Maker is now aware of the details about the incidents and can check if an incident is fake (e.g. from fake tweet not recognized by platform) and send the proper rescue team if the incidents are real.
15:40	Through beAWARE system, Decision Maker prepares a	beAWARE system generates a report and sends it to all end- user through mobile app.	Citizen and first responders receive, through mobile app, the public alert



pu	ublic alert for all	
	citizen.	



3.5 Description of Flood Demonstration site

The flood SDS will take place in Vicenza, a city in north east zone of Italy, crossed by Bacchiglione River.

More in detail, the catchment of the upper Bacchiglione River, closed at Ponte degliAngeli in the historical centre of Vicenza (Figure 3), is located in the north of the Veneto Region, a plain that is fringed by the Alpine barrier at a distance of less than 100 km to the north of the Adriatic Sea [3].



Figure 3. The Bacchiglione Catchment closed at Vicenza

With regard to the precipitation climatology, the southern part of this plain is the drier, with approximately 700-1000 mm of mean annual rainfall, whereas more than 2000 mm are measured close to the pre-alpine chain. Obviously, these differences are mainly related to the mountain barrier and its interaction with southerly warm and humid currents coming from the Mediterranean Sea (Smith, 1979). Indeed, the topography of the region rises from the southern plain at about 30 m above sea level (A.S.L.) to about 1500-2200 m A.S.L. in the first orographic barrier, the pre-alpine chain, and then further to the north to the Dolomites, a mountain massive that peaks at over 3000 m A.S.L. In the northern part of the Bacchiglione catchment, the terrain elevations raise from 250 to 1000 m A.S.L. in less than 1 km, with slopes up to 70%. A significant portion of the annual rainfall often concentrates into very short periods of time in the form of what often turns out to be an extreme event with deep convection playing a central role (Barbi et al., 2012; Rysman et al., 2016). As a consequence, severe flooding event have threatened agricultural and urban areas in the recent years (e.g. Scorzini and Frank, 2015), since the upper Veneto plain is a highly populated and urbanized area. These floods are characterized by low response time (lower than 12 hours) and are also triggered by snowmelt.





In detail, the most recent severe flood that affected the territory of the Vicenza Municipality happened between 31st October and 1st November 2010. It was triggered by extreme rainfall and snowmelt in the upper Bacchiglione basin: over 500 mm rainfall was recorded.

The Vicenza city centre, a very busy residential and commercial area, was submerged due to the overtopping of the levees at the "Ponte degliAngeli" river section. Figure 4shows the map of the cumulated precipitations in the Veneto Region and the time series of water levels reached by the Bacchiglione River in Vicenza at the "Ponte degliAngeli" river section.



Figure 4. a) The 2010 flood event: a) Cumulative precipitation b) Bacchiglione River levels at Ponte degliAngeli Bridge in Vicenza



Figure 5. Levee breach upstream of Vicenza (a) and flooding of Vicenza City (b) during the 2010 flood

b)





Figure 6.Flooded area in Vicenza after the 2010 flood compared with the 2012 (a) and the 2013 (b) floods²

In other zones floods were caused by levee breaks and surcharge of the existing urban drainage system (Figure 5). The plots reported in Figure 6show the overall flooded area in Vicenza during the 2010 event compared with other minor flood events occurred in November 2012 and May 2013.

3.6 Equipment and participants of Flood Scenario

The pilot will involve AAWA's personnel who will provide the beAWARE early warnings data input and test the functionality implemented in P1.

AAWA's staff will perform "virtually" the main roles required during a flood event, according to the actual level of development of the beAWARE platform, which will be the following:

Decision Maker:

Main actions in the pilot: receive alert from the system; constantly monitoring the situation both before (based on forecasts) and during the crisis in the PSAP; send global warning to citizen both before and during the flood; activate the specific security protocol.

First responders and Rescuers:

Main actions in the pilot: receive the alert before the flood (based on the forecast) in order to accomplish the tasks required by the security protocol; receive specific communication

² Source: Municipality of Vicenza: http://www.comune.vicenza.it



through the beAWARE platform from the decision Maker; send, by the beAWARE app, incident report in the flooded area to the decision Maker.

Citizen

Main actions in the pilot: receive the global alert before and during the flood (based on the forecasts); send though/via the beAWARE mobile app incident reports about the flooded area; post in social media (Twitter) relevant information about the crisis.

The pilot will take place in Vicenza City in July 2018, in one day; the PSAP will be located in a designated place designed as control room. This pilot will only be virtual – i.e. no actual physical deployment of the system in the Vicenza SDS will take place, and the services of the beAWARE platform will be provided remotely, including the technical support. No physical motion will be actuated on the ground and no real field participants will take part in the experiment. A complete field test will take place in Vicenza in March 2019, and will include the functionality provided in P1, as well as additional functionality to be implemented in the second prototype, P2, due M24 (December 2018).

The communication infrastructure will be a VDSL line and the available 4G network; moreover, there will be computing infrastructure with laptops, smartphones and pc workstations.



4 Fire Scenario

4.1 Fire Pilot Operational scenario

P1 for the fire pilot operational scenario is based on the real fire that occurred in August 2015 on the territory of La Devesa de l'Albufera (Valencia). This pilot case focuses on the management of the fire and evacuation of 450 people from a 3 floor building threatened by fire to a safe place as well as on providing the necessary health care and facilities. It illustrates the pre-emergency level 3(extreme risk of wildfire).

The preparation of this prototype pilot is based on the exchange of knowledge, with continuous discussions in meetings, telcos and e-mail with domestic partners as well as with members of beAWARE consortium.

The completion of P1 will be based on an exercise as its evaluation. The duration of the exercise is a 2 days event composed of the three parts.

The first part is, the meteorological sensors measurements indicated that there is an extreme risk of forest fires, and therefore the established protocol for pre-emergency level 3 (extreme risk of wildfire) will be started as well as deploying the required resources.

The second part is, when PSAP receives a fire warning, from a citizen through the beAWARE system, and the fire protocol will be activated according to its severity, by means of informing and mobilizing the correspondent personnel.

The third part is, ordering and managing the evacuation of approximately 450 people (400 secondary education students plus 50 teachers) from a specific 3 floors building that the be-Aware system has indicated it is required. The proposed building is the Secondary Education Institute "El Saler". The emergency level 2 ends when people in danger are evacuated and fire is extinguished and controlled.

Secondary Education Institute "El Saler" information:

- Location: Avinguda delsPinars, s/n. El Saler (Valencia) 46012
- Coordinates: 39°22'54.1"N 0°19'52.9"W or 39.381700, -0.331362

The fire pilot use case will involve different types of organizations which are:

- Valencia Local Police
- Valencia Fire and Rescue Service:
- Valencia Forest Guard



The main tasks and roles of above mentioned personnel is described in below sub-chapter.

The exercise ends when the evaluation of the exercise is completed.

4.2 Fire Pilot Use Case User Requirements

The most important User Requirements for the forest fire use case are the detection of people and goods in danger, the provision of real time weather forecast, the location of vehicles and personnel involved and geolocalised, bi-directional notifications through the mobile application. The User Requirements for the Use Case 204 as stated in D2.1 are presented in Table 4 below:

User Requirement	Requirement name	Requirement description
UR_201	Detection of people and goods in danger	Display information authorities/first responders to detect people, cars and buildings in danger.
UR_202	Detection of critical aspects	Provide authorities/first responders information in order to detect the following kind of situation, process, material or condition that can cause a wildfire or that could intensify its damaging impacts: Namely drought, air temperature and other weather aspects, fuel accumulation spots, crowds, etc.
UR_206	Specific weather data	Provide authorities/first responders and citizens with specific weather data of the Devesa place, as it has a specific microclimate that might be different from other places.
UR_210	Mobile application	Provide citizens' to communicate a fire alert, detected neglect or other risk situations and even send visual data through a mobile application.
UR_211	Location of vehicles and personnel involved	Display authorities/first responders to visualize GPS location and/or real time footage of vehicles and personnel on the incident site. Transmitted to an online map where the coordination centres can follow both the development of the incident and the location and amount of resources. The online map will also provide the possibility of interacting with the police and other agencies involved

Table 4. Fire Pilot User Requirements





User Requirement	Requirement name	Requirement description
UR_212	Traffic warnings	Sending warnings to citizens in order to avoid interferences inside the area.
UR_213	Recommendations	Sending recommendations to citizens.
UR_214	Warnings Sending warnings of pre-emergency alerts to cit by authorities	
UR_215	Evacuation orders	Ordering evacuations of citizens at risk.
UR_216	Internal sharing of information Sharing data (images, videos, geolocation, representation regarding the forest fire among authorities & responders	
UR_217	Twitter analysis and warningWarning authorities/first responders about Twi messages concerning the forest fire event.	
UR_219	CoordinationandcommunicationProvide communication between authorities andbetweendifferentresourcesresponders, in order to improve their coordinati	



4.3 Description of Fire Scenario Use Case

4.3.1 Use Case 204: Evacuation management during an emergency

This use case focuses on the evacuation management during a forest fire from a 3 floors building block threatened by fire to a safe place, as well as on providing the necessary health care and facilities; a population at risk of 450 people is considered (older, adults, young, children). The pre-emergency level 3 (extreme risk of wildfire) is established and therefore the authority will order the evacuation. Citizens and first responders will be given instructions to facilitate the evacuation and presented in Figure 7.



EVACUATION MANAGEMENT DURING AN EMERGENCY

Figure 7. Block Diagram of the UC_204³

The guidebook templates at the Barcelona meeting with other important clarifications which carried out in discussions between technical partners and end users helped for the development of a workflow for the implementation of the first pilot. Those clarifications are presented below in the 4.3.1 Scenario time lapse protocol.

³ The aerial images from Drones presented in the Figure 7. Will be implemented in Prototype 2.



During the exercise of P1 for the fire pilot, each step of the platform will be tested and any possible errors or flaws will be noted, along with suggestions for further improvements and adjustments.

4.4 Scenario time-lapse protocol

The exercise will take place in La Devesa, Valencia. It will be consist of three parts.

In the first one, the meteorological sensors measurements will indicate that there is an extreme risk of forest fire, and therefore the established protocol for extreme risk of fire will be started, deploying the required resources.

The second part will be initiated when PSAP receives a fire warning, preferably from a citizen through the BeAWARE system, and the level 0 emergency fire protocol will be activated, according to its severeness, informing and mobilizing the correspondent personnel. Once a firefighter arrives to the fire spot, he decides to increase the emergency from level 0 to level 2, requiring protective measures for people.

Finally, the third part will consist on ordering and managing the evacuation of a specific building that the beAWARE system has indicated it is required. The exercise ends when the people in danger are evacuated and the fire is extinguished. In Table 5 the above analysis is presented.

TIME	INPUT	ACTION	OUTPUT
DAY 0	Weather forecast (temperature, humidity, wind, etc.)	CHECK WITH THRESHOLDS	CRISIS CLASSIFICATION
DAY 0	CRISIS CLASSIFICATION (OUTPUT)	Show visual data to PSAP	EXTREME RISK OF FIRE (PRE- EMERGENCY LEVEL 3)
DAY 0	NOTIFICATION	ACTIVATE PRE-EMERGENCY LEVEL 3 PROTOCOL) [STANDARD PROTOCOLS, NOT beAWARE]	THE DECISION. MOBILIZED RESOURCES. [CONTROL ROOM OPENED]
0:00	CITIZEN SENDS IMAGE/VIDEO/TEXT SPOTTING A FIRE	INFORM AUTHORITIES ABOUT AN ONGOING FIRE	FIRE PROTOCOL ESTABLISHED
0:00	CITIZEN SENDS VIA TWITTER IMAGE/VIDEO/TEXT SPOTTING A FIRE	beAWARE SYSTEM MONITORES AND DETECTS THIS MESSAGE AS IMPORTANT	SEND REPORT TO PSAP
0:00	CRISIS CLASSIFICATION	THROUGH beAWARE SYSTEM INFORM PSAP/FIRST RESPONDERS	MESSAGE "FOREST FIRE IN , WE

Table 5. Fire scenario time-lapse protocol



			ARE IN LEVEL 1 EMERGENCY"
			MESSAGE "FOREST
		THROUGH beAWARE MOBILE	FIRE IN , WE
0:00	CRISIS CLASSIFICATION	APP INFORM CITIZENS	ARE IN LEVEL 1
			EMERGENCY"
			MESSAGE "FOREST
0.00		beAWARE SYSTEM INFORM	FIRE IN , WE
0:00	CRISIS CLASSIFICATION	THROUGH SOCIAL MEDIA	ARE IN LEVEL 1
			EMERGENCY"
	DECISION OF THE PSAP		ACTIVATION
		ACTIVATION OF FIRST	MESSAGE "FIRE
0:01		RESPONDERS [THROUGH	PROTOCOL
		BEAWARE]	ESTABLISHED" (TO
			ALL 1ST RESPONDERS
	MESSAGE RECEIVED FROM	PUSH "CONFIRM" BUTTON TO	VES/NO (1ST
0:02	AUTHORITY TO FIRST	DECLARE AVAILABILITY	
	RESPONDERS	[BEAWARE APP]	
	IMAGES VIDEOS AND TEXT	ANALYSIS OF GEOLOCATED FIRE	MAP WITH PEOPLE IN
0:05	RECEIVED	IN A MAP AND FORECASTED	GREEN (NO RISK IN
		EVOLUTION	ASSETS/PEOPLE)
			"INCENDIO EN CURSO
		SEND MESSAGE TO CITIZEN	EN, NO SE
			ACERQUEN A LA
0:05	MAP WITH PEOPLE IN GREEN		ZONA" (FIRE IN
			PROGRESS IN,
			TO THE AREA)
			MAP WITH
			PEOPLE/ASSETS IN
0.05	IMAGES, VIDEOS AND TEXT	ANALYSIS OF GEOLOCATED FIRE	YELLOW (THERE IS
0.05	RECEIVED		RISK OF FIRE
		AND FORECASTED EVOLUTION	APPROACHING TO
			RESIDENTIAL AREA)
			"INCENDIO EN CURSO
			EN, TEN
			PREPARADAS TUS
			PERTENENCIAS" (FIRE
0:05	MAP WITH PEOPLE IN YELLOW	SEND MESSAGE TO CITIZEN	IN PROGRESS IN,
			HAVE YOUR MOST
			IMPORTANT
			BELONGINGS
			PREPARED)
			"SE RECOMIENDA
6.45		SEND MESSAGE TO	EVACUAR A
0:15	MAP WITH PEOPLE IN RED	AUTHORITY/PSAP	PERSONAS, PELIGRO
			INMINENTE" (PEOPLE
			EVACUATION IS



			RECOMMENDED, IMMINENT DANGER)
0:15	DECISION OF THE AUTHORITY/PSAP	SEND MESSAGE TO CITIZEN (RED)	<pre>""INCENDIO EN CURSO EN, EVACÚEN LA ZONA, DIRÍJANSE A" (FOREST FIRE IN , PLEASE EVACUATE, HEAD TO)</pre>
0:15	PEOPLE MARKED IN RED	TASKS'ASSIGNMENT TO THE FIRST RESPONDERS AND DETERMINATION OF THE RELIEF PLACES/SECURITY ROUTES	MESSAGES TO FIRST RESPONDERS
0:16	FIRST RESPONDERS WITH ASSIGNED TASKS MARK THEMSELVES AS "BUSY"	RE-CALCULATION OF AVAILABLE/UNAVAILABLE RESOURCES	OUTPUT: MAP WITH RESOURCES AND ITS AVAILABILITY (PSAP SCREEN)
0:30	PEOPLE MOVES FROM RED ZONE TO RELIEF ZONE	SEND NOTIFICATION TO PSAP	"LAS PERSONAS EN PELIGRO SE HAN TRASLADADO A LA ZONA DE SEGURIDAD" (PEOPLE IN DANGER HAVE MOVED TO THE RELIEF ZONE)
0:30	FIRST RESPONDERS CONFIRM PEOPLE HAS BEEN MOVED TO THE RELIEF AREA	SEND NOTIFICATION TO PSAP	"SE CONFIRMA QUE LAS PERSONAS EN PELIGRO SE HAN TRASLADADO A LA ZONA DE SEGURIDAD" (IT IS CONFIRMED THAT PEOPLE IN DANGER HAVE BEEN MOVED TO THE RELIEF ZONE)
0:55	FIRST RESPONDERS CHANGE THEIR STATUS TO "AVAILABLE"	RE-CALCULATION OF AVAILABLE/UNAVAILABLE RESOURCES	MAP WITH RESOURCES AND ITS AVAILABILITY (CISE SCREEN). MESSAGE TO THE AUTHORITIES.

4.5 Description of Fire Demonstration site

La Devesa de L'Albufera (also known as *La Dehesa del Saler*) is a natural park located 8 km away from the city of Valencia. It is a Mediterranean forest with a line of dunes that has been melded over the centuries after the isolation of the Albufera Lake from the Mediterranean



Sea. It is composed of 850 hectares of Mediterranean pines, palms, kermes oak, mastic scrubs and honeysuckle. This environment attracts many animals, such as birds, small vertebrates and amphibians. Every year hundreds of bird species migrate from Africa to North Europe, and this place becomes a perfect spot for them to recover from this long journey.

The Mediterranean climate is characterized by dry summers and mild, moist winters. Mediterranean climate ecosystems are among the most fire-prone in the world.

The territory of La Devesa de l'Albuferain Valencia, as shown in Figure 8 and in Figure 9 has been affected by some fires in the past. Concretely, in 2015, a fire burned 6 hectares. This event occurred in August 14th and had a quick response by the firefighters thanks to an early warning and the proximity of the firefighters' command centre. According to local media sources, the time-response between warning and firefighters extinguishing tasks was 12 minutes.



Figure 8.La Devesa de L'albufera

For the fire exact location, a suitable area for the demonstration is checked. We consider that the evacuation of one of the 4 buildings shown in Figure 10 would fit all the requirements.







Figure 9.La Devesa de L'albufera (Maps)





Figure 10.Proposed buildings for the evacuation during the last fire episode

4.6 Equipment and participants of Fire Scenario

This exercise will involve personnel from Valencia Local Police, Valencia Fire and Rescue Service, and Civil Protection volunteers. In addition, some citizens will be simulated in the exercise in order to test the beAWARE early warnings data input and overall functioning.

The main tabletop tasks to be done by the "personnel" will be the following:

Incident commander (fire & rescue service)

- Role: Technical and tactical management of an incident.
- Responsibilities: Management of the operational response, management of the personnel and responsible for their safety, managing through the team leaders.

Team leader (fire & rescue service)

- Role: Technical and tactical management of an incident if the incident commander isn't present, management of the firefighters.
- Responsibilities: Management of the operational response and the firefighters.

Firefighters (fire & rescue service)

- Role: Fire and rescue operations.
- Responsibilities: Extinguishing fires, rescue of people, traffic incidents etc.

Local Police

- Role: PSAP and emergency tasks



- Responsibilities: First respond to a fire by spotting/locating the fire and clearing the zone and supporting firefighters in their tasks, especially with regards to allow them open access to the zone, traffic incidents and rescue operations.

Volunteers (fire & rescue service)

- Role: Fire and rescue operations.
- Responsibilities: Supporting the firefighters in their tasks, providing extra material, catering, etc.

The PSAP will be located at Local Police headquarters (Avenida del Cid n.37, Valencia, 46.018). It is equipped with 100 Mb symmetric Internet network, 15 operator posts plus a videowall screen. It has to be noted that the management room will be shared during the exercise with police officers that are attending the requirements the city of Valencia has.

The exercise will take place in La Devesa, Valencia. It will be composed by three parts. In the first one, the meteorological sensors measurements will indicate that there is an extreme risk of forest fires, [PRE-EMERGENCY LEVEL 3] and therefore the established protocol for this level will be started, deploying the required resources. The second part will be initiated when PSAP receives a fire warning, from a citizen sending a picture of a spotted fire through the BeAWARE system, and the [EMERGENCY LEVEL 0] fire protocol will be activated, as in the first instance it poses no danger to persons or properties, informing and mobilizing the correspondent personnel. Next, citizens' status will change from Green to Yellow and then Red, and Authorities and PSAP will take decision and will send messages to First Responders. First Responders status will be updated to "busy" and they will start the evacuation of people in danger and will update their status to "available".



5 Heatwave Scenario

5.1 Heatwave Pilot Operational scenario

P1 pilot for the heatwave case scenario focuses on the management of the places of relief (UC_305). The goal of P1 for the heatwave is to look at the ability to manage places of relief in the event of a heatwave scenario. More specifically, will present the management of the data that the platform will receive, such as meteorological and social media data, the distribution of information to different groups of citizens or rescuers and finally, the steps that will be taken in case of an update in an incident.

To ensure success of the pilot HRT invested a lot in its preparation, organising discussions with other partners and organizations, telcos, email exchange, update and training of the volunteers that will take part but also creating an integrated evaluation structure. For the completion of P1, a tabletop exercise will take place. As it is agreed for the heatwave pilot operational scenario there are 3 major roles.

- First responder
- Citizen
- Control Room personnel

The role of the first responder is to send images, videos and text through the mobile app, as well as to receive and complete the requested tasks.

The role of the citizens is to upload at twitter photos and text, to send from the mobile application, videos, images and voice messages as also to receive and comply with public alerts.

All these tasks for the first responder and for the citizen are in order to check that the application receives data, assesses their importance, identify who sends them, evaluate and take further action. In addition, it will be checked whether the information received by either citizens or rescuers from the PSAP is clear and can be performed without any misinterpretation.

Finally, the control room personnel comprises/includes three members: the analyst (a meteo expert), the decision maker (commanding officer) and the incident manager (operator-police officer).

This theoretical, discussion-based, exercise will be divided in six phases. The separation in phases has been done to make the entire process, methodically correct, at time-determined steps in order to have a clear distinction of the steps to be performed.



At the 1st phase, which is the pre-emergency phase, FMI will provide forecasting and current temperature values to Crisis classification and sensor thing server. This is a 3 days event where there will be three metrics from 3 different locations in the city (near the sea, near the mountain and in the city center). The reason for getting weather data from 3 different locations in the city is to look at the specific period of time, 3 days, if there are changes in weather and to have an overall picture of the weather of the city and not just a part of it.

At the 2nd phase, two places of relief will be inserted manually at the system and the Knowledge Base (KB) will create two first incident report messages. Additionally, PSAP will show those two incidents on the map.

At the 3rd phase, a public alert will be sent that relief places are open.

The 4thphase starts with a text from citizens that are in the relief place, sent via the mobile application, and closes with the update of the incident of the 2nd phase.

The 5th phase, starts with three tweets from inside the relief place, continues with 2 updates for the incidents of phase 2 and close with the creation of one new incident in a different location, based on respective citizen-send tweets.

Finally, the 6th phase is a public alert to not use the first place of relief and direct people to an alternative/secondary place. At the end of the day a message will be send to all citizens that for the next days there is no heatwave alert and the phenomenon will deteriorate.

5.2 Heatwave Pilot Use Case User Requirements

Several User Requirements have been implemented in P1 for the heatwave Use Case. The following User Requirements have been described at D2.1.

For Use Case 305, the User Requirements have to do with real time weather forecast and heatwave intensity which will provide to the authorities with real time weather forecast data in relation with the heatwave phenomenon and a risk assessment regarding the intensity of the phenomenon in the city.

Furthermore, the possible locations for incidents as well the number of people affected in each incident is very important. In heatwave, incidents such as heat-stroke, malaise or similar incidents can occur. Through the beAWARE platform, authorities, PSAP and rescuers will be informed about the number of people affected per incident or if any update will take place. Moreover, the ability to the authorities to have a city-overview of the event as also information storage for future lessons also plays a vital part.



In addition, the PSAP will send a warning to the public, as well as being informed about the capacity of relief places. It is worth to mention that the information that will be collected from social media (tweets, photos and videos) will play a vital role from the begging, the progression and the end of the hazard. Finally, crucial part plays the coordination and the communication between different teams and groups in order to be everything managed. The User Requirements for the Use Case 305for the pilot use cases for P1 are presented in Table 6 below:





Use Requirement	Requirement name	Requirement description
UR_301	Real time weather forecast	Provide the authorities with real time weather forecast in relation to the progression of the heatwave phenomenon
UR_304	Heatwave intensity	Provide the authorities with a risk assessment regarding the intensity of the phenomenon in the city.
UR_305	Possible locations for incidents	Display to the authorities visual information about specific locations in the city (or outside the city) where an incident took place and a rescue team intervention is required (for example, based on past experience, traffic jam and/or accidents will be more likely to occur at a main street intersection/ public park/ entrance to hospitals or banks etc.). In such cases a decision might be made to send rescue teams in advance to shorten response time if/when an incident occurs
UR_310	City-wide overview of the event	Provide the authorities to have a city-wide overview of the event – allow decision making authorities an overall view of all incidents handled at any point in time/ see where all rescue teams are located in real-time to allow them to make informed decisions regarding who to send where etc
UR_311	Information Storage	In this phase of the platform the information from past historical events are stored. In future phases of the platform end-users /authorities will have access to them for future lessons- learned purposes and decision making authorities can review the information gathered and handled during the event, and set-up better procedures to handle future events more efficiently

Table 6. Heatwave Pilot User Requirements





Use Requirement	Requirement name	Requirement description
UR_312	Warning citizens	Provide to citizens warnings through the beAWARE app, of an imminent heatwave and a list of proactive measures and how to reduce its effects
UR_316	Capacity of relief places	Provide to the authorities the current state of the available capacity of all relief places provided to the public
UR_322	Information for incident status from Social Media	Provide to the authorities information regarding potential risks in case there is a situation inside the city (eg car accident, etc.) gathered from social media
UR_325	Suggested places for relief	Provide citizens with information regarding the suggested places for relief through an app.
UR_326	Type of visualization	Display to the authorities/citizens all the information in a web-GIS platform
UR_327	Send emergency reports	Allow citizens to send text, images and video messages from their mobile phone (for the different operative systems) and from their social media account to the authority.
UR_329	Visualize video cameras	Display streamed video from video cameras to the authorities/citizens
UR_330	Localize video and images	Provide authorities with the ability to localize videos and images sent by citizens from their mobile phones
UR_332	Localize tweets	Provide authorities with the ability to localize Twitter messages
UR_333	Localize calls	Provide authorities with the ability to localize Phone Calls to an emergency number concerning citizens who are trapped
UR_338	Warnings	Allow authorities to send warnings of pre- emergency alerts to citizens.
UR_340	Internal sharing of information	Allow authorities and first responders to share data (images, videos, geolocation, reports)





Use Requirement	Requirement name	Requirement description
UR_341	Twitter analysis and warning	Allow authorities/first responders to be warned by Twitter messages concerning traffic jam, availability of places of relief, potential hazards or people in danger
UR_342	Coordination and communication between different resources	Provide communication between authorities and first responders, in order to improve their coordination.



Finally, is worth to mention that meteorological data, such as, ground temperature, air temperature, wind velocity and direction, heat index, humidity and temperature dispersion in more local level are essential information for PSAP and for authorities. With those added information PSAP will have the ability to be better prepared for the heatwave and take the correct decisions and measures for this hazard.

5.3 Description of Heatwave Scenario Use Case

5.3.1 Use Case 305: Management of Places for Relief

This Use Case describes the monitoring of the places of relief offered by municipalities to people during a heatwave phenomenon as a shelter during the day which are presented in Figure 11. Block Diagram of the UC_305



Figure 11. Block Diagram of the UC_305

The initial template that was agreed at the Barcelona meeting with other important clarifications which were carried out in discussions between technical partners and end users helped for the development of a workflow for the implementation of the first pilot. Those clarifications are presented in Table 7 below. More specifically, during the first pilot in order to test P1 for the heatwave scenario, each step of the platform will be tested, any possible errors or flaws will be noted and corrective actions will be taken for the second prototype.



5.4 Scenario time-lapse protocol

After the description of the prototype pilot for the heatwave operational scenario, the presentation of all the requirements and the analysis of those that will be used for P1, the time-lapse protocol is presented in Table 7.

More specifically, at the first phase, the pre-emergency, there will be a continuous and detailed weather data analysis for three days from FMI as also there will be an evaluation of the data that will be collected.

The emergency phases start with the second phase starts where manually 2 places of relief are inserted on the map of beAWARE and indicate them as open to the public, (offline mode) and right after those 2 places of relief going online. PSAP will inform authorities about the ongoing situation in order to take decisions. Moreover, Knowledge Base creates 2 incidents reports messages and as action the first responder will be informed to take action and as output PSAP will show 2 incidents on the map and send location to first responders through beAWARE platform.

The third phase starts with an input message to citizens and to first responders about the relief place. Through beAWARE platform this message will go to citizens to go to the specific relief places and another will go to first responders to direct citizens to the specific relief places.

The fourth phase starts with messages from citizens, inside the relief place how many people are inside and the situation inside. The platform detects the information and the availability/capacity of the relief placed is updated. PSAP shows the updated incident highlighting the place with the respective color code and will inform authorities for decisions. Furthermore, there will be an update at the incident of phase 2 and PSAP will be informed from first responders.

The fifth phase start with tweets from inside the relief place about the capacity problem and PSAP will be informed from social media. The information from those tweets that are extracted and analyzed detects the changes in the availability/capacity of the relief place and the respective color of the relief place changes.

Furthermore, there will be 2 new updates about the phase 2 incidents and finally, a new, third, incident, in another location will appear on screen.

The final, sixth phase, will be from beAWARE platform to inform citizens to direct to an alternative relief place, because the first relief place is reaching its capacity limits.



TIME	INPUT	ACTION	OUTPUT
DAY1 Phase 1 DAY2 Phase 1 DAY3 Phase 1	Pre-emergency phase. 3 metric in 3 different locations (near sea, near mountain, city center)	FMI collects weather data	Notification, Control Room Opened
12:00 Phase 2	Start of emergency phases. Insert manually 2 places of relief on the map of beAWARE and indicate them as open to the public (offline phase)	Relief Places are indicated as open on the map of beAWARE (online phase).	PSAP inform authorities to take decisions
12:10 Phase 2	KB will create 2 incident report messages	Activation of First Responders	PSAP will show 2 incidents on the map, send location to first responders
12:15 Phase 3	Through beAWARE app inform citizens and first responders that a specific relief place is now open	Authorities send message to citizens to go to the specific relief places. Inform first responders to direct citizens to the specific relief places. (online phase)	MESSAGE "The place of relief X is now open"
12:30 Phase 4	Messages from citizens from inside the relief place about the situation in the relief place and their condition	Citizens will upload photos, videos, text at beAWARE app.	Detect the information and the availability/capacity of the relief placed is updated PSAP shows the updated incident highlighting the place with the respective color code and will inform authorities for decisions
12:35 Phase 4	Update the incident of Phase 2	Information to PSAP	Message to PSAP about
12:45 Phase 5	Tweets inside the relief place that is reaching capacity limits	3 tweets from inside the place of relief	Detect the information and the availability/capacity of the relief placed is updated PSAP shows the updated incident highlighting the place with the respective

 Table 7.Heatwave scenario time-lapse protocol



			color code and will inform authorities for decisions
12:50 Phase 5	2 new updates of the incidents of Phase 2	Send update message	First responders inform PSAP about the incidents
12:55 Phase 5	New incident in another location	Send information to First Responder about the new incident	First Responders go to the new incident
13:00 Phase 6	Public alert not to use relief place number 1, due to its capacity.	Message through beAWARE app to citizens to go to a secondary relief place.	Citizen will go to a different relief place

beAWARE^①

5.5 Description of Heatwave Demonstration site

As already described in D2.1, the scenario will take place in the wide area of Thessaloniki Figure 12, which consists of urban, suburban and forest areas. Thessaloniki is the 2nd largest city in Greece and on its North-East side is located a suburban forest. Based on a study made in 2013 regarding the density of population in the cities in Greece, the urban complex of Thessaloniki is in the highest population density level in Greece with over 9000 people/km²⁴.



Figure 12. Map of Thessaloniki

Hellenic Rescue Team is in constant contact with the Civil Protection and with the Municipality of Thessaloniki and more specifically with its services responsible for dealing with the heatwave. In addition, Hellenic Rescue Team has ongoing contacts with the Fire Brigade in Thessaloniki as well as with the Prefecture of Central Macedonia and its competent services such as the bureau of the Civil Protection.

The heatwave test will take place in the urban area of Thessaloniki in consultation and with cooperation with the abovementioned organizations and not only. There are many areas in the city of Thessaloniki with different characteristics that could be used for the scenario. Municipality of Thessaloniki has places for the public to find shelter during an extreme weather condition which could be used for the pilot test. In addition, there are large open ground places that can be used for training purposes.

⁴https://el.wikipedia.org/wiki/%CE%98%CE%B5%CF%83%CF%83%CE%B1%CE%BB%CE%BF%CE %BD%CE%AF%CE%BA%CE%B7



Furthermore, is worth to mention heatwave is a complex problem and brings different difficulties, in the social life as also into humans individually. For that reason, many rescuers will be needed as well as many organizations that will help in carrying out the exercise and smoothly completing it.

For the successful completion of the first heatwave pilot, it is important to mention that equipment and personnel will be used, as well as volunteers and finally it will be a clear cooperation between the actors and all stakeholders.

As referred to Deliverable 2.1, the aim also is to present the status of places (Figure 13) of relief visually in order to make the information easier to use (e.g. spots in a map etc).



Figure 13. Visualization of the status of places of relief in the city

- Dots on a map (e.g. Google Map) showing the location of the places for relief and their capacity.
- Different colors depending on the status of each place's occupancy (e.g. Green means <50% of occupancy, yellow means <70%, orange means <90%, red means >90%).

5.6 Equipment and participants of Heatwave Scenario

For the implementation of the Heatwave Scenario, HRT plans to station PSAP at its HQ. From the capacity of the equipment of HRT an amount of it will be used.

The participants will mainly be HRT volunteers, however HRT will also attempt to involve other actors, such as:

- Municipal social services, that are responsible for the management of places for relief during a heatwave
- Civil protection, on both municipal and regional level
- Citizens



In addition, the observers will be representatives from different national and local authorities as also from other volunteer organizations and members of the Network of Interest.

Furthermore, a training course will be organized for HRT volunteers to present the system to them before P1 pilot. Members of other volunteer organizations will be invited to participate as well, in order to disseminate and present the developed technologies. In this training course, as a first contact with beAWARE, there will be a theoretical presentation of the project and its platform in order everyone to be familiarized. Then, will be sent electronically some initial steps, such as discussions in small groups, or pre-training preparations, equipment set-up and dissemination of the needed information such as the manual of the platform and the final step will be a full-day practical training of HRT members and all participants in the heatwave scenario to record weaknesses as well as various qualitative and quantitative data before the actual prototype exercise. The volunteers will be trained in how to use the technologies through a series of activities and in the end an evaluation will take place. The volunteers will learn how to use the technologies with the support of the technological partners and will afterwards receive user guides.

Finally, the volunteers will be trained on how to use the technologies through a series of activities and with the support of the technological partners and will also receive user guide of the system and the application. At the end of the pilot, an evaluation of the system and its tested functionalities will take place. The details of the evaluation procedure are presented in the following section.



6 Pilots Evaluation

The full evaluation methodology for the three pilots, which will take place during the implementation of beAWARE platform, is described in the deliverable D2.2. However, according to the actual level of development of the technology, not every aspect of that methodology can be applied to P1 pilot.

The evaluation will be done in multiple steps. Initially, what will be checked is the ability of the system to send alerts when thresholds with respect to both forecasts and sensor's measurements are exceeded. The next step is to check the availability of the system to show updated reports, as new information is coming in and if the reference image/video/tweets can be accessed.

For this reason, the approach **user interface (UI) – user experience** will be proposed as the most appropriate approach for the **subjective** evaluation of P1 for all use cases for the three scenarios.

About the user interface, it is important to highlight that the current is not the final version of UI for end-user, however the feedbacks come from the pilot evaluation could give important suggestions about the development of the final UI.

The main technique that can fit the UI will be Heuristic Evaluation based on a set of rules such as:

- **Visibility of System Status** (The system should always keep users informed about what is going on. For example, the progresses during a file transfer. Provide immediate feedback, etc.).
- Match between system and the real world (The system should speak the (end) user's language, with words, phrases, metaphors and representations familiar to the user).
- **User control and freedom** (Supports undo and redo actions. Allow user to override the system).
- **Consistency and standards** (Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow behavior user except and platform conventions).
- **Error prevention** (Prevents a problem from occurring in the first place. Be permissive to various entry formats).
- **Recognition rather than recall** (Making objects, actions, and options visible. Make navigation visible and make it easy to go back, go to home page and quit).
- Flexibility and efficiency of use (Speed up the interaction for the expert users with accelerator. Experts prefer few screens with a lot of information and a lot of flexibility



in the methods, while novice users prefer going through step by step sequences with little information).

- Aesthetic and minimalist design (Dialogues should not contain information that is irrelevant or rarely needed. In other words, present only necessary information for the task, rarely used information should be in secondary screens or windows).
- **Manage errors** (Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
- Help and documentation (Use prompt and contextual help related the task, allow easy search).

Bearing in mind that the improvement of the quality of the beAWARE system tested through P1 of the all use cases with the following information is subject of evaluation:

1) Maps (for instance, a map with people/assets in green, yellow or red) and general visualization of the provided information from the system, such as assigned tasks, crisis classification regarding the risk of the hazard, etc.

2) Textual information (for instance, message to citizen)

"Information quality" is a measure of the value which the information provides to the user of that information. "Quality" is often perceived as subjective and the quality of information can then vary among users and among uses of the information. Nevertheless, a high degree of quality increases its objectivity or at least the intersubjectivity.

A list of elements will be used in assessing Information Quality in beAWARE is:

- <u>Accurate and Believable</u> (validity of some information has to do with the degree of obvious truthfulness which the information carries),
- <u>Concise and complete</u> (few words allowing to understand the type of the emergency, its timing and its location),
- <u>Consistently Represented</u> (information has to be easily localized in a map and its content has to be clearly understood by adding a legend in a map for example) and,
- <u>Timely</u> (Timeliness refers to information that is current at the time of publication)

Based on the above mentioned general criteria, the evaluation of the beAWARE system, which includes its tools and manual too, will be subjective one collected from participants and observers.

According to the general criteria above, this evaluation will be done with the help of one or more of the methodologies proposed in Deliverable 2.2 e.g. questionnaires, interviews, hot and cold debriefs, Debriefing forma (Table 8.), and written feedbacks for all 3 scenarios use cases are presented below.





Interview:

The interviews for all use cases will be done with the participants of P1. The methodology that will be followed is to examine, in depth, the experience, the difficulties and all the steps that followed for the completion of P1 pilot for all use cases.

Hot Debrief:

The hot debrief will take place immediately after the test and some example questions that will be asked are:

- Can you tell your role and task during the test?
- Was there a difference between what was expected and what actually happened?
- Were there technical issues?
- What were the good points and what didn't work so well?
- Do you have any problems in using the technology?
- Is the technology adequate to the required tasks and functionalities?

Cold Debrief:

The cold debrief will take place after few days and the questions will focus on the evaluation of the participants on what happened at the P1 pilot after they had some time to form a more clear picture about their experience. Some example questions are:

- What was achieved with this pilot?
- What went well?
- What could have gone better?
- What repeatable, successful processes did we use?
- What were the stumbling blocks and pitfalls, so they can be avoided in future?
- What would your advice be based on your experiences here?



Table 8. Debriefing forma Debriefing forma for Test & Drills

GRE WHAT WE WHAT W WHAT GOO	EEN WENT LL? ORKED? FELT DD?	AMBE WHAT NEE CONSIDERAT WHAT WORKE COULD BE BE	R DS ION? D BUT TTER?	RED WHAT MUST CHANGED? WHAT DID N WORK? WHAT FEL POOR?	BE PI OT 1	Actions ease assign names o specific actions
GO	OD	CONCE	RNS	STOP	!	
Use Case	Date of Event	Date of Debrief	Hot Debrief	Cold Debrief	Debrief Leader	Time & Location





Questionnaires:

1. Question 1

Which of the following would best describe your role in P1 pilot? (Please mark as many as apply)

- **D** Command and Control Room operator
- □ Rescuer
- □ Citizen in need or signaling incident
- Citizen who received global alert
- □ Observer/Bystander
- Analyst
- Decision Maker / Senior Authority Official
- Other (Please Specify) _____

2. Question 2 (flood scenario)

Please answer the following questions regarding the functionalities performed via beAWARE during the flood pilot.

Action	Q1 Did you complete the required function on beAWAREP1 pilot?	Q2 [Answer If Q1 = Yes] Please rate the ease with which this function was performed on beAWARE?	Q3 [Answer If Q1 = Yes] Did you ask for or receive assistance in completing this task?	Q4 [Answer If Q1 = No, I could not] Which of the following would best describe why you did not complete the function?
Log into the Platform	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Receive notification about forecasted water levels which exceed the predefined alert thresholds	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:



				1
Check on the city map the alerts about forecasted water levels which exceed the predefined alert thresholds	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Sent Global alert to Citizen before the crisis	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Receive Global alert before the crisis Receive	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
notification about measured water levels which exceed the predefined alert thresholds	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	T could not find the relevant option The system was not responsive Other, please specify:
Check on the city map the alerts about measured water levels which exceed the predefined alert thresholds	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Sent incident reports by mobile app	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Uploading information, pictures,	Yes No, I could not	Very Easy Easy Difficult	Yes No	I could not find the relevant option The system was not responsive



videos, via the mobile app	No, I was not assigned this function	Very Difficult		Other, please specify:
Receive reports about relevant Tweets Check on the city map the incident reports and their updates based on incoming information (text, image, video & audio data sent via the mobile app as well as posts in Twitter	Yes No, I could not No, I was not assigned this function Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult Very Easy Easy Difficult Very Difficult	Yes No Yes No	I could not find the relevant option The system was not responsive Other, please specify: I could not find the relevant option The system was not responsive Other, please specify:
Sent Global alert to Citizen during the crisis	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Receive Global alert during the crisis	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:



3. Question 2 (fire scenario)

Please answer the following questions regarding the functionalities performed via beAWARE during the fire pilot.

	Q1	Q2	Q3	Q4
Action	Did you complete the required function on beAWARE 1 st prototype pilot?	[Answer If Q1 = Yes] Please rate the ease with which this function was performed on beAWARE?	[Answer If Q1 = Yes] Did you ask for or receive assistance in completing this task?	[Answer If Q1 = No, I could not] Which of the following would best describe why you did not complete the function?
Log into the Platform	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Alert arrived into the app	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other. please specify:
Receive reports about relevant Tweets	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Message to do specific tasks	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Message to direct people away from fire danger	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Uploading information, pictures, videos, tweets	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:



Do specific	Yes	Very Easy	Yes	I could not find the
tasks	No, I could not	Easy	No	relevant option
(citizens and rescuers)	No, I was not	Difficult		The system was not responsive
•	assigned this function	Very Difficult		Other, please specify:

4. Question 2 (for heatwave)

Please answer the following questions regarding the functionalities performed via beAWARE during the heatwave pilot.

	Q1	Q2	Q3	Q4
Action	Did you complete the required function on beAWARE 1 st prototype pilot?	[Answer If Q1 = Yes] Please rate the ease with which this function was performed on beAWARE?	[Answer If Q1 = Yes] Did you ask for or receive assistance in completing this task?	[Answer If Q1 = No, I could not] Which of the following would best describe why you did not complete the function?
Log into the Platform	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other, please specify:
Alert arrived into the app	Yes No, I could not No, I was not assigned this function	Very Easy Easy Difficult Very Difficult	Yes No	I could not find the relevant option The system was not responsive Other. please specify:
Message to go to the specific relief place Message to direct people to specific relief place	Yes No, I could not No, I was not assigned this function Yes No, I could not No, I was not assigned this	Very Easy Easy Difficult Very Difficult Very Easy Easy Difficult	Yes No Yes No	I could not find the relevant option The system was not responsive Other, please specify: I could not find the relevant option The system was not responsive
relier place Uploading information, pictures, videos, tweets	function Yes No, I could not No, I was not assigned this function	Very Difficult Very Easy Easy Difficult Very Difficult	Yes No	Other, please specify: I could not find the relevant option The system was not responsive Other, please specify:



Do specific	Yes	Very Easy	Yes	I could not find the
tasks inside	No, I could not	Easy	No	relevant option
the relief place	No, I was not	Difficult		The system was not responsive
	assigned this function	Very Difficult		Other, please specify:

5. Question 3

Overall, how would you rate the beAWARE system in terms of the following functionalities?

	Poor	Fair	Average	Good	Excellent
Provide a clear outcome of the situation before the crisis					
Provide a clear outcome of the situation during the crisis					
Getting needed data and information from the system					
Provide timely warnings about a potential or eminent hazard					

6. Question 4

Please answer the following questions regarding the overall interaction experience with the beAWARE platform that you had during the pilot



	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Learning to operate the platform was easy for me.					
I found it easy to get the platform do what I want it to do.					
My interaction with the platform was clear and understandable.					
I found the platform to be flexible to interact with.					
I found the platform easy to use.					
The various functions of the platform are well integrated					
The sequence of tasks performed in the platform were ordered logically					
It was difficult for me to see if I was on the right to track to complete the tasks given					
The actual results of the tasks aligned well with the results I would have expected					
It would be easy for me to become skilful at using platform					
I feel like I need to learn a lot of things before I could get going with the platform					
I would imagine that most people would learn to use this platform very quickly					



7. Question 5

If any, please list and summarize up to three major problems you encountered while using the platform.

1st most major problem	
2nd most major problem	
3rd most major problem	

8. Question 6

We would appreciate it greatly if you could provide any comments that you think would be beneficial for the improvement of the beAWARE platform

The last type of the proposed evaluation in P1 will be **written feedbacks** from the participants and observers. This feedback can be collected in a systematic way if there is used a template form similar or the same as it is shown below.



7 Conclusions

In this deliverable, the pilot use cases that will be used for the demonstration, validation and evaluation of the P1, as also the pilots' evaluation have been presented.

Initially, for all pilot use cases the 3 steps (pre-emergency, during the emergency and postemergency) are presented and according to AAWA protocol and procedures management knowledge for floods an example table in Barcelona meeting was created and agreed.

After the meeting, important steps were taken that were examined and analyzed for each scenario separately. During telcos and direct contact between members of the consortium the steps that will be followed were finalized.

A general introduction on how to approach the specific deliverable from the view of the first prototype pilot for all use cases was made.

Because each use case for each operational scenario has its own approach, and flood, fire and heatwave has their own unique characteristics, it has been made a separate analysis for each one. All the user requirements of each operational scenario were presented in an analytical table with the User Requirement code, name and description.

Moreover, in this deliverable the time-lapse protocol for each operational scenario was presented. This protocol for each operational scenario, shows all the steps in chronological order, what is the input of each step, what is the action for each step what is the output, and who is who is the person responsible to perform each step. In addition, scenario demonstration sites (SDSs) were presented, along with a part of the equipment and the participating actors.

Finally, the evaluation process was presented. As mentioned in D2.2, the evaluation will be done through different forms such as interview, hot and cold debriefs and with questionnaire. All these ways of evaluating have the ability to investigate the correct steps taken but also the mistakes and problems and to explore possible proposals for the future steps of the program.

To sum up, in this deliverable, the pilot use cases scenarios for P1 are presented. The user requirements, the description of each scenario, the time-lapse protocol, the demonstration site for the 1st prototypewere recorded and analyzed. Finally, is worth to mention that the evaluation procedure will help better understand all the steps which will take place for the 1st prototype and make all the necessary changes and adjustments that are needed. This delivery is the first step of the process that will be followed for use case pilots and for the next prototypes. The goals of P1 are to create and monitor beAWARE platform's initial steps and to reveal any weaknesses and shortcomings in order to improve them into the next stages of the project, to implement the collaboration between technical partners and end users.



8 References

- [1] beAWARE, "D2.2 Evaluation Methodology."
- [2] beAWARE, "D2.1 Use Cases and Initial User Requirements."
- [3] Barbi et al., 2012