Technical Report about the Citizen Observatory – Lemene case study

Project partner: AAWA, CMVE

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1. INTRODUCTION

This report is part of the activities of the Work Package 3.3 - *Development of an Innovative Two Way Flood Risk Communication Environment in Transboundary River Basins* of the VISFRIM Project (Vipava/Vipacco and Other Transboundary River Basins Flood Risk Management). The activities included in this WP are aimed at implementing a Citizens' Observatory inside the case studies of the project, through which a greater involvement of population in water governance processes could be achieved.

Specifically this report refers to the activities performed in the Italian case study (Lemene catchment).

2. RAISING AWARENESS ACTIVITIES AND REQUIREMENTS SPECIFICATION

During the project implementation AAWA, leader of the current WP:

- elaborated and shared guidelines and presentations about "Citizens' Observatory (CO) for Flood Risk mitigation", subject of WP 3.3;

- stimulated project partners to attend an online course on "Citizen Science Projects: How to make a difference", gently provided for free by the WeObserve project (where AAWA was partner), by sharing all the related material;

- worked to the organization of a workshop about "Citizens' Observatories for Flood Management" (Cerje Peace Memorial, Miren-Kostanjevica, 10 March 2020), that was postponed due to Coronavirus epidemic.

Since the situation about Coronavirus didn't allow the realization of such physical event, staff from AAWA worked to arrange it in an online way through videoconferences or similar tools. In detail, on 18 November 2020, an online workshop about the Citizens' Observatory on flood risk management was jointly organized by staff from the H2020 WeObserve project (https://www.weobserve.eu/) and the VISFRIM project. In detail the WeObserve project aims to mainstream Citizens' Observatories for environmental management, including by holding Roadshow events throughout Europe; whereas the VISFRIM project aims at improving flood

risk management in cross-border river basins, including via the implementation of a Citizens' Observatory (CO).

This workshop brought together more than 50 people from Italy and Slovenia: local authorities, regional/national policy makers, scientists and experts.

In detail the online workshop allowed participants to learn about the basic principles of COs, providing with hands-on experience of citizen science and Citizens' Observatories and demonstrating how decision makers can exploit information provided by citizens. Specifically AAWA, coordinator of the VISFRIM project and partner in the WeObserve project, showcased how this kind of approach is effectively of support in the management of the Brenta-Bacchiglione river. Based on such experience, participants discussed the potential of Citizens' Observatories in the context of flood risk mitigation.

A specific news was later published on the project website.
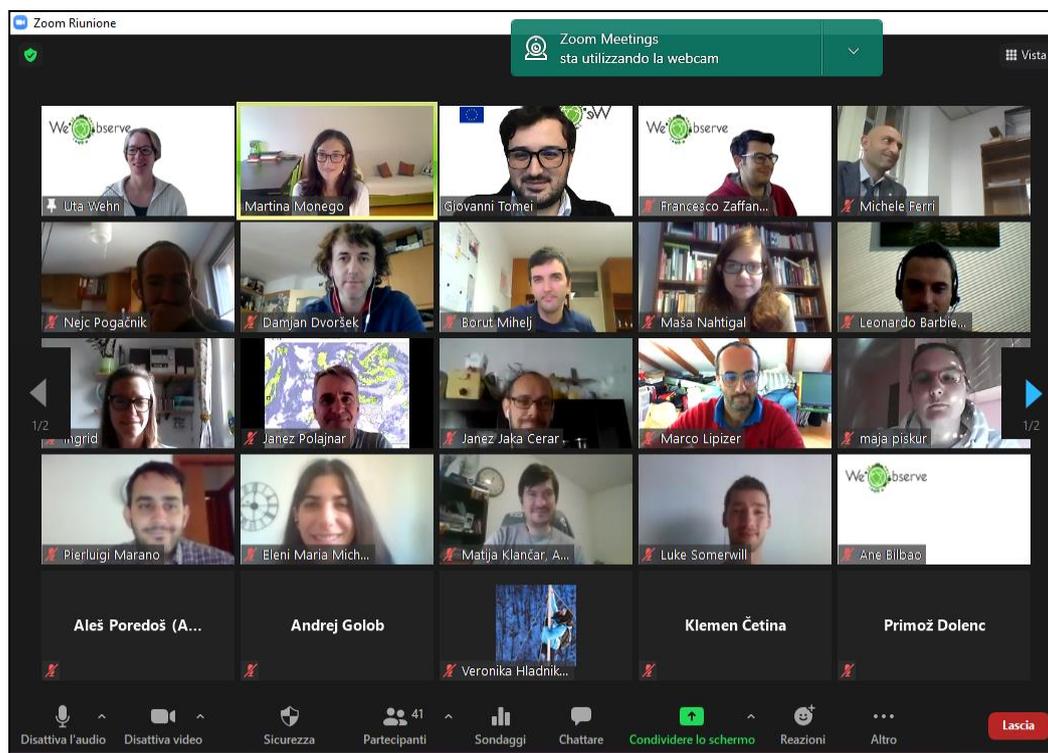
Several meetings were later organized with the Venice Metropolitan Area of and its external consultant to start citizens' involvement activities in the Lemene pilot. In particular, on 16 December 2021, a dissemination event about the VISFRIM project was held in the council

chamber at Portogruaro. The initiative, attended by mayors and representatives from Land Reclamation Consortia, was organized by the Venice Metropolitan Area, Eastern Alps River Basin District, Veneto and Friuli Venezia Giulia regions, project's partners, with the support of the municipality from Portogruaro.

The meeting was the occasion to show the results achieved until now, with particular reference to the environmental data set implemented on a WebGis platform and the several topographical surveys carried out and next to start. The plan of future activities was also presented in the context of the Citizens' Observatory (WP 3.3 - Development of an Innovative Two-Way Flood Risk Communication Environment in Transboundary River Basins): the organization of a series of meetings with local stakeholders and citizens aimed at promoting the use of project-implemented technologies (mobile app and related WebGis for environmental monitoring), so to evaluate their stability, robustness and utility.

3.   DESIGN OF THE SOFTWARE ARCHITECTURE AND PROTOTYPING

During the project implementation AAWA monitored the external contractor Interplay Software Srl, in charge of the implementation of the technologies (mobile app and related

webgis platform) in support of a Citizens' Observatory for flood monitoring and its successive employment in pilot case studies trough the involvement of local stakeholders.

In the following paragraphs the functionalities of both the technologies are described.

Citizen Web Portal

The Web portal is accessible by connecting with a Web browser to the project address https://co-visfrim.it

The client can be used with desktop, laptop or smartphone devices and three languages can be selected (Italian, Slovene, English).
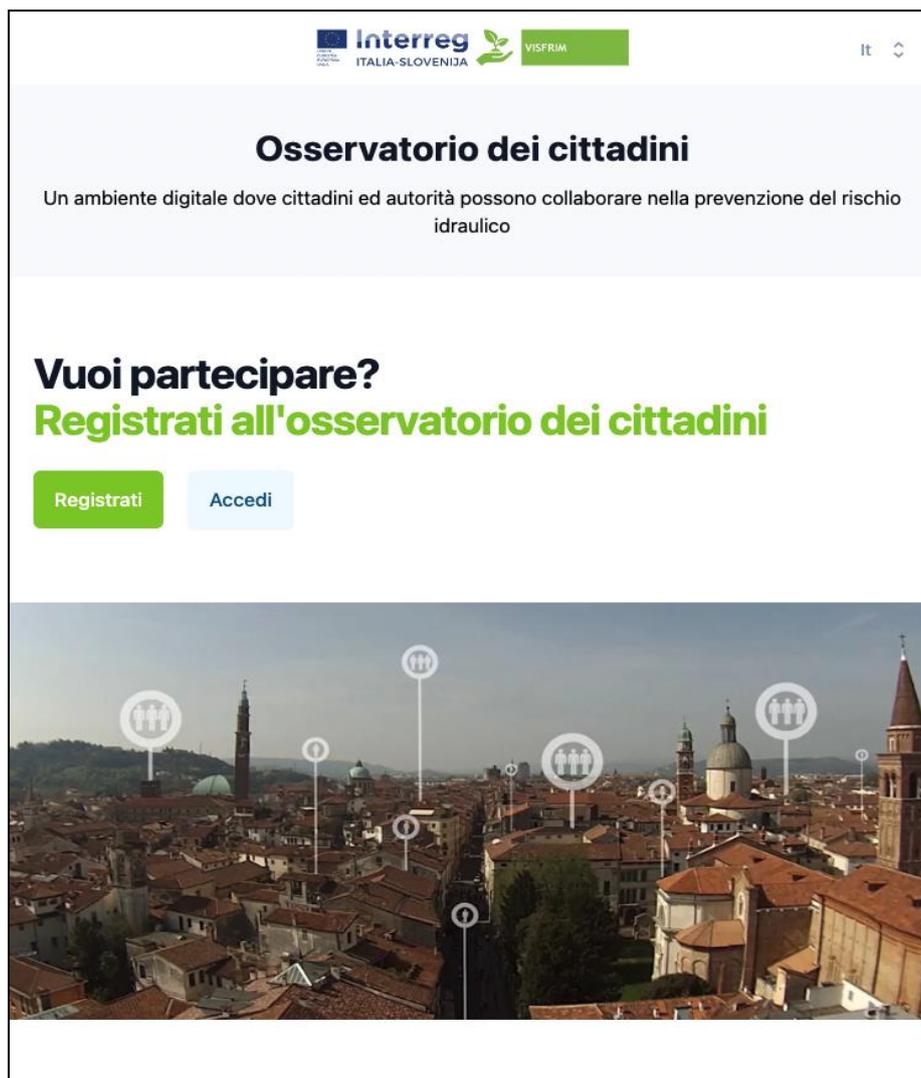
Welcome page

Registration

To use the application, you firstly need to register.

Note: the registration is obviously unique for both the web and mobile app.

Registration takes place starting from the welcome page, by clicking on the 'Register' button.

In addition to the email, mandatory for registration, and the password, some contact information is optionally requested.

During registration it is also possible to indicate the areas of interest for the reception of alert notifications from authorities.

IMPORTANT: during registration user is asked to check the conditions of use of the data and adhere to the privacy guidelines.

At the end of the registration process, the system sends an email verifying the existence of the specified email address. The message contains a confirmation link: once clicked, the user is enabled to use the system and directed to the login page.

Login

The login form is accessible from the welcome page. From the login form it is possible to start the password reset process.

Section 'My alerts' - List of alerts created by the user

From the login, the citizen user is directed to his/her own alerts page, where he/she can review the history/list of alerts sent to the system. From here he/she can create a new report by clicking on the invitation at the top of the page.
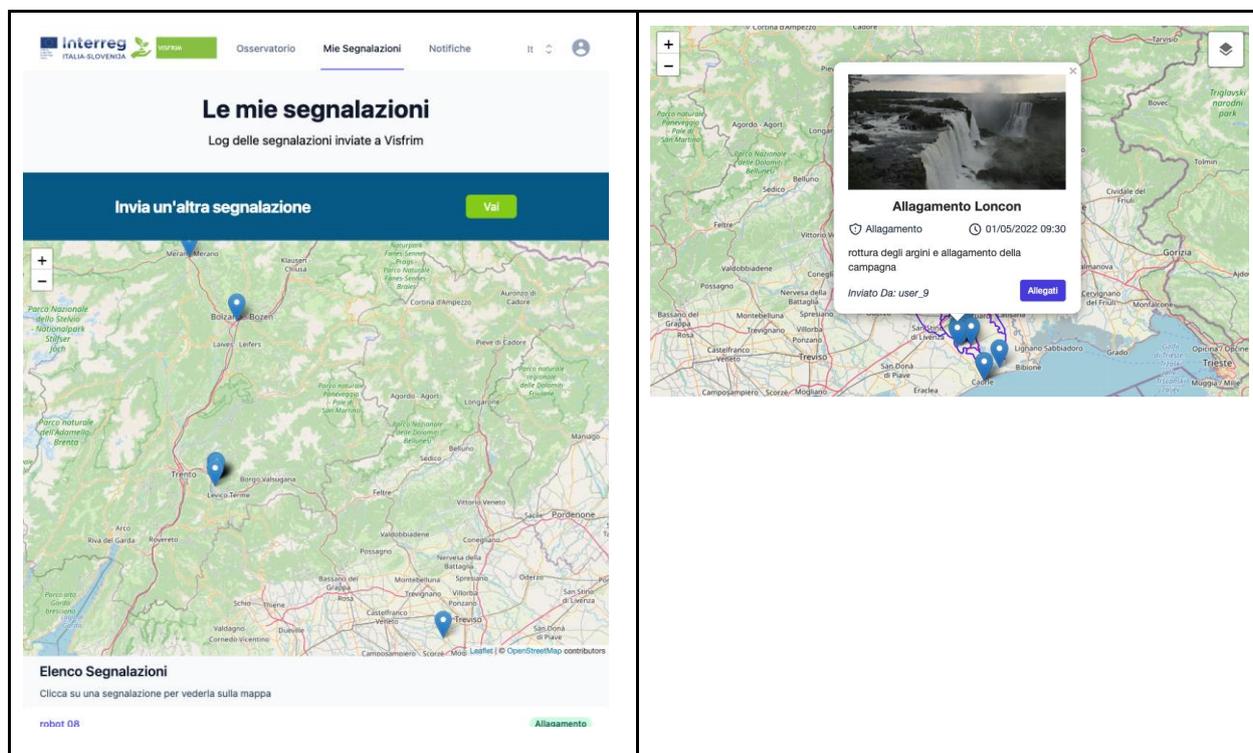
Furthermore

- clicking on the marker a 'popup', containing the data of the report, is displayed. It is also possible to expand the photo and view it at its original size.
- Clicking in the list, the map is centred and the corresponding marker automatically opens the associated marker.

The use of maps in desktop devices is done intuitively by the mouse:

- To zoom: double click on the map, or 'widget' with + and - at the top left of the map
- To move around the map: keep clicked + drag
- (Map Create report) To move the GPS positioning marker: keep clicked + drag

On devices mobile:
- To zoom: double tap on the map, or 'widget' with + and - at the top left of the map
- To move around the map (full width maps): place two fingers + drag
- (Map Create report)
  - To move the map marker GPS positioning: touch the marker + drag
  - To move on the map place one or two fingers + drag

Creating a report

To create a report it is necessary to fill in a form specifying some mandatory information and other descriptive ones.
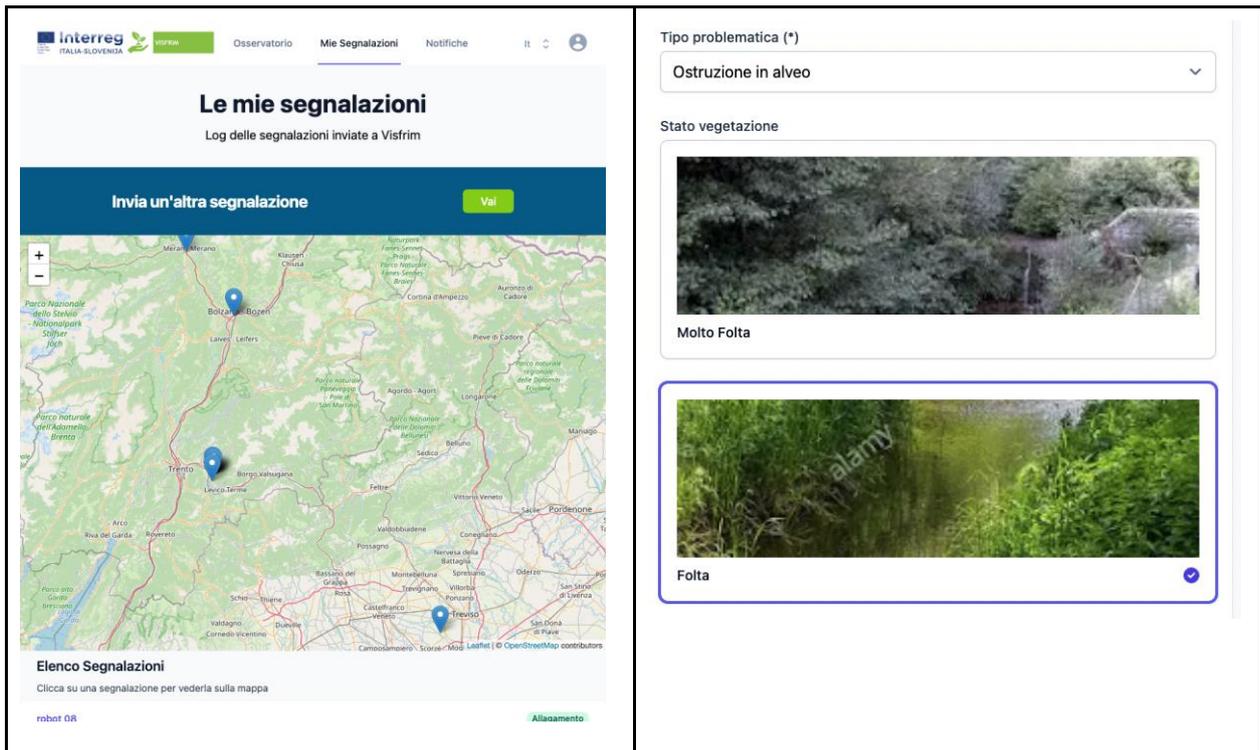
The mandatory information includes:
- The title - to be filled in by the user
- Date / time - the current date / time is used. The user can change it if he/she is having a GPS problem during the monitoring phase. The position detected at the moment is used; the user can later move the 'marker' that identifies the position on the map if necessary
  - *Note: the automatic detection of the position can only take place if the user has accepted to be located by the app or in any case according to the preferences set on the device*
- Type of problem - if not specified by the user, 'Generic Report' is used.

It is highly desirable to accompany the report with photo or video documentation (Optional data). It is possible to attach a photo or video available inside the device or take a photo from the app. Notes: the methods of recording / sending multimedia files are partially dependent on the device used (ios / android / desktop). In any case:
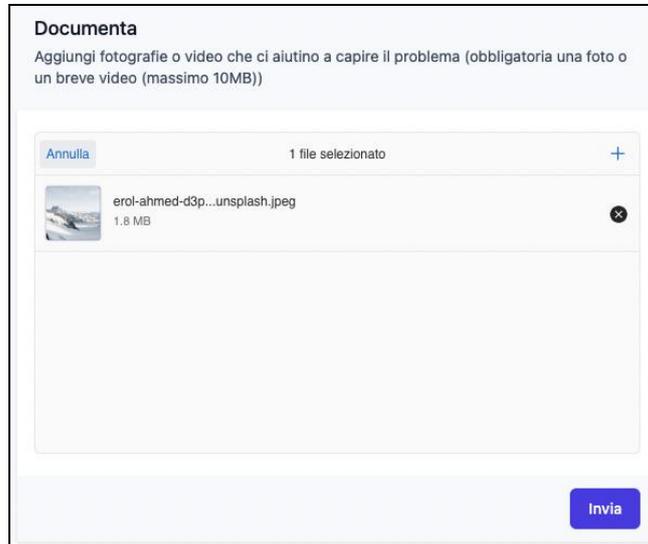
- The app reports the size of attached videos / images before sending.

- JPEG images are optimized before sending.

- Since it is not possible to compress the video, you should only use the video when a good quality internet connection is available. Also, the video must be limited to a few seconds.

- However, there is a limit to the size of the file sent, especially for the video case

It is also possible to:

- fill in a text field with additional notes

- report the state of the vegetation - by clicking on one of the explanatory photos

Inserting files from the desktop

Section Viewing the reports created by other users

By selecting the Observatory page from the menu, all the observations sent by citizens are displayed on the map.

By clicking on the observation, a popup opens in the same way as already shown in the 'My Report' section, with the details of the report.

It is possible to filter the reports using the 'time filter' shown above the map which allows you to choose the period of interest.
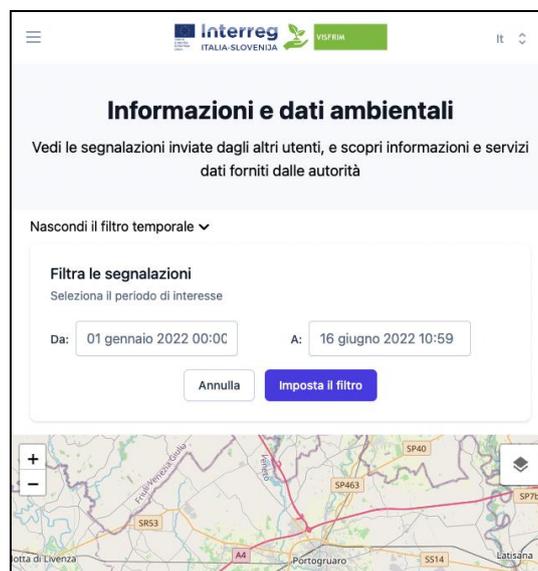
Visualization of environmental data useful for hydraulic risk

The 'Observatory' page also allows the visualization of 'GIS levels' made available by the Authority.

The user can choose which levels to display using the menu associated with the 'control' at the top right of the map.

For active layers, the GIS server is contacted via the WMS protocol and the 'features' present in the layer are displayed on the map. Clicking on the feature, a popup, that presents the data available for the 'feature' in the database, displays.
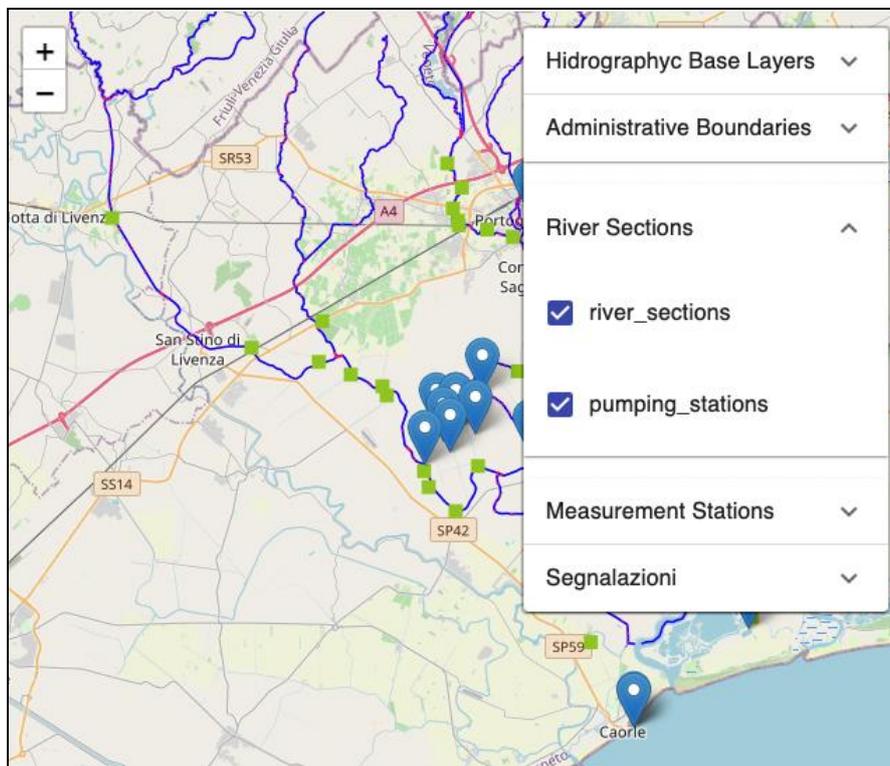
The observatory also makes it possible to monitor the water level measured by two data gauging stations installed thanks to VISFRIM funding inside the Lemene basin.

The user can see the data of the last week or set as desired parameters of the display:

- Start date
- Time window: 1 week - 1 day - all data starting from the start date

Receive a notification

The app receives messages sent by the authority via the notification system. The kind of reception depends on various factors.

According to the Web Push standard, the operation is as follows.

- Web 'foreground' - the visfrim app is displayed in a 'tab' currently 'active' in the browser
  - In this case the app receives the notification and presents a popup with the main data of the notification, with a link that refers to a page where the message is presented in detail
- Web 'background' or 'inactive' - the visfrim app is not currently displayed in any browser window or it is but in an inactive tab
  - In this case the notification is received / presented by the system operating system of the desktop or mobile device (eg Mac Notification Center) - according to the settings

- Some browsers (in particular Safari - IOS and MacOS) do not support the standard and therefore do not receive notifications
- App - see later the specific documentation of the app

Normally notifications they are delivered in a few seconds, but please note that delivery methods and times are variable and depend on the provider and the state of the network.

Viewing all the notifications sent by the Authorities

By clicking on the notifications menu, it is possible to see the history of the notifications sent, starting with the most recent.

Clicking on a notification from the list displays, in the map area, the areas of interest for the notification, as filled in by the authority.
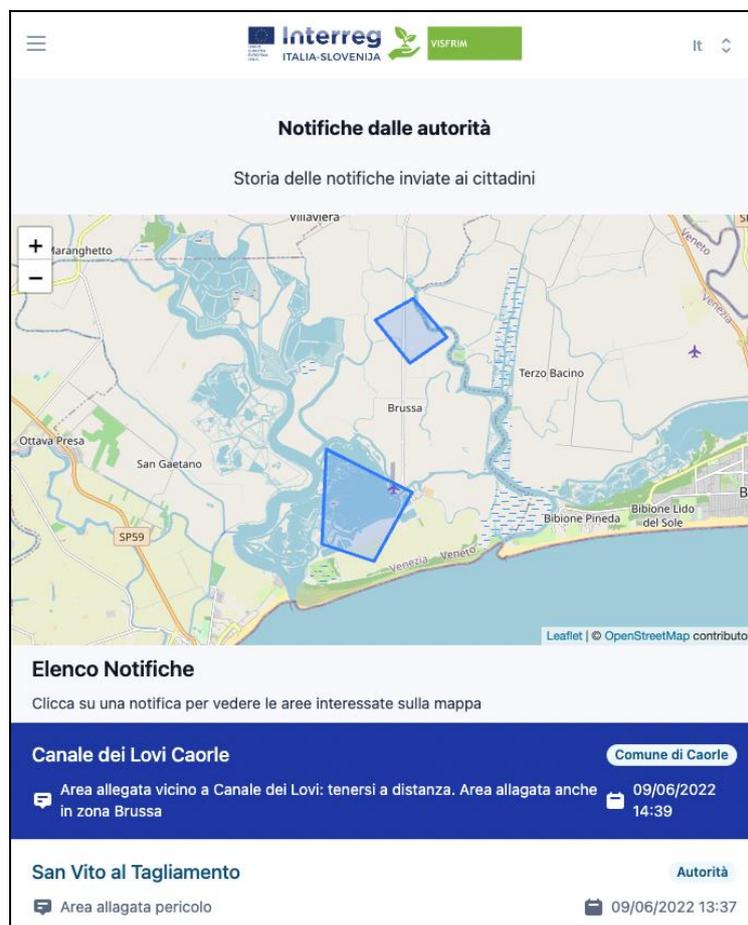
<u>*MANUAL – Mobile app*</u>

The functionalities of the mobile app are mostly the same already documented for use by the Citizens of the webapp.

Here are some specific indications for the use of the mobile app.

Download and start

The app can be downloaded from the Apple and Google stores, under the name *CO Visfrim*.

Upon startup, authorization to send notifications is requested.

The phone language is used and can be changed internally in the app from the menu bar (Italian, Slovene, English).

Registration

Registration can be done from the app itself or if the user has already registered at the citizens' observatory from the portal /web app, the previously created account can be used.

Android - creating a report

The insertion of photos/videos, when creating a citizen report, uses a specific interface shown below.

It is possible to take a photo or to obtain a photo or a video present in the device (android does not differentiate between camera 'roll' and other 'folders' that contain files).
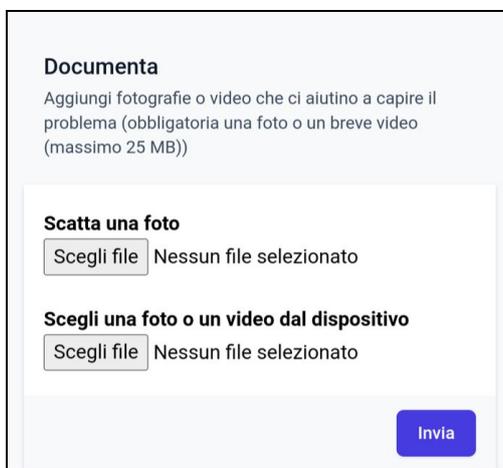
Documenta

Aggiungi fotografie o video che ci aiutino a capire il problema (obbligatoria una foto o un breve video (massimo 25 MB))

Scatta una foto
Scegli file   Nessun file selezionato

Scegli una foto o un video dal dispositivo
Scegli file   Nessun file selezionato

Invia

The limit currently set is 25 MB in total.

Receiving notifications

The native app allows users to receive notifications also on IOS devices.

It is possible to receive notifications (for the areas of interest expressed during the creation of the user profile) both when the app is in use and when the app is not active. The management methods of notifications and any preferences / settings are the standard methods of IOS and Android respectively.

<u>*MANUAL – Web Portal for Authority users*</u>

In this section the specific, additional functions available to users 'Authority' are described.

Creating a Notification

A notification is created by filling in a form that provides:

● Date of the report

● Areas concerned ('polygons') - descriptive information to communicate the areas impacted by the phenomenon that is the subject of the notified problem

● Title

● Detailed message

● Authority (mandatory): example - Municipality of Caorle

● Municipalities / destination areas: the notification will be selectively sent to citizens who have signed an interest in these areas during registration

To describe the polygon, Authority can use the 'controls' at the top right (polygon: to create a new shape; pencil: to modify it - after selecting it with a click; trash: to delete it).

List of Reports

The authority also has a complete list page of the reports sent by citizens, which shows all the data including the real user's name, that is not available to ordinary users as citizens for privacy reasons.

4. IMPLEMENTATION OF A CITIZENS' OBSERVATORY IN THE PILOT AND ANALYSIS OF CITIZENS' FEEDBACK

On 14 April 2022 a further dissemination event about the VISFRIM project was held in the council chamber at Portogruaro. The initiative, organized by the Venice Metropolitan Area and the Eastern Alps River Basin District, with the support of the municipality from Portogruaro, was attended by representatives from the Land Reclamation Consortia, Environmental Agencies, Municipalities and Civil Protection.

In the first part of the meeting, the development of the mobile app and the related Web-Gis portal, planned within the "Citizens' Observatory", was presented. Later the "drone" instrumentation and its applicability within the project were presented, especially in the context of the Citizens' Observatory, given its ability to monitor sites that are difficult to access by an observer on the ground.

The meeting continued with the implementation of some monitoring activities along the Lemene river, near the center of Concordia Sagittaria (VE). In particular, a questionnaire for environmental monitoring was distributed to participants, available also as an online form, as an alternative to the use of the mobile app, currently under development. Several monitoring activities were carried out: some measurements of water level from a bridge using a measuring tape and the aerial survey of the river bank using the drone managed by the technicians from the Metropolitan City of Venice. These monitoring activities will be replicated later to test the stability and robustness of the technologies (mobile app and Web-Gis portal).
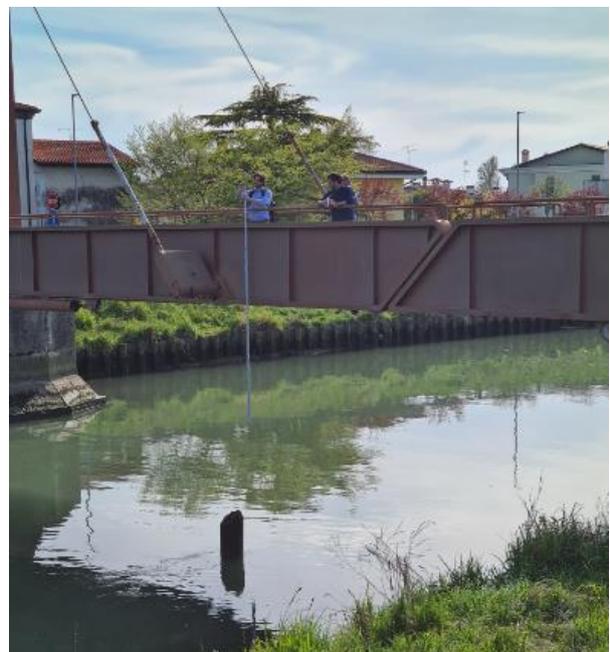

A specific news was elaborated and later published on the website (https://www.ita-slo.eu/it/tutte-le-notizie/events/visfrim-%E2%80%93-nuova-giornata-informativa-sullo-stato-del-progetto-portogruaro) and social media.

On 24 June 2022 a field exercise was held in the city center of Portogruaro in order to test the efficiency of ICTs (Information and Communication Technologies) developed in the VISFRIM project in the context of the Citizens' Observatory: specifically, the "Co Visfrim" mobile app, through which every user is enabled to actively take part at environmental monitoring by sending geo-referenced reports, including videos/pictures.

Several Civil Protection members from the local District in Portogruaro, who had attended a short online training course the previous day, were involved in the pilot.

In particular the civil protection volunteers, divided into more teams, used the mobile app to send various reports about simulated hydraulic criticalities in the study area: flooding, structural failure of riverbed works, obstructions by vegetation, etc. The Metropolitan City of Venice monitored some river trunks by drones and sent reports by the mobile app, whereas Eastern Alps River Basin District evaluated the acquisition of volunteers' reports via the related web-gis portal and sent in turn alert notifications to the participants.
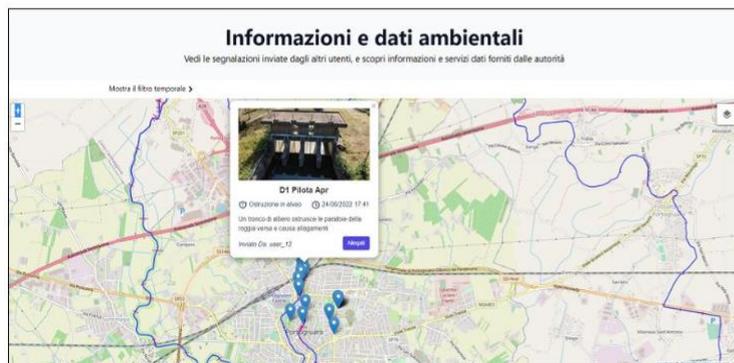
The test ended successfully and the teams came back to the Fire Brigade centre at Portogruaro to exchange feedbacks and opinions about the applicability of such a technological system for flood risk mitigation purposes.

A specific news was elaborated and later published on the website (https://www.ita-slo.eu/it/tutte-le-notizie/events/visfrim-applicazione-campo-di-un-osservatorio-dei-cittadini-nel-bacino-del) and social media.

Relazione tecnica sull'Osservatorio Cittadino – caso studio del bacino del Lemene

Questo report rientra tra le attività del *WP 3.3 - Sviluppo di un ambiente tecnologico per una comunicazione bidirezionale con i cittadini, finalizzata alla gestione del rischio idraulico* del progetto VISFRIM. Le attività comprese in questo WP sono finalizzate all'implementazione di un Osservatorio dei Cittadini all'interno dei casi di studio del progetto, mediante il quale è possibile conseguire un maggiore coinvolgimento della popolazione nei processi di governance dell'acqua sfruttando il potenziale di Tecnologie dell'Informazione e Comunicazione (ICT) verdi. Nello specifico questo deliverable si riferisce alle attività realizzate nel caso studio italiano (bacino del Lemene): sensibilizzazione e definizione dei requisiti del sistema tecnologico; progettazione dell'architettura software e prototipazione; implementazione di un osservatorio dei cittadini nel progetto pilota e analisi dei feedback dei cittadini.

Tehnično poročilo o Opazovalnici občanov – študija primera reke Lemene

To poročilo je del dejavnosti delovnega paketa 3.3 – Razvoj inovativnega dvosmernega okolja za obveščanje o tveganju poplav v čezmejnih porečjih projekta VISFRIM. Dejavnosti, vključene v ta delovni program, so namenjene izvajanju Opazovalnice občanov znotraj študije primerov projekta, prek katerega bi lahko dosegli večjo vključenost prebivalstva v procese upravljanja voda z izkoriščanjem potenciala zelenih informacijskih in komunikacijskih tehnologij (IKT). Konkretno se to poročilo nanaša na dejavnosti, izvedene v italijanski študiji primera (porečje Lemene): dejavnosti ozaveščanja in specifikacije zahtev; načrtovanje programske arhitekture in izdelava prototipov; izvedba Opazovalnice občanov v pilotu in analiza povratnih informacij državljanov.