

MECHANISMS OF INFORMATION AND DISSEMINATION FOR REGIONAL DEVELOPMENT OF DANUBE MEADOW

Dr. eng. Maria Cristina TRIFU¹

Dr. Ecaterina LUCA¹

¹ National Institute of Hydrology and Water Management, Romania

ABSTRACT

This paper was performed under the bilateral project "Danube Water Integrated Management" - Danube Water ETC MIS 161, developed within the CBC Programme Romania-Bulgaria 2007-2013, co-financed by the European Union whose aim was to create a cross-border Romania-Bulgaria system for management and monitoring of environmental factors on the Danube in emergencies and grounding joint response to emergency situations (drought, flooding, pollution, contamination). In order to support the local and regional authorities in managing extreme events and efficient allocation of intervention resources and data on sources of risk, and informing the public, during the Danube WATER project was realized a geo-portal that brings together useful information about environment, provide real-time information on emergency situations (floods, droughts, pollution, contamination) on the Danube River and allows interaction with water users and the population from the Danube riverain area.

This paper present the main mechanisms of information and dissemination of information for regional development of Danube Meadow, used in the framework of the Danube Water project, for localities from the eligible area of the project, located on the common Romanian-Bulgarian sector, between Gruia and Chiciu/C l ra i.

By the distribution of information materials (leaflets, brochures), promotional material, media information and organized visits to municipalities, county councils, environmental agencies, the mechanisms of information and dissemination were easily implemented along the eligible area, and communication with administrative authorities has been more convincing.

Keywords: Danube Water, dissemination, people awareness, local authorities, Danube Meadow

INTRODUCTION

The project Danube WATER Integrated Management (WATER), MIS ETC 161 is based on a common cross-border effort for the implementation of a common management and monitoring system for water quality in extreme environmental conditions (floods, droughts, accidental pollution by chemical and radioactive substances), including providing a data and information dissemination mechanism, necessary for the regional development of the border area. Besides the development of logistic infrastructure and joint actions across the border, another important outcome of the project is the implementation of an IT platform [1] that will be used for real time information exchange between local decision factors and dissemination of information to public.

According to the Aarhus Convention signed on June 25, 1998 [2] in order to contribute to the protection of each person's right of living in a clean and healthy environment, each signing state must guarantee the rights of citizens to information, his participation in the decision making process and the right to justice on environmental issues.

Taken into account that the information on the environment must become available for the public through easy accessible electronic databases, the Danube Water project has proposed the development of a complex geo-portal, based on web technology, where the users can find information about hydrological forecasts, water and soil pollution, thematic maps such as the national network for quantity and quality gauge stations. They are also invited to bring their contribution by sharing relevant information or photos about the emergency events and pollution one.

The institutions and populations from both countries need information regarding water flow, water quality, dynamics of life quality for local flora and fauna. This paper presents the mechanisms of information and data dissemination developed within the Danube Water project, which is based on the following activities: i) spreading questionnaires, flyers and posters, ii) development of geo-portal, iii) actions people-to-people in the eligible area and iv) information using mass-media.

Study Area

Danube is the river with the biggest international basin from Europe and eighteen countries have territories in the Danube river basin, sharing responsibility for water management and protection of the water resources [4]. The study area of the project is located in the Danube Floodplain along the common Romanian-Bulgarian sector, on a distance of 470 km (Figure 1). Romania and Bulgaria are responsible for monitoring the waters in the downstream part of the Danube and it is extremely important that a monitoring system at unitary standards exists, as well as unitary methodologies for, processing data in real time and dissemination of the information to all interested parties.

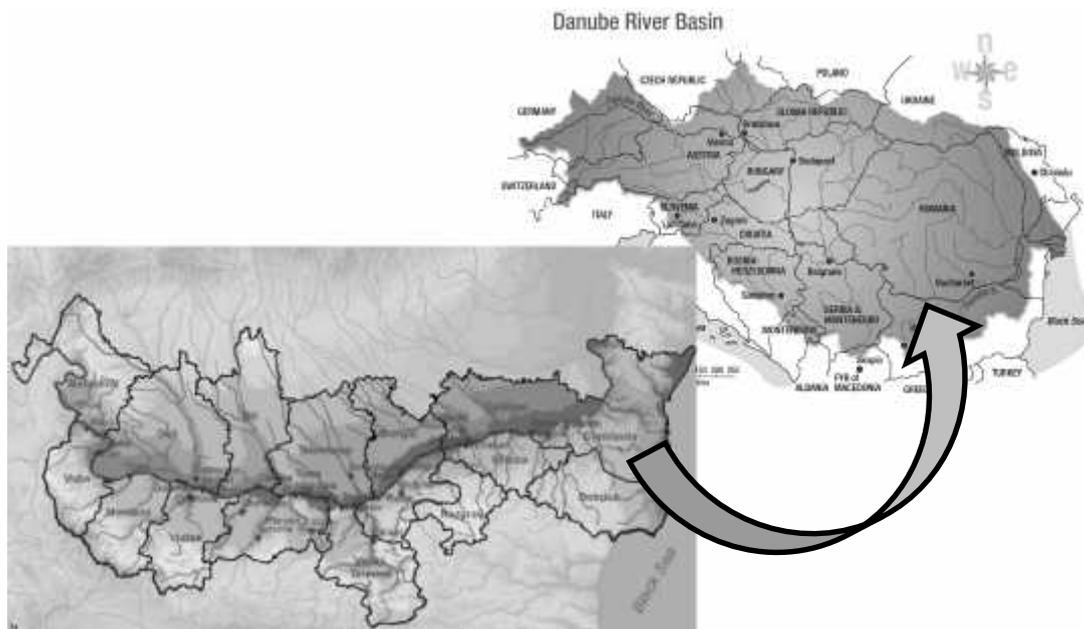


Figure 1. Study area – Lower Danube (Ro – Bg)

At the Danube River Basin scale, the main information regarding the sustainable and equitable use of waters and freshwater resources is provided by the International Commission for the Protection of the Danube River (ICPDR) which works on the base of the Danube River Protection Convention. Public participation is one of the key principles of International Water River Management, meaning that the Danube River Basin Strategy should be known and agreed by the water users. Many joint bodies have recently developed websites with information about their activities, aiming to promote stakeholder involvement [3].

METHODS

The most important mechanism of information and dissemination for regional development of Danube Meadow was the development of trilingual geo-portal web-page (www.danube-water.ro) for presentation of legislation, hydrological forecasts, information about water and soil pollution.

The accomplishment of geo-portal web-page has concerned the following actions:

- Actions necessary for geo-portal design: elaboration of one questionnaire in Romanian language (Part 1 and Part 2) for the identification of needs for the potential beneficiaries of the strategic project “Integrated Management of the Danube River”
- Actions necessary for publicity and dissemination to the accomplished geo-portal: meetings in the field with representatives from city halls, county councils, environmental agencies from the eligible area
- Actions necessary for presentation of accomplished geo-portal: regional meetings, organised by the project’s partners, with representatives from city halls, county councils, environmental agencies

In order to identify the real needs of potential beneficiaries of the project (large communities from the border area, water management authorities, economic operators in the border area county Environmental Protection Agencies, local public administration) an important step concerns the collection of data and information about the expectations of potential beneficiaries for the portal structure. For this purpose a questionnaire, in Romanian language was developed including 16 questions about the harmonization of joint Romanian-Bulgarian hydrological forecasts on the Danube and 11 questions about the interface of geo-portal, public section (for interaction with users).

The geo-portal of the WATER system was designed for public sector and private one, having two sections with specific information. *The geo-portal web page for public sector* includes areas for the presentation of generic information and relevant environmental parameters, allows enrolment to newsletters, provide a broad forum on the issues linked to the hydrological forecasts and environment pollution, as well as an "environment health map" based on the information stored in the system and on confirmed alerts recorded by the population and economic entities. *The geo-portal web page for private section* allows authorized users access to modules and functionalities that are allowed in single-sign-on system, displaying tasks, reports and dashboards specific to the user profile, as well as a personal page work space for internal users.

Several activities for population awareness about the geo-portal web-page were organised in Romanian eligible area, in 2015 year. This activity was focused on the population from areas affected by flood and pollution.

A great number of flyers (about 6000 pieces), in Romanian languages, were provided within the eligible area, to different administrative institutions (city halls, regional environmental agencies, county councils) and, in the same time, posters regarding *the geo-portal site access* were displayed on street, at strategic places accessible to the public (notice boards) [5]. These activities were accomplished with the support of local administrative institutions after discussions and project's presentation. The most important information included in the flyers spread in the eligible area has concerned the following: i) the functionalities of the external geo-portal, focusing on the advantages of using this web-page which provides the hydrological and geological forecasts, inundation maps, as well as the environmental monthly information (air quality and radioactivity bulletins); ii) the presentation of SII WATER system focusing on the monitoring module, decisional support system (DSS) and forecasting module; iii) the improvement of forecasting and awareness methods used on the Danube River necessary for the increasing capacity for a rapid intervention in case of floods and accidental pollution.

The flyers were distributed in the important localities from the Dolj, Olt and Teleorman counties, within Romanian eligible area, having significant number of population, such as: Alexandria (42.129 inh.), Craiova (293.567 inh.), Slatina (70.293 inh.), Caracal (30.954 inh.), etc. In the same time a lot of flyers and posters were placed in strategic places on the entrance of the administrative institutions, accessible to the public.

Another mechanism of information and dissemination for regional development of Danube meadow was *people-to-people actions* with the mayors, prefects, managers of environmental agencies regarding the project's results and the advantage to access the external geo-portal especially during the extreme events.

Trying to develop an information system as close as possible to stakeholder's needs, regional conferences were organised in the period 2014-2015, in both Romanian and Bulgarian eligible areas, with the local administration representatives and stakeholders (representatives from city halls, county councils, environmental agencies, NGOs, water users, inspectorate for emergency situations, etc), in the following cities: C I r a i Giurgiu and Constanta (Romania) and Plevna (Bulgaria).

Besides the spread of flyers, poster and direct discussion with representatives of administrative institutions from six counties, information and dissemination campaigns were organised in four regional newspapers, having 5000 – 80000 copies/ edition. The press release has informed the population about the advantages of using the geo-portal web-site, being necessary for awareness in extreme conditions, like the floods or water pollution, by regular consultation of hydrological forecasts or floods maps. On the base of press releases almost 97000 inhabitants were taken into account for awareness activity.

RESULTS AND DISCUSSION

On the base of “in situ” survey, information from 24 administrative institutions was obtained. The survey was conducted to cover a focus group able to provide feedback

loop for geo-portal design, meaning a high range of hydrological forecasts users on the Danube and of environmental protection stakeholders (municipalities, prefectures, General Inspectorate for Emergency Situations, Water Basin Directorate, Romanian Water, water users in the basin, basin committee members). The questionnaires were analysed in order to take into account the stakeholders suggestions and requirements.

Many of those who responded to the questionnaires has appreciated as being very usefully the developemnt of a geo-portal web page containing hydrological forecasts and the environmental protection events provided by the national institutions, offering the possibility to gather the information in a single place.

More than half of respondents have considered that the actual hydrological forecasts bulletins are very complex, providing detailed information. However, taken into account all suggestions, in order to increase the accuray of the available information, the hydrological forecast models provides in the private sector of the geo-portal web-page, the results of hydrological forecast models provides information about the propagation time, the tendency of levels and discharges evolution on sections of rivers, forecasts with a greater precision, the influence of tributaries from neighboring countries, the influence of water disposal from the snow. However, some of them requested information about precipitation amounts recorded in 24 hours at each hydrometric station and information about the Black Sea (waves, wind), but meteorological forecasts was not finnally included.

Respondents also appreciated as very helpfully the idea of presenting in graphical form the trends in the levels of the Danube. 97% of those who filled the questionnaires has appreciated that the fallowing information should be included within the geo-portal: date and place of pollution events (date and time, km on the Danube), the nature of pollution (type of substance, quantity, speed of propagation, the extent), the affected area (location, polluted surface), environmental (concentration, speed of propagation), mode of action early stage; information about the source of pollution and pollutants; extended forecast (propagation times, type pollutants, concentrations of pollutants and their impact on water quality / environment and human health, the influence of pollution on downstream users, the necessary measures to limit and reduce the negative effects of pollution on short and medium term).

Many of those who responded to the questionnaires have appreciated as being very usefully the harmonizing of the joint Romanian - Bulgarian forecasts, as well as the unified management of extreme situations. Information necessary for population's awareness against floods and pollution, as it was mentioned by 95% of the respondents was included in geo-portal and it concerns the following: forecasts, warnings, risk maps, weather warnings, information from the river basins issued by the relevant authorities for the Danube area, with more accurate location; information regarding the water quality of the Danube; discharges, temperature and water levels; values of water quality parameters values by region, information about sources of pollution, restrictions on the management / utilization of water resources; longitudinal profiles of defense dams, with corresponding quotas; longitudinal value of water level along the whole Danube; the affected area, pollution level and nature of pollution and as much relevant data, including the pollutions' consequences necessary for a more efficient management of extreme situations

The geo-portal is developed in order to disseminate the information regarding interest issues related to the Danube waters, hydrological forecasts or daily hydrological bulletins and in the same time it allows discussions between citizens and administrative institutions, by via “Forum” (www.danube-water.ro/forum/), about an issue regarding hydrology or hydrological incidents, or they can claim any kind of hydrological incidents. The portal is available in three languages: Romanian, English and Bulgarian. A significant part of the portal is the Monitoring Module. It starts with the Environmental Health Map, a GIS map (Figure 3).



Figure 3. Environmental Health Map

This module facilitates environmental data collection from Romanian and Bulgarian national institutions and visualization in real time, of the hydrological forecast data, level data and water quality data, data on air quality and radioactivity. The monitoring module concerns geospatial data (Figure 4), trends, graphs that help the management and the decision support of the emergency situations. The main components of the Monitoring Module are: i) background maps, themes and thematic layers that help to identify or to add points of interest on the map; ii) monitoring of the recordings from the automatic and manual stations (recordings of level and flow, recordings of air quality parameters etc.); iii) the representation of measured data as graphics with the desired time interval choice; iv) different tools for filtering, selecting, measuring, import and export of geospatial data [5].

The activity people-to-people accomplished in 2015, facilitated the information of 655.049 inhabitants from the Dolj, Olt, Mehedinți and Teleorman counties about the helpfully information provided by the project portal.

The dissemination action through regional meetings with public administration’s staff from eligible area for the presentation of the Water geo-portal, has offered the possibility to visualize on-line the public portal as well as all modules (monitoring, decision support system, forecasting) incorporated in the SII-WATER system and has contributed to continuum development of web-page. A lot of participants have

considered that the geo-portal has a friendly interface and it is very usefully for the prevention and forecasting activities and it should be extended to other River Basins.



Figure 4. Thematic map in the framework of geo-portal (geospatial data)

CONCLUSIONS

It is the duty of each state to ensure that the national public authorities have updated environmental information and that compulsory systems for an adequate information flow are established. The most important recommendations from the beneficiaries, on the information that should be on the portal, in particular those related to improving hydrological bulletins with new information and representations of data, by pollution in water and air, from displaying the affected section by pollution gained through mathematical modeling were taken over by the project team.

In the framework of Water project, the mechanism of information and dissemination for regional development of Danube meadow has sustained the information dissemination of the accomplished geo-portal to more than targeted population (more than 500.000 peoples) and the project's partners have obtained, from the local administrations level within the eligible area, a direct feedback regarding the design and the relevant information posted on the geo-portal.

Finally it was developed and implemented a trilingual geo-portal (www.danube-water.ro), by the consultants of SII WATER design, which finally was linked by the panels for environment conditions display, which were bought for national dispatched in

Ministry of Environment, Water and Forest and National Administration “Apele Române” premises.

As a major conclusion the geo-portal web page displays continuously data, meaning real time registration from automate stations that will be available for large public, interested mainly about the on-line data and information and less about long term information and data about water and environment.

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