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## InfoWATER PROJECT

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**Abstract.** The paper presents the project of the Technical University in Košice: Raising the awareness of residents, especially Košice and Prešov self-governing region in the field of sustainability of water resources with emphasis on the involvement of students. The aim of the submitted project is to raising awareness about water management and water resources in the Slovak republic. The activities in the project are divided into four groups – informational, includes thematic brochures, audio record, video record and pamphlets; media, includes advertisement; online activities include web site, social networks and online competitions and the last activity – presentation, includes professional lectures. The targets groups of the project are kindergarten children, primary school students, citizens of affected area and government. The project activities are designed for certain target group, especially the members of the government were invited to the professional lectures. But, on the other hand, information activities mainly the thematic brochures are designed for all four targets group. There are 3 types of the thematic brochures for all four target groups, and every brochure is divided into 2 thematic topics. The topics are Water of Eastern Slovakia, Household water, Flood protection, Water structures of Eastern Slovakia, Water in the landscape and Water retention measures. Online activities, mainly online competitions are designed for kindergarten children and primary school children. The competitions are designed for kindergarten children and primary school children, and the topics are Water unites us, Future of the water, as you can see the water is not just from the tap, Water through the lens.

**Keywords:** water project, household water, flood, flood protection

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### 1.INTRODUCTION

Water is an integral part of human lives. However, many countries cannot take it for granted. As a result of the growing population and climate change, there is a worldwide decline in water and an increase in extreme drought. The territory of the Slovak Republic is no exception. In some watercourses in eastern Slovakia, the level of watercourses is decreasing, and this trend has an increasing tendency (Zeleňáková et al., 2014). Unlike water levels, household water consumption is not declining. Water treatment is becoming more and more financially and technically demanding, groundwater and surface water are often contaminated with various pesticides and nitrates. The solution to the problem of water scarcity can be the use of rainwater, which is largely discharged into the sewer. Appropriate technological procedures for water treatment can achieve the required quality and enough water for household needs (Bárek et al., 2006).

Environmental education has grown significantly in recent years. Environmental topics are part of general subjects in schools. Despite these facts, a separate subject curriculum has not yet been developed. For this reason, the concept of environmental education based on sustainable development was created. The base output of the environmental activities were three parts: Eco centrum, Ecolab, and educational trail (Moyezová, Izakovičová, 2013). The recommended form for implementation of cross-cutting themes is the project method. The method can create a space to connect educational process with other activities. The project method allows theoretical facts to more engaging way. Problem lectures or workshops are applied within the project method (Zemko, Jakab, 2015).

In 2014, the Government of Slovak Republic has approved the Operational Program quality of the environment in field of sustainable and efficient use of natural resources, ensuring the protection of the environment, active adaptation to climate change and the promotion of energy-efficient low-carbon economy.

One of the goals of the Program is key development of science, research and innovation with an emphasis on green development. Projects aimed at meeting the objectives have been running since 2014. The list of all the applications are available online on this website: <https://www.op-kzp.sk/zoznam-schvalenych-a-neschvalenych-ziadosti/> (Operational Program quality of the environment).

Submitted paper describes relevant activities, which are the main part of the project named Raising the awareness of residents, especially Košice and Prešov self-governing region in the field of sustainability of water resources with emphasis on the involvement of students. The aim of the project is to raising awareness about water management and water resources in the Slovak republic.

## 2. InfoWater PROJECT

The target groups of the mentioned project are kindergarten student, primary school student, citizens of affected area and government. The project is primarily settled for citizens of eastern Slovakia. Activities outgoing from the Water project are divided into 4 groups – informal activities, medial activities, online activities, and presentation activities. Submitted paper describes informal and online activities in detail.

### *Informal activities*

The first group of project activities are the informal activities. Those also include 4 sub-groups – the thematic brochures, audio records, video records and pamphlets. There are three types of thematic brochures, and each of them contain two topics: Water of Eastern Slovakia, Household water, Flood, Flood protection, Water structures of Eastern Slovakia, Water in the landscape. For the sake of simplification, the information brochures are named Information brochure no. 1, Information brochure no. 2 and Information brochure no. 3. The content of the mentioned brochures is adapted to the target groups (Figure 1).

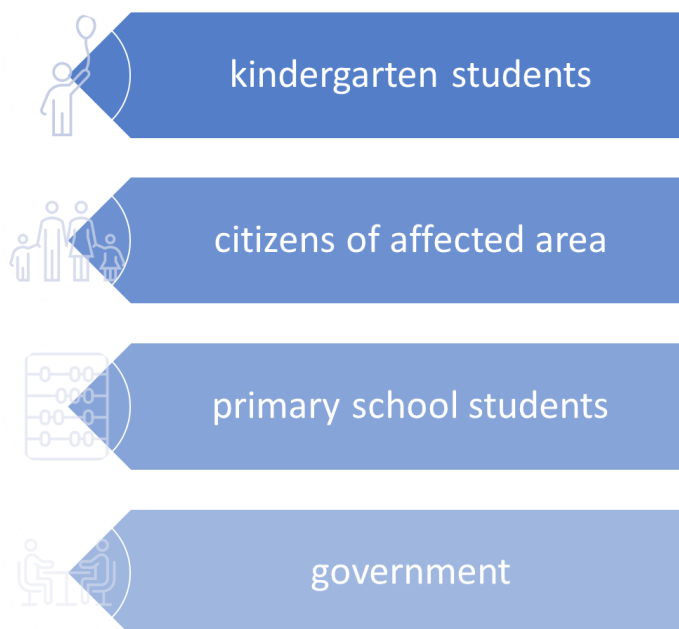


Figure 1 Labelling of the target groups in Information brochures

Figure 1 shows four icons, which are used to label the content of the Information brochures. Elaborated topics are individually adapted for each mentioned group. When creating the content page of brochures, it was important that the content was tailored to the target group. Therefore, icons are used in the brochures to indicate for which group the page is intended. The Information brochure no. 1 contains topics Water of Eastern Slovakia and Household water. Information about the first topic, Water of Eastern Slovakia addressed for kindergarten children are very easy described. Children can find pictures of precipitation, rivers, snowman, or ice cubes with an explanation how to water gets to the ground (Figure 2).



**Figure 2.** Pictures of the water for kindergarten children (originally in Slovak language)

The following topic Household water also contains some easy pictures for kindergarten children. In this section, the pictures are aimed to how can kids save the water in their own household. For example, using shower instead of the bath, stop the water while brushing teeth and using the rainwater to water the flowers.

More complexed information contains section primarily designed for primary school student. There are some questions about rivers in Slovakia, blind map, and a crossword.

The most complex information can be found in the section tailored for citizens in affected area and government. In the Information brochure no. 1 are described some information about drink water in the Eastern Slovakia, basic data about the main drink water source Starina and a brief description about water quality according to Decree 247/2017. Citizens and government should read the Information brochure no. 1 because of the availability and simplicity the data about average daily household water consumption, how and why to use grey water, what about the price of the water and finally there are described a current state of drinking water supply and development of public sewers in conditions of Slovak republic.

Information brochure no. 2 contains topics Flood protection and Water structures of Eastern Slovakia. The content is also divided into four groups, and the icons label suitability of the readers (Figure 1). The topic Flood protection in the kindergarten children section includes some pictures of flood with couple of questions to enhance critical thinking of the children. Primary school students can exam themselves in the test questions related to the flood and flood protection, and citizens and government can read about the review of the flood situation in Slovakia.

The last Information brochure no. 3 presents topics Water in landscape and Water retention measures. Kindergarten children can color a picture of water cycle in nature and talk about the water cycle processes. Mentioned activity should also help to increase and support the critical thinking. Section designed for primary school students contains a problem to determine amount of the rainwater in the city. To solve the problem, students should use the Model hectare method which consists of the following equation:

$$Q = \varphi * S * q_s \quad (1)$$

where:

$Q$  = rain runoff [l/s]

$\Phi$  = runoff coefficient [-]

$S$  = catchment area [ha]

$q_s$  = rain intensity [l/s\*ha]

Calculation procedure of the mentioned problem are described in detail to help primary school students solve it.

In the section designed for citizens and government, readers can find a brief description about water retention measures, for example:

The water retention measures are multifunctional measures aimed to protecting water resources and addressing water related problems or the maintenance of aquatic ecosystems, as well as the characteristics of water bodies using natural resources and processes.

The water retention measures:

- ✚ retain water (outflow) beyond the existing capacity of the systems, discharge it at a controlled rate or ensure its penetration/infiltration into groundwater,
- ✚ they make it possible to use the retention capacity of soils and aquatic ecosystems to ensure further improvements in the environment and well-being, such as water quality, biodiversity, value, resilience, and adaptation to the effects of climate change,
- ✚ they are usually used on a relatively small scale; compared to the size of the river basin or territory in which they are carried out,
- ✚ they imitate a natural process.

Urbanization and how to mitigate the adverse impact of the urbanization are described in the government's section. As a sample, there are adduced infiltration ditches, soaking and filter belts.

All three Information brochures are designed in the same style. Mentioned icons (Figure 1) shows content suitable for the target groups (kindergarten children, primary school students, citizens in the affected area and the government). There are 3 types of the brochures with 6 topics above mentioned.

### **Online activities**

Online activities contained in the InfoWater project includes web page, social networks, and online competitions. The webpage is available online: <https://infovoda.webnode.sk/>. As social networks are used webpage YouTube, Facebook, and Instagram. YouTube channel *Info Voda* contains videos with topics Physical properties of liquids, Water and the water structures, Watercourse treatment, Longitudinal and transverse profile and bank modification, Revitalization of the water courses, Weirs, Water reservoirs and dams.

There took place also two webinars – the first webinar named Water Day webinar have been held on the International Day of the Water 22.3.2021. The record from the webinar is available online <https://www.youtube.com/watch?v=IRmIgcI4RJk>.

The second Earth Day webinar have been held a few weeks ago, and the record is also available online <https://www.youtube.com/watch?v=n0Eu5dM5p4g>. Both webinars attended by experts from the Faculty of the Civil Engineering and experts from professional public.

To join the webinar, the invitation letters were sent to the mayors of municipalities of the Eastern Slovakia through their email addresses. Together there were send 1 063 invitations. Because of the technical failure, 33,04% of the emails were not delivered.

Among online activities belong active social networks – Facebook and Instagram. Administrators of the mentioned social networks publish posts related to the main theme of the project – water management and water resources in Slovakia. Social media activities are also aimed to the target groups, especially the kindergarten and primary school student. The students can join the challenges and competitions and get valuable prizes. The competitions have a great success and lot of students are involved.

## **3.RESULTS AND DISCUSSION**

Previous chapters briefly describe Informal and Online activities currently ongoing project InfoWater. Besides, the project includes two other activities – media and presentations. The main goal of the project is to address as many schools as possible. The first output of the project is the list of schools in Eastern Slovakia with a statistical review of involvement in the project. Measurable project indicators include count of thematic brochures distributed to the schools, audio and video record and pamphlets in print.

Online activities contained in the InfoWater project includes web page, social networks, and online competitions. Active social profile provides photos and posts related to mentioned competitions and the winners. Also, on the social networks readers can found the records of lecturers that took place on Water and Earth Day.

## 4.CONCLUSION

Submitted paper briefly presents project Raising the awareness of residents, especially Košice and Prešov self-governing region in the field of sustainability of water resources with emphasis on the involvement of students. The main goal of the mentioned project is to provide the target groups basic information about water sources and water management in the Slovak republic with very simple and playful form. Mentioned project includes informal, online, media and presentation activity. Submitted paper provide a brief overview to the informal and online activities. Nowadays, the project is very successful, and the activities are still ongoing.

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### REFERENCES

- Moyzeová M, Izakovičová Z., 2013. *Príklad netradičnej formy environmentálnej výchovy*. Ekologické štúdie, ročník 4, vol. 1/2013, 58-64. Nitra: Slovenská ekologická spoločnosť pri SAV, ISSN 1338-2853. Available online: [http://publikacie.uke.sav.sk/sites/default/files/2013\\_1\\_ES\\_58-64\\_Moyzeova\\_Izakovicova.pdf](http://publikacie.uke.sav.sk/sites/default/files/2013_1_ES_58-64_Moyzeova_Izakovicova.pdf)
- Bárek V. a kol., 2006. *Precipitation water disposal*. Available online: [http://www.slpk.sk/eldo/2006/018\\_06/barek\\_v.pdf](http://www.slpk.sk/eldo/2006/018_06/barek_v.pdf)
- Operational Programm quality of the environment. Available online: <https://www.op-kzp.sk/obsah-vyzvy/67-vyzva-zamerana-na-podporu-budovania-environmentalnych-centier-za-ucelom-realizacie-informacnych-aktivit-v-oblasti-adaptacie-na-zmenu-klimy/>
- Zemko M, Jakab I., 2015. *Environmentálna výchova formou projektového vyučovania*. Edícia Prírodovedec č. 601. Nitra: Univerzita Konštantína Filozofa v Nitre, ISBN 978-80-558-0770-6. Available online: [https://www.researchgate.net/profile/Martin-Zemko/publication/295542838\\_Environmentalna\\_vychova\\_formou\\_projektoveho\\_vyučovania/links/56cb00c208ae1106370b670f/Environmentalna-vychova-formou-projektoveho-vyučovania.pdf](https://www.researchgate.net/profile/Martin-Zemko/publication/295542838_Environmentalna_vychova_formou_projektoveho_vyučovania/links/56cb00c208ae1106370b670f/Environmentalna-vychova-formou-projektoveho-vyučovania.pdf)
- Zeleňáková M. a kol., 2014, *Verification of the decreasing of minimal flows in river basins of eastern Slovakia*, Extrémy oběhu vody v krajině. Mikulov, 8. – 9.4. 2014. ISBN 978-80-87577-30-1