

REPORT ON ORGANIZED WORKSHOP ON THE SUSTAINABILITY OF THE SWARM RESULTS

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University of Nis



Strengthening of master curricula in water resources management
for the Western Balkans HEIs and stakeholders

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1. Introduction

This document reports the **Workshop on the sustainability of the SWARM results** of the Erasmus+ Capacity Building in the Field of Higher Education project „Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders“ (SWARM), held on the 20th and 21st December 2021. The workshop was chaired by Milan Gocić (UNI), Panagiotis Prinos (AUTH) and Skoulikaris Charalampos (AUTH). The workshop was organized as a hybrid event (in-person and online using Zoom platform) technically supported by the Aristotle University of Thessaloniki (AUTH).

The workshop was organized by the Aristotle University of Thessaloniki (AUTH) in collaboration with the consortium partners.

2. Workshop in general

The Workshop was a chance to discuss how to achieve sustainability of the SWARM outputs after the project ending.

The following topics were discussed:

- dissemination and sustainability,
- experiences and good practices in the implementation of similar projects in programme partner countries,
- feedback from the organized schools,
- impact of the SWARM results on different levels.

In total, 25 participants attended (16 in-person and 9 online) from all partner institutions.

Workshop moderators:

Panagiotis Prinos, Aristotle University of Thessaloniki

Skoulikaris Charalampos, Aristotle University of Thessaloniki

Milan Gocić, University of Nis

First day, 20 December 2021

Panelists:

Milan Gocić, University of Nis

Nevenka Ožanić, University of Rijeka

Michael Tritthart, University of Natural Resources and Life Sciences, Vienna

Petar Filkov, University of Architecture, Civil Engineering and Geodesy

Luis Angel Espinosa, University of Lisbon

Skoulikaris Charalampos, Aristotle University of Thessaloniki

Zakhar Maletskyi, Norwegian University of Life Sciences

Summary:

First session was oriented to sustainability in general:

- Dissemination and sustainability;
- Experiences and good practices in the implementation of EU infrastructure project **RISK** at the University of Rijeka, Faculty of Civil Engineering (UNIRIFCE);
- Experiences and good practices from Austria;
- Experiences and good practices from Bulgaria;
- The Continuity and Future of a Joint Scientific Project: Experiences from Water-related Projects;
- Experiences and good practices from Greece;
- Exit strategies.

Workshop started at 9:30 after the participant's registration and finished at 16:00. After each presentation, participants answered the questions.

Panagiotis Prinós opened the welcoming session and gave the floor to **Milan Gocić** who presented the topic related to the dissemination and sustainability.

Dissemination is the process of making the results and deliverables of a project available to the stakeholders and to the wider audience. It is crucial for the success of the project and for the sustainability of outputs in the long term.

Where dissemination tends to focus on activities to inform, educate, and engage, sustainability tends to focus on models and scenarios.

The outcomes may relate to what people will be able to do better, faster, or more efficiently because of what the project has achieved. The project outputs may include tools, models, guidelines, methods, case studies, or recommendations that can be taken up by the community.

Nevenka Ožanić presented experiences and good practices in the implementation of EU infrastructure project RISK at the University of Rijeka, Faculty of Civil Engineering. In order to increase the level of research activities the University created the environment for increasing both research and learning outcomes with an emphasis on collaboration and development of multidisciplinary scientific fields. She pointed out that timely preparation is crucial to develop an institution and solve its most pressing needs.

Michael Tritthart presented experiences and good practices from Austria such as sustainability in

1. An international capacity-building project: UNIDO_CB
2. A national climate change research project: PURIFY
3. An EU-funded research and infrastructure project: SEDDON II

Petar Filkov presented experiences and good practices from Bulgaria. He highlighted that "*sustainability of SWARM results*" should mean sustainability of master curricula. It is better to speak

about *sustainability of master programmes*, related to *water resources management (WRM)*, not about their curricula, because

- Curricula are changed over time to take into account the changes in science, practice, etc.
- Names of study programmes usually are not changed

We should be focused on the target groups because the university is not a single player.

Maria Manuela Portela and **Luis Angel Espinosa** presented the continuity and future of joint scientific projects: the Portuguese experience from water resources-related projects. **A joint scientific water-related project** should employ scientists and academics to carry out research in order to provide independent scientific advice and support to water resources policy. It is an active player in the global arena, involved in strategic international cooperation gathering partners worldwide, working on a diverse range of scientific fields addressing water-related issues.

Research synergies are mostly multi-sectoral with public and private research organisations, industry, universities and national and international bodies and allow sharing of infrastructure, laboratory equipment, and data materials as well as transferring knowledge and making agreements.

Mutual learning processes also open up avenues for collaboration, as well as new business and investment opportunities. The concept allows tailoring research and innovation policies to national, regional and local contexts and can contribute to achieving the Sustainable Water Goals.

As a conclusion **a project must always have some “added value”**.

In the increasingly competitive and globalising world of higher education, the future of universities relies on how successfully they interact with their environment.

Collaborative linkages with research partners, including industry, can prove vital for water research-intensive universities.

Skoulikaris Charalampos presented experiences and good practices from Greece. Until the end of the 20th century **Water Resources Management** was, almost exclusively, oriented to hydrotechnical works focusing on the technical reliability and economic efficiency of projects that covered human’s water demands and securing human’s life and wealth. Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. At the same period, **integrated water resources management (IWRM)** established a multidisciplinary and multisectoral approach on setting the management of waters as part of a system rather than an autonomous process.

Zakhar Maletskyi highlighted the need for exit planning including mapping of key resources, understanding drivers and needs, foundation for continuation, structure relevant to the project, cooperation, openness and dialogue. Grants are almost always **fixed term arrangements** meaning the grant recipient needs to suitably prepare to either end funding or alter the service delivery.

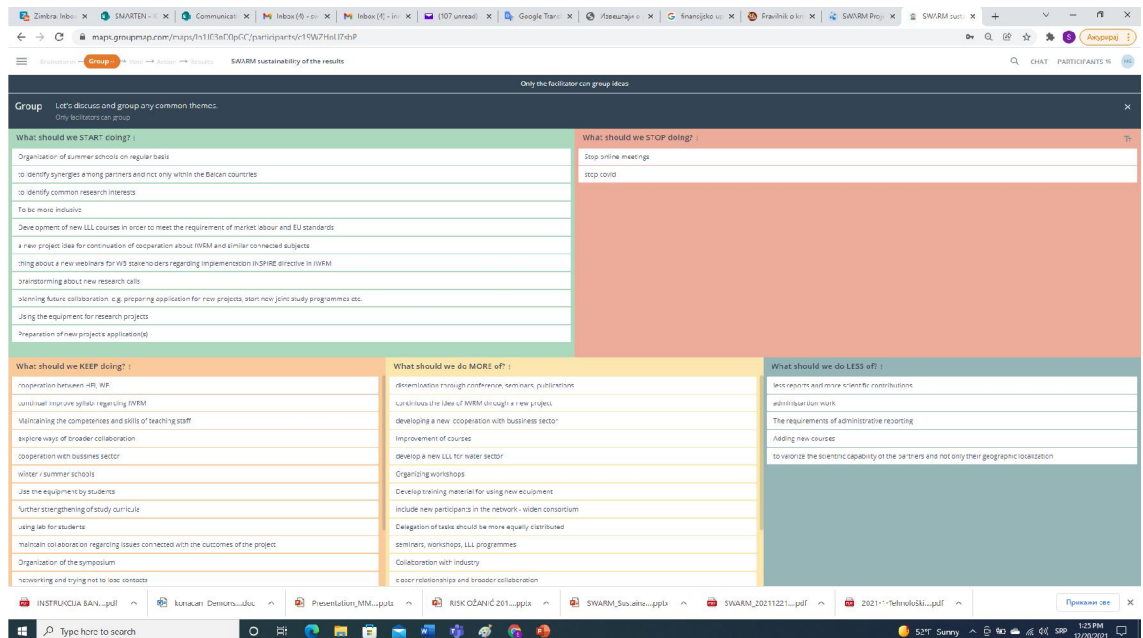
Second session was oriented to group work on sustainability of achieved SWARM results and collaboration with industry moderated by Zakhar Maletskyi. Five group of questions have been asked:

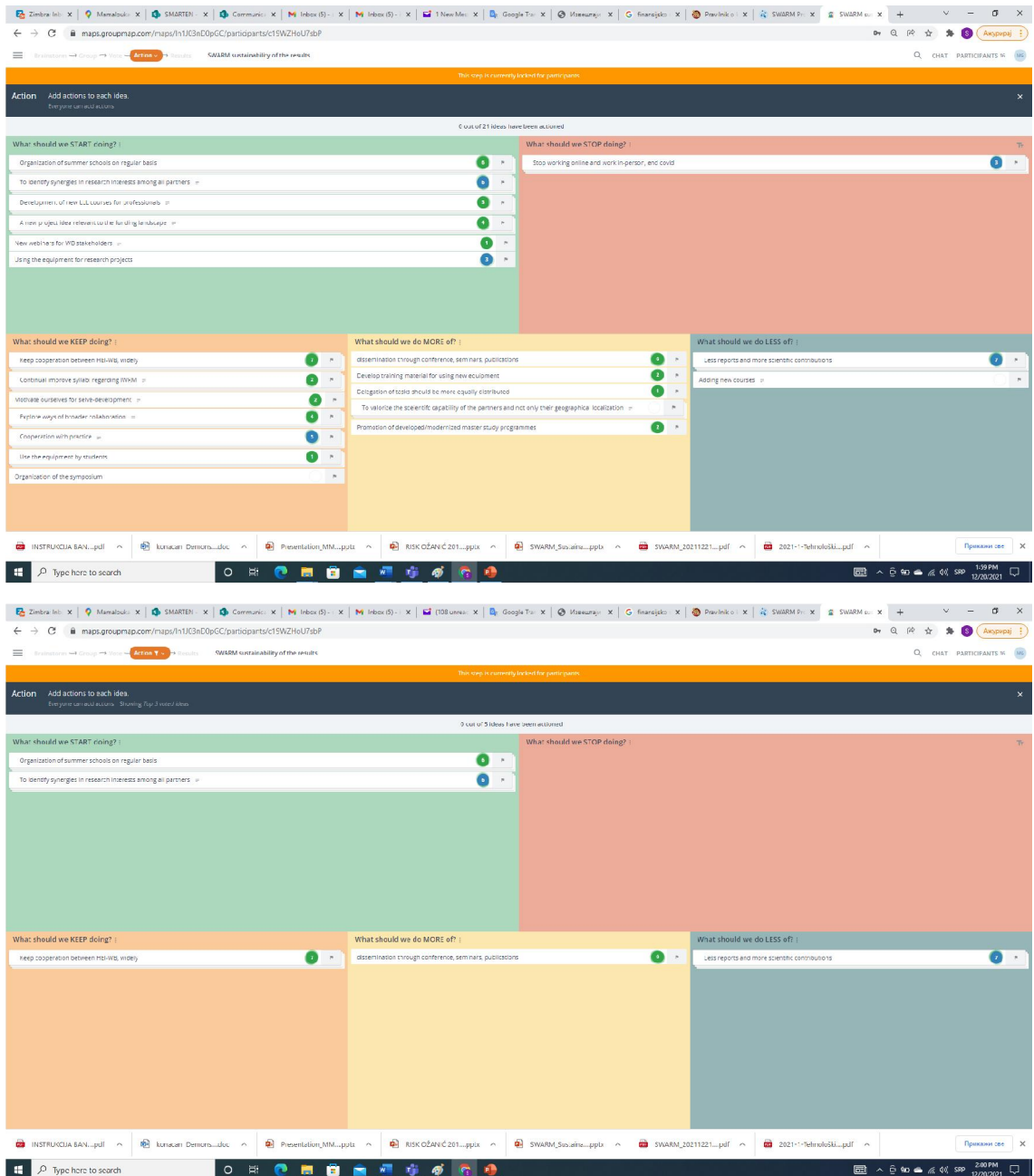
1. What should we START doing?
2. What should we KEEP doing?

3. What should we do MORE of?
4. What Should we STOP doing?
5. What should we do LESS of?

As conclusions of the discussion are:

- Organization of summer schools on regular basis
- To identify synergies in research interests among all partners
- Development of new LLL courses for professionals
- A new project idea relevant to the funding landscape
- New webinars for WB stakeholders
- Using the equipment for research projects
- Keep cooperation between HEI-WB, widely
- Continual improve syllabi regarding IWRM
- Motivate ourselves for self-development
- Explore ways of broader collaboration
- Cooperation with practice
- Use the equipment by students
- Organization of the symposium
- Dissemination through conferences, seminars, publications
- Develop training material for using new equipment
- Delegation of tasks should be more equally distributed
- To valorize the scientific capability of the partners and not only their geographical localization
- Promotion of developed/modernized master study programmes
- Stop working online and work in-person, end COVID
- Less reports and more scientific contributions,
- Adding new courses.





The screenshot displays a Miro board titled "SWARM sustainability of the results" with a sub-header "This step is currently locked by the panel owner". The board is divided into four main sections for action items:

- What should we START doing? (Green section):**
 - Organization of summer schools on regular basis
 - To identify synergies in research interests among all partners
 - Development of new L4 courses for professionals
 - A new program idea relevant to the building landscape
 - New meetings for PhD stakeholders
 - Using the equipment for research projects
- What should we STOP doing? (Red section):**
 - Stop working online and work in person, and could
- What should we KEEP doing? (Orange section):**
 - Keep cooperation between HE-WI, widely
 - Continual improve syllab regarding NWO
 - Monitor ourselves for self-development
 - Follow-up of broader collaboration
 - Cooperation with practice
 - Use the equipment by students
 - Organization of the symposium
- What should we do MORE of? (Yellow section):**
 - dissemination through conference, seminars, publications
 - Develop training material for using new equipment
 - Eligibility of tasks should be more equally distributed
 - To valorize the scientific capacity of the partners and not only their geographical localization
 - Promotion of developed/modernized master study programmes
- What should we do LESS of? (Blue section):**
 - Less reports and more scientific contributions
 - Adding new courses

The board also shows a taskbar with various files open, including "INSTRUKCJA BAN...pdf", "konkurencja Demokrac...doc", "Presentation_MM...pptx", "RISK OZAN C 201...pptx", "SWARM_Sustainability...pptx", "SWARM_20211221...pdf", and "2021-1-1-technologi...pdf". The system clock indicates 1:59 PM on 12/08/2021.

What should we START doing?		What should we STOP doing?			
Organization of summer schools on regular basis - Maja & UNS coord., Milan, Emina	6	Stop working online and work in-person, end covid	3		
To identify synergies in research interests among all partners - Zakhar - coord., Maja, Jelena	6				
Development of new LLL courses for professionals	3				
A new project idea relevant to the funding landscape	4				
New webinars for WB stakeholders	1				
Using the equipment for research projects	3				
What should we KEEP doing?		What should we do MORE of?		What should we do LESS of?	
Keep cooperation between HELWB, widely	7	Dissemination through conference, seminars, publications - UoM	4	Less reports and more scientific contributions	7
Continual improve syllabi regarding IWRM	2	Develop training material for using new equipment	2	Adding new courses	
Motivate ourselves for self-development	2	Delegation of tasks should be more equally distributed	1		
Explore ways of broader collaboration	4	To valorize the scientific capability of the partners and not only their geographical localization			
Cooperation with practice	5	Promotion of developed/modernized master study programmes	2		
Use the equipment by students	1				
Organization of the symposium					

Second day, 21 December 2021

Panelists:

Barbara Karleuša, University of Rijeka

Daniel Wildt, University of Natural Resources and Life Sciences, Vienna

Petar Filkov, University of Architecture, Civil Engineering and Geodesy

Charalampos Skoulikaris, Aristotle University of Thessaloniki

Milan Gocić, University of Nis

Emina Hadžić, University of Sarajevo

Jelena Djokić, University of Pristina in Kosovska Mitrovica

Maja Petrović, University of Novi Sad

Olivera Gavrilović, Public Water Management Company "Vode Vojvodine"

Biljana Šćepanović, University of Montenegro

Summary:

Workshop started at 9:30 and finished at 15:30. After each presentation, participants answered the questions.

Third session was oriented to how to keep project results alive.

Barbara Karleuša presented results from winter school at UNIRIFCE. Students do research work to describe the structure of water management in their country, including: legal frame, legislation, organization, administrative structure, water management financing, international cooperation. During the second week, students presented the water supply system (WSS) of the city in which they study.

Daniel Wildt presented results from winter school at BOKU and highlighted the need of this type of activities. Course summary consists of

- Introduction to unsteady problems in hydro- dynamics
- Ordinary differential equations
- Partial differential equations – Development of a flood wave
- Theory on computer-based river modelling
- 1D models, error estimation
- Unsteady pipe flow (hydraulic surge)
- Introduction to OpenFOAM

Petar Filkov presented results from winter school at UACEG. The school was organized using MS Teams. He showed the winter school plan and evaluation results.

Charalampos Skoulirakis presented results from winter school at AUTH. Principal aim was the introduction to students of the basic concepts of:

- Sustainable and integrated water resources management
- Hydraulics (open channels, river, water supply networks etc)
- Hydrology and use of hydrological models and tools (e.g. GIS)

Advantages and disadvantages of the procedure are:

- Familiarization of students with ITCs
- Lack of inter communication
- Small number of students
- No cameras/microphones
- Difficulties in demonstrating programs and tools virtually

Milan Gocić presented sustainability of WB developed LLL courses. Lifelong learning is a form of self-initiated education that is focused on personal development. Lifelong learning is the voluntary act of learning throughout life. Individuals and communities need to acquire skills that are relevant to their lives, their needs and their work. Learning benefits should be ensured for individuals, communities, employers and society.

Fourth session was oriented to an overview of the funding landscape to initiate further cooperation. Milan Gocić suggested a few possible ways of future cooperation through participation in Erasmus+ calls. Partners suggested NATO science for peace and scientific bilateral projects.

Fifth session was oriented to the impact of the SWARM results on different levels.

Emina Hadžić presented impact of the SWARM results on the HEIs in Bosnia and Herzegovina. UNMO and UNSA contribution through SWARM project is:

- Contribution to the review of the current situation in the water sector of Bosnia and Herzegovina, especially in the segment of integrated water management, as well as the impact on the education of engineers in the field of Water Engineering.
- Contribution to the improvement of curricula of existing subjects in the field of water resources and environmental engineering, as well as the introduction of new subjects with the aim of improving students' competencies.
- Participation in the transfer of knowledge to the public sector as well as citizens in order to raise awareness of the importance of effective management of water resources.

Modernization of the curriculum is achieved through:

- advanced approach to curriculum development using interdisciplinary communication, analysis of needs and problems of society and enterprises, mobilization of university resources and capacities for their solution,
- introduction of innovative teaching and learning methodologies,
- promotion of excellence in the use of ICT in higher education through the procurement of the most advanced laboratory equipment,
- increase the competencies, skills and applicable advanced knowledge of graduates in the WRM, harmonized between the WB and EU partner.

Sustainability of results in B&H can be summarized through:

- **Two improved master programmes in WRM** at the WB partner HEIs
- **A new training programmes**, with training materials for water resources sector developed and conducted.
- **Retrained teaching staff** with up-to-date knowledge in WRM to teach on the new/improved master programmes.
- **Advanced teaching and learning process introduced.**
- **Introduced new laboratory equipment, library units and software** necessary for the continuation of the master programmes.
- Prepared **Training Manual on Water Resources Management**, which will be useful for stakeholders and others

- Raising the awareness of citizens and stakeholders through lectures, webinars, round tables

Jelena Djokić presented impact of the SWARM results on the HEIs in Kosovo*. The following was expected from SWARM:

- Modernized curricula on Bachelor and Master level,
- LLL courses provided for the professionals in the water sector,
- UPKM equipped for better performance.

Maja Petrović presented impact of the SWARM results on the HEIs in Serbia. She highlighted the necessity of education of experts for water resources management in line with the national and EU policies. The list of specific national issues in WRM contains of

- Low economic price for drinking water;
- High water losses in water supply networks;
- Water protection - the weakest part of the water management system;
- Maintenance of the existing systems for flood protection is minimal;
- Coordination and cooperation in the planning and implementation of programs is unsatisfactory;
- New, functional and sustainable concept of water management based on groundwater, and artificial reservoirs is needed.

Biljana Šćepanović presented impact of the SWARM results on the HEIs in Montenegro. The main motivation of the Faculty of Civil Engineering UoM is to **develop new and improve the existing education** in the field of water management.

Also, the motivation is to **raise technical capacity** and accomplish creation of **more efficient systems** in the field of **water resources management**.

The role of the UoM (FCE) in SWARM is

- UoM(FCE) modernized curricula of existing master study programmes Civil Engineering – Infrastructures – Water Engineering.
- UoM(FCE) set up a laboratory for the teaching purposes at the master's program Water Engineering.
- UoM(FCE) teaching staff took EU organized trainings
- Students took part in the winter school for acquainting new practices and skills.

Academic staff at UoM have a direct benefit in the HEI per year through:

- development of courses,
- lecturing,
- trainings,
- study visits and workshops,

- collaboration with other members in the Consortium,
- utilization of the equipment,
- development of new competences,
- involvement in dissemination actions, and other.

Impact on the individual beneficiaries' enrolment rate and/or career development cannot be measured yet due to the fact that the project currently undergoes the preparatory phase and starts of the development phase.

Administrative staff at HEI will have a direct benefit in the HEI per year through the implementation of project administrative activities.

Estimated number of students at study programmes at HEI is 15-20.

It is expected the high number of **beneficiaries** of project results **outside the HEI**:

- LLL promotional course for non-academic sector,
- new learning material development,
- professional collaboration with the public companies, and other.

Impact at institutional level:

- Institution's visibility will be increased,
- Institution's quality standards and goals are raising,
- The competences of teaching staff are raising,
- Many new contacts at individual and institutional scale have been established.

Olivera Gavrilović presented impact of the SWARM results on the water-related sector. She highlighted the importance of participation of non-academic institutions in creation of study programmes together with the HEIs.

Skoulikaris Charalampos presented impact of the SWARM results on international level. He highlighted the activities of the SWARM partners at the international level promoting the achieved results.

At the end of the workshop Milan Gocić made final remarks.

The presentations can be downloaded from <http://www.swarm.ni.ac.rs/>.

3. Workshop evaluation

The symposium evaluation form had the following questions:

- Relevance of the topic (Figure 1),
- Usefulness of the acquired knowledge (Figure 2),
- Rating of presented materials (Figure 3),
- Rating organization (Figure 4),
- Rating of working conditions (Figure 5),
- Rating interactivity in workshop (Figure 6),
- Assessing the fulfilment of expectations regarding workshop (Figure 7),
- Overall impression (Figure 8).

In total, 15 responses were received. The general conclusion is that the workshop had an excellent logistic and that the quality of presented material was very good. Some opinions (comments):

- I wish I could participate in person, in-situ. Online participation does not allow good interactivity. But the colleagues made their best to assure good interactivity.
- Everything is excellent

Relevance of the topic

15 responses

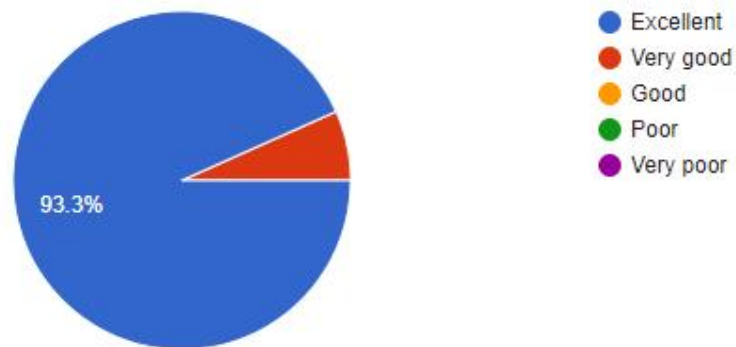


Figure 1 Relevance of the topic

Usefulness of the acquired knowledge

15 responses

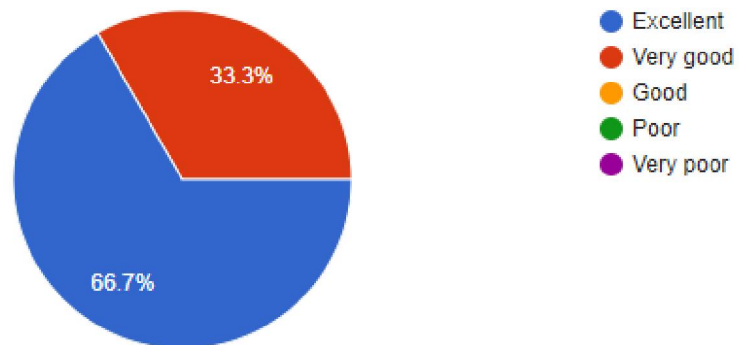


Figure 2 Usefulness of the acquired knowledge

Rating of presented materials

15 responses

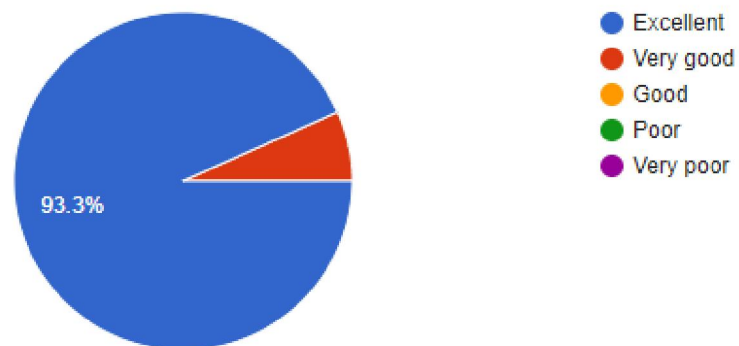


Figure 3 Rating of presented materials

Rating organization

15 responses

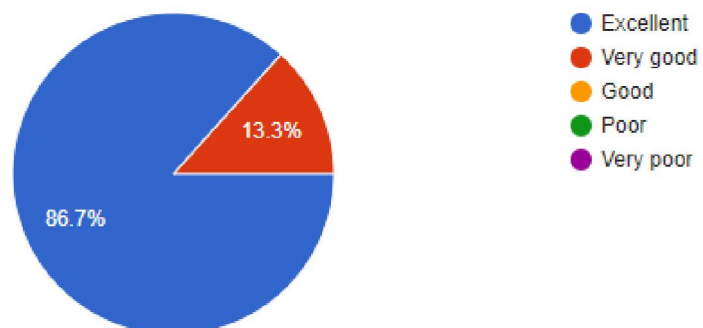


Figure 4 Rating organization

Rating of working conditions

15 responses

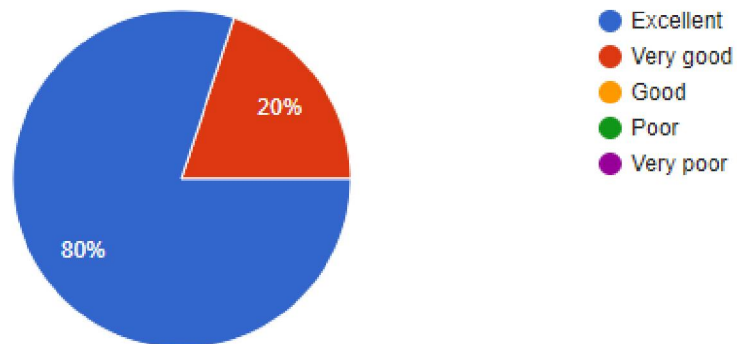


Figure 5 Rating of working conditions

Rating interactivity in workshop

15 responses

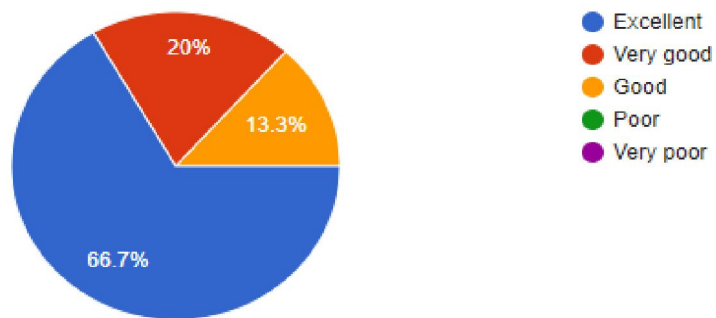


Figure 6 Rating interactivity in workshop

Assessing the fulfilment of expectations regarding workshop

15 responses

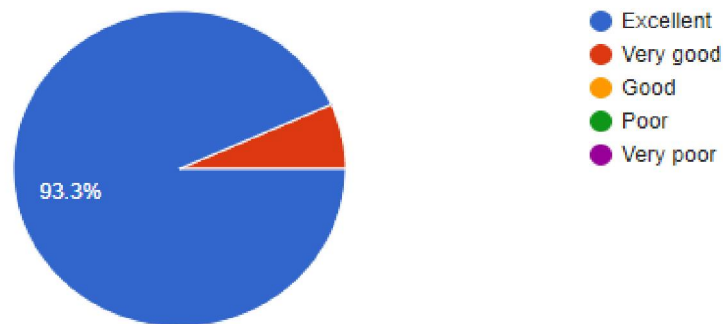


Figure 7 Assessing the fulfilment of expectations regarding workshop

Overall impression

15 responses

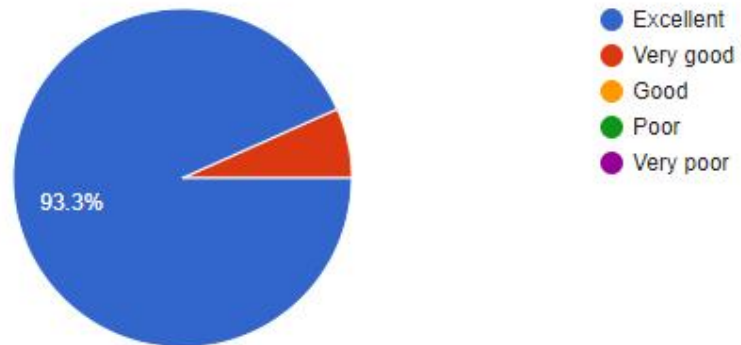


Figure 8 Overall impression

ANNEX I – Workshop agenda

Workshop on the sustainability of the SWARM

20-21 December 2021, Thessaloniki, Greece

Venue: Department of Civil Engineering, Div. of Hydraulics & Environmental Engineering

Monday, 20 th December 2021		
Department of Civil Engineering, Div. of Hydraulics & Environmental Engineering		
09:30-10:00	SWARM participants registration	
First Session – Sustainability in general		
10:00-10:10	Welcome speech	Panagiotis Prinos, AUTH
10:10-10:35	Dissemination and sustainability	Milan Gocić, UNI
10:35-11:00	Experiences and good practices in the implementation of EU infrastructure project RISK at the University of Rijeka, Faculty of Civil Engineering (UNIRIFCE)	Nevenka Ožanić, UNIRIFCE
11:00-11:25	Experiences and good practices from Austria	Michael Tritthart, BOKU Daniel Wildt, BOKU
11:25-11:50	Experiences and good practices from Bulgaria	Petar Filkov, UACEG
11:50-12:15	The Continuity and Future of a Joint Scientific Project: Experiences from Water-related Projects	Maria Manuela Portela, UL Luis Angel Espinosa, UL
12:15-12:35	Experiences and good practices from Greece	Elpida Kolokytha, AUTH Skoulikaris Charalampos, AUTH
12:35-13:00	Exit strategies	Zakhar Maletskyi, NMBU
13:00-14:00	Lunch	
Second Session – Group work on sustainability		
14:00-15:45	Group work on sustainability of achieved SWARM results and collaboration with industry	Zakhar Maletskyi, NMBU Milan Gocić, UNI
15:45-16:00	General conclusions	

Tuesday, 21 st December 2021		
Department of Civil Engineering, Div. of Hydraulics & Environmental Engineering		
Third Session – Keeping project results alive		
09:30-09:55	Results from winter school at UNIRIFCE	Barbara Karleuša, UNIRIFCE
09:55-10:20	Results from winter school at BOKU	Daniel Wildt, BOKU

10:20-10:45	Results from winter school at UACEG	Petar Filkov, UACEG
10:45-11:10	Results from winter school at AUTH	Panagiotis Prinios, AUTH Skoulikaris Charalampos, AUTH
11:10-11:30	Sustainability of WB developed LLL courses	Milan Gocić, UNI
11:30-12:00	Coffee break	
Fourth Session – Overview of the funding landscape to initiate further cooperation		
12:00-13:00	Future collaboration	All participants
Fifth Session – Impact of the SWARM results on different levels		
13:00-13:20	Impact of the SWARM results on the HEIs in Bosnia and Herzegovina	Emina Hadžić, UNSA Merima Šahinagić-Isović, UNMO
13:20-13:40	Impact of the SWARM results on the HEIs in Kosovo*	Jelana Djokić, UPKM Jelena Rajović, AASKM
13:40-14:00	Impact of the SWARM results on the HEIs in Serbia	Maja Petrović, UNS Slaviša Trajković, UNI
14:00-14:20	Impact of the SWARM results on the HEIs in Montenegro	Ivana Ćipranić, UoM Biljana Šćepanović, UoM
14:20-14:40	Impact of the SWARM results on the water-related sector	Olivera Gavrilović, PWMC VV Jelena Vojvodić, PWMC VV
14:40-15:00	Impact of the SWARM results on international level	Skoulikaris Charalampos, AUTH
15:00-15:30	Conclusions from the workshop	

ANNEX II – Attendance list

Name	Country	Participation
Milan Gocić	P1-UNI	In-person
Slaviša Tajković	P1-UNI	In-person
Vojkan Miladinović	P1-UNI	In-person
Michael Tritthart	P2-BOKU	Online
Daniel Wildt	P2-BOKU	In-person
Zakhar Maletskyi	P3-NMBU	In-person
Panagiotis Prinos	P4-AUTH	In-person
Skoulikaris Charalampos	P4-AUTH	In-person
Petar Filkov	P5-UACEG	Online
Barbara Karleuša	P6-UNIRIFCE	Online
Bojana Horvat	P6-UNIRIFCE	Online
Nevenka Ožanić	P6-UNIRIFCE	Online
Luis Angel Espinosa	P7-UL	Online
Maria Manuela Portela	P7-UL	Online
Maja Petrović	P8-UNS	In-person
Vesna Mašulović	P8-UNS	In-person
Emina Hadžić	P9-UNSA	In-person
Suada Sulejmanović	P9-UNSA	In-person
Ammar Šarić	P9-UNSA	Online
Merima Šahinagić-Isović	P10-UNMO	In-person
Marko Čeček	P10-UNMO	In-person
Jelena Đokić	P11-UPKM	In-person
Gordana Milentijević	P11-UPKM	In-person
Milan Mišić	P12-AASKM	In-person
Ivana Čipranić	P13-UoM	In-person
Biljana Šćepanović	P13-UoM	In-person
Olivera Gavrilović	P14-PWMC VV	Online

ANNEX III – Accompanying photos

