



Co-funded by the
Erasmus+ Programme
of the European Union



Impact of the SWARM results on the HEIs in Montenegro

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

University of Nis



www.swarm.ni.ac.rs

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

Project number: 597888-EPP-1-2018-1-RS-EPPKA2-CBHE-JP



Co-funded by the
Erasmus+ Programme
of the European Union



Basic Information

Contract number	597888-EPP-1-2018-1-RS-EPPKA2-CBHE-JP
Project acronym	SWARM
Project name	<i>Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders</i>
Project duration	15th November 2018 - 14th November 2021
Programme	Erasmus+ Call for Proposals EAC/A05/2017
Total cost	931,289.00 €
Coordinator	University of Niš, Serbia Univerzitetski trg 2, 18000 Niš, Serbia
Project website	www.swarm.ni.ac.rs
Project e-mail	swarmuni@gmail.com

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

www.swarm.ni.ac.rs



Motivation

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**.



Overall Broader Objective

Education of experts for water resources management in the
Montenegro
in line with the national and EU policies.

Specific Objectives

- **Improve the level of competencies and skills in MNE HEIs** by developing new and innovative master programmes in the field of water resources management (WRM) in line with the Bologna requirements and national accreditation standards
- **Design and implement new laboratory** in MNE HEIs in cooperation with EU project partners
- **Develop and implement LLL courses for the water sector** in line with EU Water Framework Directive

Work Packages

Preparation WP1: Analysis of water resources management in the Western Balkan region

Leader: **University of Natural Resources and Life Sciences, Vienna (BOKU)**

Development WP2: Development of competence-based curricula aligned with EU trends

Leader: **Aristotle University of Thessaloniki (AUTH)**

Development WP3: Development of trainings for professionals in water sector

Leader: **University of Pristina in Kosovska Mitrovica (UPKM)**

Development WP4: Implementation of developed master curricula and trainings

Leader: **Norwegian University of Life Sciences (NMBU)**

Work Packages

Quality Plan WP5: Quality assurance and monitoring

Leader: **Universidade de Lisboa (UL)**

Dissemination & Exploitation WP6: Dissemination and Exploitation

Leader: **University of Niš (UNI)**

Management WP7: Project management

Leader: **University of Niš (UNI)**

The role of the UoM (FCE) in SWARM

- 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.

The role of the UoM (FCE) in SWARM

- UoM(FCE) laboratory: Exercises at the master's program Water Engineering.



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

www.swarm.ni.ac.rs

Impact 1

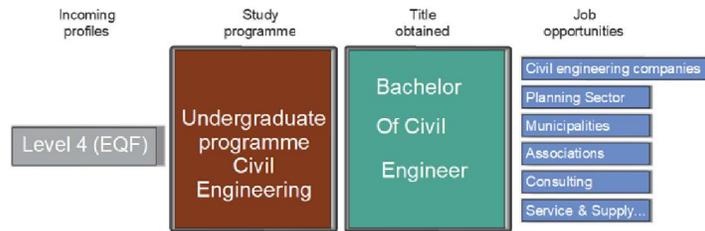
- **Academic staff at UoM** have a direct benefit in the HEI per year through:
 - development of courses,
 - lecturing,
 - trainings,
 - study visits and workshops,
 - collaboration with other members in the Consortium,
 - utilization of the equipment,
 - development of new competences,
 - involvement in dissemination actions, and other.

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

www.swarm.ni.ac.rs

UNDERGRADUATE

STUDY PROGRAM CIVIL ENGINEERING	Module 1 CONSTRUCTION
	Module 2 INFRASTRUCTURE



Semester 3

- Basics of Hydrotechnical Engineering *

* - existing course
(e) - elective course

Programme title: CIVIL ENGINEERING

Level: Undergraduate academic studies

EQF level: 6th level

Academic title: Civil Engineer –Bachelor of Civil Engineering – 180 ECTS

Language: Montenegrin

Duration: 3 years – 6 semesters

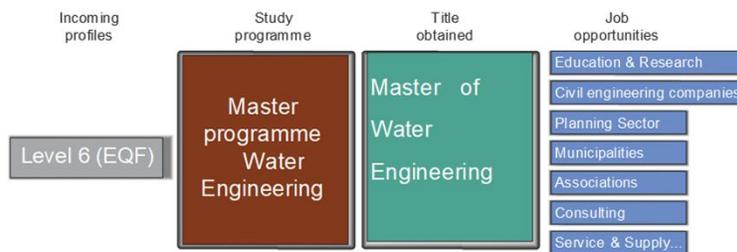
ECTS credits: 180 ECTS

MASTER STUDIES

<u>Study program</u> CIVIL ENGINEERING CONSTRUCTION	<u>Module 1</u> CONCRETE AND MASONRY STRUCTURES
	<u>Module 2</u> STEEL, COMPOSITE AND WOOD CONSTRUCTION
	<u>Module 3</u> GEOTECHNICS
	<u>Module 4</u> MODELING AND THEORY OF STRUCTURES
<u>Study program</u> CIVIL ENGINEERING INFRASTRUCTURE	<u>Module 1</u> TRAFFICS ENGINEERING
	<u>Module 2</u> WATER ENGINEERING
<u>Study program - Interdisciplinary</u> MANAGEMENT IN CIVIL ENGINEERING	

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

www.swarm.ni.ac.rs



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

www.swarm.ni.ac.rs

**MASTER STUDIES- CIVIL ENGINEERING INFRASTRUCTURE –
MODULE 2 – WATER ENGINEERING**

Name of the subject	Sem.	The number of classes			No. ECTS
		L	E	LB	
FIRST YEAR					
I - COMMON SEMESTER					
1 ENGINEERING GEODESY	1	2	1	1	5
2 ENGINEERING GEOLOGY	1	2	1	1	5
3 PROJECT MANAGEMENT	1	2	1	1	5
4 ENGINEERING HYDRAULICS	1	2	1	1	5
5 HYDROLOGY	1	2	1	1	5
6 MANAGEMENT IN CIVIL ENGINEERING	1	3	1	1	5
Total of active teaching		13	6	6	
Total of ECTS credits					30
MODULE 2 WATER ENGINEERING – II – SEMESTER					
1 ENGINEERING HYDROLOGY	1	2	1	1	5
2 HYDRAULIC STRUCTURES	1	2	1	1	5
3 MUNICIPAL HYDROTECHNICS	1	3	1	1	5
4 WATER PROTECTION AND QUALITY	1	2	1	1	5
5 RIVER REGULATION	1	2	1	1	5
6 MODELING IN HYDRAULIC ENGINEERING	1	1	0	3	5
Total of active teaching		12	5	8	
Total of ECTS credits					30
SECOND YEAR					
MODULE 2 WATER ENGINEERING – III – SEMESTER					
1 WATER TREATMENT	1	2	1	1	5
2 MEASUREMENTS IN HYDROTECHNICS	1	2	1	1	5
3 USE OF WATER POWER	1	3	1	1	6
4 DRAINAGE AND IRRIGATION	1	2	1	1	5
5 PORTS AND HARBORS	1	2	1	0	4
6 HYDRAULIC OF GROUNDWATERS	1	2	1	1	5
7 MASTER'S THESIS	1	13	6	6	30.0
Total of active teaching	V	26	12	11	60
Total of ECTS credits					120

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

www.swarm.ni.ac.rs

Programme title:	CIVIL ENGINEERING MASTER – STUDY PROGRAMME INFRASTRUCTURE – MODULE - WATER ENGINEERING
Level:	Master academic studies
EQF level:	7 th level
Academic title:	Graduated Civil Engineer Master – WATER ENGINEERING – 300 ECTS
Language:	Montenegrin
Duration:	2 year –4 semesters
ECTS credits:	120 ECTS

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

www.swarm.ni.ac.rs



At the UoM, the interest in enrolling in these studies is growing.

17 students enrolled Master studies /Water Engineering this academic year.

Upon completion of this program, students may continue their education in the Doctoral Studies program in Civil Engineering at home or abroad.



Impact 2

Impact on the individuals 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.

Impact 3

- **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 4

- **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.

Theme-based training of teaching staff



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

Laboratories equipped



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

swarm

Co-funded by the Erasmus+ Programme of the European Union

Handbook for the training in WRM

2020 ERASMUS+ Projekt

Priručnik za obuku za upravljanje vodnim resursima

February, 2020.

www.swarm.ni.ac.rs

<http://www.swarm.ni.ac.rs/activities?id=53>

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

www.swarm.ni.ac.rs

swarm

Co-funded by the Erasmus+ Programme of the European Union

Webinar – Frontiers in WRM

Webinar

Frontiers in Water Resources Management

Tuesday, 5th May 2020

6 panelists
75 participants from 28 countries

9:00 Greetings and Welcome
Milan Godić, University of Niš
Zakhar Maletskiy, Norwegian University of Life Sciences

9:05 Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders (SWARM)
Milan Godić, University of Niš

9:15 Perception of Strengths and Weaknesses towards Improving Water Resources Management in the Western Balkans
Michael Tritthart, University of Natural Resources and Life Sciences, Vienna

9:30 Water Resources Management issues in Bosnia and Herzegovina
Emina Hadžić, University of Sarajevo

9:45 Analyse of water sector needs in the Western Balkans
Milan Godić, University of Niš

10:00 Water Resource Management in Cold Climate
Harsha Ratnaweera, Norwegian University of Life Sciences

Contact & Info
milan.godic@gaf.ni.ac.rs
www.swarm.ni.ac.rs/news-events

Organised by

In the framework of

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Number of participants

Country	Percentage
Norway	1%
Serbia	1%
Bosnia and Herzegovina	1%
Greece	1%
Austria	1%
Croatia	1%
Sri Lanka	13%
Germany	8%
Russian Federation	5%
Ukraine	19%
India	3%
Other countries	45%

<http://www.swarm.ni.ac.rs/activities?id=55>

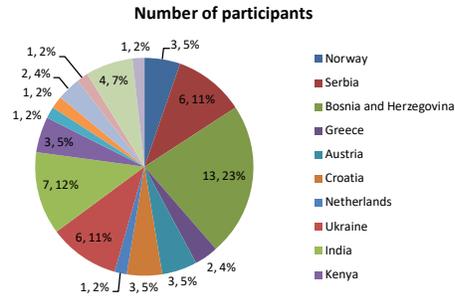
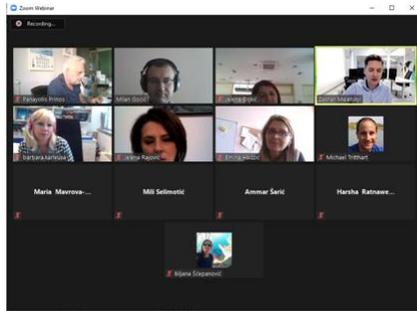
Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders

www.swarm.ni.ac.rs

Inter-project coaching meeting

18 panelists
57 participants from 16 countries

- Two main topics:
- Innovation in teaching and learning methods
 - Achieved synergy with a non-academic sector



<http://www.swarm.ni.ac.rs/activities?id=60>

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

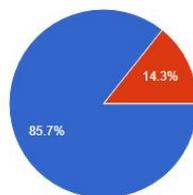
www.swarm.ni.ac.rs

Training in water resources management

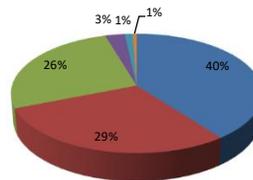
three-day training
14 panelists
174 participants from 6 WB countries and 45 water related companies

- Topics related to the professionals in the water sector
- Academic and panelists from the water sector

Overall impression



- Excellent
- Very good
- Good
- Poor
- Very poor



- Bosnia and Herzegovina
- Montenegro
- Serbia
- Croatia
- North Macedonia
- Kosovo*

<http://www.swarm.ni.ac.rs/activities?id=75>

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

www.swarm.ni.ac.rs



Symposium

Academic staff from UoM take part in the Symposium

Water Resources Management: New Perspectives and Innovative Practices

Co-funded by the Erasmus+ Programme of the European Union 

International Symposium

Water Resources Management: New Perspectives and Innovative Practices

September, 23rd-24th 2021
Novi Sad, Serbia

ORGANIZER
Faculty of Technical Sciences
University of Novi Sad

SUPPORTER   Co-funded by the Erasmus+ Programme of the European Union

www.swarm.ni.ac.rs

Strengthening of master curricula in water resources management for the Western Balkans HEIs and stakeholders www.swarm.ni.ac.rs





**Thank you
for your attention!**