



# RESPONSE TO THE FIRST EXTERNAL REVIEWER REPORT

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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 report provides a response to the first external review of the project. The aim of the report is to summarise the external reviewer’s recommendations and Quality Assurance Committee (QAC) team and WP Leaders team responses as part of the framework of WP5 “Quality assurance and monitoring” and activity A5.3 “External evaluation of the project” 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).

The report and its recommendations were discussed during the fourth QAC meeting organized on-line in September 2020.

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## 2. Commendations

In general, the external report highlights some points of commendation and details the projects achievements to date.

### Overall achievement

WB regional issues related to WRM in the field of HEI are analyzed in WP1. The corresponding report (output) of the first activity to identify the current state targets Bosnia and Herzegovina, Kosovo, Montenegro, and Serbia presenting the following topics: a) the policy, strategic planning and legal framework; b) governance and institutional frameworks; c) management instruments; d) infrastructure development and financing; e) sources of financing for WR development; f) outcomes and impact; g) priority challenges; and g) issues in WRM in WB. The second activity targets analysis of EU innovations in water policy and EU recommendations and legislation in water sector by analyzing the EU legislation for the directives targeting: a) water framework; b) floods; c) drinking water; d) ground water; e) urban waste-water treatment; f) industrial emission; g) renewable energy; h) habitats; i) birds; and other related directives. Analysis of master curricula related to WRM in EU and WB countries is reported in the third activity. Needed laboratory resources in WB HEIs are identified in the fourth activity in alignment with formed EU HEIs WM laboratory equipment. The fifth activity targets the barriers and opportunities for innovative EU practices in the WRM reported by the organized workshop. The general overview of existing successful models of education in the field of WRM of EU HEIs and comparative analysis with the existing curricula in WB partner countries will represent the basic guidelines for the definition and development of the new courses and master curricula in WB countries.

WP2 addresses curricula development activities organized in 6 activities, which are completed besides the fourth activity. The first activity aiming at development of specific competencies and learning outcomes of curricula in WB is reported by a corresponding catalogue, along with career opportunities with specific job descriptions. Development of courses content and syllabi is reported in the corresponding report for the second activity WP.2.2 and Innovation of existing and development of new master curricula for WRM in WB in the third activity. The fourth activity for course accreditation is on-going. The fifth activity on acquired teaching and learning methods is well documented covering both the strategy and realized activities and their outcomes. Purchase of required literature, equipment and software is documented in the report of the sixth activity.

Trainings for professionals are objective of WP3 realized in three activities. The first activity introduces LLL courses about WRM in EU countries, and the second analyses water sector needs and companies in WB countries. The last activity targets development of training material on WRM.

WP4 is dedicated to implementation of developed master curricula (accreditation) that are forthcoming activities or currently in progress.

Quality assurance and monitoring are developed within WP5. The first activity to develop quality plan is well documented with corresponding procedures, tools, and specification of relevant internal and external evaluation, along with specification of reporting templates, questionnaires and forms. The other activities cover a) Regular Quality Assurance Committee meetings; b) External evaluation of

the project; c) External financial control; and d) Inter-project coaching, which are on-going activities in progress.

Dissemination and exploitation constitutes WP6 in 6 planned activities. The dissemination and exploitation plan contains all necessary elements and details for dissemination, communication and exploitation strategy, with defined objectives, activities, target groups, key messages, specification of dissemination tools, monitoring and evaluation, and exploitation including sustainability. Branding activities resulted with clear development of logos and key messages. Opened social network profile and project web site has ensured electronic presence and wider dissemination. The project participants have created a very functional and transparent web site within the second activity, where one can get info on reports on realized project activities. The web site is constantly updated with new information. The project management platform is used to communicate all partners about activities. Promotional materials include brochure, poster, rollup, folder, notebook, bag, tags, etc. All partners have created their web pages and links to other web sites with the project results. The following activities are still in progress and are regularly updated (info day for student enrolment, roundtable with academic sector, winter/summer schools and promotional symposium).

WP7 is devoted to project management activities. The first three activities include local project and Brussels kick-off meetings, and development of the project management plan. They are completed and well documented. The remaining three activities about steering committee meetings, regular project coordination and development of reporting documents are on-going in progress. The management guide contains all relevant specifications of management structure, roles and responsibilities, decision-making, management procedures, monitoring of realization, output delivery, reporting templates and forms, communication methods, protection of intellectual property, financial management, and contingency plan. All public documents are transparent on the web site and they confirm that relevant activities were undertaken to manage all required activities and solve problematic issues, by established project management procedures. A software platform was used to enable monitoring of activities by corresponding project management bodies and coordinators. Detailed reports including presentations are given for all meetings, including, kick off meeting, steering committee and project management meetings, developed project management and reporting guidelines. For day-to-day activities, they use relevant project management software. Preventive monitoring visits are documented by relevant agenda, minutes and presentation slides.

## Relevance

This project addresses relevant and actual issues about WRM in WB countries. A lot of activities were realized within the project scope to develop curricula and organize specific trainings for improving the skills and competence level. The realized activities defined in the project *correspond* to the *project objectives* and addressed *real problems and needs*. The project partners have analysed and defined requirements, state-of-the-art situation in WRM developed curricula and trainings and organize relevant dissemination activities.

The *target beneficiaries*, as defined within the project proposal have participated in planned activities and organized events (seminars, trainings, etc.) and other measures were taken to support the project realization.

Curricula were developed according to a relevant methodology, analysing the needs, and mapping skills and knowledge to competences and learning objectives. All trainings and presentations were carefully prepared and organized. Final reports on all organized events and delivered presentations are transparent and accessible on the web containing details on the organization, intended goal, lecturers and participants.

Relevance can also be confirmed by a relatively high number of participants, quality of presentations and evaluation reports of these events.

## Efficiency

The well documented reports about realized project activities and delivered outputs confirm well transformation of the inputs to outputs. The used project management software ensures that all participants are communicated. In addition, it enables a platform for monitoring of realized activities, raising the efficiency on a higher level, although the projects targets coordination of a relatively huge number of project participants.

Analysing the execution of activities, one can conclude that all scheduled tasks started and are executed in planned deadline. No severe deviations have been noticed in project executions, besides small delays due to Corona-19 situation, expecting to prolong accreditation of new curricula.

## Effectivity

All wider and specific objectives defined in the project proposal are fulfilled and all main outputs delivered.

The reports shared on the project web site confirm that the project purpose was reached by a high number of participants on the organized events.

## Impact

The project has a large contribution to the realization on the general goal to educate experts from WRM in WB. The overall impression of the project is that it will have a great overall impact. All planned outcomes are being delivered or are in progress according to the initial project plan without deviations.

## Sustainability

WP6 specifies details on exploitation including sustainability.

Analysing the project sustainability, I would suggest more efforts to be set in enabling work positions for prospective students, as this will be motivator for students to study the proposed master curricula. This can be achieved by initiating a development strategy on a national or local level that will organize administration or institutional support of WRM.

Financial sustainability needs to be supported by action plans or decisions in addition to the adopted University strategical documents in order to ensure that the University will continue to finance and organize the new master curricula and organize trainings after project termination.



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### 3. Recommendations

#### Minor remarks and recommendations of the external reviewer concerning the reports of WP1 and relevant responses by BOKU

- The strategy for identification of the current state should be documented and explained why only the selected criteria are analysed for a specific topic. For example, policy and strategic planning is not sufficient, I recommend including action plans and monitoring of their realization in the report since the annexes reference them.

As stated in the introduction the reports related to Water Resource Management in WB have been developed based on guidelines by UNEP (2012). Thus the criteria were also selected according to these guidelines. There is an extensive summary and synthesis in the report on WP 1.1 (section 9: Issues in Water Resource Management in WB). This section also includes recommendations and ideas on how to implement and monitor improvements related to issues in Water Resources Management in WB.

- Although a comprehensive analysis of the state-of-the art is provided in WP.1 only the needed equipment was reported to upgrade the HEIs in the project context. The report does not contain a summary of missing skills and knowledge topics that are essential for development of curricula. Note that the fifth activity (WP.1.5) includes the presentation of challenges and barriers, and a relevant summary will increase the quality of the WP 1 results.
- The competences in WP.2 should follow the summary of the skills and knowledge requirements identified in WP.1. Therefore, these requirements are missing, although there is a comprehensive list of generic and specific competences expected within the new curricula.

The title of WP 1.4 is “Identification of needed laboratory resources in WB HEIs and alignment with formed EU HEIs WRM laboratory equipment list”. This is why the report focuses on needed equipment. Missing skills and knowledge has been identified in the course of WP 1.3, where master curricula of all partner countries were analysed. A list of missing skills and knowledge gaps in WB (including descriptions) are compiled by WB partners and annexed to deliverable WP 1.3 (<http://www.swarm.ni.ac.rs/activities?id=22>).

So far the report of WP 1.5 includes an introduction and presentation of a group discussion which summarize the innovative practices in the EU water sector. In order to point out the outcomes of the workshop event more clearly, we added an executive summary to the report of WP 1.5 (<http://www.swarm.ni.ac.rs/activities?id=25>).

#### Reviewer’s comments related to WP2 and relevant responses by AUTh

- In addition, I recommend the Universities to plan adding subjects on resource management of other environmental resources, including renewable energy resources or waste management within the scope of the studies as electives or branches of currently defined studies. Also I recommend adding knowledge and skills of modelling and simulation within WRM.

We appreciate your recommendations and will be taken into account in the future.

- The competences in WP.2 should follow the summary of the skills and knowledge requirements identified in WP.1. Therefore, these requirements are missing, although there is a comprehensive list of generic and specific competences expected within the new curricula.

After the inclusion of the annex to WP1.3 the competences followed.

- The WP.2.1 report needs a clear distinction of WRM competences from competences for other sciences or engineering topics.

We agree with the comment and a clear distinction of WRM competences from competences for other sciences or engineering topics was included. This extended the corresponding table in the Catalogue of Competencies in WP 2.1 (generic and specific to WRM). The competences were reorganized to generic, engineering and WRM competences in accordance to the evaluator comments. Various extra WRM competences have also been added (<http://www.swarm.ni.ac.rs/activities?id=43>).

- The potential links in the report of WP.2.1 is obsolete since it is presented in details for each University in the report of WP.2.2.

We agree with the comment and we removed the potential links in the revised version of WP.2.1. Changes of some courses (UNI and UPKM) were implemented. The report WP2.2 contains new section 1.1 Methodology for the SWARM competence-based curricula development as well as updated sections related to the making links between competencies and courses (<http://www.swarm.ni.ac.rs/activities?id=46>).

- Some of the generic competences are neither covered by mandatory nor by elective subjects, and they need to be specified, or relevant clarification where these competences will be achieved.

After the revision of the competences the new list of competences are in line with the above. Subject-specific competencies will be divided into engineering and WRM.

- Although a comprehensive strategy for implementation of course innovation is developed and specified in the report WP.2.3, still the report targets details on the developed curricula and does not present what is the innovation achieved. The document should more clearly specify what is new (method of achieving competences, the program itself) and what is the benefit of the invention in order to justify the innovation, instead of presenting just the study program details. This needs to be updated, also, with a possible list of social, technology development, environment or other benefits.

Clarifications with regard to innovation will be added to the updated version of the report. A new section 2.3 will be added, entitled “Innovation achieved in SWARM courses” (<http://www.swarm.ni.ac.rs/activities?id=51>).

- No need to present the links between the competences and subjects in WP.2.3 since they were elaborated in WP.2.2.

We agree with the comment and removed the potential links in the revised version of WP.2.3. Additionally, the competencies which were not selected will be deleted.

- Details on study programs should be enlisted as annex to the report. Also a description of a study subject needs to be accompanied by recommended and optional literature and the methods how will be the course delivered (weekly hours of lectures, tutorials, practical assignments etc.)

We appreciate your recommendation (NB: it was part of WP 2.3). We believe that the study programs should be described in the main text and not as an annex. In our view, a detailed description of the course (explanations, literature, etc.) should not be part of the SWARM deliverables.

#### **Reviewer’s comments related to WP3 and relevant responses by UPKM**

- The developed training (learning) material should be mapped to skills, knowledge and competences specified in the LLL program.

After the implementation of the Activity 3.1 Report on LLL courses for professionals in EU water sector, EU partners prepared a report regarding LLL courses for professionals in water sector and briefly described them explaining their organization. This report was used for preparing joint training material for education WB professionals in water sector. Trainings’ material is focused on future-oriented water technology, considering the local needs and capabilities, because training and job qualification are critical success factors for a future-oriented development of sustainable water resources management. To identify topics in the field of water resources management, a comprehensive survey of employees in the water sector in the Western Balkans was conducted. A total of 1,136 respondents participated in the survey. Based on the received answers, current topics in the field of water resources management were defined, which were marked as the most desirable for the training of professionals in the water sector. The training material should serve as a basis for employees in the water sector who will attend courses organized by higher education institutions from the Western Balkans as participants in the SWARM project. In addition, the training material can serve anyone interested in the water sector as a basis for obtaining up-to- date information on legal frameworks, technical and technological processes, IT tools, adaptation to climate change, limited availability of water resources, management of atmospheric water quality, use of used water, management flood and drought risk as well as innovative techniques in water resource management.

The learning outcomes for the LLL courses have been provided in WP3.3 document “Training outline and selected trainers” (<http://www.swarm.ni.ac.rs/activities?id=53>).

- Elaboration of selecting the participants in the project activities needs to be extended with explanation why those participants have been included in the events.

Within the scope of Activity 3.2 there was a survey conducted on water sector needs in WB. That survey was used to tailor the trainings to meet the needs of each WB country regarding water dependent jobs. The survey has also provided with data on the water sector professionals, and the general but also a particular level of knowledge among the participants, and their self-assessment on their skills and competencies. The participants were selected based on the survey and in direct meetings with local, regional and national authorities in WB countries regarding WRM. Information regarding selection has been added to WP3.3 document “Training outline and selected trainers” (<http://www.swarm.ni.ac.rs/activities?id=53>).

- There is no report how many handbooks were printed or distributed, and/or promoted to relevant staff working in governmental institutions from WRM.

UPKM has printed 420 copies of the handbooks those will be used for trainings. The handbooks were distributed to the WB partners on the projects. The handbooks will be promoted during the trainings for the relevant staff working in governmental institutions from WRM.

This will be a part of the final dissemination report and also WP3.3 document “Training outline and selected trainers” (<http://www.swarm.ni.ac.rs/activities?id=53>).

- Although not directly planned, I strongly recommend organizing LLL courses within developed curricula and training material.

The trainings will be held for the professionals in water sector based on the reports on LLL courses in EU, survey and by using the training material produced in the Activity 3.3, as a part of Activity 4.2.

#### External reviewer recommendations – Relevance

- Within the WP3 there is no specific action that plans realization of LLL courses in WB, although the state-of-the-art in EU is well documented, needs for WB are analysed and training material developed. I would encourage additional activities outside the project scope to organize such courses. This would be a great add on value to the project to cover the third specific objective of the project.

We established a programme description that will be used during the implementation of LLL trainings (WP4.2 Implementation of trainings for professionals in water sector). They will be realized in December/January 2020/2021 in the framework of WP4.

- I recommend raising the awareness level at wider community, including other WB countries, by inviting them on dissemination or training events. This will improve the regional cooperation and overall visibility of the project results and outcomes.

Not only representatives from WB countries but also a wider public have been/will be invited to be a part of the SWARM dissemination activities. The lists of invited people and participants were provided and were a part of the SWARM reports. For example, in total 111 participants registered for the webinar “Frontiers in Water Resources Management”, 75 attended from 28 countries (Norway, Serbia, Bosnia and Herzegovina, Greece, Austria, Croatia, Sri Lanka, Germany, Russian Federation, Ukraine, India, Kenya, Republic of Moldova, Uganda, Bulgaria, Montenegro, Portugal, Belgium, Malaysia, Belarus, Kyrgyzstan, Bangladesh, Canada, Tajikistan, Kazakhstan, Saudi Arabia, France, United Kingdom) or 68% attendance rate. Also, in total 72 participants registered for the Inter-project coaching event, 57 attended from 16 countries (Norway, Serbia, Bosnia and Herzegovina, Greece, Austria, Croatia, Netherlands, Ukraine, India, Kenya, Uganda, Bulgaria, Montenegro, Portugal, Kazakhstan, Kosovo\*) or 79.17% attendance rate.

- The project outputs need to be disseminated to non-academic persons and business partners, including those that were contacted for analysis of the needs within WP.2.

The project outputs have been disseminated distributing promotional material during face-to-face events or on-line events sending pdf versions, presenting papers related to the SWARM projects at the national or international scientific events such as conferences, seminars or workshops, using website and social networks and through producing and distributing of bi-annual newsletters including promotional materials and achieved results.

- This project should also raise awareness about skills and competences that will be achieved by the prospective master students, and influence governmental institutions about competent staff for future WRM on national and local levels. These governmental institutions and relevant business sector may support realization of new curricula by introducing possibility of scholarships and internships or provision of lectures and courses for relevant staff.

We agree that in the context of the developed WRM programs, lifelong learning courses addressed to existing employees in WRM, government institutions and businesses could create the conditions for better understanding, support and sustainability in the teaching WRM. In the SWARM project LLL courses are prepared.

Invitation of persons from some governmental institutions at the roundtables or similar dissemination events has been planned. In the future, organization of lectures in water companies and visits, for example hydropower stations, water supply companies will be planned.

- I recommend the Universities to plan adding subjects on resource management of other environmental resources, including renewable energy resources or waste management within the scope of the studies as electives or branches of currently defined studies.

Two partners (UPKM and UNS) added subjects related to environmental resources. Also, WB partners will develop some slides regarding environmental resources which will be a part of existing courses. As a suggestion for realization in the future, WB partners should try to create a list of subjects from different fields that students can select.

- I recommend adding knowledge and skills of modelling and simulation within WRM.

We agree that knowledge and skills for modeling and simulation in WRM are extremely important. We will check how well they are offered through relevant courses in the developed WRM programs. We would make changes if necessary.

WB stressed using tools for modeling in their subjects. The list of competencies has been extended and the current list includes general, engineering and water resources management competencies.

Also, in the SWARM unique set of courses (<http://www.swarm.ni.ac.rs/activities?id=46>) and the Report on SWARM master curricula (<http://www.swarm.ni.ac.rs/activities?id=51>), it is written in the "objectives" and "competences" and after in tables "link between competences and subjects":

- "implementation of advanced computational models in solving technical problems",
- "using appropriate engineering software packages as an aid to research, analysis, problem solving and presentation",
- "application of computational models for solving engineering problems in construction".

- Relevance can also be confirmed by a relatively high number of participants, quality of presentations and evaluation reports of these events.

Please find the links to our organized webinars: a) <http://www.swarm.ni.ac.rs/activities?id=60> and b) <http://www.swarm.ni.ac.rs/activities?id=60>.

- I recommend that the event organizer and project coordinators also to report on the selection criteria for all participants on realized activities, in order to ensure that the main target audience is communicated.

Final dissemination report will include the selection criteria also report Training outline and selected trainers developed (<http://www.swarm.ni.ac.rs/activities?id=53>) under activity WP3.3 contains selection criteria for the participants at the planned trainings for professionals in the water sector.

#### **External reviewer recommendations – Impact**

- I strongly encourage at the last report to include comparison of the situation prior to project start and the situation after finishing the project, such as number of experts in WRM, number of job positions, number of held LLL courses and improvement of competences of existing employees in WRM. This would give sufficient answer on the project impact and quality of project results.

The last report will include the number of students and participants involved in the project realization as well as a feedback after realization of LLL courses which can be used to make some comparisons to the period before the SWARM project. After the project realization, WB partners will check employability in the industry and time to obtain a job.

### External reviewer recommendations - Effectivity

- I would encourage the project coordinator to explain the strategy or methodology how the target group was selected for participation on the events, trainings or mentoring, giving details if all relevant target audience is communicated.

Final dissemination report will include the selection criteria also report Training outline and selected trainers developed (<http://www.swarm.ni.ac.rs/activities?id=53>) under activity WP3.3 contains selection criteria for the participants at the planned trainings for professionals in the water sector. It will also include the communication channels to achieve the desired number of participants.

### External reviewer recommendations - Sustainability

- Are the benefits of the project and exploitation of the results going to be extended also after the project lifetime/financing period?

Accredited curricula will be supported by the national ministries of education. Training material will be freely available. LLL courses will be a part of LLL centers at WB universities or corporate centers, where it is possible.

- I would suggest more efforts to be set in enabling work positions for prospective students, as this will be motivator for students to study the proposed master curricula. This can be achieved by initiating a development strategy on a national or local level that will organize administration or institutional support of WRM.

Thanks for the suggestion. We would consider initiating the creation of WRM strategy at national or local level. In this way, we will provide interest in the future WRM program on national and local levels and new jobs for our students.

- Financial sustainability needs to be supported by action plans or decisions in addition to the adopted University strategical documents in order to ensure that the University will continue to finance and organize the new master curricula and organize trainings after project termination.

Revised the Project management and reporting guide (<http://www.swarm.ni.ac.rs/activities?id=9>) included the links between previous adopted documents and environmental science and WRM field.

### Additional activities suggested to improve the relevance, and overall project impact

- Four WB countries are included in the project. I strongly recommend including also North Macedonia and Albania, at least in the dissemination phase.

Representatives from North Macedonia and Albania will be invited to participate in the future dissemination events.

- Although not directly planned, I strongly recommend to organize LLL courses within developed curricula and training material.

Training material was produced under activity WP3.3 Development of trainings' content and corresponding educational material. The trainings will be held for the professionals in water sector based on the reports on LLL courses in EU, survey and by using the training material produced in the Activity 3.3, as a part of Activity 4.2. In future, WB partners can plan accreditation of one course/subject from the developed curricula as a LLL course.