



WP2

Development of curricula

Lead Organization of WP2: **UNS - Serbia**

Participating Organization: UB; UNI; UBL; UNSA; INSZASUM; BOKU;
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Title: Defined goals, competences and learning outcomes of bachelor and master curricula

Participating Organization: UB; UNS; UNI; UBL; UNSA



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Defined goals/objectives, competencies and learning outcomes of Bachelor and Master curriculum

Soil erosion and floods are identified as one of the main land degradation drivers in the Bosnia and Herzegovina, through Land Degradation Neutrality Target Setting Process. Considering the importance of prevention and control of soil erosion as a human induced phenomena, which as a consequence has torrential floods and floods in general, higher education system of the Bosnia and Herzegovina coming into the focus of decision makers, particularly on the local community levels particularly those affected by floods in the recent decade.

Improvement and modernization of existing erosion/floods related subjects on Bachelor and Master studies at the Faculty of Forestry University of Banja Luka, will create base for better education of students but also experts employed in the forestry/agriculture/water sectors, who are enrolled on Master study program. Capacity building and knowledge improvement of experts in the area of soil erosion and floods, particularly from the prevention and mitigation point of view, will gave new insights and skills recognized on national, but also regional and international level. Existing Bachelor and Master studies (syllabus and subjects) at the Faculty of Forestry University of Banja Luka, are not aligned with the requirements of practice and international commitments that Republic of Srpska (Bosnia and Herzegovina) has. Achievement of land degradation neutrality, flood mitigation and prevention has been defined as one of the priorities in the future work of relevant institutions asking active participation of science and education. Improvement of existing curricula and subjects on the Bachelor and Master studies at the Faculty of Forestry UBL, will be carried out in accordance with the Bologna Declaration and experiences of EU countries (Austria, Italy, Bulgaria) and countries in the region.

The plan for further upgrading of the existing curricula at the Faculty of Forestry, University of Sarajevo (FFUNSA), taking into account the experience and knowledge gained through cooperation with partners of the SETOF project, is based on the need for new specialized knowledge related to the growing problems caused by torrential watercourses and soil erosion, which are projected to increase in future. Suggestions for innovated goals and competencies have been made for existing programs at the FFUNSA and for a new joint-MSc program which is being developed within the SETOF project.

Integrative management of natural resources has been recognized as very important approach in flood mitigation, where forestry sector plays a central role. Improvement of existing situation and efficient prevention of future floods and soil erosion, draws attention to the importance of highly skilled professionals and experts who will gain required knowledge through improved syllabuses and subjects of Bachelor and Master studies. Sustainable use of natural resources, particularly forests, land, water requires appropriate management systems, but also modern education system in this regard.

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New Master study program established by the University of Belgrade, and supported by University of Banja Luka and University of Sarajevo, will be the starting point for delivering trainings and knowledge to forest engineers and soil scientists how soil erosion can be controlled through implementation of practical techniques. Prevention and combat land degradation, soil erosion, and floods has particular importance on the local level of implementation. With this study program, experts will be trained for innovative techniques and measures that will have a positive impact on sustainable land/forest management reflected through decreased floods events and soil erosion. Students of new Master program will be trained and educated for soil protection, soil erosion control and prevention of torrential floods.

Expected learning outcomes based on modernized Bachelor and Master curricula at the Faculty of Forestry UBL and new Master program established at the Faculty of Forestry UBG are:

- Capability to analyze and research environmental principles related to soil erosion and flood control, aimed to define main gaps and challenges for sustainable soil management and efficient flood prevention and control;
- Knowledge on modern techniques and approach and capability to select and implement the most important ones in the field of soil erosion and floods, to identify appropriate solutions against erosion and prevention of torrential floods;
- Create and develop new systems aimed to protect soil, prevent floods and decrease soil erosion;
- Appropriate application of knowledge and skills, with the capability for lifelong learning.

Expected competencies of the students are:

- Work in teams to design and implement advanced solutions to problems in soil erosion and torrential floods;
- Independently research, analyze and implement tasks in the field of soil erosion and torrential floods;
- Communicate clearly and precisely, both verbally and in writing;
- Think critically and creatively, both independently and with others and organize ideas effectively;
- Ability to prepare effective oral presentations and to deliver it among a broad audience.

Upon finishing modernized study program on Bachelor and Master study at the Faculty of Forestry UBL, and newly established Master program, graduates and experts will be well educated in the field of soil erosion and torrential floods, capable to develop, implement and



control soil erosion and torrential floods, as well as to continue their education in doctoral studies in forestry or other scientific fields of biotechnical sciences.

The innovation of plans and programs entails changes in subjects in the field of erosion protection, torrential and forestry issues that upgrade the outcomes and competencies of BA and MA profiles in both departments of *Forestry and Horticulture* the Faculty of Forestry, University of Sarajevo (FFUNSA). The existing subjects are thematically and substantively relevant to the study programs dealing with sustainable management of forest resources and land resources in general, and can be integrated into the new study program foreseen under the Project. According to UNSA rules, it is possible to innovate existing programs up to 20% in the content of an individual case without the obligation to carry out the approval procedure with the competent ministry. Such innovations in modules will be provided during Project realisation period.

The proposed outcomes for the profile of experts in the field of erosion and torrential flood prevention are as follows:

- Properly interprets and uses specific terminology and principles in the field of torrential and erosion control when communicating with experts in hydrology, spatial planning, urban planning, forestry
- Knows and interprets mechanical and physical processes that cause erosion
- Explains the importance of major factors affecting soil erosion and knows how to evaluate factors and the possibility of erosion development
- Can provide an estimate of expected land loss using mathematical models and is aware of the limitations and conditions of the same estimates
- Can select and design an appropriate erosion measurement scheme ranging from large to small
- Applies some model to evaluate the impact of erosion control factors and measures related to soil erosion
- Identifies erosion risk zones using GIS tools
- Knows erosion protection techniques and techniques

The new module that will be developed during the project is "*Karst Terrain Conservation*" which is based on the need for better experience and deeper knowledge, and skills in the field of management of karst forests and forest lands. The main arguments for treating the problem of soil loss in karst terrains by water and wind, which is about 50% only in Bosnia and Herzegovina, is the possible greater experience and knowledge of such terrains by FFUNSA staff, and therefore the possibility of contributing to a joint study program by transferring their own knowledge.