



Erasmus+



## Cluster Meeting

# “GREEN TRANSITION IN MONTENEGRIN HIGHER EDUCATION LANDSCAPE”

*April 16, 2024*

*Faculty of Civil Engineering, University of Montenegro  
Podgorica*



U eri klimatskih promjena, gradovi moraju biti dobro planirani i upravljanje gradovima mora biti dobro promišljeno.

*Sustainable development, Goal 11*

Prvi korak ka tome je **modernizacija studijskih programa** tako da oni podržavaju rast svjesnosti o životnoj sredini i obezbjeđuju adekvatno znanje i vještine, obrazujući inženjere novog profila.



Motivated by this idea, we are realising the Erasmus+ CBHE project named:  
*Curricula innovation in climate-smart urban development based on green and energy efficiency with the non-academic sector (SmartWB)*

## **MAIN OBJECTIVE**

- Improving the quality of higher education** in the CSUD field by:
- the exchange of knowledge, experience, and good practices,
    - modernising university courses in line with EU trends,
  - improving the level of competencies and skills of teaching staff.

# Work packages

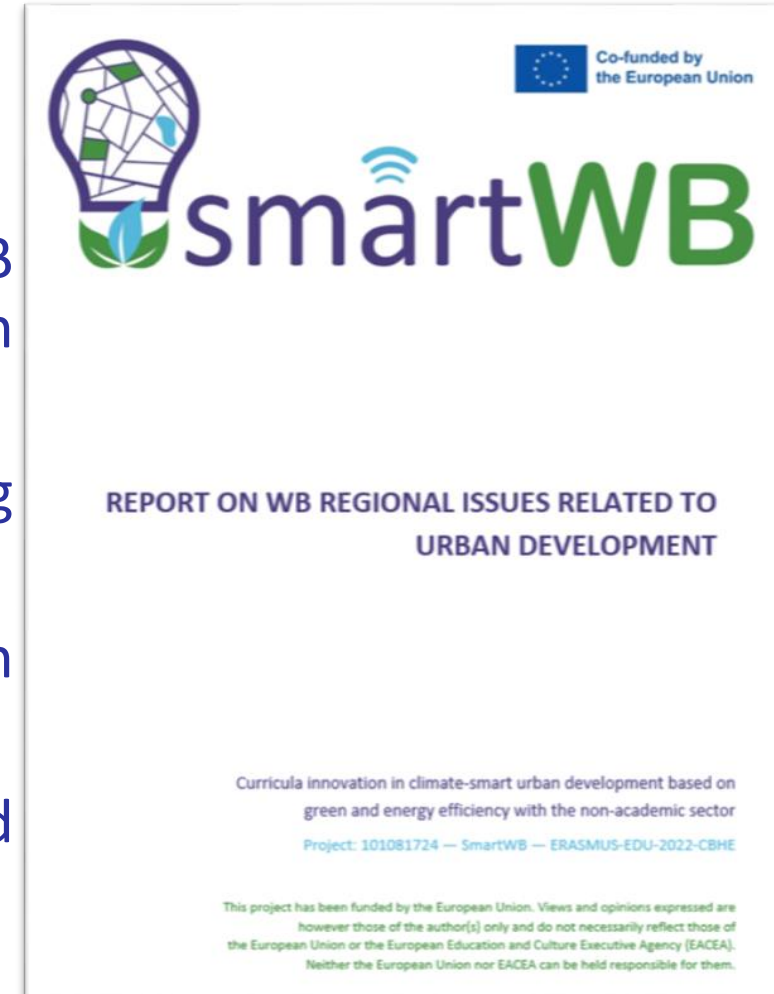
Work Package	Work Package Name	Status	Start Month	End Month
1	Project management and coordination	<i>ongoing</i>	M1	M36
2	Analysis of current status in climate-smart urban development	<i>completed</i>	M1	M6
3	Capacity building of WB HEIs	<i>completed</i>	M1	M17
4	Creating technological platform	<i>in progress</i>	M1	M17
5	Implementation of modernized courses and platform	<i>pending</i>	M17	M36
6	Quality assurance and monitoring	<i>ongoing</i>	M2	M36
7	Impact and dissemination	<i>ongoing</i>	M1	M36

1

*To check the relevance of the curricula innovation in CSUD based on green and energy efficiency, **WB regional issues related to urban development were analysed.***

### *Conclusions:*

- Sustainable urban planning is an important priority for WB countries, as the region seeks to balance economic growth with social and environmental sustainability.
- WB should consider improving energy efficiency and reducing carbon emissions - in cooperation with the academic sector.
- Modern curricula and innovative teaching methods based on up-to-date equipment exploitation are needed.
- A stronger link between academia and bussiness sector should be established.



2

*To indicate the level of readiness for business-academia cooperation and user needs for green jobs and climate-smart solutions*

### *Conclusions:*

- A comprehensive questionnaire was prepared, and a survey was carried out through 369 participants.
- More than 90% of the respondents are ready to adopt new methodologies and technologies, to be competitive for future green jobs.
- Over 60% of respondents in all WB countries believe that it is necessary to innovate current education in terms of CSUD.



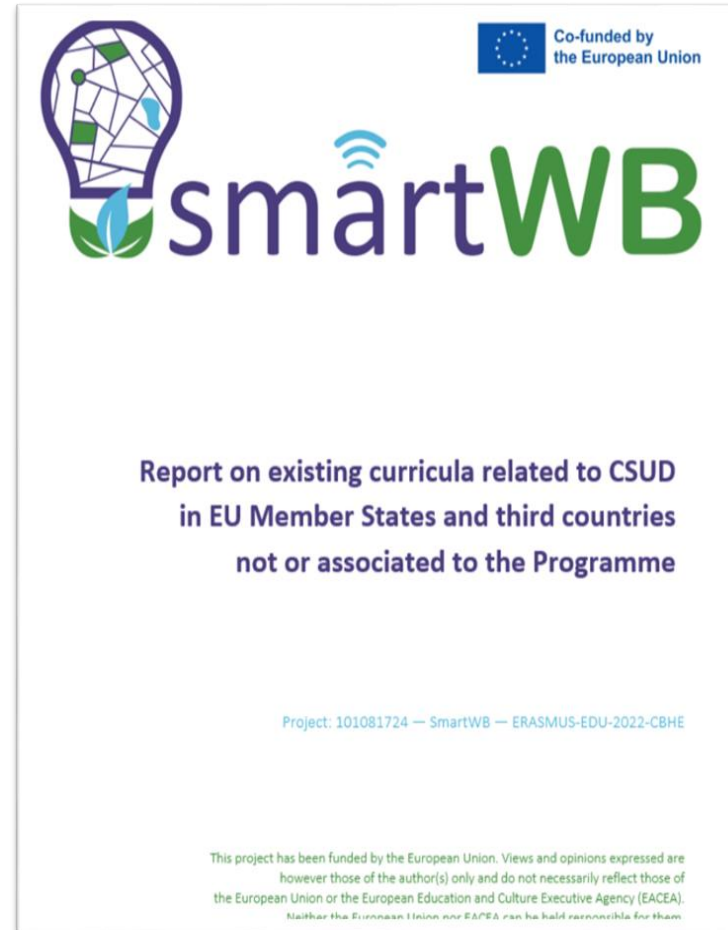


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*Before modernising university courses, the existing curricula related to CSUD in WB HEIs were analysed, and the needs of each HEI were identified.*

### *Conclusions:*

- The analysis showed some structural differences at the curriculum level between the universities from the EU and WB countries. EU universities offer a range of courses and programs related to CSUD.
- The bachelor programs in EU universities have higher concentrations of subjects related to *spatial and urban planning, energy efficiency, and governance and planning policies*. There are fewer or no such subjects in the bachelor programs in WB HEIs.



1

It is essential to modernise these courses to prepare future urban professionals to address the challenges posed by climate change



**20** courses at **7** WB HEIs have been modernised, in collaboration with EU teachers, and the non-academic sector representatives

Chapter 5. Horizontal structural elements/assemblies  
5.1. Massive structures  
5.2. Wooden structures  
Practice 5. Types of massive structures

Chapter 6. Floor and ceiling constructions, sound insulation aspects  
6.1. Floor constructions – characteristics and types  
6.2. Ceiling constructions – characteristics and types  
Practice 6. Significant floor and ceiling constructions in terms of sound insulation

Chapter 7. Openings in the walls - doors and windows  
7.1. Door openings  
7.2. Window openings  
Practice 7. Door and window openings – characteristic dimensions

Chapter 8. Vertical communications in buildings  
8.1. Ramps  
8.2. Stairs – internal and external  
8.3. Elevators  
Practice 8. Construction of reinforced concrete (RC) staircase

Chapter 9. Roofs and roof structures  
9.1. Pitched roofs - roof constructions: rafter roofs, purlin roofs  
9.2. Pitched roofs - roof constructions: roofs on trussed beams, lattice roof trusses;  
9.3. Flat roofs Flat roofs: drainage method, construction composition, finishes and penetrations  
Practice 9. Construction of pitched and flat roofs

Chapter 10. Roof coverings: from baked clay, from different types of materials

Chapter 11. Thermal insulation and external building constructions  
Practice 11. Installation of thermal insulation on building elements

**Chapter 12. Building energy efficiency**  
**12.1. Sustainable design principles for green buildings**  
**12.2. Building energy efficiency and passive house design**  
**12.3. Renewable energy systems and net-zero energy buildings**  
**Practice 12. Possibilities for creating climate-smart buildings**



2

The need to purchase up-to-date laboratory equipment, software, and library units was detected.



The modern laboratory equipment and software is delivered to 7 WB HEIs



3

All WB HEIs expressed their need to establish a better connection with the business sector and to provide new and innovative solutions in CSUD education.

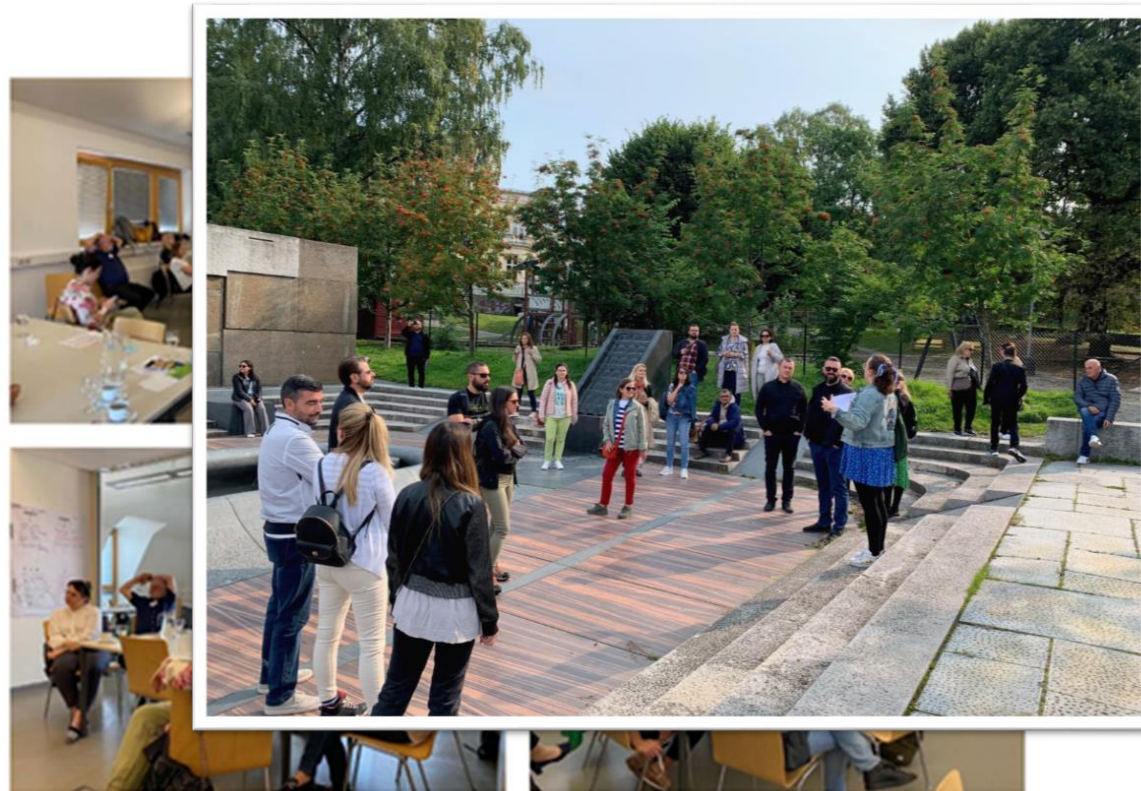


More than 50 agreements for cooperation have been signed between 7 WB HEIs and companies



4

Along with all previously mentioned, **training of the teaching staff** to acquire new teaching methods in the CSUD is in demand.



*Some of the topics:*

Universities in digital revolution era  
Mobile phone as educational tool  
Problem based learning  
IoT and smart cities  
Augmented collaboration toolkit  
E-Learning modules for serious games  
Urban resilience with nature based solutions  
ChatGPT in education  
Digital tools for education

...

## Expected impact of the project

- **Modernised curricula** are based on transferring best practices from the EU to WB HEIs.
- **Trained teaching staff** through theme-based training to acquire new teaching and learning methods.
- **Educated professionals** in the field of CSUD through organised LLL courses.
- Laboratories with **up-to-date laboratory equipment** and software, where the students will gain practical knowledge that can be immediately applied, will strengthen the WB HEIs and CSUD field in the WB region.
- Development of an open **web-based platform** to provide new possibilities for business-academia collaboration by offering state-of-the-art solutions in the field of UD.

## Ostali očekivani uticaji

Jača povezanost sa privrednim sektorom, sa fokusom na teme inovativnih i zelenih rješenja u građevinarstvu

- Potpisani ugovori o saradnji Građevinskog fakulteta sa kompanijama
- Tehnološka platforma za razmjenu znanja i iskustava u oblasti klimatski pametnog urbanog razvoja (najmanje 20 organizacija iz Zapadnog Balkana)

Podizanje nivoa ekološke osviješćenosti svih učesnika u procesima urbanog razvoja

- Promocija ekološkog urbanog razvoja; okrugli stolovi za *feedback* iz ove oblasti
- Radionice na temu inovativnih i zelenih rješenja u urbanoj sredini
- 7 događaja u cilju promocije korišćenja niskougljeničnih tehnologija i rješenja



## Ostali očekivani uticaji

Usklađivanje visokog obrazovanja sa potrebama i promjenama tržišta rada, u cilju lakšeg zapošljavanja svršenih studenata

- Istraživanje privrednog sektora u cilju identifikacije potreba za tzv. zelenim poslovima i klimatski pametnim rješenjima
- Osmišljeni programi za studentske prakse
- 2 sedmice prakse biće obezbijeđeni
- 2-dnevna radionica na temu mogućnosti otvaranja „zelenih poslova“ u urbanom razvoju

Ostvarena saradnja sa novim partnerima i osnažena saradnja sa starim



# HVALA NA PAŽNJI



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