

IMPROVING WESTERN BALKANS' RESILIENCE TO HAZARDS BY BUILDING CAPACITY IN HIGHER EDUCATION

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Abstract

In recent years the number and severity of natural and man-made disasters, as well as fires, has significantly increased. The resilience of the Western Balkans societies to hazards has to be improved, and that can be done by introducing new study programmes and lifelong learning courses in educational offer. It will provide a sustainable educational foundation in Disaster Risk Management and Fire Safety field in Western Balkans countries and ensure national highly skilled professional resources and regional capacity for resilient society. Aim is to build regional-based disaster preparedness and a culture of safety and resilience at all levels according to EU Integration Strategies and National relevant strategies. Based on the above ideas, the project proposal Knowledge FOr Resilient society - K-FORCE was successfully prepared and selected for funding under ERASMUS+ programme Capacity Building in Higher Education - EAC/A04/2015. The partners are eleven HEIs: from Denmark (DTU, AAL), Sweden (LU), Slovakia (UNIZA), FYR Macedonia (UKIM), Bosnia and Herzegovina (UBL,

UNTZ), Albania (UT, EPOKA), Serbia (VTSNS) and 5 non-academic partners (Protection and Rescue Directorate of the Republic of Macedonia, National Fire Safety Association of Republic of Serbia, European Youth Parliament Serbia, Ministry of Security of Bosnia and Herzegovina: Protection and Rescue Sector and Sector for International Cooperation and European Integrations and Union of chambers of commerce and industry of Albania). To become resilient society, it is necessary to implement the EU Civil Protection Mechanism at a regional level and intensively cooperate and communicate, for which a new skilled young workforce is required, well prepared to cooperate in multilingual and multicultural environment. The paper presents the results of survey done among the youth in WBC in order to investigate the level of safety culture and mutual level of understanding the risks in their environment.

Keywords: resilient society, youth, safety culture, higher education.

Introduction

In the past decades the number of natural and anthropogenic disasters and fires has shown a significant growth in the Western Balkans (WB). Human losses, extensive damages to the urban areas, negative environmental impact and further weakening of the regional economy are some of indicators of increasing vulnerability. The WBs are highly prone to natural hazards and to the impacts of climate change. Furthermore, within the last 15 years most of the nations in the region newly gained their independence following a regional conflict and have undergone major structural changes. The newly independent nations and their urban areas sustain inadequate institutional capacities and have significant socio-economic and spatial vulnerabilities, increasing their risk to disasters initiated by natural hazards (Gencer 2014). Preliminary surveys, targeted to identify the problem origin, indicated that competences, knowledge and skills of the existing staff in the field of Disaster Risk Management and Fire Safety Engineering (DRM&FSE) are insufficient to solve its growing problems, as they acquire knowledge and skills from other engineering disciplines. Knowledge and skills shortages in this sector are already being identified by great interest shown after 2014 flood in the WB, while the expected climate change and hazard events expansion will only exacerbate the situation. The recent devastating floods in the WBC region, notably in

Serbia and Bosnia and Herzegovina in 2014, confirmed that most countries of this region continue to have difficulties integrating risk reduction into public investment planning, urban development, spatial planning and management and social protection. With the impact of climate change, combined with changes in land-use patterns, risks of disasters will further increase in the coming years. Within the expanding emergency sector labour market, an urgent demand is expected for more educated and trained staff, as well as for continuing education in DRM&FSE field. There is a rising need for multidimensional approach and interdisciplinary engineering competences. Considering before mentioned, in WB region, available education is becoming insufficient and unsustainable without further modernization. In order to improve the resilience of the region to hazards, it is necessary to provide the required number of experts in the field of DRM&FSE. The concept of resiliency should be an integral part of disaster preparedness. Resiliency emphasizes the capacity of human recourses, infrastructure, operations, and even social systems to respond to and recover from extreme events. A special emphasize should be placed on building countries' financial resilience that would, jointly with knowleable humane resources, enchance preparedness to disaster risks. The growing cost and frequency of natural catastrophes and their implications for economic growth and development have led to a concern over the level of public awareness and education relative to large-scale catastrophes and disaster risk reduction measures. Public awareness and education of disaster risk reduction are, in particular, increasingly acknowledged as important components of effective risk management of natural catastrophes (Stocktaking Report on Risk Awareness And Education on Natural Catastrophes, 2008).

ENHANCING KNOWLEDGE AND EDUCATION IN DISASTER RISK MANAGEMENT

In recent years the number and severity of natural and manmade disasters has significantly increased. In addition, future disaster will be extreme and more complex with far-reaching and longer-term consequences as a result. Consequently, Decision No 1313/2013/EU on a Union Civil Protection Mechanism emphasizes an integrated approach to disaster management as increasingly important (Decision of the European parliament and of the council, 2013). To become resilient society, it is necessary to

implement the EU Civil Protection Mechanism at a regional level and intensively cooperate and communicate, for which a new skilled young workforce is required. According to European Parliament Resolution Community approach on the prevention of natural and manmade disasters, prevention has a crucial significance for protection against disasters, requiring a further action. Reaching the prevention objectives and carrying out prevention actions, improving the disaster risk knowledge base and facilitating the sharing of knowledge, best practices and information, were defined as the first ranked action to take. Education and training (ET 2020) lie at the heart of the Europe 2020 strategy (ET 2020) to exit the recession and establish the foundations for future knowledge-based growth and social cohesion. The same goal is promoted in multiple EU documents, e.g.: European and Mediterranean Major Hazards Agreement (EUR-OPA), South East Europe 2020 Strategy – Jobs and Prosperity in the European Perspective (SEE 2020 Strategy) and Supporting growth and jobs – an agenda for the modernization of Europe's higher education systems COM (2011) 567 final.

The above listed are common objectives and goals both for EU and WB region, considering the on-going European integration process in the Balkans. The resilience improvement by developing higher education (HE) is in compliance with WB countries' national HE strategies and action plans, as well as national strategies in the field of fire protection and emergency.

Resilience to natural hazards should be a core element in the design of development programs. We need to better understand how and where we are vulnerable to disasters, and how best to manage the risks we face. Informed, knowledgeable and educated citizens and public authorities, with the human and financial resources to back them up, are the key to successful disaster risk management planning and implementation (Disaster Risk Assessment and Risk Financing: A G20 / OECD methodological framework, 2012).

STATE AND DEVELOPMENT PERSPECTIVES OF DRM&FSE HIGHER EDUCATION IN WESTERN BALKANS

Within civil protection in Western Balkans Region, disaster risk reduction and disaster management need to be treated as a matter of priority, particularly in the light of the severe floods in 2014.

In July 2015 Serbia became the 33rd participating state in the EU Civil Protection Mechanism. Serbia will have to accomplish a countrywide risk assessment and assessment of its risk management capabilities.

The floods in the south of the country in February 2015 showed the need for Albania to further strengthen its capacity in this sector. As regards civil protection, the 2014-2018 national strategy for disaster risk reduction and civil protection has not been adopted yet.

Bosnia and Herzegovina expressed its interest in becoming a member of the EU Civil Protection Mechanism in 2014 and concluded a protocol on cooperation and establishment of a point of contact with the mechanism. Further coordination and cooperation efforts and further preparations for joining the mechanism are needed.

Western Balkans' higher education needs to respond and to educate and train young people for the sector that will significantly grow as these countries need to fulfil Chapter 27 requirements according to EU Enlargement Strategy.

Climate change, fast urbanization and new technologies, in interaction with irresponsible human activities, cause the need for multidisciplinary and interdisciplinary engineering competences, knowledge and skills. Considering these, available HE is insufficient and unsustainable at regional level without modernization and further development. The brief analysis of available bachelor, master and doctoral study programs in the field of Disaster Risk Management was conducted on the regional and European level (Laban et al. 2015). WB countries included in this research were Serbia, Bosnia and Herzegovina, Albania, Macedonia, and Croatia.

The research showed that there is an insufficient number of master degree programs in WB region to ensure sustainable and uniform capacity building in human resources in this area, and academic bachelor studies are implemented only at University of Novi Sad, Faculty of Technical Sciences in Serbia. A similar program does not exist even in neighbouring European countries, and the current situation in HE in this field is not self-sustainable, because there are no doctoral programs to ensure future researching staff. Number of graduates is insufficient for regional or national needs. Consequently, there is a need for experts who are competent to operate in all phases of the catastrophic events and that are able to solve problems in the field. Also, there is a need for education of competitive experts who will be able to create a sustainable financial plan for disaster preparedness and preventive measures, according to regional economy recourses. At this moment, existing HE programs do not meet the

mentioned WB countries' needs for qualified staff. In order to improve regional resilience to hazards and capability for regional cooperation in risk prevention and response, it is necessary to provide the required number of multidisciplinary experts by modernizing and developing HE at the regional HEIs in subject field. Aim is to build regional-based disaster preparedness and a culture of safety and resilience at all levels. The WB HEI needs to assess the level and quality of HEIs capacity (infrastructure, facilities, laboratories, workforces etc.) in this field and to identify the key competences, knowledge and skills necessary for contemporary practice and future needs. A master study programs should be developed to satisfy various criteria, according to regional needs for resilient society, such as the shift from reactive to proactive actions and developing a culture of prevention. Based on the above, the project proposal Knowledge FOr Resilient society – K-FORCE was successfully prepared by University of Novi Sad in cooperation with 11 HEIs from Denmark (DTU, AAL), Sweden (LU), Slovakia (UNIZA), FYR Macedonia (UKIM), Bosnia and Herzegovina (UBL, UNTZ), Albania (UT, EPOKA), Serbia (VTSNS) and 5 non-academic partners (Protection and Rescue Directorate of the Republic of Macedonia, National Fire Safety Association of Republic of Serbia, European Youth Parliament Serbia, Ministry of Security of Bosnia and Herzegovina: Protection and Rescue Sector and Sector for International Cooperation and European Integrations and Union of chambers of commerce and industry of Albania). The K-FORCE project proposal has been selected for funding in ERASMUS+ program Capacity Building in Higher Education – EAC/A04/2015. The three years period of the project realization will start in October 2016. The project goals answering to above-mentioned issues will be achieved through development of innovative master studies implemented in six HEIs in the region and PhD studies implemented at UNS, Faculty of Technical Sciences (FTS) as well as through continual knowledge improvement of staff already working in this field through newly developed LLL courses. It will help harmonization of new programs content with the region's needs. Final goal is to produce capable experts, able to withstand difficult requirements of today and tomorrow.

FUTURE EDUCATION ASPIRATIONS ASSESSMENT

The Youth Safety Culture survey was conducted as part of the Knowledge for Resilient Society (K-FORCE) project (<http://kforce.uns.ac.rs/>) funded by the European Union under the Erasmus+ scheme to assess future education aspirations of youth.

The primary target group was set as High School and University students from Albania, Bosnia and Herzegovina and Serbia. The survey itself was characterised as a mass survey aiming to have as many subjects (answers) as possible, with the questions being simple and easy to understand for young people from different backgrounds.

Survey was drafted by European Youth Parliament Serbia (EYP Serbia) and contained three sections:

- previous experience in the field of DRM&FSE,
- safety culture and personal stances and
- future education aspirations.

Subject classification was proposed in regards to the subjects' country and city of residence, age, level of current education (High School or University) and field of education. The survey took between 5 and 10 minutes to fill out and was anonymous.

A total of 1462 subjects gave their responses to the survey. Because of missing information, invalid responses or other reasons, 98 responses were deemed invalid and the data analysis was done on 1364 subjects that filled out the survey completely and correctly.

Some of the comprehensive results, regarding youth future education aspirations are given in the tables below. For each question, possible answers are listed and the number of subjects which gave that answer is specified below it, as well as the percentage that this number represents to the total number of subject who answered that question.

Table 1 Sample characteristics

Total subjects:		1364				
By country of residence:						
Albania	Bosnia and Herzegovina	Serbia	Croatia			
486	469	396	13			
35.6%	34.4%	29.1%	0.9%			
By current education:						
University student		High School student		Not enrolled		
978		370		16		
71.7%		27.1%		1.2%		
By area of education:						
Engineering and Technology	Humanities and Social Sciences	General High School studies	Natural Sciences	Arts	Medical Sciences	Not enrolled
664	272	204	183	24	10	7
48.7%	19.9%	15.0%	13.4%	1.8%	0.7%	0.5%

Table 2 Future education aspirations of respondents

I had a chance to learn about disaster risks and fire safety as part of my High School/University curriculum or during a lecture organised at my School/University.		
Yes	No	
562	802	
41.2%	58.8%	
If yes, in what context?		
I had a complete course concerning this.	I had a part of a course concerning this.	I attended one lecture.
75	246	241
13.3%	43.8%	42.9%
I had a chance to learn about disaster risks and fire safety outside of my School/University.		
Yes	No	
839	525	
61.5%	38.5%	

If yes, in what context?				
I am a member of an organization that addresses these issues.	I attended an open lecture.	I heard about it during a conference/seminar.	I read an article.	
38	148	124	675	
4.5%	17.6%	14.8%	80.4%	
I would be interested in studying Disaster Risk Management or Fire Safety at University.				
1	2	3	4	5
404	251	296	212	201
Mean value:	2.67		Median:	3
I would be interested in obtaining a Master's degree in Disaster Risk Management and Fire Safety.				
1	2	3	4	5
579	283	227	143	132
Mean value:	2.24		Median:	2
I would attend an elective course in Disaster Risk Management and Fire Safety (if one existed) at my University.				
1	2	3	4	5
239	238	309	269	309
Mean value:	3.12		Median:	3
I would attend a free course in Disaster Risk Management and Fire Safety.				
1	2	3	4	5
131	135	311	333	454
Mean value:	3.62		Median:	4

Aim of the survey was to acquire preliminary data about the existing interest among youth for future K-FORCE project activities. According to the preliminary data there is a promising number of students that would be interested to attend a course or are interested in studying Disaster Risk Management or Fire Safety at University. The information from the conducted survey will be used to better develop and implement

curricula in the field of DRM&FSE at partner Universities in Albania, Bosnia and Herzegovina and Serbia.

A BRIEF INSIGHT INTO NEW STUDY PROGRAMS

DRM&FSE subject area refers to multidisciplinary and interdisciplinary disciplines. Curricula include subjects from various academic disciplines, with Engineering and engineering trades as the dominant academic discipline, Environmental protection, Architecture and Construction, Civil Protection, Fire Science, Rescue studies, Climatology, Hydrology, Seismology and Economy as well as other disciplines (Health, Sociology).

The implementation of interdisciplinary DRM&FSE study programs in the field of Technical Sciences will enable continuation of the studies for a number of different profiles of engineering undergraduates, as well as continual education of professionals by offering LLL courses. Introduction of a novel interactive ICT platform for staff, student and workers' training will enable preparation of real-life case studies.

These programs support the creation and dissemination of Open Educational Resources in diverse European languages. Study programs, learning material offered by Flexible ICT learning platform, LLL courses, Glossary of DRM&FSE key words and terms, as well as an On-line Library will be available in English and regional languages (Serbian, Albanian and Bosnian).

Educational ICT based laboratories created in WB HEIs with interoperability capabilities and on-line library will provide national, regional and international case studies, integrated risk methodology assessment, hazard, risk and vulnerability regional cross-border mapping and results publications. That will insure continuous common regional problem based approach and compatibility of knowledge and skills, also aligned with contemporary trends in DRM&FSE field. Interdisciplinary, multi-language and ICT based both higher and continuous education approach insures regional and international cooperation will allow the exchange of knowledge and the mobility of students, teachers and workers, and strengthens national and regional capacities in EU integrations. Teaching methods improvement and modern ICT use in the education process will coincide with higher education development in the EU. This is especially

true in knowledge about best available practices, EU legislation, practical laboratory skills and consequent harmonization with EU curricula.

Within implementation process, European HEIs will have crucial role. They will be responsible for knowledge transfer and experience sharing in including scientific research into education, thus securing curriculum quality from the start. They will steer the content of curriculum and syllabi, define student-centered learning and teaching methods, share case studies for capstone-type subjects and advice on best usage of modern ICT in the education process. Compliance of the regional study program with similar programs, developed in the EU countries, strengthens the capacity of individual countries and the region as a whole in the process of European integration. Therefore, the brief analysis of available master and doctoral study programs in HEIs in the field of Disaster Risk Management and Fire Safety Engineering was done on the European level (Gencer 2014).

It was found that the majority of the most advanced engineering study programs in this field are available in Sweden at Lund University, Denmark at Danish Technical University and Aalborg University, Great Britain at University of Edinburgh and in FYR Macedonia at Ss. Cyril and Methodius University in Skopje. All of the studies are established in a close connection to Faculties and Departments of Civil Engineering. There are also fully developed study programs, at all three levels in Slovak Republic, at Faculty of Special Engineering, University of Žilina.

As Risk Management and Fire Safety education are not widely found in WB HEIs' curricula, the transfer of know-how of European HEIs to WB HEIs is special valuable, and response to the need for enhanced staff expertise which can underpin new curriculum modernization or development in a way to meet standards developed in EU.

Cooperation with the European HEIs and their contribution is crucial for new programs quality due to knowledge sharing, experience transfer in the fields of scientific research and education, particularly in developing similar programs and modules and assistance in defining needs for program content and teaching methods improvement and modern ICT and computer technology use in the education process coinciding with higher education development in the EU.

EXPECTED IMPACT OF MODERNIZED AND NEWLY DEVELOPED STUDY PROGRAMS

It is expected that modernized and newly developed study programs will contribute to resilience improvement of societies in several ways.

Firstly, students will be educated within an interdisciplinary and problem-solving framework, through acquiring theoretical, practical and applicable knowledge, skills and competences, according to National qualifications framework and European qualifications framework, WB countries' needs and EU trends, which will be well recognized by the national and regional labor market. Students on other HEIs study programmes will gain basic or improved knowledge of DRM&FSE issues, consequently resulting in raised awareness among student population.

Implemented programs will enable regional and international mobility of students and teachers from WB and their horizon broadening in this specific field.

Teaching staff will have opportunity to upgrade their teaching experience, capacity to pass on the knowledge updated with novel trends in both the field and teaching tools and methodology. Teaching staff in other disciplines will be able to foster their knowledge and capacity to introduce and interconnect DRM&FSE issues into their disciplines. Non-profit NGOs will have opportunity to realize their own visions and missions in building national and regional capacities for safe and prospective WB societies, on the path towards EU. Professionals in DRM&FSE area will expand and upgrade their knowledge and skills through LLL courses. Public bodies and administration in charge for civil protection will improve qualification structure and better act as liaison between the emergency sector and scientific and education institutions as well as liaison between educational institutions and stakeholders from the emergency sector.

Employees in various industrial sectors will have an open access to created On-line Library, ICT portal and LLL courses database, through which they can gain knowledge on various DRM&FSE issues, thus raising their awareness about fires and disasters.

CONCLUSION

Natural disasters devastate lives and livelihoods across the world and slow down the development progress achieved through many decades of hard work. Consequently, the fiscal and economic pressure of developing countries, such as WB, having to deal with the adverse effects on natural disasters is increasing. Numerous human casualties, significant material damage and negative environmental impact of natural and manmade disasters and fires in the WB are the warning calling for change of approach to these issues. There is a need to raise awareness about disaster risks and their potential financial consequences. Raising public awareness regarding natural catastrophic risk and risk reduction strategies is a key component in the promotion of a culture of safety within a nations' borders and beyond. Increased resilience and sustainable development requires a more proactive approach to tackle risk at its roots.

Resilient societies are based on knowledge and training, as well as preparedness. Building synchronized regional capacities in higher education in Disaster Risk Management and Fire Safety Engineering, according to regional needs and contemporary trends, is a first step towards building resiliency of our region. Acquired knowledge in the field of Disaster Risk Management and Fire Safety Engineering will provide the base for building a resilient society. It is necessary to build countries' own, consistent and compatible capacities in this educational field, which will enable a uniform level of required knowledge and skills.

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