



INTEGRATED WATER RESOURCES MANAGEMENT IN KOSOVO (IWRM-K)

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Report on Analysis of Skill Needs and Educational Offers in the field of IWRM in Kosovo



Focus-Group Workshop with Educational Stakeholders, Pristina, October 2, 2019

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Acronyms/Abbreviations

DLEAP	Danube Learning Partnership
EAA	Environment Agency Austria
ECTS	European Credit Transfer System
EHEA	European Higher Education Area
ERA	European Research Area
EU	European Union
HE	Higher Education
HEIs	Higher Education Institutions
HMI	Hydro-Meteorological Institute
IPs	Irrigation Provider Companies
IWRMK	Integrated Water Resource Management Kosovo
KEPA	Kosovo Environmental Protection Agency
KESP	Kosovo Education Strategic Plan
KIPA	Kosovo Institute for Public Administration
LLL	Life-long learning
MIE	Ministry of Infrastructure and Environment
MESTI	Ministry of Education, Science, Technology and Innovation
MoU	Memorandum of Understanding
RBDA	River Basin District Authority
RWC	Regional Water Companies
RWSSP	Rural Water Supply and Sanitation Program
SDG	Social Development Goals, Agenda 2030
SER	Self-Evaluation Report
SHUKOS	Kosovo's water and wastewater association
UP	University of Pristina
VET	Vocational Education and Training
VTC	Vocational Training Centres
WTF	Water Task Force
YCS	Young Cell Scheme
YWP	Young Water Professionals

Executive Summary

This baseline study is carried out in the framework of the IWRM-K Program. It presents an analysis of skill needs and educational offers in the field of integrated water resources management (IWRM) in Kosovo with a focus on higher education.

The enhanced protection, sustainable use and equitable allocation of water resources in Kosovo requires a skilled workforce in the water sector. For that reason, the Program systematically targets young water professionals (YWP) in the decisive stages of their formation: students in higher education, graduated job seekers and young professionals employed in the public or private water sector. The main strategy is to match the labour market with education, which means supporting academic education of students so that they can acquire the skills required in the sector's institutions. Empowered institutions with a well-educated workforce manage and protect water resources in an integrated and informed manner in line with the overall goal of the Program.

The systemic development of skills of young water professionals in Kosovo will be based on the analysis of the status quo, the assessment of needs, and the development and implementation of tailor-made educational programs. Through the baseline study current and future needs of the Kosovar society and labour market in terms of expertise in the field of water resource management are identified as well as the needs of (young) water professionals in terms of education and continuing training opportunities.

To this end, this study provides the basis for the design of further educational and training programs to educate a new generation of (young) water professionals and to provide lifelong learning opportunities for in-service professionals, i.e. water professionals that are already working in the water sector. Additionally, the study analyses the educational components of other (ongoing) initiatives from relevant Swiss and other donor funded projects in Kosovo and in the region, in order to build on their activities and lessons learnt and to seek synergies and provide recommendations. Typically, in Kosovo there is no study program on IWRM as such, but several study programs covering topics related to water. The aspects of the water resource management are taught separately in different fields of studies and at different faculties and the students are not able to receive fully fledged studies on IWRM matters.

Employers from the water sector state that graduates lack relevant skills and competences after finishing formal education. In their opinion formal education is focused on teaching and knowledge and less on research related matters and the actual application. The institutions in the water sector try to handle the situation through in-house training measures, but in principle they do not have the resources and means for capacity development in order to prepare graduates for their job. Another point of criticism is that in the development and accreditation of study programs, labour market needs are not taken into consideration thoroughly.

The educational institutions are aware of certain deficiencies related to the education of young water professionals, but also their capacities are limited, in terms of teaching capacities and laboratories as well as data for research. As a matter of fact, it is difficult for a small country like Kosovo to handle all the technical challenges related to water management at local implementation level. For that reason, a "centre of technical expertise in the water sector" is mentioned as a means to tackling these difficulties.

Finally, based on analysis and findings, this study provides conclusions and a number of recommendations for the design of educational programs and accompanying measures. Specifically, it lines out the three possible pillars of IWRM-K support as being to:

- Improve the education system and the study programs so that knowledge, skills and competences of the graduates match with (long-term) needs in IWRM;
- Development of (short-term) training measures for water community staff that is already working at Higher Education Institutions, Ministry of Infrastructure and Environment, and Young Water Professionals to build capacities in line with the (current) demands;
- Support MA, PhD and PostDoc studies and research at Swiss and Austrian universities to further enhance the capacities and competences of the academic staff of the Higher Education Institutions.

1. Introduction

1.1. Methodology

This study is prepared based on a qualitative research approach using secondary sources (desk research) and primary sources (interviews, focus group discussion).

Initially, a desk research was conducted by analysing existing studies and reports related to water management¹ as well as study programs in this field. Besides the desk research, several semi structured interviews took place with representatives of higher education institutions (HEIs), employers such as the Kosovo Environmental Protection Agency (KEPA), the Hydro-Meteorological Institute (HMI) and the River Basin District Authority (RBDA), Young Water Professionals (YWP), the Ministry of Education, Science, Technology and Innovation (MESTI) (successor of the Ministry of Education, Science and Technology) and with experts from the Environment Agency Austria (EAA). The aim of these interviews was to analyse the current educational offer related to the water sector as well the gaps (in education) regarding the required knowledge, skills and competences in the respective labour market.

In addition to these meetings, the findings in this study are based on the desk research. In this respect, the team analysed syllabi and programs that entail modules or courses related to water resource management. This included an analysis, if elective subjects are actually taught, and to which extent labour market needs are taken into account in the preparation of new or revised study programs.

Finally, the content analysis was paired with findings from semi-structured interviews. The validation of the information from desk research and from the semi structured interviews took place in the frame of a workshop though group work and focus group discussions.

1.2. Background on higher education and employment in Kosovo

Higher Education is of particular importance for Kosovo as the country has a very young population (average age of 30.2 years)² and experiences high (youth) unemployment. Persistently high youth unemployment (55.4%, with 64.7% of women and 51.5% of men being unemployed³) points to a misalignment between education outcomes and labour market needs⁴. This also includes higher education: Unemployment among university graduates is still relatively high, despite having declined to just above 20% in the last quarter of 2018, suggesting a mismatch between higher education programs and labour market needs⁵.

Furthermore, the education system, especially the public one still offers programs and curricula which are not fully relevant for students and that lack a clear indication of learning outcomes. This leads to inaccurate expectations of students on knowledge, skills and competencies that can be gained through these programs.

The Education Statistics in Kosovo report from MEST (now MESTI) and the Kosovo Agency of Statistics state that in the academic year 2017-2018 there were 70,000 students in public universities and 40,000 students in private HEIs⁶. At national level, women represent in total 56% of all students enrolled in public HEIs. More specifically, there is a majority of women at both Bachelor and Master levels.⁷ At the same time, women remain underrepresented in research and as academic staff in public universities across Kosovo.⁸ There are very few

¹ World Bank Group, *Water Security Outlook, June 2018; Water Task Force, Development of University Program for the water sector in Kosovo*

² European Commission, *Overview of the Higher Education System – Kosovo, Erasmus+, February 2017.*

³ Kosovo Agency of Statistics, *Labour Force Survey 2018*, at: <http://ask.rks-gov.net/media/4671/anketa-e-tregut-te-punes-2018.pdf>.

⁴ European Commission, *Kosovo 2019 Report*, p. 48

⁵ *Ibid*, p. 71.

⁶ *Education Statistics in Kosovo, MEST and Kosovo Agency of Statistics*, <http://ask.rks-gov.net/add-news/statistikat-e-arsimit-20172018/>

⁷ KWN, *Gender Analysis. Higher Education, Research and Applied Science in Kosovo (HERAS)*, August 2019, p.8 (tables 3 and 4).

⁸ *Ibid*, p.10 (table 7).

students with ethnic minority backgrounds in public universities. Underrepresented/vulnerable groups of students include:

- Groups from lower socio-economic background;
- Minorities including members from the Roma, Ashkali and Egyptian (RAE) communities⁹;
- Students with a disability;
- Non-traditional students (mature students, students with foreign qualifications);
- Female students (in particular those from the RAE communities);
- Students from rural areas; and
- Returning migrants.

To achieve the ambitious goals of the European Higher Education Area (EHEA), European Research Area (ERA) and the Social Development Goal 4 (SDG 4, in particular targets 4.3., 4.4. and 4.5¹⁰), Kosovo needs to adapt its education system in order to develop next generations of graduates, entrepreneurs, innovators and change agents that will be able to shape and develop the socio-economic environment of the country. Although public HEIs still have the mission to provide comprehensive education they will be encouraged to further expand their potential to become agents of change, providing programs for developing competences in learning spaces that enhance and enable creativity and innovation.

Overall, the higher education and research sector in Kosovo is characterized by rapid expansion (with newly established universities and a corresponding increase in the number of students) and insufficient accompanying legal and economic measures. This, however, does not contribute towards an education system that is able to provide the higher education base required for further societal, economic, scientific, cultural and technological progress of Kosovo in a qualitative and sustainable manner. In this context, the University of Pristina (UP) is playing a major role, whereas regional universities are still lagging behind. The 3rd mission of universities - reflecting on the involvement of universities with society – has not been embraced yet in HEIs' strategic development.

As outlined in the 2019 EC Progress Report on Kosovo, the country is at an early stage of preparation for science and research: The quality of post-graduate programs preparing for research careers is poor, with HEIs applying very uneven criteria for promotion based on scientific research and publications. Basic and applied research is fragmented. More efforts are required to create synergies and direct links between education and research.

Specific aspects of education fall under the responsibility of two or more stakeholders (e.g. research, innovation) which creates the potential of overlap and duplication. The current lack of coordination and steering mechanisms in the field of higher education requires a strong multi-stakeholder dialogue among key actors in order to enhance coherency, effectiveness and efficiency of the higher education and research system and to better contribute to economic, social and cultural developments of Kosovo at large and in the water sector in specific.

⁹ As per data from the Kosovo Statistics Agency (<http://askdata.rks-gov.net/PXWeb/pxweb/sq/askdata/>) the participation of minority community members in the academic year 2017/2018 range from 0,53% at the University of Mitrovica, 1.11% percent in the University of Pristina, 3,62% at the University of Gjakova, 3,75% percent at the University of Gjilan, up to 6,95% percent at the University of Prizren. Even the high nominal percentage given for the University of Prizren is comparatively low given the relatively high (over 18 percent) share of participation of non-Albanian and non-Serb minority communities in this region.

¹⁰ Target 4.3.: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university. Target 4.4.: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship. Target 4.5.: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

2. Assessment of the current state of educational offers

2.1. Higher education

At university level there is no study program on “integrated water resource management” as such, but several study programs covering topics related to water resource management, mainly the BA and MA programs on Hydrotechnics at the Faculty of Civil Engineering and Architecture at the University of Pristina, but also other as listed below (*details on the study programs and courses in Annex 3*).

University of Pristina (UP):

- Faculty of Civil Engineering and Architecture:
 - BA on Hydrotechnics
(with courses on Hydrotechnical Structures, River Engineering, Water purification, Geotechnical engineering, Environmental protection, Probability and statistics, etc.)
 - MA on Hydrotechnics
(with courses on River Regulation, Water supply of settlements, Hydrology, Geotechnic of Hydrotechnical Structures, Hydrogeology, Application of GIS in water management, Water Resource Management, Waste Water Treatment, Channelling Settlements, etc.)
- Faculty of Mathematics and Natural Sciences:
 - MSc on Ecology and Environment protection (course on Freshwater Macroinvertebrates)
 - PhD (course on Biological Assessment and Protection of Freshwater Ecosystems)
- Faculty of Mathematics and Natural Sciences:
 - MSc Biology (course on Freshwater Ecology)
- Faculty of Mathematics and Natural Sciences:
 - MSc Chemical Engineering (course on Chemical Process of Water Treatment)
- Faculty of Mathematics and Natural Sciences:
 - MSc Geography (course on Applied Hydrology)

University of Mitrovica:

- Faculty of Geosciences
 - MSc in Hydrogeology and Engineering Geology
(with courses on Geodynamic Engineering, Special Hydrogeology, Hydrogeology of the Kosovo, Basement and their consolidation, Geophysical Hydrogeological investigations for water supply needs, Protection of groundwater, Geotechnics, Hydrogeology of the mineral deposits, Water Monitoring; Sedimentary basins and hydrocarbon, Geological and technical, Water Wells and Boreholes applied Geo-statistics etc.)

University of Peja:

- Faculty of Management in Tourism, Hospitality and Environment
 - BSc Management in Environment (course on Water Quality)

University of Applied Science in Ferizaj:

- Faculty of Tourism and Environment
 - BA & MSc Management of Tourism and Hospitality (course on Environmental Protection and Tourism)

UBT College:

- BSc. Agriculture and Environmental Engineering (new study program from the study year 2019/2020 on)
- BSc in Construction Engineering and Infrastructure (including courses on Hydraulic engineering, Dam Engineering, Water Resources Engineering, Quality Assessment)
- MSc on Construction Engineering and Infrastructure (profile specialization on Hydro Engineering)

Additionally, the following courses AT THE University of Pristina have been identified as relevant for IWRM:

- Climatology with Meteorology, General Hydrology (at the UP Faculty of Mathematics and Natural Sciences);
- Environment and Society (at the UP Faculty of Philosophy – Department of Sociology);
- Economics of Development of Kosovo (UP Faculty of Economy); and
- Hygiene (at the UP Faculty of Medicine).

There is another possibility for young professionals (holding a bachelor degree) to get further education in EU countries. So called **Young Cell Scheme (YCS)** is a Program co-financed by the Government of Kosovo and the EU Office in Kosovo, coordinated by the Ministry of European Integration and Diaspora (successor of the Ministry of European Integration). The main objective of the YCS Program is to contribute to build and enforce a professional, accountable, merit-based and apolitical Civil Service at all levels in Kosovo. YCS supports Kosovan public administration through this specific scholarship programme that aims at improving the professional capacity of civil servants to better service Kosovo citizens. After finishing their master studies in the EU universities, the grantees have a contractual obligation to return to Kosovo and to be employed for at least three consecutive years within the Kosovo public administration. Grantees so far had the opportunity to specialise in various fields within Economics, Law and Politics of the European Union, as well as in Environmental Sciences, Agricultural Studies, Statistics, Aviation Safety and Regulations, Engineering, Telecommunications, Food Safety, etc.

2.2. Vocational Education and Training

Vocational Education and Training (VET) is education and training that focuses on providing skills for work. At the MESTI there is a VET department. Currently there are 129 profiles in VET education, none directly linked to IWRM. Related vocational school programs are “Installation of water supply and wastewater connections”, “Recycling” and programs in the field of agriculture and tourism. However, in case there is a concrete demand, i.e. need in the labour market, the MESTI is basically interested in developing new profiles and curricula within VET related to water management.

In addition, Kosovo has eight, regional based, Vocational Training Centres (VTC) in charge of providing courses for unemployed people. The modules and curricula for these courses are managed by the VTC in cooperation with MESTI. Given the high unemployment rate in Kosovo and the potentially rising need for a skilled workforce in the water sector on all levels of education, this could be an option for capacity building activities in specific fields related to water management (e.g. for sewage works operators).

2.3. Further training measures

There are capacity building measures and on-the-job trainings taking place within the sector’s institutions.

These measures are institutionalised if we consider the mandate of the Kosovo **Institute for Public Administration (KIPA)**, which is a governmental institution established for civil servants training in order to develop and enhance the quality of civil services provided by the public administration in country. The KIPA implements the capacity building measures through training, seminars, conferences and workshops for civil service and public admini-

stration in general, after they identify the training needs in close cooperation with local and international institutions/projects. With the latter ones as well as with sister-institutions from the region and beyond, the cooperation terms are specified through memorandum of understanding. Cooperation with KIPA may ensure a sustainable capacity building in the water sector. However, up to now water-related trainings have been implemented mainly in ad-hoc basis and not in an integrated/institutionalized manner. Furthermore, acquiring and maintaining the skills required for a job in this sector seems to depend also on self-study of the employees.

As part of the **Danube Learning Partnership (DLEAP)**, Kosovo’s water and wastewater association SHUKOS organize capacity development activities and young water professionals (YWP) get (one-day) lectures on different water related subjects such as “Wastewater treatment technology applied in certain RWCs”, “Reduction of non-revenue water”, etc.

When it comes to knowledge and skills development in the frame of other (ongoing) initiatives from relevant Swiss and other donor funded projects in Kosovo and in the region, the **Rural Water Supply and Sanitation Program (RWSSP)** supports the long-term capacity development of the sector through employing water and sanitation students and graduates to gain experience in the sector by involving them in non-revenue water surveys as well as water source surveys.

2.4. Employment opportunities for (young) water professionals

For (young) water professionals there are employment prospects in:

- The public sector e.g. ministries, in administration, municipalities;
- Public enterprises;
- The service sector, e.g. in engineering and planning offices, in consulting, planning and project execution
- Self-employed, e.g. as freelance engineers, engineering consultants, experts or project executives; and
- Research and development, e.g. at universities, non-university research institutions and development departments of companies.

In the frame of the report *Development of University Program for the water sector in Kosovo*¹¹, an assignment of the Water Task Force, the authors of the report tried (sic!) to evaluate the number of employees in the water sector (excluding the private sector and educational institutions). As this report dates back to November 2010, the numbers given in the report were compared in the frame of this study with the estimated employment in the water sector in 2018-2019 (see table below).

Table 1: Employment statistics in water sector

Organization	Number of employees (year 2010)	employees (year 2018-2019)
MIE (RBDA, ED, KEPA, HMI)	55-60	40-50
Other ministries + WTF/IMWC + WSRA	30-40	31
7 RWC (Regional Water Companies)	1540	1991
3 IPs (Irrigation Provider Companies)	300-400	380-420
Contractors		180-250
Private consultants, experts		25
Others		
Total	Around 2000	Around 2800

¹¹ Water Task Force, *Development of University Program for the water sector in Kosovo*, November 2010, p. 15.

Also the figures given for the years 2018-2019 are an estimation (by the YWP), as it is difficult to get accurate figures from the side of the institutions.

Another source for the number of employees in the water sector is the *Labour Force Survey 2018*. As it can be seen in the tables 1.8 and 1.9 of this survey¹², half of the employed persons are employed in the following four categories: *trade* (17%), *construction* (11,9%), *education* (11,3%) and *manufacturing* (10,3%). In contrast the employment in the category *water supply, sewerage and waste management* represents only 1,3% of the employed population, i.e. 4.400 persons (4.100 male and 300 female) out of 348.100 persons employed in total. While taking into account that this category includes not only the water sector and that water professionals also work in areas such as administration and education, these figures clearly show that employment in this area is comparatively low.

This is also highlighted by the *Kosovo Water Security Outlook*:

“A specific area of weakness relates to the technical capacity and the level of staffing, particularly at local implementation level. Kosovo has a relatively small population and economy. Necessarily the institutions for water management are also comparatively small. However, each institution is faced with similar technical challenges to those faced by larger countries and EU Member States. The difficulty arises that the institutions do not achieve “the critical mass” to afford high levels of technical specificity in the assignment of staff positions.”¹³

Besides the extended expertise it is also assumed that for adequate water resource management in the long-term additional water professionals will be needed in order to cope with future challenges in the water sector.

All in all, obviously there is a growing demand for water professionals in the future, paired with the extension of the required expertise. For that reason, according to the *Kosovo Water Security Outlook* special attention should be paid to vocational training and academic development.¹⁴

2.5. Qualification profile of (young) water professionals

In accordance with their mandates, tasks and responsibilities, Institutions in the Kosovar water sector look for employees that are able to:

- Be responsible for environment and nature monitoring, establishment and management of databases and environmental information systems;
- Give professional opinions on the procedure for approval of management plans of nature protected areas;
- Propose technical solutions to prevent and reduce environment and nature pollution;
- Develop plans and programs in the field of environmental protection and develop programs and educational materials to raise public awareness for environment;
- Follow the implementation of the environmental action plan and give professional opinion on urban and spatial plans, prepare reports on the state of the environment;
- Provide scientific and other support for protection of environment, nature, and biological diversity;
- Do research on the water related fields and provide data and information on the real needs of the sector;
- Use new methodological approaches to come to the solutions that are innovative and appropriate for sector development.

¹² Kosovo Agency of Statistics, *Labor Force Survey 2018*, p.18-19, at: <http://ask.rks-gov.net/media/4671/anketa-e-tregut-te-punes-2018.pdf>.

¹³ World Bank Group, *Water Security Outlook*, June 2018; Water Task Force, *Development of University Program for the water sector in Kosovo*, November 2010, p. 71.

¹⁴ *Ibid*, p. 71.

Based on the profile of the MA Program on Civil Engineering and Water Management at the University of Natural Resources and Life Sciences Vienna¹⁵, the Qualification Profile of a graduated water professional (MA level), would look like this:

QUALIFICATION PROFILE

Knowledge, skills and competences

Graduates have a well-founded knowledge of the natural sciences as well as a comprehensive understanding of the sustainable use of resources and the ability to responsibly research, design, plan, build and maintain based on systemic thinking.

In the field of water and soil, the graduates understand the essential connections in the fields of hydrology, water management planning, constructive hydraulic engineering and river basin management, state-cultural water and soil water management, urban water management, industrial water management and water conservation, hydrobiology and aquatic ecology and waste management.

In the field of construction technology, graduates have in-depth knowledge of structural design, geotechnical engineering, resource-oriented construction, constructive engineering, construction and project management. In the area of land management, transport and geodata management, they are able to apply future-oriented instruments for the recording and documentation of natural areas, for the environmentally friendly development of land use and for infrastructure planning.

Graduates possess the necessary knowledge from administration and industry. They have communication, coordination and leadership skills and are aware of the importance of mobility, language skills and internationality for a successful career.

With regard to the labour market relevance of study programs, the 3-pillar principle of the University of Natural Resources and Life Sciences is worth to mention. The 3-pillar principle is the central identification feature of both the Bachelor and Master studies in Civil Engineering and Water Management. In the MA program, the sum of the contents of the compulsory and elective courses consists of at least 15% engineering, 15% science and 15% economics, social sciences and law (on BA level at least 25% each). Excluded from the 3-pillar principle are the master's thesis, the compulsory practice and the free elective courses. Through the elective course students specialise for certain fields and occupations, which eventually leads to a variety of profiles within one qualification profile.

¹⁵https://boku.ac.at/fileadmin/data/H01000/mitteilungsblatt/MB_2018_19/MB17/066_431_Mastercurriculum_KTW_W_2019U.pdf, p.3.

3. Gap analysis and recommendations

3.1. Gaps in the educational programs and analysis of the current infrastructure and capacities of Kosovar (higher) education institutions

As already stated above, in Kosovo there is no study program on “integrated water resource management” as such¹⁶, but several study programs covering topics related to water. For that reason, the aspects of the water resource management are taught separately in different fields of studies and at different faculties (even universities) and the students are not able to receive fully fledged studies on IWRM matters.

Employers from the water sector state that graduates lack relevant skills and competences after finishing formal education. This is the general assessment, on further inquiry the following areas are mentioned: a lack of skills in the field of IT, software development, GIS, wastewater treatment, water sheds, water hydraulic, monitoring (biological monitoring, meteorological monitoring), measurement and similar.

In their opinion formal education is focused on teaching and knowledge and less on research related matters and the actual application. To make matters worse, some important subjects exist only on paper (as electives), but in fact they are not taught or not regularly, as this is bound to a certain number of attending students.¹⁷

The institutions in the water sector try to handle the situation through in-house training measures, but in principle they do not have the resources and means for capacity development in order to prepare graduates for their job. Another point of criticism is that in the development and accreditation of study programs, labour market needs are not taken into consideration thoroughly.

The educational institutions are aware of certain deficiencies related to the education of young water professionals, but also their capacities are limited, in terms of teaching capacities and laboratories as well as data for research. At the same time, they are confronted with a growing administration.

This brings us back to the assessment in the *Kosovo Water Security Outlook*, where it is stated that it is difficult for a small country like Kosovo to handle all the technical challenges related to water management at local implementation level. For that reason, a “centre of technical expertise in the water sector” is mentioned as a means to tackling these difficulties.¹⁸

This was also discussed in the frame of the workshop on October 2, 2019, as well as other ideas; in fact, it will require a bundle of (long-term) measures to develop the local capacities for integrated water resource management in Kosovo.

3.2. Design of educational programs and measures to anchor the qualifications of (young) water professionals in labour market and society

3.2.1. Conclusions

The workshop on October 2, 2019 was important in the regard that it brought together stakeholders from the water sector, namely educational and employing institutions to shed light on the actual deficiencies and on the already existing capacities in the field of IWRM.¹⁹ There is a common understanding about certain gaps, both in the educational programs as well as related to employment opportunities for (young) water professionals. At the same time, the interviews showed that for stakeholders it is difficult to formulate their actual needs in terms

¹⁶ As stated in chapter 4.2 there is also no VET program on IWRM.

¹⁷ Information on obligatory and elective courses can be found in Annex 2.

¹⁸ World Bank Group, *Water Security Outlook, June 2018; Water Task Force, Development of University Program for the water sector in Kosovo, November 2010, p. 71.*

¹⁹ For the report see Annex 1.

of required competences and expertise and how many staff members are needed in specific fields.

Additionally, it is quite apparent that the current demand for (young) water professional is not that high, but there will be a higher demand in the future. For the time being there are no concrete figures on the demand in the water sector (short/medium/long term), for that reason projections need to be made in order to plan and prepare the educational offer accordingly.

As investments in (higher) education are per se long-term endeavours, it should be considered to handle a possible “acute”/short-term demand via short-term measures (i.e. through sending people abroad, the organization of in-house training measures, contracting external experts for short-term assignments, etc.). A systemic approach requires enhanced university-institution cooperation, e.g. through the participation in the industrial boards at the university faculties, for people from the industry to contribute to the curriculum development (and to the labour market relevance of the study programs), or through joint research activities.

3.2.2. Recommendations

The IWRM-K could think of **three pillar support**:

1. Improve the education system and the study programs so that knowledge, skills and competences of the graduates match with (long-term) needs in IWRM;
2. Development of (short-term) training measures for the staff in the water community that is already working at the HEIs, MIE (RBDA, KEPA, HMI), the YWP in order to build their capacities in line with the (current) demands;
3. Support MA, PhD and PostDoc studies and research at Swiss and Austrian universities to further enhance the capacities and competences of the academic staff of the HEIs;

Concrete activities related to the three pillars:

- Revise existing curricula and/or establish new study programs, in cooperation with Swiss and Austrian universities, whereas joint study programs should be considered;
- Equip the laboratories in accordance with the state-of-the-art;
- Establish a working group for the development of an interdisciplinary study (BA, MA, and PhD) within the University of Pristina (UP) with a focus on IWRM.

Such studies will provide a unique opportunity to study the environmental, bio-physical, legal, institutional, and socio-economic aspects of water use and management in an integrated context. This MA/MSc program could promote a holistic perspective and awareness of water resources management issues through a wide range of courses offered by collaborating departments and faculties at different Universities in Kosovo. Such program could be attended by professionals with diverse disciplinary backgrounds, such as: environmental (ecology), hydro-engineering, biology, chemistry, geography, economy, sociology. It is expected that the candidates who will attend such programs will upgrade their skills on the integrated approach of managing the water aspects, i.e. they will be provided with concepts and practices mainly for river basin management planning techniques, implementation approach strategies, water governance, and water risk assessment;

- Establish life-long learning (LLL) courses at the University of Pristina (and other universities). Both interdisciplinary studies as well as LLL courses are foreseen in the statute of the UP, but have not been introduced yet.
- Develop VET education program as well as LLL or re-training opportunities for water professionals on secondary school level;
- Organize practical work or internships for students at the future employers;
- Provide scholarships for MA, PhD and PostDoc studies and research at Swiss and Austrian universities. The YCS platform can be utilized.
- Organize summer schools on integrated water resource management.

- Establish MoUs between the employers and the HEIs for an enhanced cooperation (in curriculum development and/or research, through visiting professors, etc.). Furthermore, the labour market relevance shall be further enforced in the accreditation process.

The three-pillar support should be accompanied by enhanced multi-stakeholder dialogue and cooperation, facilitated by the IWRM-K.

ANNEX 1: Focus-Group Workshop with educational stakeholders

Introduction to the workshop

In the line with the IWRM-K and as a follow-up to the 3rd mission conducted on 26-30 August 2019, WUS Austria together with the PFU continued its efforts to identify available data/documentation, facilitate assessments of capacity development needs of relevant stakeholders, and learn about other ongoing or planned programs/projects pursuing similar objectives. In that context, the IWRM-K on 02 October organized a workshop with education stakeholders and selected employers in the water sector as well as young water professionals in order to validate the first preliminary findings collected on the Kosovar society/labour market needs in terms of expertise in the field of water resource management. The workshop was led by WUS Austria experts. The preliminary findings identified so far will be integrated part of the baseline study that the WUS Austria experts are developing at the moment.

The event was delivered as per the agenda that was shared with the targeted audience.

Opening Remarks

In the beginning, the IWRM-K team leader, WUS Experts, and Environment Agency Austria (EAA) consortium members opened the workshop by pointing out the need for the development of a skilled workforce in the water sector in order to enhance protection, sustainable use and equitable allocation of water resources in Kosovo. The team leader of the IWRM-K, Mr. Dimitrija Sekovski presented that the aim of the workshop is to assess current and future needs of the Kosovar society/labour market in terms of expertise in the field of water resource management, as well as the needs of young water professionals in terms of education and continuing training opportunities. He further reiterated, that the program is currently in the interception phase, it is identifying the investment priorities in Kosovo, designing a set of activities, and together with Kosovo Institution will adopt the principles of integrated water resource management in line with the objectives and requirement of the EU Legislations, and other contemporary water resource management approaches. The inception phase will end in April 2020, and as of May same year, the Program will start with its implementation. Furthermore, the TL stated that considering the complexity of the challenges Kosovo is facing with regard to water resource management, climate changes implications, and the limited investment in this sector, the IWRM-K is working to address some of the root problems of the current situation. The program has three main components:

- Preparation of the River Basin Management Plans to improve water use efficiency in line with the requirements of EU Legislation;
- Institution development and capacities of the country by targeting key institutions like KEPA, River Basin, Hydro-meteorological Institute, and many other actors; and
- Democratization of the water resource management.

Within the institutional development capacities, the program will be working to improve legislations, and is assessing the key functions needed to be implemented by the existing institutions in order to have a better water resource management. The program is analysing all the experiences from Switzerland and Austria, and based on these models the program will improve and develop the future system, knowledge and skills needed for a better integrated water resource management system.

The team leader further pointed out that higher education is very important, and in these regard the program is assessing the Kosovo education priorities, the current programs in the field of water, the profiles they offer, the need for modification, and other types of programs available like it is the case with young water professionals that are proving on job training for

different institutions. The program will also offer possibilities for research, data collection in hydrology, metrology, water quality assessment etc.

And the workshop today organized by the WUS Austria experts with education stakeholders and selected employers in the water sector as well as young water professionals will aim to present the preliminary findings and validate them before the baseline study is finalized and incorporated in the inception report of the overall program.

The WUS Expert Ms. Veronika Nitsche presented that within the frame of the development of the IWRM-K Program, it was observed that there is a lack of skills, knowledge and lack of employment in water management, and for that reason it was decided to foster skills of young water professional and water professional at large. Ms. Nitsche delivered a presentation on the matters and among other issues stated that the systemic development of skills of young water professionals in Kosovo will be based on the analysis of the status quo, the identification of current and future needs, and the development and implementation of tailor-made educational programs. In order the above is achieved, Ms. Nitsche mentioned the steps that need to follow:

- Review of the current water related education options;
- Analyse the employment opportunities for young water professionals;
- Identify a qualification profile of (young) water professionals in Kosovo in terms of knowledge/skills and competences, based on state-of the art in education and trainings in the European Higher Education Area (EHEA)/in Switzerland and Austria
- (Based on the future profile of young water professionals in Kosovo) identify gaps in educational programs in the field of water resource management in Kosovo, in particular for the establishing of educational provisions beyond the Bachelor level;
- Provide recommendations for the design of (new) educational/training programs (full-time/part-time study programs, certificate courses/modules, distance learning, etc.);
- Analyse other (ongoing) initiatives from relevant donor funded projects in Kosovo and in the region, in order to build on their activities and lessons learnt and to seek synergies;
- Analyse the current infrastructure and capacities at Kosovar HEIs to host the recommended (new) educational programs and make recommendations to fill any gaps, and
- Identify measures to anchor the qualification of (young) water professionals in the labour market/society (enhance their visibility) and to promote the services provided by this professional group.

Further, Ms. Nitsche reiterated that during today's sessions the work of the focus groups will be focused on educational provisions, current working environment, qualification profile of a (young) water professionals, future educational/training infrastructure, recommendations for future educational programs, and gaps in terms of capacities (teaching staff, professionals/experts available to teach news courses/contents/methods, infrastructure, financing of programs/courses, training opportunities etc.).

Under the same session, Mr. Arnulf Schönbauer from EAA presented the IWRM concept which aims to promote changes in practices which are considered fundamental to improve water resource management. The current definition, IWRM rests upon three principles that together act as the overall framework: social equity, economic efficiency, and ecological sustainability. Further Mr. Schönbauer presented the EU Water Framework Directive which aims for 'good status' for all ground and surface waters (rivers, lakes, transitional waters, and coastal waters) in the EU. In these regards, it is in the interest of Kosovo to follow EU Directives on water management. The focus should also be on environmental status, economical aspects and also the state of the stakeholder's participation.

Presentations of the preliminary finding

Under this session, WUS Austria expert Mr. Aqim Emurli presented the preliminary findings from the meetings with representatives of HEIs, employers, Young Water Professionals (YWP), Ministry of Education, Science and Technology (now the MESTI) etc. In those meetings, WUS Austria informed the stakeholders about the baseline study which will include main aspects of skills development in water sector, key competencies, list of institutions that would need specific skills and degrees, list of higher education institutions (HEIs) that have programs/modules on water matters and similar. Mr. Emurli shared with the audience that in addition to the above-mentioned meetings, the preliminary findings are based on the desk research that the WUS Austria team has conducted prior the workshop. In this respect, the team had analysed majority of the syllabi's and programs that entail the water modules or session in their studies, has analysed which subjects are taught as elective and which not, whether the academic staff look for the labour market needs when they accredit new or revise the existing programs. As a result of it, Mr. Emurli shared with the audience the following set of preliminary findings:

What employers usually look for profiles were:

- Responsible for environment and nature monitoring, establishment and management of databases and environmental information systems;
- Give professional opinions on the procedure for approval of management plans of nature protected areas;
- Propose technical solutions to prevent and reduce environment and nature pollution;
- Develop plans and programs in the field of environmental protection and develop programs and educational materials to raise public awareness for environment;
- Follow the implementation of the environmental action plan and give professional opinion on urban and spatial plans, prepares reports for the state of the environment;
- Provide scientific and other support for protection of environment, nature, and biological diversity;
- Do research on the water related fields and provide data and information on the real needs of the sector;
- Use new methodological approaches to come to the solutions that are innovative and appropriate for sector development.

On the issue of what the employers and education institutions think:

- The lack of skills and competencies that the newly graduates possess after finishing the formal education;
- The employers do not have the resources and means to build the capacities of the graduates in order they are prepared for the water sector;
- The formal education is focused more on teaching and knowledge based and less on the research related matters;
- When the programs are developed and accredited, the labour market needs are not taken into consideration thoroughly;
- The aspects of the water are taught separately in different fields of studies and different faculties and the students are not able to receive fully fledged studies on IWRM matters;
- Some important subjects are taught as elective and not mandatory (even in those cases only one elective subject is becoming mandatory)

- There is a lack of skills in the field IT, software developers, GIS, waste waters, water sheds, water hydraulic, monitoring, measurement and similar;
- Kosovo would need profiles with competencies such as, engineer on hydro-technique for waste water treatment, meteorological monitoring, biological monitoring, etc.;

Whereas, regarding how the challenges could be overcome the preliminary findings were:

- Through offering internship for students and academics to Austria, Swiss, offering PhD's, PostDoc, bringing eminent professors of the field as visiting professors at the UP, organizing joint programs between the UP, AT and/or Swiss universities;
- To revise the existing curricula: the revision of curricula is an option in particular when the process of program accreditation is initiated. In this direction, great help could be expertise from Austria and Swiss to develop joint program, give scholarship to graduates or academic staff or train the students, academic staff, senior management on the issues that are not covered sufficiently during the studies;
- To establish new curricula: Until now, the benchmark university has been Zagreb university but they are willing to engage with other universities from EU as well, in this case, Austrian and Swiss universities;
- To establish interdisciplinary studies within the UP with focus on water resource management (statute of UP it is foreseen interdisciplinary courses to be established but to date there are not, therefore, any initiative of this kind could be welcomed by the UP);
- In parallel to the revising existing and developing new curricula, informal training on the water resource management to be delivered for the academic staff, students at BA and MA through the training centres of the Universities or outsourced;
- Equip the labs with new tools and items in order the students do find it attractive the related subjects;
- Think about lifelong learning opportunities that HEIs could facilitate;
- To develop VET education program as well as LLL opportunities for water professionals;
- Organize practical work or internships for the students at the future employers. This will contribute towards bringing the education system closer to the water employers through skills development and produce needed profiles, and
- Establishments of the MoUs between the employers and the HEIs in order the need and demand is further aligned. Furthermore, the market relevance shall be further enforced as requirement for the accreditation process of the new or existing programs;

Group work session

In the next session participants were divided into three groups:

- 1st group: Analyse the employment opportunities for young water professionals
- 2nd group: Analyse the education opportunities for young water professionals;
- 3rd group: Identify gaps in educational programs in the field of water re-source management in Kosovo.

The groups had 45min to brainstorm, exchange ideas and then come to joint conclusions. The deliberations from the working groups were presented and discussed in a joint session, moderated by the WUS Austria team of experts. Below is a brief presentation of the conclusions of the discussion:

Conclusions from the workshop with educational stakeholders and selected employers in the water sector

Employment opportunities for (young) water professionals

- a. How does the current working environment for (young) water professionals look like?
 - Diversified environment where specifics are determined by employing institutions
- b. What qualifications in terms of knowledge, skills and competencies are required?
 - Basic knowledge on water resources:
 - managing skills
 - IT skills
 - biology/chemistry
 - hydro-technical engineering
 - geography/geology/climatology
 - It is possible to develop a water profile – interdisciplinary
- c. In case the staff is not qualified enough, does your institution have resources and means to build their capacities?
 - Yes, in specific disciplines. Institutions have resources to offer trainings to build professional skills for their staff like Ministry of Public Administration (now MIAPA) of the offer training for different profiles.
- d. How these trainings could look like (i.e. duration, form, content, learning objectives, etc.)
 - Short time training, study visits in foreign institutions, and with regard to content it is based on what are the leaning outcomes that we expected to develop during trainings.

Discussion and ideas about presentation of the Group I

From the student's perspective there is a gap between the science and practice, and they miss the practical part in most of the courses taught. There is a lack of laboratories to make measurements etc. Participants also mentioned that in the geographical aspect the water resource management is much more complex and includes other profiles like: geology, climatology, meteorology etc. In addition, it was proposed that interdisciplinary study program it should also include economy, water urbanization etc.

Education opportunities for young water professionals

- a. What educational provisions, including training opportunities (formal, informal) in the respective fields are currently available in Kosovo?
 - There is no study program on "water resource management" as such and there are no formal or informal trainings at the University of Pristina (UP) on this topic
 - VET: formal training in two profiles, and lifelong training
- b. Opportunities to have practical work for students
 - Centre for career development to offer extra courses, training for students (informal)
 - SHUKOS and YWP
 - Sharing experiences
 - Presentations
- c. Do you think that graduates are well equipped for employment in the field of water resource management; If not, what is missing in terms of education;
 - A study program on water resource management is missing.

- This brings the need to develop e new study program on water resource management, as an interdisciplinary water program and to bring experts from different fields.
- d. What are the gaps in terms of capacities (teaching staff, professionals/experts available to teach news courses/contents/methods, infrastructure, financing of programs/courses, training opportunities etc.)?
- Lack of teaching staff for specific fields
 - The existing staff is overloaded with academic issues
 - Lack of possibilities for extra curriculum training
 - Lack of online database

Discussion and ideas about presentation of the Group II

Participants discussed that in the Faculty of Hydrotechnics, students are familiar with water resource management as there are subjects that cover water, and during the process of the program accreditation expert recommendations were to include more subject that cover water management issues, however the problem is to achieve 60 ETCs in order to have new subject. There should be three full time professors in the relevant filed in order to accredit the program.

Future Needs for young water professionals

- a. What should be the qualification profile of (young) water professionals in order to be able to meet future (societal) challenges in Kosovo?
- Faculty of Civil Engineering, development of IWRM Department under Hydrotechnics
 - Natural Sciences Faculty - integrated Interdisciplinary program
- b. How should the future educational/training infrastructure for (young) water professionals look like to ensure lifelong learning opportunities (full-time versus part-time study programs, training modules, certificate courses, distance learning etc.)?
- Faculty of Civil Engineering - curriculum advancement with the topic/subjects on IWRM and Natural Sciences (Obligatory)
 - Full time PhD for specific IWRM topics
 - Full/part time MSC like Erasmus + Program; Different Interdisciplinary IWR
 - Training modules/ Certificates in all sectors with topics on Hydraulic, Hydrology, Hydrogeology, GIS, Software, Aquacultures, wet Lands, fish hydraulic structures Webinars etc.
 - Revision of the existing programs and development of specific competencies, with broader focuses and combining technical, natural sciences, and other parts.
 - Creation of the working group to design interdisciplinary program in three levels BA MA and PhD, also we can create professional with good competencies and fulfil the gaps in the labour market.
 - Train people and use them as a resource.

Discussion and ideas about presentation of the Group III

Participants agreed that trainings should be focused also on broader aspects, and not only on technicality, the demand from those perspectives, and bring up an education system focusing on the market as well on how to improve laboratories, teaching etc.

Ms. Nitsche further reiterated that in order to plan education programs and study programs, there is a need to know about how many people are needed. How many are currently employed, and how many are needed in the future (and what is their profile, e.g. HE/VET). Is there a need now or will there be a higher demand in the future. In which disciplines there are already qualified people, in which are they needed? From group presentation, we also heard that there are already trainings provided.

Participants mentioned that students at BA and MA have knowledge on water resource management, however they lack the practice in this regard, they lack skills and as such they need trainings. Some of the hydrotechnics students are able to find the job immediately after they finish BA, like in private companies, and less on public institutions. Establishment of water Institutions also sees as a very important process, where experts from different field like geography, chemistry, agriculture, etc., can provide contribution on water resource management.

Some participants think that BA is not enough to gain the desired knowledge and skills on water resource management, and there is a need for students to continue with Master level as well.

Conclusions

Ms. Nitsche presented that the workshop today with focus group and discussion among participants brought into light many issues. From one side we heard that there are a lot of existing capacities, and on the other side we see that there is no connections and links between institutions and knowledge. For that reason, the program brought together Universities, institution, employment institution to discuss so we can build up based on the existing capacities. This of course will require organization of other workshops so we can discuss more in depth the cooperation between academia and industry. Ms. Nitsche further noted that the WUS Austria experts will fine tune all the finding and come back to all participants to jointly follow these topics.

Mr. Schönbauer from EAA reiterated the need to enhance university-institution cooperation, participation in the industrial boards, so people from the industry can contribute to the curriculum development, and industries from the other side are interested to work together with universities.

The team leader of the IWRM-K, Mr. Sekovski, thanked participants for the fruitful contribution, he mentioned that all these discussions will help the program to propose the strategic direction of the program, and present it to the donor as well as communicate with different stakeholder at different level the baseline. Based on the finding on what is available, and what is missing, the program will be able to formulate activities that will help to achieve broader aligned skills. He further noted that, all workshop participants raised and agreed on the issue of development of interdisciplinary courses, if there is a need to develop profiles that will be able to manage this cross disciplines, how to approach, if there is a need for special study on water management, or would it fit within the environmental studies, or have a generic understating of water resource management incorporated within the existing curricula.

In the case on Kosovo and neighbourhood the questions are also if it is worth to invest in curricula from the beginning or incorporate into existing curricula the water resource management, provide training outside the county etc. All this will be assessed by the program, and we will join our forces to come up with the best possible solution, present it to the donors and have stakeholder's agreement for final funding.

WORKSHOP AGENDA

09:30 – 09:45	Overview of event's objectives and agenda	Mr. Dimitrija Sekovski, TL
09:45 – 10:00	Introduction to the workshop	WUS Austria Ms. Veronika Nitsche & Mr. Aqim Emurli
10:00 – 10:15	Presentation of the concept of the baseline study	WUS Austria Ms. Veronika Nitsche
10:15 – 10:30	Presentation of preliminary findings from the previous meetings/missions	WUS Austria Mr. Aqim Emurli
10:30 – 10:45	Coffee break	
10:45 – 11:30	Group work session: <ul style="list-style-type: none"> - 1st group: Analyse the employment opportunities for young water professionals - 2nd group: Analyse the education opportunities for young water professionals; - 3rd group: Identify gaps in educational programs in the field of water resource management in Kosovo 	The session will be moderated and facilitated by WUS Austria. The participants will be divided in three groups, will have 45 minutes to work on the given topic.
11:30 – 12:30	Focus group discussion on the required qualification (knowledge, skills and competences) of young water professionals in order to meet current and future challenges	Moderated/Facilitated by: WUS Austria Ms. Veronika Nitsche & Mr. Aqim Emurli
12:30 – 13:00	Wrap-up and outline of the next steps	Mr. Dimitrija Sekovski, TL & WUS Austria
13:00 – 14:00	Lunch Break	

Participants

	Name and surname	Institution	Group
1	Afrim Berisha	KEPA	3
2	Letafete Larifi or Bashkim Kas-trati	HIK	2
3	Manduha Gojani	RBDA	1
4	Veton Alihajdari	MEST (now MESTI)	2
4	Besnik Loxha	ADO UP	2
5	Ferdije Zhushi	University of Prishtina (UP)	1
6	Berbuqe Nushi Latifi	UP Institute of public Health	1
7	Bardha Korqa	UP	2
8	Mimoza Zhubi	University of Ferizaj	3
9	Sabri Avdullahi	University of Mitrovica	1
10	Behxhet Shala	University of Mitrovica	2
11	Mimoza Hyseni Spahiu	University of Peja	1
12	Adem Dreshaj	University of Peja	2
13	Albona Shala Abazi	University of Peja	3
14	Valbon Bytyqi	UP	1
15	Laura Kusari & one student	UP	2

	Name and surname	Institution	Group
16	Linda Grapci	UP	3
17	Naim Hasani	UP	2
18	Shukrane Germizaj	UP	3
19	Sokol Xhafa	YWP	3
20	2 nd member of the YWP	YWP	1
21	3 rd member of YWP	YWP	2
22	Arnulf Schönbauer	EAA	3

ANNEX 2: Desk Research – Study programs and courses related to water resource management

List of study programs and courses related to WRM collected from the following HEIs:

- UP Faculty of Civil Engineering and Architecture:
 - BA on Hydrotechnics
 - Hydrotechnical structures
 - River Engineering
 - Water purification
 - Geotechnical engineering
 - Environmental protection
 - Probability and statistics
 - ...
 - MA on Hydrotechnics
 - River Regulation
 - Water supply of settlements II
 - Hydrology
 - Geotechnics of Hydrotechnical Structures
 - Hydrogeology
 - Application of GIS in water management
 - Water Resource Management
 - Waste Water Treatment
 - Channelling Settlements
 - ...

- UP Faculty of Mathematics and Natural Sciences:
 - MSc Ecology and Environment protection
 - Freshwater macro-invertebrates
 - PhD
 - Biological assessment and protection of freshwater ecosystems

- UP Faculty of Mathematics and Natural Sciences:
 - MSc Biology:
 - Freshwater ecology

- UP Faculty of Mathematics and Natural Sciences:
 - MSc Chemical Engineering
 - Chemical process of water Treatment

- UP Faculty of Mathematics and Natural Sciences:
 - MSc Geography
 - Applied Hydrology

- UP Faculty of Agriculture:
 - MA on Plant Production? Or Plant Protection

- University of Mitrovica: Faculty of Geosciences
 - MSc in Hydrogeology and Engineering geology

- University of Peja - Faculty of Management in Tourism, Hospitality and Environment

- BSc Management in Environment
 - Water Quality
- University of Applied Science in Ferizaj - Faculty of Tourism and Environment
 - BA & MSc Management of Tourism and Hospitality
 - Environmental Protection and Tourism
- UBT
 - BSc. Agriculture and Environmental Engineering

Additionally identified relevant courses/subjects:

- UP Faculty of Mathematics and Natural Sciences:
 - Climatology with Meteorology
 - General Hydrology
- UP Faculty of Philosophy – Department of Sociology:
 - Environment and society
- UP Faculty of Economy:
 - Economics of Development of Kosovo
- UP Faculty of Medicine:
 - Hygiene

The following courses/subjects have also been identified as relevant for integrated water resource management:

- Stakeholder Consultation
- Water law and Water Policy/Environmental Law
- Economics (cost benefit analysis)
- Chemistry
- General Biology with focus on aquatics
- Spatial planning
- Geodesy/remote sensing
- Aquatic Ecosystems
- Soil science
- New Software

The table below includes most relevant information related to the desk research.

University - Faculty	Study program	Course title	Obligatory/ Elective	Syllabi available	SER available	Comments
UP Faculty of Civil Engineering and Architecture	BA on Hydrotechnics	Hydrotechnical structures	Obligatory	Yes	No	The course is obligatory and includes topics on different types of hydrotechnical structures; dams - construction purposes elements and reservoirs; earth dams; waterproof structures at dams; gravity dam design, etc.
UP Faculty of Civil Engineering and Architecture	BA on Hydrotechnics	River Engineering	Obligatory	Yes	No	The course is obligatory and includes topics on river engineering; river uses; river legislation and planning; fluvial processes; river basin; river basins in Kosovo; hydraulic models; river morphology, etc.
UP Faculty of Civil Engineering and Architecture	BA on Hydrotechnics	Water purification	Obligatory	Yes	No	The course is obligatory and includes topics on water supply development; water needs analysis, water supply resources; surface and groundwater quality; planning of water removal systems; physical, chemical, and biological processes of water purification, etc. Note: Arnulf Schönbauer (EAA) suggests that this course should be taught in the MA program, instead the course on "Water supply" in the BA program.
UP Faculty of Civil Engineering and Architecture	BA on Hydrotechnics	Geotechnical Engineering	Elective	No	No	Note: According to Arnulf Schönbauer (EAA) this course should be obligatory. The course was not taught in the last semester (due to the regulations on elective courses, which are only taught, if there is a certain amount of students attending).
UP Faculty of Civil Engineering and Architecture	BA on Hydrotechnics	Probability and statistics	Elective/ Obligatory from 2020 on	No	No	Note: According to Arnulf Schönbauer (EAA) this course should be obligatory. The course was taught in the last semester and will obligatory from 2020 on.
UP Faculty of Civil Engineering and Architecture	MA on Hydrotechnics	River Regulation	Obligatory	Yes	No	The course is mandatory and includes topics on river characteristics and the use of rivers; hydrologic regime of rivers; bed form and Alluvial processes; river morphology; planform – meandering and braiding; river surveys; fundamentals of land surveys; hydrology, etc.
UP Faculty of Civil Engineering and Architecture	MA on Hydrotechnics	Water supply of settlements II	Obligatory	Yes	No	The course is mandatory and includes topics on water supply development; water balance; water qualities and their impact; groundwater supply; facilities in water supply systems; protection of drinking water from pollution, etc.

University - Faculty	Study program	Course title	Obligatory/ Elective	Syllabi available	SER available	Comments
UP Faculty of Civil Engineering and Architecture	MA on Hydrotechnics	Hydrology	Obligatory	Yes	No	The course is mandatory and includes topics on development of hydrology; full waters; using probability theory and mathematical statistics in hydrology; defining empirical security; Pearson's Law I and III, statistical control of hydrological data, etc.
UP Faculty of Civil Engineering and Architecture	MA on Hydrotechnics	Use of water-power resources	Obligatory	Yes	No	The course is mandatory and includes topics on hydropower systems; energy characteristics of power plants; gates of hydropower plants; hydropower plants with derivation; and underground power plants, etc.
UP Faculty of Civil Engineering and Architecture	UP Faculty of Civil Engineering and Architecture	Geotechnic of Hydrotechnical Structures	Elective	No	No	Note: According to Arnulf Schönbauer (EAA) this course should be obligatory.
UP Faculty of Civil Engineering and Architecture	UP Faculty of Civil Engineering and Architecture	Hydrogeology	Obligatory	No	No	
UP Faculty of Civil Engineering and Architecture	UP Faculty of Civil Engineering and Architecture	Application of GIS in water management	Elective	No	No	Very important subject; should be obligatory. In fact, even though elective, students always attend this course in order to get the needed ECTS.
UP Faculty of Civil Engineering and Architecture	UP Faculty of Civil Engineering and Architecture	Water Resource Management	Elective	No	No	The course should be mandatory. The course was taught in the last semester; in fact, even though elective it is continuously taught at MA level.
UP Faculty of Civil Engineering and Architecture	UP Faculty of Civil Engineering and Architecture	Waste Water Treatment	Obligatory	Yes	No	Arnulf Schönbauer (EAA) suggests that this course should be taught in the BA program. At Bachelor level taught through the Water Purification course and On site decentralised wastewater systems.
UP Faculty of Mathematics and Natural Sciences:	MSc Ecology and Environment protection	Freshwater macro-invertebrates	Elective	Yes	No	The course is elective and includes topics on the life cycle, ecology, feeding relations and the role they play in the monitoring system as indicators for evaluation of the water quality. It also includes topics about the European Water Framework Directive, its implementation as well as the human impact on freshwater environments. -> <i>Follow-up whether the course is actually taught.</i>

University - Faculty	Study program	Course title	Obligatory/ Elective	Syllabi available	SER available	Comments
UP Faculty of Natural Sciences and Mathematics	PhD	Biological assessment and protection of freshwater ecosystems	Obligatory	Yes	No	The course in PhD is focused in the field and laboratory research methods of freshwater ecosystems, Physico-chemical characteristics and classification of freshwater ecosystems. Lotic and lentic freshwater ecosystems. Biological methods of water quality assessment. Macro-invertebrates as an indicator of water quality.
UP Faculty of Mathematics and Natural Sciences	MSc Ecology and Environment Protection	Water pollution and management	Elective	No	Yes	The course is elective and includes topics on aspects of aquatic ecosystems pollution; water pollution from industries, sewage, agricultural activities; contamination of water from pharmaceutical and health of wildlife; sustainable management of water; rests of determining water quality, etc. -> <i>Follow-up whether the course is actually taught.</i>
UP Faculty of Mathematics and Natural Sciences:	MSc Biology	Freshwater ecology	Elective	No	Yes	The course is elective and includes topics on techniques used in research of freshwater ecosystems; concepts and approaches from chemistry, physics, mathematics and statistics, ecology, and evolution; water sampling and electro-fishing in accordance with research guidelines and with the requirements of certification, etc. -> <i>Follow-up whether the course is actually taught</i>
UP Faculty of Mathematics and Natural Sciences:	MSc Chemical Engineering	Chemical process of Water Treatment	Elective	No	Yes	The course is elective and includes topics on water resource management, in the sustainable development aspect; application of water treatment methods based on physical, chemical and biological processes attempting to eliminate unwanted substances from water; technological processes of surface water treatment used for obtaining drinking and industrial-use water, as well as cleaning wastewaters. -> <i>Follow-up whether the course is actually taught.</i>
UP Faculty of Mathematics and Natural Sciences	MSc Geography	Applied Hydrology	Obligatory	No	Yes	The course is obligatory and includes topics on groundwater, genesis, classification stocks; Rivers, study methods; water pull, catchment; morphometry river basin, water level, water flow, water flow curves, measurement of sediment in the water, theories of probability in hydrology, statistical and graphical methods in hydrology, hydrological instruments, water balance of the basin; physical factors geographic basin etc.
UP Faculty of Agriculture	MA on Plant Protection	Intro. subject on irrigation tech-				Study program currently not held?

University - Faculty	Study program	Course title	Obligatory/ Elective	Syllabi available	SER available	Comments
		niques				
University of Mitrovica: Faculty of Geosciences	MSc Hydrogeology and Engineering geology		Obligatory/ Elective	No	Yes	The study program in MSc has courses on Geodynamic Engineering; Special Hydrogeology; Hydrogeology of the Kosovo; Basement and their consolidation; Geophysical Hydro-geological investigations for water supply needs; Protection of groundwater; Geo-technical; Hydrogeology of the mineral deposits Water Monitoring; Sedimentary basins and hydrocarbon; Geological and technical; Water Wells and Boreholes applied Geo-statistics, etc.
University of Peja: Faculty of Management in Tourism, Hospitality and Environment	BSc Management in Environment	Water Quality	Obligatory	Yes	Yes	The course is mandatory and includes topics on main water pollutants, methods of water quality monitoring, ways of preventing water pollution, the impact of water pollution on human health and aquatic ecosystems etc. The course should be included in the baseline study and other project phrases.
University of Applied Science in Ferizaj, Faculty of Tourism and Environment	BA & MSc Management of Tourism and Hospitality	Environmental Protection and Tourism	Elective	Yes	Yes	The course is elective and includes water among other environmental topics.
UBT	BSc. Agriculture and Environmental Engineering			No	No	Planned to start in 2019/2020 ²⁰
University of Pristina Faculty of Philosophy - Department of Sociology	BA	Environment and society	Elective	Yes	No	This course focuses on the sociological approach to the study of environment and ecology. Within this course students learn about the concept of environment and ecosystem; on connectivity and mutual influences between society and the environment; on the dimensions of environmental problems (local and global) and efforts to resolve them; on environmental culture and ethics and environmental prac-

²⁰ www.ubt-uni.net/sq/studimi/programet-e-studimit/programet-bachelor/inxhinieria-e-agrikultures-dhe-mjedisit/

University - Faculty	Study program	Course title	Obligatory/ Elective	Syllabi available	SER available	Comments
						tices at home and in the world.
University of Pristina Economy Faculty	BA	Labour market economics	Obligatory	Yes	No	This course analyse labour supply and demand, equilibrium in the labour market and wage setting in the market, investing in human capital and returning from it investment, effects on the labour market (employment/ unemployment) of certain policies of the labour market, etc.
University of Pristina Economy Faculty	MA	Economics of Development of Kosovo	Obligatory	Yes	No	The course presents an overview of various aspects of Kosovo's development, current trends of many aspects of Kosovo's development, such as economic structure, finance and fiscal policy etc. The course has topics on Kosovo's mineral resources, Energy, Agriculture, industry, environment etc.
University of Pristina Faculty of Mathematical-Natural Sciences	BA	Climatology with Meteorology	Obligatory	Yes	No	This course analyses division; interfaces with the atmosphere geographer; composition; structure; energy processes; temperature; moisture; precipitation; air pressure; baric systems; air movements; climatic factors and climatic types; meteorological elements and factors; air temperature; horizontal and vertical temperature changes; climate classifications; climatic indices and climatic zones.
University of Pristina Faculty of Mathematical-Natural Sciences	BA	General Hydrology	Obligatory	Yes	No	This course analyses segregation, outdoor water distribution, water circulation and balance, Groundwater, genesis, reservoir classification. Rivers, study methods, watershed, catchment. Basin morphometry, basin water balance. Physical geographical factors of the basin. Lakes, genesis, distribution classification and water balance.
University of Pristina Faculty of Medicine		Hygiene	Obligatory	Yes	No	This course analyse Basic knowledge on environmental factors, positive and negative impacts on health. Water, Food, Air, Noise, Soil, Climate change. Environmental risk assessment. It falls within Public Health: water born disease; drinking water requirements.