

Final report

Seminar Wastewater Management and Treatment

Starting with network for knowledge exchange and cooperation

Summary

Kosovo is on the threshold of tackling the serious pollution of the surface water, but there is limited know-how regarding wastewater treatment. For that reason Bylmeti, a dairy company in Kosovo treating wastewater, The University of Mitrovica and PUM came to an agreement to start a curriculum on wastewater treatment of the Technology-Environmental Engineering department of the University of Mitrovica to meet the needs of local businesses, water companies and communities. World Water Academy (WWA) was requested to bring in expertise in didactics and setting-up networks, including the training and material of introduction to wastewater treatment.

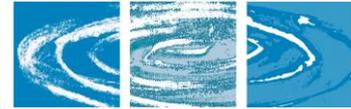
Starting point of this PUM program is this Seminar Wastewater treatment held at 13-16 July 2015 in Kosovo. This seminar was aimed to introduce wastewater issues to persons concerned from Universities, Industry and central and local Authorities. Besides this, also the need for education, creation of a network for cooperation within Kosovo and the PUM program has been discussed during the workshop/course. Topics discussed during the Seminar were: EU and national legislation and regulations, Introduction to water cycle, Basics of chemistry and biology, Domestic and industrial wastewater, Wastewater treatment processes and Process control. 28 Participants were registered to participate the course, at the end 18 participants received a certificate. The Seminar is highly appreciated by the participants; 90 % rated the course as excellent and 10 % as good. Regarding the relation to and application in their daily work 80 – 90 % rated excellent or good.

The conclusion, regarding creating a network was, that the start should be based on engaged professionals from various organization (government: national and local, universities: students and teachers, businesses/industry and water companies). In the beginning coordination will be centralized by the University of Mitrovica. Action will be taken for making a Newsletter for sharing information, best-practices: once per two months.

The results of the Seminar were positive and is a good start for the program on vocational education on wastewater treatment.

The role of the World water Academy was to lead the preparation and execution of the Seminar, including tailoring of the course *Basics Wastewater Treatment* and material to the needs in Kosovo. Besides this, WWA were requested to find out the possibilities and kick-start a first network to network and exchange knowledge in the field of wastewater treatment in Kosovo. RVO supported and funded the preparation and execution of seminar.

Report: Johan Oost (with input from Klaas Visscher) | 17 augustus 2015



Introduction

Kosovo is on the threshold of tackling the serious pollution of the surface water by foundation of Water companies and initiatives of industry and communities to realize wastewater treatment plants. Bottleneck is that in Kosovo there is limited know-how regarding wastewater treatment and Universities until now did not developed proper curricula for this purpose. Because of this lack on know-how wastewater treatment plants already built are often not functioning because of a wrong design or insufficient knowledge to operate a plant in a proper way. In this way the money spent on investments is often wasted.

During a PUM mission in January 2014 focused on solving a wastewater problem at Bylmeti, a dairy company in Kosovo, this lack of know-how became clear. Meetings with the Universities of Mitrovica and Pristina confirmed this and made clear the Universities are aware of the need to develop and implement curricula in the field. Therefor Bylmeti and The University of Mitrovica asked PUM for assistance to introduce education in wastewater treatment at the University of Mitrovica Kosovo. Parties involved came to an agreement to start a curriculum on wastewater treatment of the Technology-Environmental Engineering department of the University of Mitrovica to meet the needs of local businesses, water companies and communities. This agreement (Annex 1), budget summary (Annex 2) and Plan of Action (Annex 3) are added to this report.

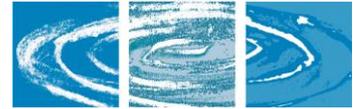
When the objectives of the agreement are achieved the University of Mitrovica will provide in graduates who can become professionals at private companies, consultancies, (wastewater) authorities, water and environment ministries, academia, NGOs and city and municipal authorities.

Starting point of this PUM program for vocation education in the field of wastewater treatment in Kosovo is a Seminar Wastewater treatment held at 13 -17 July 2015 in Kosovo. The Seminar is organized by PUM, World Water Academy, University of Mitrovica and Bylmeti (see annex A). With regard to the additional costs to organize the seminar a grant of 10.880 euro has been allocated by the Netherlands Enterprise Agency (RVO.nl). The Seminar has been opened by Mr. Carel Brands from the Dutch Embassy in behalf of the Ambassador. This report is a reportage of this Seminar.

Goals of the Seminar

This seminar of a week was aimed to introduce wastewater issues to persons concerned from Universities, Industry and central and local Authorities. Besides an introduction to the effects of wastewater on the quality of surface water and the technological possibilities to reduce the discharge of wastewater, also the need for education and the PUM program has been discussed during the workshop/course. During the seminar agreement on the coordination and counseling of the PUM program in Kosovo has been aimed at. In this way it will be guaranteed that the needs of future employers for professional employees are taken into account.

Therefor the Seminar was focused on:



- Introduction of wastewater treatment to persons from Universities, Industry and central and local Authorities already or in the future to be faced with wastewater issues.
- Creating a network for with cooperation within Kosovo
- Based on the network: further elaboration on the vocational education project of PUM, University of Mitrovica and Bylmeti.

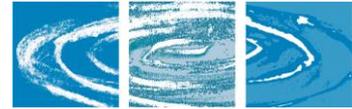
Introduction to wastewater treatment

28 Participants were registered to participate the course, at the end 18 participants received a certificate (see Annex B). Topics discussed during the Seminar were: EU and national legislation and regulations, Introduction to water cycle, Basics of chemistry and biology, Domestic and industrial wastewater, Wastewater treatment processes and Process control (see annex C; Program Seminar). The participants received a textbook including background knowledge regarding the training. This textbook is based on a standard course *Wastewater Treatment* of the World Water Academy, which is already given in The Netherlands, South Africa and Indonesia. The training and textbook for this seminar has been completed and tailored by the PUM experts to the needs of the target group in Kosovo.

Part of the course was to perform basic calculations regarding characteristic process parameters.



Presentations by Dutch experts



Performing exercises in small groups

In general the participants had sufficient basic knowledge in chemistry and microbiology to follow the lessons. Engineering and performance of calculations is a point of attention.

The excursion to the wastewater treatment plant of Bylmeti makes the lessons learned more explicit. Although the plant is in restart the aeration equipment and sludge grow could be shown and discussed. Very instructive was the demonstration and explanation of the laboratory equipment by the Bylmeti staff. The participants were invited to participate in doing analyses and studying the activated sludge with a microscope. Bylmeti is able to perform most of the common wastewater analyses.

During the course also the need for developing knowledge of wastewater treatment in Kosovo is discussed. The turn off of the wastewater treatment plant of Skanderaj, because of high energy costs, makes clear that even when a wastewater treatment plant is a gift or financial arranged, knowledge has to be available in Kosovo to assess if this plant can be financial and technical run by the community.

Creating a network for cooperation within Kosovo

One of the aims of the Seminar was a start of the formation of a network in Kosovo regarding wastewater management and treatment. In the Netherlands, but international as well, there are many networks in the water sector to exchange knowledge and ideas, to stimulate cooperation and communication and to organize events. In the Netherlands networking has contribute in a large extent to the fast development of wastewater treatment.

During the Seminar the participants were by presentations informed about the different kinds of networks in the (waste)water sector in The Netherlands and international:

- a. Networks for individual professionals
- b. Networks to stimulate business (more for organization to join as member)



- c. Branch or umbrella organizations (like VEWIN for drinking water companies and Dutch Water Authorities for regional water authorities)
- d. Research and education (like STOWA, PAO and World Water Academy)

In more detail networks for individual professionals and what they do are presented:

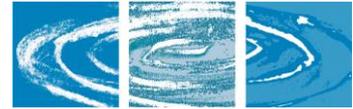
- a. Royal Netherlands Water Network
- b. International Water Association
- c. Romanian Water Association
- d. Water Institute in Southern Africa (WISA)

The participants worked on this issue by means of two different teaching methods (with post-its and group work) to listing the various organizations dealing with wastewater in Kosovo and collecting the first ideas from the group of participants about the needs and how to create a network on wastewater in Kosovo.

The conclusion was that the start should be based on engaged professionals from various organization (government: national and local, universities: students and teachers, Businesses/industry and water companies). The first coordination has to be centralized by one organization. At this moment: University of Mitrovica, but it could be another open-minded organization in a later stage The basis of the network is enthusiasm to organize something together to exchange ideas and knowledge.

Based on the proposed ideas, the participants wants to take action to:

1. Making a Newsletter for sharing information, best-practices: once per two months
2. Organizing field trips for students (maybe also professionals/teachers): Practical work / exercises
3. Managing a database (done by University of Mitrovica)
4. Involving the ministry of Environment to get a larger role (using this for public awareness purposes as well)
5. Evaluation after one year



Further elaboration on the vocational education project of PUM

During the Seminar the agreement to start a curriculum on wastewater treatment at the Technology-Environmental Engineering department of the University of Mitrovica is signed by the Rector of the University of Mitrovica and the Executive Director of Bylmeti. Because the CEO of PUM already signed this document this event means the official start of the program.



Sign of the agreement

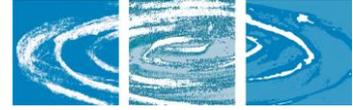
Publicity

During the excursion to Bylmeti TV recordings has been made. Moreover an article is published in the Kosovapress (<http://www.kosovapress.com/sq/ekonomi/fabrika-bylmeti-me-projekt-te-traitimit-te-ujerave-te-zeza-46949/>).



Interviews by Kosovapress

World Water Academy published an article at the website and in the Dutch and international news letters about this project: See Appendix D.



Evaluation of Seminar and course

As part of the ISO certification of Wateropleidingen (the mother organization of World Water Academy), the course had an evaluation. All participants were requested to fill-in an evaluation form. Most of the participants completed an evaluation form. The results are summarized in this paragraph. Appendix D shows the complete overview of the evaluation results

The Seminar is highly appreciated by the participants; 90 % rated the course as excellent and 10 % as good. Regarding the relation to and application in their daily work 80 – 90 % rated excellent or good.

Some answers on open questions that gives an idea of the experience during the seminar and expectations for the future of the participants are summarized below.

- *“Well awareness is lacking in Kosovo, so this course can help to raise awareness. Visiting a small WWTP. Getting to know each other and meet people.”*
- *“This type of seminar would be present more in our state. For me the best points of course is sharing ideas and information for wastewater treatment, and also know the importance of environment.”*
- *“The best points of the course is the combination of lectures and exercises and visit to factory Bylmeti.”*
- *“Every lecture during this seminar has been new and useful. I have to increase our knowledge about wastewater treatment.”*
- *“This type of seminar would be present more in our state. For me the best points of course is sharing ideas and information for wastewater treatment.”*
- *“Translation of the material an Albanian language because for a lot of students it is very important and quite necessary.”*
- *“Don't forget us, come back and work with us!”*



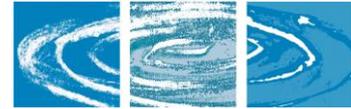
Group photo after certification

Conclusions and follow-up

The results of the Seminar were positive and is a good start for the program on vocational education on wastewater treatment. At least 18 participants are more familiar now with the effect of wastewater on surface water, the way wastewater management is organized in the Netherlands and other countries and technological possibilities to solve the problems on wastewater. Moreover a network is started for knowledge exchanges and cooperation.

Next steps concerning the continuation of the program are:

- Establishing of a project team in Kosovo. University of Mitrovica and Bylmeti will be in the lead
- Selection of potential teachers of the University of Mitrovica, University of Pristina and possible another public University of Kosovo. University of Mitrovica in cooperation with the other Universities will be in the lead.
- Establishing of a project team in the Netherlands. Potential trainers to be sent to Kosovo will be part of this project team. Project manager will be in the lead.
- Selection of PUM Senior Experts to become trainers. Project manager in cooperation with PUM Coordinators Wastewater and Education will be in the lead.
- Advising regarding laboratory equipment for practical training of the students (project manager).
- Update of the Plan of Action (project manager).



Annex A Project team

Kosovo

- Prof. Ass. Dr. Rifat Morina; Act. Vice Rector University of Mitrovica
- Mr. Afrim Berisha; Executive Director Bylmeti

The Netherlands

- Klaas Visscher: Senior Expert PUM
- Willem van Starckenburg: Senior Expert PUM
- Johan Oost: project officer World Water Academy, expert in capacity development and networking



Annex B List of participants

Nr.	Name	Institution/ Company	E-mail	Phone	*	**
1	Tafe Veselaj	Kosova Environment Protection Agency	Tafe.veselaj@rks-gov.net		G	Y
2	Agron Shala	Hydrometeorology Institution of Kosovo	Agron.shala@rks-gov.net		G	Y
3	Osman Fetoshi	Ministry of Environment and Spatial Planning	Osman.fetoshi@rks.gov.net		G	Y
4	Mehush Aliu	University of Mitrovica (Professor)	mehush.aliu@umib.net		Ut	Y
5	Fatos Rexhepi	University of Mitrovica (Assistant Professor)	Fatos.rexhepi@umib.net		Ut	Y
6	Lorika Salihu	University of Mitrovica (Student)	Lorika_salihu@hotmail.com		Us	Y
7	Qendresa Qorraj	University of Mitrovica (Student)	qendresa.qorraj@hotmail.com		Us	Y
8	Vlora Rama	University of Mitrovica (Student)	Vlora_rama@hotmail.com		Us	Y
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10	Floriye Abazi	Chief of Inspectors-Municipality of Podujeva	flori.besholli@hotmail.com	+386(0)49414439	G	Y
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13	Zijadin Gojnovci	Consultant	zijadin_g@hotmail.com	+37744111168	B	N
14	Ahmet Hoxha	Manager of Laboratory at Company Trepfarm			B	N
15	Elbasan Shala	Environmental Inspector	elbasan.shala@rks-gov.net	+37744260161	G	Y
16	Arton Ramadani	Environmental Inspector	arton_ramadani@hotmail.com	+37744681246	G	Y
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19	Rrustem Abiti	Kosovo chamber of commerce	rrustem.abiti@oek-kcc.org	+37745597000	B	N
20	Adnan Bullatovci	Environmental inspector of municipality of Fushe Kosova			G	N
21	Ron Vermeulen	Turbin Balkan	ron@turbin.nl	+386 49 100 129	B	N
22	Ibrahim Mulaj	Turbin Balkan	ibrahim@turbin.nl	+386 49 100 129	B	Y
23	Kemajl Kurteshi	University of Prishtina			Ut	Y
24	Flamur Sopaj	University of Prishtina			Ut	Y
25	Ahmet Hoxha	Trefharm	Ahmet.hoxha@trepharm.com	0037744269634	B	N
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27	Merita Abdullahi	University of Mitrovica (Student)	Merita_abdullahi@hotmail.com	+38128535725	Us	N
28	Rifat Morina	Vice rector, University of Mitrovica	Rifat.morina@umib.net	+38128535725	T	N
29	Afrim Berisha	Bylmeti	bylmeti@gmail.com	+37744167194	T	Y

* stands for kind of organisation: G = government, B = business, Ut = University teacher, Us = University student, T = Team of organisation

** stands for certificate: Y(es) / N(o)



Annex C Overall Program Seminar

13 July		
Time	Subject	Trainer
09.00	Coffee & Tea	
09.30	Welcome Carel Brands, Dutch Embassy will open the project Expectations (with picture game)	Johan Oost
10.30	Management of Wastewater treatment plant/facilities: <ul style="list-style-type: none"> • Investments / lifelong costing • (EU) legalisation • Research 	Willem van Starckenburg
12.00	Presentation on Cooperation in The Netherlands and other experiences (like in Romania): added value, necessity to cooperation in a sector International cooperation	Johan Oost
12.30	Lunch (provided by the program)	
13.30	Presentation Vocational Education project PUM University Mitrovica <ul style="list-style-type: none"> • Curricula end trainers • Didactics' • Practical training (laboratory) • Knowledge centre 	Klaas Visscher
	<i>Short break</i>	
15.00	Stakeholder Analysis in Kosovo (interactive session with post-its/flip overs) First interactive discussions on how to cooperate Assessment of needs of Kosovo (interactive session with post-its/flip overs) <ul style="list-style-type: none"> • network for cooperation • knowledge centre 	Johan Oost
16.30	Wrap-up	
17.00	End of the day	

14 July		
Time	Subject	Trainer
08.30	Welcome and introduction of the course	Johan Oost
09.00	General introduction on the water cycle	Willem van Starckenburg
9.45	Basics of chemistry and biology	Klaas Visscher
10.30	<i>Short break</i>	
10.45	Sampling, Analyses and Basic calculations	Klaas Visscher
11.45	Domestic and industrial wastewater (composition of wastewater)	Klaas Visscher
12.30	<i>Lunch break</i>	
13.00	Introduction to processes (including aeration and oxygen transfer) Overview (possible) process steps in a treatment plant	Klaas Visscher
14.30	<i>Short break</i>	
14.45	Pre-treatment, in-company measures and treatment industrial wastewater	Willem van Starckenburg
15.45	Stabilization ponds	Klaas Visscher
16.15	Trickling Filters	Klaas Visscher
16.45	Lessons learnt	Johan Oost
17.00	End of the day	



15 July		
Time	Subject	Trainer
08.30	Welcome, summary day 1	Johan Oost
09.00	Activated sludge	Klaas Visscher
10.30	<i>Short break</i>	
10.45	Nutrient removal	Klaas Visscher
11.30	Activated sludge exercise	Klaas Visscher
12.00	<i>Lunch break</i>	
13.00	Excursion to treatment plant and laboratory Bylmeti	Johan Oost
16.30	Lessons learnt	Johan Oost
17.00	End of day	

16 July		
Time	Subject	Trainer
08.30	Welcome, summary day 2	Johan Oost
09.00	Settling and treatment of sewage sludge	Willem van Starckenburg
09.45	Anaerobic treatment of industrial waste and wastewater	Willem van Starckenburg
10.30	<i>Short break</i>	
10.45	Anaerobic treatment of industrial waste and wastewater	Willem van Starckenburg
11:30	Operation and Maintenance	Willem van Starckenburg
12:00	Evaluation and certification	Johan Oost
12.30	Lunch	
13.00	Presentation on capacity development and life-long learning	Johan Oost
14.00	How to cooperate to meet the needs (session where every party) First draft of cooperation between the parties Interactive session	Johan Oost
16.00	Evaluation, follow-up and appointments	Johan Oost
17.00	End of the day and dinner	



Annex D Results evaluation participants

course	Seminar Wastewater Management and Treatment		
module	0		
coursedate	13 - 17 July 2015	number of participants	24
coursecode	15023 KS PUM	number of forms	19
location	Mitrovica, Kosovo	percentage	79%

CONTENT AND STRUCTURE

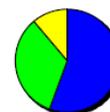
1. What is your opinion on the content of the course?

excellent	16	84%
good	2	11%
could be better	1	5%
bad	-	0%
very bad	-	0%
total	19	100%



6. Is the course related to your daily work?

excellent	10	56%
good	6	33%
could be better	2	11%
bad	-	0%
very bad	-	0%
total	18	100%



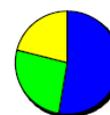
2. Did the various topics of the course link up?

excellent	10	56%
good	8	44%
could be better	-	0%
bad	-	0%
very bad	-	0%
total	18	100%



7. Is the course applicable in your daily work?

excellent	10	53%
good	5	26%
could be better	4	21%
bad	-	0%
very bad	-	0%
total	19	100%



3. What is your opinion on the depth and details of the course?

excellent	6	32%
good	13	68%
could be better	-	0%
bad	-	0%
very bad	-	0%
total	19	100%



8. Did the topics relate to current affairs (up to date)?

excellent	12	63%
good	7	37%
could be better	-	0%
bad	-	0%
very bad	-	0%
total	19	100%



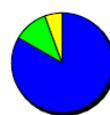
4. What is your opinion on the length of the course

too long	4	22%
long	8	44%
good	6	33%
short	-	0%
too short	-	0%
total	18	100%



9. What is your opinion on the location?

excellent	15	83%
good	2	11%
could be better	1	6%
bad	-	0%
very bad	-	0%
total	18	100%



5. Is the course complete?

excellent	11	58%
good	7	37%
could be better	1	5%
bad	-	0%
very bad	-	0%
total	19	100%



excellent
good
neutral
bad
very bad





Annex E Article World Water Academy website

Start of wastewater knowledge exchange in Kosovo

Kosovo, as one of the newest countries in Europe, is the poorest country of the Balkan. It is appointed as partner country of the European Union. This means that it should work towards meeting regulations and directions from the EU, like for water.

At this moment there is hardly no municipal wastewater treatment plants operating in Kosovo. The first plant is tendered and under construction and the in the planning, the largest cities in Kosovo will construct facilities in coming years. Some industries have their own treatment facilities but this is still the minority. There is no education or training in wastewater treatment in general.



With this background PUM started a plan to develop an education program in Kosovo and asked World Water Academy (WWA) to help with the start in Kosovo.

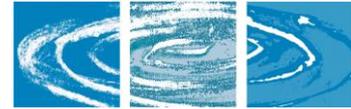
Network

Looking at the situation parallels can be drawn with the situation in the Netherlands from 40-50 years ago. There was an increasing need for more knowledge and skills in the wastewater treatment sector. One of the successes that time was a more structured knowledge and skills sharing and education. In Kosovo there is no network or education at all. While, in the Netherlands, but international as well, there are many networks in the wastewater sector to exchange knowledge and ideas, to stimulate cooperation and communication and to organize events to keep on increasing the wastewater treatment.

One of the aims of this seminar was to come to a first network for cooperation and knowledge exchange. After a presentation with examples of networks in the water sector and needs inventarisation with the participants, WWA presented a first advice. The main components are that the start should be based on engaged and enthusiastic professionals, preferably from various organizations (government: national and local, universities: students and teachers, Businesses/industry and water companies). The first coordination is centralized by one organization. The basis of the network is enthusiasm to organize something together to exchange ideas and knowledge.

Based on the proposed ideas, the group of participants wants to go further. They agreed to take action to:

1. Make a Newsletter for sharing information, best-practices: once per two months
2. Organize field trips for students (maybe also professionals/teachers): Practical work / exercises
3. Manage a database (agreed to be done by University of Mitrovica)



4. Involve the ministry to get a larger role (use this for public awareness purposes as well)
5. Evaluation after one year.

In coming period, PUM and World Water Academy will briefly support in the first phase of the set-up of the network.



Training Basics of Wastewater Treatment

Based on the developed trainings, PUM and WWA tailored the program and the material to the needs of the participants. Because of the various backgrounds of the participants, it became a training with bit more general basic of wastewater treatment.

During the training a field trip has been organized to the Bylmeti Cheese factory, a company that has its own wastewater treatment system. Not only the plant has been visited, but also laboratory equipment has been showed and demonstrated. This part was highly appreciated by the participants, as one stated: *“The best points of the course is the combination of lectures and exercises and visit to factory Bylmeti”*.

The press in Kosovo was interested in the project as well. During the field trip to Bylmeti the press was present with a writing and television team: see [link](#).



Seminar

One of the participants wrote in the evaluation: *“Well awareness is lacking in Kosovo, so this course can help to raise awareness. Visiting a small WWTP. Getting to know each other and meet people.”* Another participant stated: *“This type of seminar would be present more in our state. For me the best points of course is sharing ideas and information for wastewater treatment, and also know the importance of environment.”*



From 12-17 July, Johan Oost executed a capacity development project in Mitrovica, Kosovo, funded by RVO. This *Seminar Wastewater Management and Treatment* is the starting point of a new vocational education project of PUM. The program and a first training of *Basics of Wastewater Treatment* has been developed by World Water Academy and PUM. The aims of the seminar are:

- Training of experts, future teachers at universities and potential trainers for work field
- Creating a network for with cooperation within Kosovo
- Based on the network: further elaboration of the vocational education project

The role of the World water Academy was to lead the organization of the course and program and to tailor the material to the needs in Kosovo. Besides this, WWA were requested to find out the possibilities and kick-start a first network to network and exchange knowledge in the field of wastewater treatment in Kosovo. The hosts were the University of Mitrovica and Bylmeti wastewater treatment plant.