Urban Water Footprint

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Introduction of Water Footprint (WFTP) Approach in Urban Area to Monitor, Evaluate and Improve the Water Use

WP 6.1.3 Urban Water Footprint labs: Review of water footprint plans

Lead contractor for deliverable ***WP 6.1.3: Veneto Productivity Center Foundation***

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Index

1. Scope and contents 3

2. Innsbruck UWFLab 4

a. Review of the scope of the improvement plan 4

b. Review of the targeted footprint improvement 5

c. Review of stakeholders involved 6

d. Review of actions planned 6

e. Final consideration 8

3. Vicenza UWFLab 9

a. Review of the scope of the improvement plan 9

b. Review of the targeted footprint improvement 11

c. Review of stakeholders involved 12

d. Review of actions planned 12

e. Final consideration 15

4. Wroclaw UWFLab 16

a. Review of the scope of the improvement plan 16

b. Review of the targeted footprint improvement 17

c. Review of stakeholders involved 19

d. Review of actions planned 19

e. Final consideration 22

1. Scope and contents

The scope of this paper was to make a review of plans of the three UWFLabs on the basis of the considerations included in the socio-economic-environmental (output 6.1.1) and sustainability analysis (output 6.1.2).

The following revisions take into account the whole set of activities of the UWFLabs, with an assessment of the actions of the improvement plan, the adequacy and effectiveness of the actions taken, the target groups and the stakeholders involved. Also considerations about the budget and the close correlation between it and any future activities and prospects of the laboratories have been considered.

For each lab a similar structure has been followed in order to make the content comparable across the labs.

For more detail about the implementation of the improvement plans, the hitherto experience of implementation and the related corrective actions that are proposed, the outputs of WP 5.4 and 5.5 offer detailed information. It needs to be pointed out that the execution of many of the measures take place on a longer time horizon, extending beyond the timeline of the project. Therefore if someone is interested in the long term results of implementing the plans, the personnel of the water footprint labs should be contacted. The contact information is included at the end of this document.

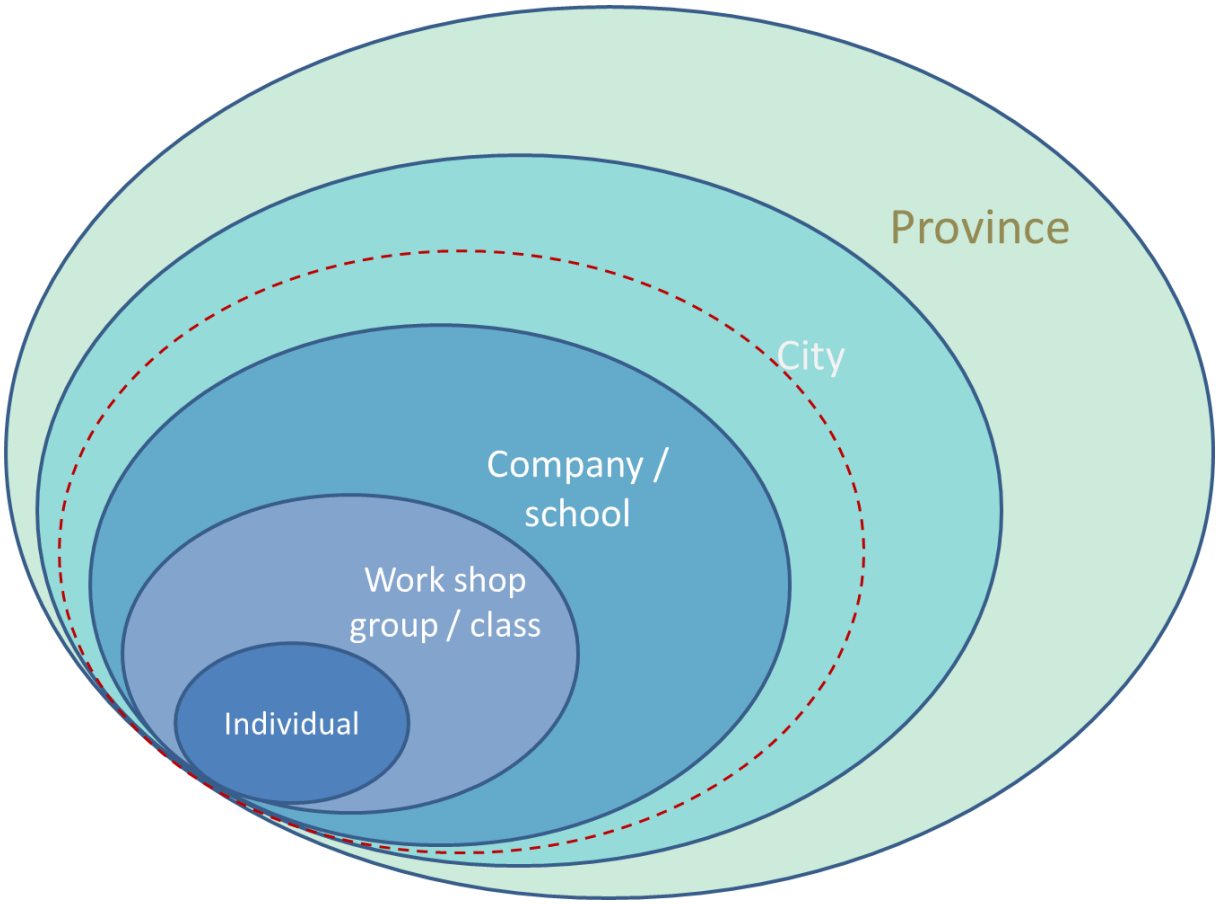
2. Innsbruck UWFLab

a. Review of the scope of the improvement plan

According to output 5.2.4 the scope of the improvement plan was planned to extend the awareness building programme. For this it was planned to apply a step-wise approach, and thus increasing the number of citizens who are aware of their water consumption regarding direct and virtual water.

This approach proved to be the best possible method.

Figure 1: Step-wise extension of target groups within the awareness building programme. The red line indicates the declared object within the project duration.



b. Review of the targeted footprint improvement

Output 5.2.4 lists two types of improvements: qualitative and quantitative.

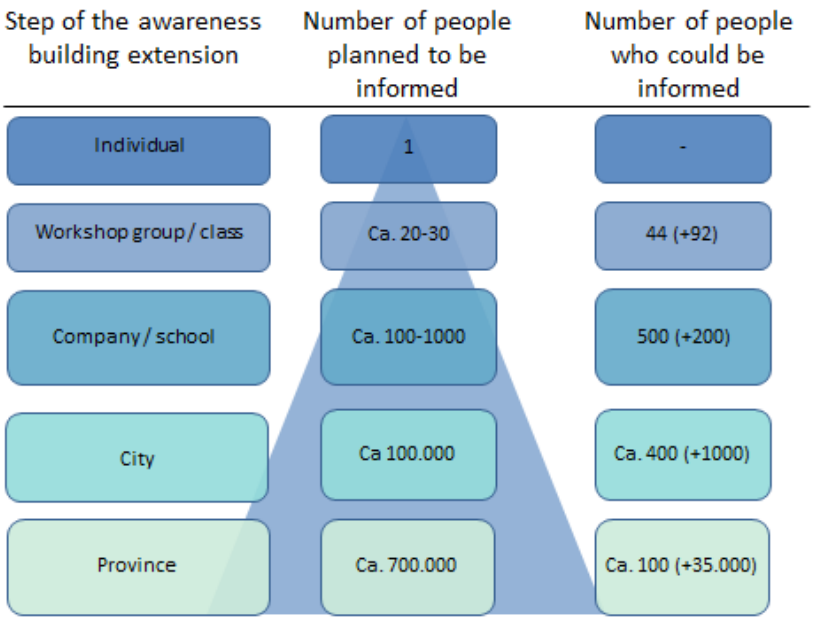
Qualitative improvement

It was planned to reduce the water footprint per person by approximately 11%. To verify this reduction it was planned to have a second monitoring period. This monitoring was performed from 22.9.2014 to 28.09.2014. However, the data have not been transferred to alpS and analysed in time for this report.

Quantitative improvement

In addition to the qualitative reduction of the water footprint, the main improvement objective was to expand the awareness building programme. Here the main aim was to reach as many people as possible. In order to reach this goal a step-wise approach was applied. On the city and province level less people could be informed than what was possible and planned. However, these people were addressed individually via direct and personal communication.

Figure 2: Step-wise approach how to increase the amount of people who are aware of their water footprint.In brakets show the number of people who could be informed via indirect not personal communication.



c. Review of stakeholders involved

The target group of the improvement was the individual citizen, with a special focus on school children. This aim could be accomplished. In total we could reach approximately 800 students from different schools.

With one group of 44 students an intensive workshop cycle was carried out. This intensive work allowed comparing their water consumption before and after the education programme. These data, however, have not been analysed yet and will be reported in output 5.5.1 and 5.5.2, respectively.

d. Review of actions planned

To achieve the aims stated above a set of different actions was planned.

Open day

The open day took place on 4.April 2014. Everything worked out as it was planned in output 5.3.2. Approximately 400 people could be informed mainly by personal communication. 100 pieces of information/promotion kits were handed out to visitors. This evening was a great success for the Urban Water Lab Innsbruck because the main goal for this event was to inform the citizens about the project.

Waterweek

The water week took place from 2.-6. June 2014. The event worked out as it was planned in output 5.3.2. Every day during the main break students could get informed on the water footprint.

Amongst other things a water footprint monitoring sheet was handed out. Originally, it was planned to get some of the monitoring sheets returned and so to increase the sample size of water footprint consumption. Unfortunately not one sheet was returned. This, however, was a matter of great concern to the teachers and headmaster. Therefore it was decided to have all students older than 16 participating a one week monitoring of their individual WFTP. This monitoring will be part of the training of teachers.

Training of additional teachers

The training of additional teachers took place at 8.9.2014 at the partner school Reithmann Gymnasium. During this training session 35 teachers were trained in i) what is a water footprint, ii) how can the water footprint be measured, iii) how can the water footprint be reduced, and iv) how can the teachers best teach this subject in their classes. During this training session the teachers committed to introduce this subject to their classes. Subsequently, the students monitored their individual water footprint for one week. This "one-week-WFTP-monitoring" is the corrective action to the water week. Approximately 500 students participated this monitoring, scheduled from 22.9.2014 to 28.09.2014. However, the data have not yet been transferred to alpS and analysed in time for this report.

Training of water experts

Water experts from various organisations will be trained regarding water footprint, water consumption and how to raise awareness in this context. To do so alpS organises a workshop/training session at 3.10.2014. All water experts will be trained in i) what is a water footprint, ii) how can the water fooprint be modelled iii) how can the water footprint be measured and monitored, iv) how can the water footprint be reduced, and v) how can water experts raise awareness regarding water consumption issues. A field trip to the water power plants in the tyrolean municipality Rinn completes the training. 12 experts have been registered for participating in this training workshop. No corrective measures are needed for this action.

Workshop at different schools

The aim of this action is to extend the dissemination of the water footprint. In output 5.3.2 it was planned to train the participants in the same subjects as above, with the aim to gather further data regarding footprint consumption and thus to increase the sample size. However due to organisational reasons this additional data gathering cannot take place. Therefore this workshop will focus on awareness building. The workshop is scheduled for 17.11.2014 with ca. 80 students participating.

To realize additional workshops, it is planned to apply for project funds (see 6.1.2). These funds will help to further develop, gather additional data on the citizens´ behaviour and level of awareness and adapt and spread the existing education programme. This will help to foster the Urban Water approach and its implementation in other municipalities of Tyrol and beyond.

e. Final considerations

With regards to the weaknesses pointed out in 6.1.2, there are several starting points for further actions. The mentioned weaknesses are mostly caused by insufficient knowledge, a lack of citizens´ awareness or missing data. Thus, doing more investigation on these topics will lower the weaknesses and contribute to a dissemination of the water footprint concept. However, this research cannot be realized without granting additional budget in the future.

The cooperation with the municipality and water service providers in Innsbruck went well, but with some limitations concerning accessible data. Therefore, we did a field trip to Rinn, to get an insight in the water-related structural circumstances of another municipality. This is a great opportunity to collect more knowledge on regional similarities and differences between the individual municipalities. But again, to build up new cooperation and execute research, visits and evaluation, new budget for staff has to be provided.

3. Vicenza UWFLab

a. Review of the scope of the improvement plan

The WP 5.2.4 document developed by the U_WF LAB Vicenza is the backbone on which the entire starting improvement action was based. The U_WFT Lab has already expressed its thoughts on the improvement plan through the documents recently prepared, that is the evaluation of the Improvement Plan (WP5.5.2) document, and the identification of corrective actions (WP5.5.3). Moreover, even in the documents that analysed the sustainability of the Laboratory and its activities (WP 6.1.2) and that focused on socio-economic and environmental aspects of the area in which they operate, are already the basis for the preparation of this analysis.

The context of action of the laboratory is primarily related to the management of storm-water improvements in urban areas. In this sense the Lab acts on the grey water indicator, pushing towards the reduction of the "parasite" water that are too abundant in the purification system and which come, in addition to the mixed network, also from autonomous artesian wells that, despite the prohibitions, deliver most of the time in a continuous jet. In addition, in reference to the structural context that would affect the reduction of blue water, some measures to transpose the provisions and "water saving" were taken, as already provided in other urban areas with more advanced experience of promotion of sustainable consumption of resources and offered in the form of rules to be included in the Building Regulations and regularly updating of the Interventions Plan.

As for the possibility of this field on influencing the decrease of the footprint, the U_WFTP Lab believes that only structural measures together with individual consciousness, which persuades not to waste a valuable resource like water, can make a difference. The application of "water saving" standards, aimed at both new construction and renovations, however, is not under the responsibility of the U_WFTP Lab which can, however, only propose them to the relevant political bodies and to persuade them adopted it. We believed that only after at least one year of adoption of these rules, we would be able to see the effect.

A second area in which the U_WFTP Lab has acted was the awareness increasing on the value of water and the need for its protection, this action was implemented with an informational-educational action carried out by the Lab aiming at the reduction of water

consumption. Although this action was intended to influence the reduction of the indicators of blue and grey water.

Even for this area the effects of the Laboratory actions will not be immediately measurable. The U_WFTP Lab had predicted a 10% reduction in consumption of water from private wells, which are expected as a result of the actions of education / persuasion carried out by the staff of the Environment, Energy ant Territory Protection Department of Vicenza Municipality to owners of private wells, personally contacted during a survey carried out between June and September 2014. The data feedback is virtually impossible assessed the fact that most of the wells do not have a meter and therefore the consumption amount is only presumed.

Although the measuring of any reduction at city level as a result of the application of "Best Practices Water use in the city of Vicenza" is currently not available. In fact, the verification of consumption relative to the sample of 800 people monitored by Acquevicentine will be significantly detected only years later (late 2016 monitoring - report 2017). From this monitoring is expected to verify the effectiveness of the awareness campaign.

The U_WFTP Lab of Vicenza has reached, with its educative action, thousands of people through various channels: institutional Vicenza and Acquevicentine web sites, articles on the main local newspaper, Acquevicentine e-mail users, workshops at events, public survey, meetings with students and public administrators.

The Vicenza U_WFTP Lab, reviewing after a while (a little while, as already mentioned) the action areas that were affected, confirms the made choices, considering them to be valid and appropriate.

However, the current inability to be comforted by objective data that can demonstrate the effectiveness of the water footprint reduction is undeniable.

This inability to define the effects through a numerical quantification, according to the Vicenza U_WFTP Lab point of view, it has not to be considered only a limitation. On the other hand, the forecasting of important structural and educational measures that may be increased and have a serious effect on the reduction of urban water footprint, can certainly be considered a strength of the Laboratory.

b. Review of the targeted footprint improvement

As for strategies to achieve the programmed improving objectives, here there are some remarks.

The indicators that were provided by the Improvement Plan referred to:

- significant contacts with citizens reached with questionnaires proposed by the Laboratory on the water cycle;
- number of pupils reached by targeted meetings;
- participation of the public and decision makers in meetings focused on U_WFTP (workshop, open day, local meeting);
- proposals to the City Administration to establish rules to promote water savings in Building Sector as in Urban Planning;
- reduction (estimated 10%) of water into the public sewer stray from private wells in a continuous stream through tightening of controls and actions of persuasion aimed at owners.

The U_WFTP Lab believes that the method of approach to achieve the planned objectives has proved to be appropriate and effective.

Every action has got a good / excellent result. All parties to which we addressed (public administration technicians - students of various age – citizens) have proved to be very attentive with respect to the issues addressed.

In particular, the interaction during the various meetings facilitated the dialogue with the parties involved and there were also many requests for further information also at a later date, that have shown an interest in the proposals.

The responses to the request for power consumption monitoring, show that the focus was not limited to one day, but that lasted for a whole month (during the first phase of monitoring that involved the active participation of the sample of users). The results obtained, particularly in the latter activity, allows us to consider the "Best Practice" as adopted and implemented.

c. Review of stakeholders involved

The target groups of the improvement actions identified by Vicenza U_WFTP Lab are represented by the following entities:

- citizens
- students

- public administrators

Thanks to the promotional activities we estimated to have reached, by direct contact with the project, over five thousand to six thousand people.

The first transmission of the questionnaires, with the membership application request, has been sent to more than 1,700 users of water services.

Public events ("Festambiente" and "Sunday without cars") have made possible the knowledge of the project and in particular of the Improvement Plan and Good Practices to more than 500 people.

The Census of wells involved more than 300 families.

Sending to the entire e-mailing list of the City of Vicenza Vicenza and Acquevicentine, for the adhesion to "Best Practices", reached more than 1000 addresses.

Workshops in schools: 300 students (considering that there are many families behind).

Considering then those who were able to be reached by news about the U_WFTP project reading the local newspapers, listening to local TV or accessing the corporate websites of the City of Vicenza and Acquevicentine. It is estimated could be tens of thousands.

We do not have the data view screen, but considering that the events related the U_WFTP has always given considerable evidence, devoting space on the home page of the City of Vicenza and Acquevicentine websites.

d. Review of actions planned

The improvement purposes have been achieved through the following actions:

Questionnaires: Email administration of two questionnaires to more than 1,700 citizens, users of water services; further processing of the results to get useful information to the work and objectives of the U_WFTP Lab; dissemination of the results via email to the members of the survey and publication on the City of Vicenza and Acquevicentine websites.

Festambiente: workshops to raise awareness of the Central Europe project to citizenship, the U_WFTP Lab, its Activity Plan and its Improvement Plan; invitations distributed via email to Acquevicentine registered users, public administrators, via web press addressed to the general public through brochures disseminated in public places, in places open to the public and in schools and through the information disseminated by the local press;

Open Day: addressed to the members of the Territory Commission of the City of Vicenza for the illustration of the European project U_WFTP and the Improvement Plan of the Laboratory;

Best Practices: the definition of advices, small measures, to water consumer awareness , directed in general to citizens and in particular to the sample of users participating in the survey, which will remain monitored until 2016, public employees and administrators. Spread via email, on City of Vicenza and Acquevicentine websites and through leaflets in public events;

3rd local meeting:particularly aimed at families and children to spread advice on Best Practices;

Private artesian wells census: during a census required by the Veneto Region for health reasons on private wells, more than 300 owners of wells went in person at the Environmental Department of the Municipality of Vicenza to give the required notice. The form to be filled also planned to provide information on the termination of delivery of the flow (often absent or for bad habit, open for a continuous jet). Staff also gave specific directions, recommendations and advice on the implementation and compliance with the regional rules on water savings.

Water "little houses": the first of the 5 "water houses" was inaugurated by the Urban Planning and Care of the city of Vicenza, they are installed in the municipal area and the other 4 are close to the opening. This measure, as explained on other occasions, aims to promote the use of local water that has a high-quality, to promote a reduction of the mineral water use, very high in Italy. This action should lead to cross simultaneous reduction of raw material (plastic), waste, energy and transport emissions;

3 meetings in schools: meetings took place in a middle school (two meetings) and in a high school (about 200 students) to spread the knowledge of the Central Europe U_WFTP project, deepening the water cycle, the hydrological system of reservoirs in our area, the management of the water supply system, its distribution and waste-water treatment and water saving issues and implementation of "Best Practices";

One Week Training: organised for municipal employees, particularly for technicians ofthe Private Building, Urban Planning and Environment Departments;

International Conference: participation in the international conference on the U_WFTP issues, organised by the CPV, held in Vicenza on 30 October 2014. On this occasion, where it

was presented the experience of the Vicenza UWFTP Lab, relevance by city media and on the Vicenza Municipality website on home page was given;

Regional Meeting: participation in Bologna, within the Smart Cities Exhibition, at a conference/workshop on the issues of water to make known the experience UWF Lab of Vicenza; October 24th "Ciclo integrato di trattamento acque reflue e rifiuto urbano umido" (Integrated cycle of waste-water treatment and municipal wet waste)

Smart City Exhibition: participation in Bologna at the national fair on environmental issues;

Technical Standards: the preparation of a document to be presented to the City Council with the proposed "Technical Standards" to be taken into account when drafting the Municipal Building Regulations now being developed; these rules provide for the adoption of systems that encourage the reduction of water consumption and the possibilities / opportunities for its reuse;

Interventions Plan: the commitment of the Town Planning Deaprtment Director to enter in the Interventions Plan statutory provisions that reinforce those already present today and going in the direction of reducing the waterproofing of soils.

The Vicenza U_WFPT Lab believes that the time available for planned activities has been well spent and that the assets have reached the intended purpose and the satisfaction of the target group.

The U_WFTP Lab has planned its activities so that they were covered by the project budget.

With regard to the implementation costs desired at the city level, please note that in the Improvement Plan the following costs were estimated :

- adjustments housing (reducing flow, two-button boxes) per household: € 300.00 to 500.00
- rainwater reuse systems (adjustments in buildings, gardens, green areas): € 700.00 to 1000.00

We believe that these provisions still valid.

As already reported in another document, we believe that if the structural measures for improvement relating to adjustments or interventions in urban environments (eg. Water-saver affixing to the taps of public buildings or water reuse systems, implementation of road

drainage systems, green areas with rainwater recovery, etc.) should be approved by the local government, it would be necessary to find new resources to implement them.

Furthermore, if we intend to revisit every few years the trend for urban water footprint in order to compare it to the one of 2014, we should provide a reasonable economic source for the collection of all updated data.

During the year 2015, the U_WFTP Lab will allow the inclusion in the Intervention Plan of the objective indicators for the reduction of the water footprint, with no cost for the municipality.

e. Final considerations

The U_WFTP Lab experience started in the town of Vicenza, has certainly represented an important opportunity to study the various issues concerning water and its management.

The proposed approach has allowed us to put up measures estimated important and significant in the direction of the protection of water resources.

We hope that in the future the U_WFTP Lab will have energy and financial resources to continue to implement its mission.

4. Wroclaw UWFLab

a. Review of the scope of the improvement plan

According to output 5.2.4 the objective of the improvement plan was to implement the process changes and investments to improve Nitrogen removal from the treated effluent discarded into the water body. This was supposed to be done by transformation of the anaerobic reactors into the denitrification reactors, improvement of internal recirculation, optimization of aeration conditions and implementation of anammox or nitrification/denitrification process of sludge dewatering liquor. Most of the projects listed include the research phase. If this proves to be effective, the full scale implementation is considered. The reduction of Nitrogen in treated effluent will result in reduction in WFTPGrey. The change in the values is possible to monitor within a specific period of time, which will be explained in the next section.

The other part of the plan applied to improving rainwater management and retention in the city by increasing the awareness of stakeholders and decision makers about its need, and by informing them about sustainable solutions by which the improvement can be done. The aim was that they will further encourage investors and design engineers to implement such solutions, by their promotion and possibly by introducing relevant regulations, for example incentives for rainwater harvesting, and/or fees for its discharge into the sewerage system. The limitation of the amount of rainwater discharged into sewers will contribute to a reduction in WFTPGrey. The usage of stored rainwater for watering green areas in drier periods and reusing it for some household purposes, e.g. flushing toilets, will reduce the fresh water consumption, thus WFTPBlue. The replacement of impermeable areas be permeable surfaces will result in a positive increase of WFTPGreen and decrease of WFTPBlue.

The presentation of the water saving solutions, which are often relatively cheap and simple, was also part of the improvement plan. Faucet aerators and send clocks for measuring the shower time were handed into during different events attended or organized by the Lab members. Their application should contribute to a reduction in WFTPBlue.

The extent of the influences of Municipal Water and Sewage company is limited as it is not responsible for defining the legal regulations in the considered subject matter, however it can always promote, increase awareness, encourage and favour sustainable solutions, and

initiate the dialogue and cooperation among stakeholders and decision makers, which might result in real changes.

The Urban Water Footprint workshops were also addressed to the students in order to educate the young generation, which will be a future group of stakeholders influencing the city policies and development.

The promotion was also carried out on a large scale via the media (internet, television and radio), during various events such as World Water Day, conferences, trade fairs, and by publishing papers in the magazines.

The program was dedicated not only to Wroclaw city but also to the whole Lower Silesian region. The representatives of municipal water and sewage companies from this area attended the workshop, learned about water footprint methodology and calculated the indicators for their cities.

The surveys on water and sewage management behaviours carried out among students and other citizens increased also their awareness. Via the questionnaires they have learned about the alternatives to their choices. In addition, the students monitored their water consumption for different purposes.

Hopefully, the awareness building, promotion of sustainable solutions and involvement of different stakeholders and citizens will contribute to WFTP reduction in the future, however this is impossible to measure at the city level. It would be possible to test the change in water consumption of the students, which participated in the survey, however this would apply to only a small non-representative sample of Wroclaw inhabitants. In addition, this is not a main scope nor a main target group of the Wroclaw Lab.

b. Review of the targeted footprint improvement

Regarding the part of the improvement plan, which objective was to reduce the Nitrogen concentration in the treated effluent, some planned activities have been already carried out. The transformation of the anaerobic reactors was carried out within the duration of the project. The improvement of internal recirculation on a pilot scale was finished in October. The results are currently analysed. This was done by installing the pumping mixers (recirculation pumps) of greater efficiency than initially in one sewage treatment line, in the old part of the plant. The outputs were compared with those for three reference lines operating in the unchanged conditions. The extra six lines, which were constructed during

extension of the waste water treatment plan, have already mixers efficient enough, thus the internal recirculation does not need to be improved there. The draft results show that improved recirculation in one line contributes to the reduction in Nitrogen concentration in the treated effluent by 0.3 mg/l. The implementation of this solution in all four old lines will reduce Nitrogen concentration by 1.2 mg/l, thus the value will decrease from 10 to 8.8 mg/l giving a safety margin with respect to the legal limit of 10 mg/l. In consequence the WFTPGrey will reduce from 51 135 000 to 44 998 800 m3/year. The installation of more efficient pumping mixers should finish in 2015.

The optimization of the aeration conditions conducted via computer modelling was also completed. The results are currently analysed. The tests indicated in which parts of the biological chambers the aeration is most effective and what is the minimum aeration efficiency giving the optimum process conditions. The aeration algorithm will be implemented in the control system soon. After the operation of the biological chambers in the modified conditions for a longer period of time (optimally – a full year), it will be possible to compare the improved results with those from the past.

The implementation of anammox or nitrification/denitrification process of sludge dewatering liquor is currently implemented on a pilot scale. The construction was finished and the test runs are currently carried out. The research on a pilot scale should finish in 2016 and should indicate, which solution gives the lowest Nitrogen value in the sludge dewatering liquor and thus – in the treated effluent. If any of the tested solutions proves to be effective and cost efficient, it might be implemented on a full scale until 2019.

Regarding the second part of the improvement plan – awareness building, promotion of sustainable solutions and involvement of different stakeholders and citizens, the outputs cannot be measured. It is hoped that as a result of these actions some modifications in the legal regulations especially regarding local rainwater management will be made and the investors and design engineers will implement the sustainable solutions into their investments. In consequence, WFTPGrey and WFTPBlue will reduce, while WFTPGreen will increase. It might be worthy to define the WFTP indicators for the new investments with regards to their location, in the future. This would enable control of WFTP within the city. Possibly, some of the approaches tested in Wroclaw, will be implemented in smaller municipalities from Lower Silesia region, as Wroclaw often serves often as an example to them.

c. Review of stakeholders involved

The main target group of the improvement plan are the decision makers, which have an impact on the investments and policies associated with water and waste water management, as well as behaviours and choices of large number of people. Among them are the municipality representatives responsible for storm water system management and spatial development of Wroclaw, as well as architects and design-engineers, which decide on the design of constructions and implementation of sustainable solutions. The actions of the Lab were also addressed to the representatives of municipal water and sewage companies from Lower Silesia region. Around 50 stakeholders attended the meetings and workshops.

The actions of the Lab are also addressed directly to real water consumers. During the project promotion on internet, television and radio different groups of citizens could hear about it, while the workshops and presentations at the university were addressed to students (close to 100 participants). The survey on water and sewage management behaviour was carried out among students, and also among 166 citizens. The presentations of the project methodology and results during conferences and in trade magazines was dedicated especially to the scientific world and other representatives from the water and sewage sector. It is difficult to estimate the number of people it has reached.

d. Review of actions planned

There were carried out various activities, which objective was to fulfil the aims of the Lab.

Questionnaires

There were carried out the questionnaires on water and sewage management behaviours. The online questionnaire was carried out among citizens (mostly professionals from the environmental sector), while the other survey was carried out among students of Wroclaw University of Environmental and Life Sciences at the workshops during the celebrations of World Water Day. In addition, the students were asked to monitor their water consumption for different household purposes for two weeks.

Promotional materials

There were developed different promotional materials, which were handed in during most events organized or attended by the Lab members. Among them are folders, three

types of leaflets, pens, pen drives, faucet aerators and send clocks for monitoring shower time. There were produced also stands promoting the projects, which were exposed during various events.

Media appearances

The project was introduced to the media in the press briefing. Further it was presented in the television and on the radio. The information on the project can be found also on internet, on a few web pages.

Conferences

The project was promoted at many conferences and trade fairs such as Western Conference of Water and Sewage Companies in Kocierz, Technical Progress in Waterworks in Wroclaw, WOD-KAN-EKO in Wroclaw, international conference Water Supply and Water Quality in Toruń, during the trade fair IFAT in Munich, in the international conference URBAN Water Footprint: experiences, best practices and future challenges in Vicenza, during the celebrations of World Water Day at Technical University of Wroclaw and during the meeting of Center of Competences Water and Environment in the Municipal Water and Sewage Company in Wroclaw. The participation in the conferences resulted in publishing two papers in the trade magazines – Environment Protection Engineering (in Polish) and Water Supply and Water Quality (in English).

Workshops

In addition, during the celebrations of World Water Day at the university, there was carried out the workshop, in which students calculated their water footprint using water footprint calculator. They were discussing, which products generate the greatest water footprint, and in which way water and thus money can be saved.

The other workshop in Cieplice was addressed to the representatives of municipal water and sewage companies from Lower Silesia region. The UWFTP methodology and models for its calculation were introduced and the footprint for 10 cities was calculated by the participants using Model A. The UWFTP reduction possibilities, especially by implementation of relevant technological solutions, were presented.

One Week Training

This event was organized for municipality representatives responsible for storm water system management and spatial development of Wroclaw. They were familiarized with the UWFTP methodology. They were also informed about the technological solutions of sustainable city management, especially those related to local rainwater management. There were shown the examples of other countries and cities, which set relevant national or local regulations and/or apply incentives to encourage implementation of such solutions. In addition, it was discussed if the UWFTP indicators could be a tool for evaluation of the investments in the future.

Open day

This event was addressed especially to architects and design-engineers as they have an impact on the design of future investments. They were introduced to the project and informed about up to date technological and design solutions for water saving, recycling and local rainwater management, which are already very popular in some countries. The workers of Strategic Development department of Municipal Water and Sewage Company have also attended the open day meeting and shared their observations regarding the attitude of investors to local rainwater management. Even though nowadays most Polish investors resign from such often slightly more expensive solutions (which return on investment is usually 3-5 years), these tendencies will change in the future due to increasing environmental awareness and expectations of citizens and more demanding regulations.

Training of additional experts

There lab was joined by three experts from outside the project, one from Adam Mickiewicz University in Poznan and two from Warsaw University of Life Sciences. There were given the access to the papers published by Wroclaw Lab. In addition, they will obtain access to the training videos recorded within the framework of the project, in order to learn more about its theoretical background and methodology.

e. Final considerations

The actions of Wroclaw Lab enabled to promote the project among different groups of stakeholders and get them interested in the project. The issues raised are very important for the sustainable city development. The reduction in Nitrogen concentration in treated effluent with is one of the objectives of Municipal Water and Sewage Company in Wroclaw

has a significant meaning both from the legal and environmental point of view. The promotion and in consequence implementation of local rainwater management technologies in the future will reduce the quantity of treated sewage and the frequency of local overflows. In order to put it into practice more debates and commitment of various decision-makers is required. This will require further involvement of the Lab members and further funding.

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