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 5.5.3 Corrective actions and improvement

Wrocław Urban Water Footprint Lab

Start date of project: 1 November 2012 **Duration: 25 months**

Submission date: 30 November 2014

CONTENTS

1 Introduction

In this document the actions carried out by the Wroclaw Lab, which aimed to fulfil the Improvement Plan are analysed and it is considered how they could be modified in order to improve their impact. Based on the experiences up to date the future laboratory actions can be planned.

2 Corrective actions and improvements

Most of the actions listed in the Improvement Plan were carried out successfully. However, there were some difficulties which are further analysed. The possible corrective actions and improvements are also discussed.

Encountered difficulties

The major difficulties associated with implementing the measures were already pointed out in the document Improvement assessment (WP5.5.2). The time between setting the actions to undertake and the project deadline was too short (June – November 2014, which gives 5 months).

There is a need to continue the operation of the Lab in order to possibly initiate any real changes such as modifications in the regulations and promotion of sustainable drainage system solutions among investors and citizens. Any changes in Wroclaw water and waste water management will be an example for other municipalities from Lower Silesia region.

The projects associated with reduction in Nitrogen concentration in treated effluent are also long lasting and some of them require a few years for their completion and for evaluation of the effects of implemented changes.

Measures Improvements

Based on the experiences already gained by Wroclaw Lab it is possible to reflect on what could be improved and plan further activities.

The surveys carried out within the time frame of the project applied only to small sample of citizens (166 out of 631 000) however, they gave a view on the general society behaviours. In order to gain more complete knowledge on users behaviours

and also be able to estimate water intake from private wells and sewage disposal into septic tanks and private sewage treatment plants it would be good to include related questions in Polish census. However, this is carried out seldom. The last two took part in 2002 and 2011, so the next one might be around 2020.

The informative and awareness building campaign should also reach much more citizens. Once they are convinced of the advantages of local rainwater management and are willing to support such investments and buy such properties, investors will start implementing such solutions on a larger scale.

The workshop at the university was addressed only to 73 students, which are simultaneously water consumers and future stakeholders. It would be good to improve students' knowledge on sustainable water and waste water management by implementing relevant content into the lectures, and thus reaching much wider group of recipients.

Further promotion of sustainable solutions and meetings with relevant stakeholders and decision makers are required in order to discuss possible changes in local regulations favouring/forcing such solutions. This will ultimately motivate/force the investors to implement them. The activities carried out among stakeholders up to now were very effective and initiated future cooperation on this topic.

With the involvement of stakeholders, decision makers and experts it might be possible to define the model for water footprint determination for specific investments. The values should be specified with regards to investment location as the Model B results indicated that water and waste water management varies in different areas of the city.

Before implementing sustainable drainage system solution on a significant scale it is impossible to justify the water footprint changes (calculated using model A and B).

The achievements of the Lab should be shared with the municipalities from Lower Silesia region interested in cooperation. Once the actions prove to be effective, they are possibly willing to implement the worked out solutions in their cities.

Any further actions involve time and money, thus require further funding.

The projects associated with reduction in Nitrogen concentration are constantly implemented. The transformation of the anaerobic reactors into the denitrification reactors was already completed. However, the results cannot be measured yet as longer term observations are required to verify the changes. In addition, simultaneous implementation of different projects also does not allow for reliable comparison.

The internal recirculation was improved in one of four sewage treatment lines of the old part of Waste Water Treatment Plant reducing the Nitrogen concentration in the treated effluent by 0.3 mg/l. The implementation in all four lines in 2015 will result in total Nitrogen reduction by 1.2 mg/l.

The simulations of different aeration conditions in the nitrification reactors were carried out via computer modelling and the aeration algorithm will be implemented also in 2015.

The pilot scale anammox and nitrification/denitrification reactors have been built. The test runs are carried out and the effectiveness of Nitrogen reduction in sludge dewatering liquor will be measured until 2016.

These projects cannot be accelerated and the research requires given time. If the tested solutions prove to be efficient and cost effective, they might be implemented on a full scale in the future.