



Project no. 4CE439P3

URBAN_WFTP

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

WP 5.2.4 Detailed improvement plan

URBAN_WFTP LAB OF VICENZA

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1 Introduction

So far in the project a water footprint methodology has been elaborated and introduced in the three urban water footprint labs, the baseline conditions for the three settlements have been assessed together with a sensitivity analysis, and potential good practices to reduce the water footprint have been identified. The next task is the drafting and subsequent implementation of water footprint improvement plans.

This document follows a common structure for the improvement plans so that all three partners proceed along the same lines and the resulting improvement plans (as well as the strategy and its implementation) will be comparable.

2 Detailed improvement plan

2.1 Scope of the improvement plan

The city of Vicenza has a territorial extension of 80.48 km². The geographical scope of the Improvement Plan of the UWFP Vicenza Lab cover the built-up areas, equal to 24.78 km², about 30.8% of the city area. The industrial areas (4%), and the agricultural areas (50.6%) are excluded from the project.

2.2 Targeted footprint improvement

The purpose is the implementation of an Improvement Plan that follows necessarily from the critical factors and weaknesses that have been highlighted from data provided by the University of Engineering in Padova as the results of the model C and SWOT Analysis.

Studies have shown some indicators for which it is a conceivable measure to improve the WFTP. The Model C has calculated the water footprint of the following urban categories: residential, public buildings, commercial buildings, roads, public green areas, waterproof surfaces.

Each of these categories may be subject to improvement, through a possible building regulation or targeted interventions, but for most of them the effects would not be perceptible in the short run as changes would take place on a longer time horizon (between 5-10 years). It is estimated that some parameters can be more effectively the subject of actions to decrease the city of Vicenza U_WFTP, given that the laboratory is strictly included in the national territory and that of the latter has the ability to intervene effectively. In fact, its three

components, Municipality, Acquevicentine SpA (the company managing the entire water cycle) and the Centro Idrico di Novoledo (which mainly has the task of monitoring the quality and quantity of drinking water) are public entities operating in the urban area of Vicenza. For the sake of strict timing of the U_WFT project and the scarcity of financial and human resources we intend to focus the improvement plan only on some of the studied factors. Even the SWOT analysis, highlighting the strengths and weaknesses of the system has given rise to other potential targets on which the VicenzaLab intends to focus its energies. Starting then from the problems that emerged, the purpose for which the U_WFP Vicenza Lab intends to bring forward a plan for improvement is twofold, one about building / planning and the other about environmental education.

Specifically:

- ⤴ On the one hand, the improvement plan aims to achieve an improvement of stormwater management to prevent the depletion of the aquifer and the release of rainwater into the drainage system. A point of consideration concerns the sealing of urbanized areas with particular reference to the fact that rainfall has a negative effect on the treatment of municipal wastewater, especially during heavy storms, and re-entry into the subsoil of precipitation can be advantageous for the environment.
- ⤴ The other goal is to improve people's knowledge of the water cycle and water conservation. There are evident knowledge gaps especially in relation to the processes of wastewater collection and treatment. The enhancement of awareness on water use in order to reduce wastewater generation, and to facilitate the return of water that is not affected by our use to the environment is the first objective of the workshop. This will be verified by a specific "Monitoring Plan".

Objective 1: To improve the management of urban rainwater at both private and public buildings. Separation of sewerage and rainwater is a priority. Interventions that induce water savings in private wells are also targeted.

Objective 2: To enhance the knowledge of the water users in order to reduce the quantity of wastewater and improve the quality of water returned to the environment.

With the activities that we are going to realize, we expect to improve both the blue and the green waterfootprint of the urban area. The results will be measurable with respect to the first objective by monitoring the consumption / year per family or in public buildings (cbm / year), while for the second goal it will not be possible to monitor the improvement in the short term

through a numeric indicator. However, we believe that the application of what we will provide, will bring undoubtedly both environmental and economic benefits.

2.3 Measures to be used

The activities to put in place to achieve the twin objectives of improving the identified parameters can be summarized as follows.

OBJECTIVE 1)

Increase of effective infiltration with the aim of:

- returning water to the territory that has not undergone changes arising from our presence
- avoiding that in hydraulically critical moments (heavy rainfalls), the mixed sewage networks are replenished with water that does not need to be further treated
- reducing the cost of sewerage and management of treatment plants (both in terms of maintenance and energy costs)
- reducing the extraction of drinking water for the uses for which a lower quality would be sufficient, including through the use of technology and dedicated solutions;

Planned Actions

1. Meeting with the technicians of private housing and city planning in order to disseminate monitoring results and improvement objectives (the invitation to the meeting could also be extended to the technicians of the municipalities of the territory controlled by the AV, or neighboring municipalities).
2. Preparing a document that contains the proposed adjustment to the planning and building regulations, aimed at encouraging a reduction of water consumption and reuse of rainwater where possible, for both private and public buildings. For work carried out by private actors "public support" may be desirable. The paper will also consider proposals for a gradual removal of stormwater not contaminated by drainage systems through the reduction of impervious surface for new pedestrian / biking trails or parking areas.
3. Proposal to the political institutions of the City of approving the draft document.
4. Census of private wells for the purpose of future controls and persuasion actions aiming at owners of private wells to stop the habit of continuous water extraction. Verifying the installation of closures of the spouts of private wells.
5. UWFP method dissemination to highlight the necessary indicators for monitoring.

OBJECTIVE 2)

Increased knowledge of the water users in order to reduce wastewater and improve the quality of water returned to the environment.

Planned Actions

1. Presentation of Model C results and SWOT analysis and improvement targets during a public event (Festambiente).
2. Collection during the event, of names and e-mail contacts of people who intend to adhere to the "Monitoring Plan" (to be contacted at a later date).
3. Redaction of a summary document to be sent to users who have collaborated in the data collection that contains both results and indications of good practices to be implemented in order to reduce water consumption and improve the quality of the water returned to the environment, containing also the consent to subsequent requests for data collection
4. Redaction of a dedicated page on the website of Acquevicentine and the City of Vicenza containing the results, good practices and a specific section on the treatment that came up from the analyzed data, showing the weak point of knowledge of the user.
5. Preparing a model for data collection that allows the users to monitor their water consumption. Data collection must be scheduled, such as weekly monitoring for two weeks before putting in place best practices and subsequent monitoring weekly for 2 months. Further monitoring monthly for 4 months in order to verify the consolidation of good practice. The data will be transmitted (or entered in the system) through Internet access, subject to verification of technical feasibility and cost-effectiveness.
6. Preparing a document containing general information about the project, its objectives, monitoring results, best practices and the invitation to participate in the improvement program, to be disseminated to colleagues of the companies involved in the project (City of Vicenza, Acquevicentine, Centro Idrico di Novoledo, CPV, University of Padova).
7. Sending invitation to users who have given their consent to participation in the improvement program (Festambiente - previous questionnaires).
8. Coinciding with the lessons provided in the training program for students, an invitation to participate in the improvement plan will be extended.

9. Processing of the collected data (see if we need to restrict only to residents in the municipality of Vicenza the opportunity to join the program, or provide for the possibility to skim data later during processing).
10. Analysis of the processed data with verification of the expected improvement.

Duration

Time required to process papers, best practices and collection model → by July 2014

Disclosure and start collecting data from the September / October 2014

Monitoring duration 6/7 months for the project; until December 2016 for subsequent monitoring of the indicators.

Data processing: May 2014; May 2015; May 2016

Processed data analysis and program / verify new targets: November 2014; February 2017

Costs: at the expense of Acquevicentine S.p.A. according to the specification of task defined for the participation in the project U_WFTP.

2.4 Executing organisations

The organizations responsible for the implementation of the Improvement Plans will be the Municipality of Vicenza, Acque Vicentine S.p.A. e il Centro Idrico di Novoledo.

2.5 Affected stakeholders

The actors involved in the Improvement Plan are decision makers (government) and citizens, especially students.

The most significant result that will be achieved by involving these subjects, is to increase their awareness on the importance of improving the urban water footprint and the water cycle management.

2.6 Preconditions of and risks to successful implementation

For the first objective, decisive conditions are the approval of the regulatory proposals by the Municipality and any allocations for improvement actions in the areas and public buildings.

For the second objective, the conditions for success are the willingness of the monitored sample of citizens to alter their behaviour.

2.7 Estimated costs of implementation

Direct action on tap: it is estimated that the total cost of every family applying for flow reducers on their water supply systems will be approximately 300,000-500,000 Euros.

Action for rainwater collection system on buildings, gardens, green areas, it is estimated that the commitment could be between 700,000 and 1,000,000 Euros.

2.8 Indicators to measure the impact

The indicators that will measure the impact of the measures put in place by the Laboratory will be:

1. significant contacts with citizens reached with questionnaires proposed by the Laboratory on the water cycle (number of surveys);
2. Number of pupils reached by targeted meetings (number of students);
3. Participation of the public and decision makers in the meetings on the proposed U_WFTP theme (workshops and open days) (number of meetings);
4. Proposals addressed to the Local Council for the introduction of legislation to promote water conservation in building sector and in town planning. (YES / NO);
5. Controls intensification and persuasion actions aiming at owners of private wells to reduce continuous water extraction (number of controls).

2.9 Monitoring and validation of results

The authority that will validate the results will be the City of Vicenza and the monitoring will take place, as far as possible, by the end of the project timeline. As for the future monitoring, which is expected to continue for the next three years, it will be made at due time.

2.10 Local promotional programme and dissemination

The promotion of measures to reduce the water footprint are addressed to:

- Local authorities that may have a significant impact on policy of the City to improve water consumption (July-September 2014);
- Citizens who are contacted online so that they can implement recommendations of best practices to reduce family consumption (February 2014-December 2016);

- Students who can be educated and made aware of the importance of a conscious use of water (September-October 2014);
- Publication of project results through the web site or e-mail to people who have joined the campaign tracking on-line questionnaires (July 2014-February 2017);
- Articles of local press advertising the initiatives of the laboratory.

2.11 Assessment of results

The authority that will be in charge of balancing the improvement results will be the city of Vicenza.

The outputs of the partial adjustment (as not all measurable by the end of the project) will be reported in a report (November 2017) that will be shared with the other partners.

2.12 Input to the joint report

The organization that could keep in touch with the other partners for the development of methodology for improvement of WFTP will be the Municipality of Vicenza, which will be supported for more technical issues by Acquevicentine SpA and the Centro Idrico di Novoledo.

2.13 Schedule of implementation

Step/activity	Deadline	Responsible organisation	Remark
Finalisation of the implementation plan	June 2014	Municipality Vicenza, Acque Vicentine SpA, Centro Idrico di Novoledo	With calculations on the water footprint
Target groups identification	February 2014	Ditto	
Defining Rules to propose to the public administrators	August 2014	Ditto	In a report with the general explanation of the project and the improvement plan proposed
Devising detailed plans	July 2014	Ditto	Including technical specifications
Identifying and contacting affected stakeholders, public consultation of the plans	February-April- June- July- September-October 2014	Ditto	Citizens, public administrators, civil servants, water cycle operators (in

			one week training), students
Monitoring of the progress of implementation	Continuously until November 2014; after in December 2016	Ditto	
Local promotional programme	27 June 2014 – 1 July 2014 – September – October 2014	Ditto	Workshop at Festambiente, Open Day with public administrators, Meetings in schools
Reporting to project partners	October- November 2014	Municipality of Vicenza	Including proposals on the improvement of methodology