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Water Tables 2013 - 2014

Policy Paper Svimed

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Executive summary

The study, based on a deep analysis on the water supply and wastewater management system, treatment and waste water disposal (sewer network, wastewater treatment system, drains) of the three project target areas, illustrate the possible scenarios applicable to the three cases studies and the results of the related feasibility evaluation.
The study was carried out with the strong contribution of local authorities and local community. Numerous meetings for the exchange of information and sharing of solutions have been organized with Ragusa Municipality's technicians (Integrate Water Service Sector 6 – Environment, Energy, Civil Protection and Green areas and with Territorial Planning and Use Sector). Some information has been obtained directly through interviews with citizens of the target areas, for allowing the approximation of some data (e.g. yearly consumption of water, wastewater treatment or number of house seasonally occupied).
For each case study, the choice of the optimal solutions is carried out through successive stages:

1. Draft feasibility evaluation: from a large number of possible interventions to few solutions, actually applicable.
2. Elaboration of alternative options (including Alternative 0 – achieve nothing).
3. Definition of sustainability criteria (environmental, social, economic).
4. Multicriteria analysis.
5. Discussion with stakeholders.
6. Identifications of the best solutions.

After the participatory process held by Svimed in the two years of project, and considering the need of Municipalities, Svimed presented a proposal for a policy document with which urged municipalities to enter into their Building Codes certain rules and regulations aimed at increasing the sustainability of water resources management. In particular to:

- reduce water losses of supply and distribution networks;
- optimize the management of water withdrawals;
- calibrate water withdrawals to the actual needs of residential, industrial, agricultural;
- encourage the reuse of treated wastewater.

Municipalities are primarily interested in measures to reduce water consumption, especially in simple interventions applicable in the existent buildings (double flush, douche diffuser) and emphasized the importance of campaigns to raise public awareness to quickly improve the management of water resources. Consequently, together with Ragusa Superintendence of Heritage and Cultural Activities, Ragusa Water A.T.O., Ragusa Civil Engineering Office, Ragusa CNA – building sector, President of Ragusa Engineers Association, President of Ragusa Architects Association, University of Catania, NGO Legambiente, they signed a political protocol, with Svimed, for integrating the proposed solutions into the existing building code.

Section I – The state of water and the table

A. The water management in your country and in your region

The overview of water resources and waste water disposal system in Ragusa, urban systems and economic and social activities developed in the target areas of Ragusa, has been useful for identifying the three case studies (and their peculiar properties):

- ✓ Urban Residential area: Building Cooperatives Soraya and Doriana
- ✓ Rural Agglomeration: Borgo San Giacomo
- ✓ Coastal Agglomerations with a high season inhabitants fluctuation: Villaggio Cerasella, Marina di Ragusa's recent settlement beside the Provincial Street 25.

Drinking water resources actually available and used by Ragusa's municipality is constituted entirely by subterranean water (wells and springs) except for Borgo San Giacomo, supplied by Santa Rosalia's dam, Irminio's river.
Comparing the volumes insert on the system and the volumes invoiced (4,65 Mlnm^3/year) we obtain a percentage of leaks of 70% that become 55% if we consider the volumes allocated but not invoiced (as municipal school, public green areas and sports facilities).

Considering a resident population in Ragusa city of 69333 inhabitants, we obtain:

- A daily water supply of 610 l/inhab (considering volumes insert in the system);
- A daily effective consumption of 270 l/inhab (considering 55% of loss);
- A daily consumption of 184 l/inhab (considering volumes invoiced).

Ragusa's urban centre is served by two wastewater treatment system (both making biological treatment, activated sludge with separated stabilization) located in C.da Lusia where are collected also the wastewater of Ragusa's industrial area.

Wastewater volumes yearly treated by C.da Lusia WWTP amount at 5,3×106 m3 for a plant planned for treating 6,4×106 m3.

The wastewater is collected to the WWTP "Lusia" by two conduits: one resultant by the industrial area and "Ragusa alta", and one by "Ragusa bassa" and Ragusa ibla.

Taking in account the information collected and the state of art of the Ragusa Area, we identified the three case studies with the aim to characterize different situations, the urban case, the rural/mountain village and the costal agglomeration. These three cases represent situation that we can find at regional at national level with similar problems, as tackling the isolation and water supply related problems;

Analyzing the data collected during the survey on the three case studies, it's clear that these isolated areas face many infrastructural problems related to water and drainage system.

In all the areas should be planned the promotion of the water saving kits, as water diffusers, dual flush button and also system of rainwater harvesting to encourage the water reuse. Furthermore water supply system should be enhanced by a grey and black water separation system in order to pipe grey water into a treatment plant and black water pipe to the existing municipal water wastewater plant of C.da Lusia.

B. The water tables

Svimed organized 3 water tables in Ragusa planned in SWMED project in order to share with stakeholders the main problems on water management related issues, possible solutions and strategies.

The aim of this first meeting was to illustrate the project and discuss with some key stakeholders in the current state of water management in the province of Ragusa, in order to identify key issues and begin to talk about possible solutions.

The aim of the second water table was to illustrate the three cases studies developed around Ragusa municipality, and discuss with the key-actors the related solutions applicable in the Province of Ragusa for

improving and making more sustainable the water management comparing the best "tools", strategies and the good practices to be integrated into the existing building code.

The aim of the third Water Table was to present the results of the feasibility study on the three target areas in the province of Ragusa (rural area "Borgo S. Giacomo", urban area - "Cooperative Soraya" and "Cooperative Doriana" - and seasonal area "Villaggio Cerasella and other isolated clusters- Marina di Ragusa") and discuss with the technicians about solutions proposed and their applicability to other contexts. Furthermore, the third water table was the occasion for discussing and signing a policy document with which the municipalities undertake to integrate/adopt standards in their building codes aimed at enhancing the sustainable management of water resources at domestic level.

C. The contribute of the SWMED project

Thanks to SWMED project data was collected and compared (by multicriteria analysis) for showing how the adoption of sustainable tools could improve the quality of life of citizens minimizing economic and environmental impact. Furthermore, during the participatory process developed during the two years of implementation of the project, Svimed presented a policy document of sustainable tools for building and restoring houses to help the municipalities to boost the implementation in their building codes aimed at enhancing the sustainable management of water resources.

The policy document is disseminated at municipal level to transfer to other municipalities the good experience and the building code proposal and to enter into their Building Codes certain rules and regulations aimed at increasing the sustainability of water resources management.

Section II
Main problems

A. Catchment, territory, environment

Water losses

B. Distribution, sewage and drainage

As for the case study "Urban Residential Area" grey and black water are addressed to the same network.

As for the case study "Rural Agglomeration" there isn't a drainage system and many ex potable water's tanks have been used for wastewater storage.

As for the case study "Coastal Agglomeration" there isn't a drainage system and wastewater management takes place through Imhoff tanks.

C. Consumptions

High consumption, at the moment there is a strong difference between water bills and the amount of water actually delivered.

High number of users who do not pay for water. The recovery of these resources would facilitate better implementation of the water service.

No municipality has carried out or is planning interventions aimed at reducing consumption.

No municipality has carried out or is planning awareness campaigns although there is the belief that a lack of awareness of citizens relating to water consumption.

D. Governance, management, administration

The state of administrative uncertainty not encourage planning - waiting for the full assignment of ATO.

It's very important to update and upgrade data collection system, in order to have continuity with useful information to assess the effectiveness of the strategies and actions.

The disorganization of the regional administration not encourage municipality planning – and there isn't financial resources addressed to this kind of infrastructures.

Awareness campaign chained to the tariffs.

E. Legislation and regulations

No specific rules on the building code for incentivizing water reduction system.

Section III
Identified solutions

A. Catchment, territory, environment

The reduction of water losses is the most significant problem for improving the effectiveness of management. The implementation of an appropriate plan of knowledge could facilitate the identification of specific interventions. Stakeholders agreed with the need to reduce water losses and points out that some parts of the network are very old (still in cast iron and lead), and need strong structural works.

B. Distribution, sewage and drainage

It should be realized interventions to improve the performance of the treatment plants, particularly to overcome the problems that occur in summer. For wastewater treatments of the isolated fractions normally have being planned interventions of "centralization", creating a problem for the existing plant

already overcharged. Some proposition have been done for the realization of natural wastewater treatment plants. The natural wastewater treatment plants might be a good solution especially for isolated fractions located along the coast. However, should fit within an overall strategy implemented by Municipality.

C. Consumptions

Municipalities are interested in interventions that can assist in the proper consumption measurement (at the moment there is a strong difference between water bills and the amount of water actually delivered). Municipality of Santa Croce Camerina – the only that has a private operators for management of water service - has an ongoing project for the installation of meters for individual users. The first available data shows that after the installation of meters has reduced the difference between water bills and the amount of water actually delivered. Mister Rocca (ATO) pointed out that it would be important to extend this good practice to all municipalities in the province, considering the high number of users who do not pay for water. The recovery of these resources would facilitate better implementation of the water service.

According to the technicians of the municipalities there is a good knowledge of tools and technical solutions to be applied. These solutions are often suggested to designers but there is still no political will for stronger action (for example, enter into obligations of the Building Regulations).

D. Governance, management, administration

Plan awareness campaigns.

Update and upgrade data collection system to oblige citizens and especially builders, to used sustainable technologies: simple tools, as the double flush, or more incisive, as a local wastewater treatment system for grey water.

Update municipality databases.

E. Legislation and regulations

Enter into obligations of the Building Regulations.

The need of an adequate technology and new rules to improve water management system and the reduction of water consumption.

Rules to be integrated into the building code have been proposed.

Section IV
A possible solution – Case study and proposals

In all the areas should be planned the promotion of the water saving kits, as water diffusers, dual flush button and also system of rainwater harvesting to encourage the water reuse. Furthermore water supply system should be enhanced by a grey and black water separation system in order to pipe grey water into a treatment plant and black water pipe to the existing municipal water wastewater plant of C.da Lusia.

Taking in account the 3 cases study, the following solution can be proposed:

- concerning Urban Residential areas, the recommended solutions are to be addressed to the grey water separation system for improving the reuse at domestic level;

- having to do with the Rural Agglomerations the main problem to tackle is related to the absence of a drainage system that should be solved building a constructed wetland plant in order to improve the adoption of more sustainable solutions and reuse of water, also in agriculture, the main activity around the village;

- the Coastal Agglomerations have to face the problem due to the absence of connection with the main facilities of the close city, thus, a large water saving campaign is proposed for supporting the adoption of sustainable solutions for domestic water reuse, as water saving kits, separation of grey and black water and storage of rainwater.

A. Greywater reuse for wc/irrigation

Objective

As for the case study "Urban residential area" the best alternative is the greywater reuse for WC/irrigation, especially from the economic point of view in relation to the recoverable volumes. The benefits of grey water recovery are more obvious, when there is available space, providing for natural technologies application such as constructed wetlands, which have lower costs of investment management and the lower management commitment required in the operational phase to end users.

Actors, stakeholder e beneficiaries

Municipality, building companies, house owners.

Actions and resources

To integrate new rules into the building code (only in case of incentives, minimizing the need of resources compared with economic impact in water management system).

Timing

Within 2015.

B. Constructed Wetland and Water Saving devices

Objective

As for the case study "rural area" the best option is the implementation of the Constructed Wetland and Water Saving devices.

Maintenance costs of Constructed wetland are very low and limited to the yearly emptying of the Imhoff tank and to the cut of the aquatic plants and the grass in the treatment area and the presence of water saving devices guarantees at least 20% decrease of consumption and so also of the plant size, thus, consequently of investment costs. Furthermore, the promotion and the use of water saving devices at low cost, has always an effect on the sizing of the treatment system, so it should be encouraged.

Actors, stakeholder e beneficiaries

Municipality, building companies, house owners.

Actions and resources

To integrate new rules into the building code (only in case of incentives, minimizing the need of resources compared with economic impact in water management system)

Timing

Within 2015.

C. Constructed Wetland and Water Saving devices

Objective

As for the case study "coastal area" the best option is to provide constructed wetland and water saving devices, with a main constructed wetland for Villaggio Cerasella and possibly smaller natural systems for the other isolated cluster. Considering that C.da Cerasella inhabitants provided autonomously to the water supply through tanker service and also to the final disposal of wastewater, the recourse to water saving device is strongly suggested and it could be the first step of a medium term planning for the design and realization of a sewer network and a treatment system. With these systems they can reduce the amount of water necessary of about 30%, reducing also the footprint of the natural treatment.

Maintenance costs of constructed wetland are very low and limited to the yearly emptying of the Imhoff tank and to the cut of the aquatic plants and the grass in the treatment area.

Actors, stakeholder e beneficiaries

Municipality, building companies, house owners.

Actions and resources

To integrate new rules into the building code (only in case of incentives, minimizing the need of resources compared with economic impact in water management system)

Timing

Within 2015.