



# SUWANU EUROPE

Development of Regional Action Plans for the fast implementation of water reuse to the 8 pilot Regions of the SUWANU EUROPE project:

## Steps for the implementation of the Local Action Plan for Po Valley, Italy

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The RAP bases their specific actions on the SO and results set by the GAP. The SO and elaborated strategy of the GAP, form the basis for the specific steps/actions to the realisation of the GAP strategy.

From centuries, in The Po Valley water activities have been devoted to manage the Po basin and to give added value to the delta of the river and to the many effluents and different water utilizations and destiny.

For the RAP development in the Po Valley (Italy), the participatory workshops and the regional working group were very effective (see 2.4. and 2.5. tasks), building up the implementation plan with some specific objectives (see below).

## 1.1 Methodological Framework

### 1.1.1 The Participatory workshops in Italy

Starting from the participatory workshops, the methodology was confirmed in a world café combined with Experts and fields operators

We had three meetings in Italy till now, the first one in Bologna the 24<sup>th</sup> of June, during the General Assembly of the Agrifood Cluster c/o ART – Emilia Romagna (Via Gobetti 101 – Bologna), the second one in Rimini, Ecomondo Fair, the 7<sup>th</sup> of November c/o Confagricoltura Stand (Hall 030 Pavilion D3 Bioeconomy Area) and the third one the 12<sup>th</sup> of December in Palazzo della Valle, Rome, during the AgroNetwork 5<sup>th</sup> Seminar on Water management c/o Confagricoltura (Corso Vittorio Emanuele II, 101 00186 Rome – Italy).

The first participatory workshop was in Bologna, during the Cluster Agrifood General Assembly the 24<sup>th</sup> of June 2019, with 90 representatives of the farmers, Food companies, research Agencies, Universities and Authorities (Ministries with Agrifood competencies).

It was a preliminary opportunity to present Suwanu Europe project CSA and to evaluate reactions and suggestions by the Cluster's associates, with a particular attention to use and reuse water management advantages and barriers.

The second participatory workshop meeting was organized during ECOMONDO FAIR in Rimini – Po Valley, in Emilia Romagna Region – ITALY between the 5<sup>th</sup> and the 8<sup>th</sup> of November 2019.

It was scheduled at 2 p.m. – 5 p.m. the 7<sup>th</sup> of November in the Confagricoltura hall, Stand 030, Pavilion D 3, “Circular BioEconomy” Ecomondo Fair, inviting 30 people engaged in water management, water authorities, municipalities, farmers, Universities, industries, with a technical skills (Chemistry, biochemistry, Engineering, agronomy, economics, statistics, ...).

As it may be understood, the aim of the workshop was to share our preliminary results and experiences of Suwanu Europe project, together with a deep listening of the main critical points and the opportunities/technologies to solve them in Italy first, in the Po Valley in particular.

The preparatory work for the Rimini workshop, concerning mainly the information level given to each participant and the pre-distributed material, was focused on the leaflet and the slides presentation for the discussion.

Another important activity was done by the visitors materials given to the public and businesses by the hostesses of the Confagricoltura stand in Ecomondo Fair Rimini, started from the 5<sup>th</sup> of November till the 8<sup>th</sup> of November: 7.600 visitors came to the stand and been informed about Suwanu Europe and more in general about the European projects where Confagricoltura assumed a partnership. Some slides were presented, with the goal to recover the General Action Plan, National Legislation and Legal Framework, Best Available Techniques, Dissemination Strategy. The workshop agenda has been sent to the participants a few days before the workshop.

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The dissemination actions for the workshop by the workshop coordinator Confagricoltura with the help of C.E.R. and UNITO, was very effective: leaflets, stand communications, press releases, programs and conferences citations.

The third participatory workshop meeting was organized during the Agronetwork 5<sup>th</sup> Seminar on Water Management: Confagricoltura, Palazzo della Valle 12<sup>th</sup> of December 2020 in Rome (Italy), with more than a hundred of representatives of the target stakeholders attending the workshop.

The Agenda and the invited audience was established, the thematic framework of the 2 workshops was clear to the audience (General presentation, thematic groups: farmers, industries, authorities and research on water reuse issues).

The invitation-program of the 2 workshops were formally disseminated and the translation of the preliminary Agenda in English was organized, as below:

<b>SuWaNu Participatory Workshops – Po Valley - Region Emilia Romagna - Italy</b> <b>Bologna 24<sup>th</sup> of June, Rimini 7<sup>th</sup> of November, Rome 12<sup>th</sup> of December 2019</b>	
<b>EMILIA ROMAGNA – ITALY REGIONAL PARTICIPATORY WORKSHOP</b>	
<b>14.00</b>	<b>Registration of the Participants</b>
<b>14.15</b>	Welcome address and opening (Donato Rotundo - Confagricoltura) Greeting to the participants from the host partner and other official participators
<b>14.30</b>	Gioele Chiari – CER Water Management Consortium of the Regional Authority of Emilia Romagna
<b>15:00</b>	<b><i>The SuWaNu –Europe project</i></b> Gioele Chiari (CER) and Daniele Rossi.(Confagricoltura)
<b>15:30</b>	<i>Thematic Groups:</i> <i>Farmers; Industries; Authorities; Research</i> <b><i>re-use of treated waste water status in our country</i></b> (name and status of the lecturer)
<b>16:30</b>	<b>Coffee break</b>
<b>16:45</b>	<i>Results from the thematic groups:</i> <i>Synthesis by Prof. Remigio Berruto University of Turin</i>
<b>17.00</b>	<i>Conclusions by</i> <i>Gioele Chiari (CER) and Daniel Rossi (CONFAGRICOLTURA)</i>

### 1.1.2 The Regional Working Group activities in Italy

The Regional Working Group in Italy, following the Agreement and the WP 2 task 2.5, started in September 2019, after Bologna Participatory workshop the 24<sup>th</sup> of June 2019 and after the summer season, to:

- Disseminate at local and regional level using traditional channels to reach stakeholders, such as fairs, leaflets, brochures, direct communication, workshops, locked down by the Covid 19 and hoping re organized after the summer season, to get at least five meetings, it means 3 more;
- Ensure the stakeholders engagement - see the list in 2.5. task - through a deep analysis of the key actors and the accession to other relevant organizations to be involved;
- Ensure a multi actor and a participatory approach that make regional actors feel part of the Suwanu Europe project – AgronetWORK workshop on Water management in Roma the 12<sup>th</sup> of December 2019 was an excellent opportunity;
- Contact the Italian relevant associations such as CER, Universities Districts, the farmers and agrocooperatives in Rome, with their wide networks, to better align the Suwanu Europe project with their objectives and cooperation actions;
- Facilitate the Implementation of water reuse solutions, also seeking and performing cooperative projects and innovative practical solutions locally based;
- Creating therefore a permanent cluster in the Po Valley to adopt and disseminate water reuse solutions.

See below the list of participants attending the Regional Working Group and the list of the Core Group's Membership (see below 6.1.3.):

<b>Table 8: Participants of the RWG meetings/event/activity</b>			
Name	Organization that he or she represents	Position to the organization	Description of the Organisation
Mr Carlo Carli	Farmers of Rimini-Cesena	Director	Producers
Mr Ezio Veggia	Azienda Agricola Veggia	Owner/CEO	Renewable Energies
Mr Alberto Mazzoni	Società Agricola Agri Alma SS	Owner/CEO	Cereals
Mr. Guido Zama	Azienda Agricola Zama	Owner/CEO	HortiCultures
Mr Eugenio Zedda	Farmers of Parma	Director	Producers
Mr Raffaele Cirone	Bees Farmers	Chairman	Bees and Honey
Ms Letizia Gori	Agri Advisor	Owner/CEO	Crops
Ms Aurora Audino	Politecnico di Torino	technologist	Water Management
Ms Sophie Meilo	University of Bologna	Professor	Water Engineering
Mr Daniel Jonas	Bee Farmers	Owner/CEO	Bees and Honey/ Climate changes
Mr Alessandro Brandon	Consultant	Owner/CEO	Water Engineering
Mr Alessandro Paterno	School Teacher	Professor	Education on water Cycles

Ms Cristina Cesellati	Advisor	Owner /CEO	Water Management
Mr Marco Marcatili	Nomisma	Water Director	Water Mangement – Researches and Studies
Mr Giorgio Martini	Agenzia per la Coesione Territoriale	Director on Infrastructures	Presidence of the Council of Ministers – Italian Government
Ms Giovanna Parmigiani	Azienda Agricola Parmigiani Srl	Owner/ CEO	Feeds and Livestocks water management
Ms Cristina Broch	Coca Cola Italy	Public Affairs Director	Soft Drink Industry
Mr Giangiacomo Pierini	HBC Italia	Communication and PA Director	Bottling Industry
Mr Alfredo Pratolongo	Heineken Italy	Public Affairs and Communication Corporate Director	Beer Industry
Mr Denis Pantini	NOMISMA	Director General Agrifood	Agri Food Industry Rersearch and Innovation Studies
Ms Luisa Todini	AgroNetwork	President	Agrifood industrial Projects
Ms Federica Argentati	Distretto Produttivo Agrumi Sicilia	President	Citrus Fruits Production
Mr Gianpaolo Cassese	Chamber of Deputies	Hon. Deputy	Agri Food Laws
Mr Francesco Mollame	Senatus Hall	Hon. Senator	Infrastructure Laws
Mr Pasquale Maglione	Chamber of Deputies	Hon. Deputy	Agriculture Commission
Mr Luigi Scordamaglia	Cluster Agrifood	Chairman	Research & Innovation Food Technology Platform
Ms Cristina Di Domizio	Cluster Agrifood	Secretary General	Research & Innovation Food Technology Platform
Mr Annibale Pancrazio	Federalimentare	V. President/ Board Member	Food and Drink Industry Federation
Mr Guido Folonari	Azienda Vitivinicola Folonari Srl	Owner/CEO	Wine Sector
Mr Maurizio Notarfonso	Federalimentare Srl	R&I Director	Food R&Innovation

### 1.1.3 The Regional Working Group Core Memberships in Italy

We selected a core group of 6 organizations within the participants of the RWG meetings/events and from the participatory workshops, with the aim to have 6 strategic thinking personalities, coming from:

Research & Innovation Agri- Food Cluster: Water Management in the food industry Research & Innovation
Food Industries: Environment in the Agrifood Industry
Farmers: Renewables Energies and Natural resources
Farmers: Wine sector
Research Agency: Water reuse and Water management
Farming cooperatives : Citrus fruits Production and water management in Sicily/Water scarcity area

In particular, the attendees in the Core Group are namely:

<b>Table 9: Core group of SUWANU EUROPE Regional Working Group for [insert name of region]</b>			
<b>Name of main contact person</b>	<b>Organization that he or she represents</b>	<b>Position to the organization</b>	<b>Role of RWG member during SUWANU EUROPE</b>
Ms Cristina Di Domizio	Cluster Agrifood	Secretary General	Water Management in the food industry Research & Innovation
Mrs Maurizio Notarfonso	Federalimentare Srl	R&I and Envi Director	Environment in the Agrifood Industry
Mr Ezio Veggia	Veggia Azienda Agricola	Owner/CEO	Renewables Energies and Natural resources
Mr. Guido Folonari	Folonari Srl	Owner/ CEO	Wine sector
Mr Marco Marcatili	Nomisma	Water Director	Water reuse and Water management
Ms Federica Argentati	Distretto Produttivo Agrumi Sicilia	President	Citrus fruits Production and water management in Sicily/ Water scarcity area

Looking to the different actors participating in the meetings, events and activities of the regional working group in Italy, we are very attentive to the stakeholder profiles and the motivations to attend our meetings and to be an active actor to define the regional plans.

Regarding water management and Water Reuse, we saw protagonists of different sectors, from the water Authorities to the farmers and the agricultural advisors, from the industry to the research Agencies, from the public sectors to the Universities, actors that are very relevant for SUWANU EUROPE:

To the multi actors Suwanu Europe leaflet, slides and contents were presented during the 3 meetings in Bologna, Rimini and Rome.

The Agenda was set and the attendees were registered. The topics of water management and water reuse were deeply analyzed and discussed.

Highlight the specific regional aspects that were presented and discussed: in particular the regulation barriers on reuse water and the acceptance of Agrifood products manufactured or treated by reuse water by the consumers.

The results of these discussions are very promising and the continuous pressure on reuse water issues is consisting in a raising awareness of the regional working Group in Italy.

The planned future collaboration between RWG and SUWANU EUROPE consortium is well established also because we organized next SUWANU EUROPE general meeting of the European project in ROME the 23<sup>rd</sup> and 24<sup>th</sup> of January 2020.

The RWG meetings were open events, and many stakeholders attended these events with open questions arena and floor microphone speeches and interventions.

## 1.2 Legal framework

Following the application of article 26 of Legislative Decree 152/99 (subsequently replaced by Legislative Decree 152/2006), the Ministry of the Environment and Territorial Protection issued

the Ministerial Decree number 185 of 12 June 2003 which regulates the Technical standards for water reuse.

DM 185/2003 allows water reuse prior achievement of quality parameters more stringent than those required by DL 152/2006.

The objectives of this decree are to limit the withdrawal of surface and groundwater, reduce the impact of the discharge of polluted substances into the environment and into the receptive water bodies and ultimately promote water saving.

DM 185/2003 (now DL 152/2006) regulates water reuse in agriculture and landscape, and for industrial uses.

At the exit of the plant, the number of monitors and controls must not be less than that established by current legislation and these data are made available to control authorities, such as the ASL.

Monitoring is deemed as crucial to prove reclaimed water compliance with DM 185/2003. Irrigation with reclaimed water must be carried out ensuring water savings.

Treatment plants must carry out enough in-house self-checks at the end of pipe compliance point. The aim is to verify the quality parameters of the treated water and to provide information on its environmental, agronomic and pedological potential effects.

The reclaimed water is then taken in charge by the responsible of the distribution network, the latter receives the reclaimed water free of charges and establishes the value of the contribution for the distribution costs to be paid by the final users.

Water will be monitored also during the distribution phase.

Ex DM 185/2003 (DM 152/2006) set to stringent standard: 54 parameters to be analysed, 20 of them are not even considered for drinking water, 11 of them are more stringent than those set for drinking water, there is no distinction among uses, irrigation technologies and strategies, crops.

**Locally Desired Result 1.1: National legislation complies with the European legislation regarding wastewater treatment and reuse of reclaimed water.**

**Action 1.1.1: Manage the transition phase towards the enforcement of the EU regulation**

Although the lack of conflicts between the Italian laws and the Regulation 2020/741/EU was checked in many technical meetings during the preparation of the proposal of regulation, still the aforementioned complex Italian legislative framework need to find a synthesis with the new EU regulation. Discussion will be stimulated at regional level (Regional Government of Piedmont, Lombardy, Veneto and Emilia-Romagna) and with the Po River Basin Authority.

The process has been already started by ANBI Emilia-Romagna with the Emilia-Romagna regional government in the frame of the revision of the urban agglomerations for the urban wastewater management and disposal in the agricultural waterworks. ANBI is having contacts with Utilitalia and interactions with water agency responsible of the treatment plants. The process is at the early stage.

**Action 1.1.2: Capability building**

The new EU regulation introduces a novel approach to the water reclamation and reuse in agriculture: the risk analysis. Competences and experiences on how to apply effectively a risk analysis criterion in a participative multi-disciplinary environment and with diverse stakeholders are lacking. To take this opportunity farmers' association and agricultural water managers must acquire the necessary skills. This capability building will also help to let converge water reuse into the integrated River Basin Plans, which preparation has started already. To achieve those goals a proactive attitude must be stimulated by Reclamation Consortia, Farmers' Associations, and Water Manager.

### **Action 1.1.3: Break the deadlock**

Currently the too stringent requirements of the Italian law had limited the reuse to few plants and agricultural areas. On the other hand, indirect unintentional reuse is largely diffused. Regulation 2020/741/EU offers eventually the opportunity to break the deadlock introducing compulsory risk analysis which outcomes should be more realistic quality parameters, tailored on the real end users' need and avoiding identified and measurable risks.

Broad application of the precautionary principle shall be avoided unless strictly necessary and for those risks having high impact on human health, on the food chain, and on the environment. Discussion at different institutional level must be stimulated and carried on.

The Ministry of Environment and national Institution like ISPRA, besides the regional Governments, the River Basins Authorities and the Agricultural water managers must be involved, taking their responsibility in order to fulfil 2020/741/EU Art.1, 2<sup>nd</sup> indent "... guarantee that reclaimed water is safe for agricultural irrigation, thereby ensuring a high level of protection of the environment and of human and animal health, promoting the circular economy, supporting adaptation to climate change, and contributing to the objectives of Directive 2000/60/EC by addressing water scarcity and the resulting pressure on water resources..."

## **Locally Desired Result 1.2: National unifies existing regional policies on water reuse, avoiding fragmentation.**

### **Action 1.2.1: Coordination within national and regional administrations**

The Regional Governments had since longtime identified the reference institutions competent for environmental matters, fulfilling EIA and SEA Directives. The process to obtain permits could be different for regions laying into the same River Basin. Aggregation of Water Agencies frequently results in inter-regional agencies working under different regional administrations.

A coordination should be fostered alleviating bureaucratic burdens facilitating water reuse in practices. Integration of water reuse into the River Basins Water Balance calculation requires an effective coordination among administrations and stakeholders as well.

## **Locally Desired Result 1.3: The legislation allows the use of water throughout the year for agricultural irrigation**

### **Action 1.3.1: Storage infrastructures**

Reclaimed water produced for irrigation purposes must be capitalized. The daily production of a small-medium size plant is barely sufficient to cover the needs of the surrounding irrigated

areas. Each equivalent inhabitant can provide the daily water requirement of less than 100 m<sup>2</sup> of an irrigated crop in southern Europe, roughly estimated.

There is a clear need to buffer the water production during the night hours and to store it as much it's possible in the month at the beginning or before the cropping season. Natural based solutions and other storage facilities should be integrated into the distribution networks to increase their reuse capability. The regional water protection plans must incorporate these actions to enable private/public entities investing in new infrastructures or refurbishment of the existing ones.

**Locally Desired Result 1.4: Strict regulations among European and National legislative frameworks regarding reclaimed water quality standards are enforced.**

**Action 1.4.1: Effectively implement risk management-based quality standards**

The implementation of risk management-based quality standards will allow to customize the water quality for identified uses, environments and socio-economic contexts. As a result, the quality standards being agreed among various stakeholders and defined according identified risks will not be any more perceived as irrational, exaggerated or not enough strict to be safe. Implementation of results 1.1.1 and 1.1.2 will facilitate harmonization and acceptance of national and EU quality standard through a better transparency and a bottom up participative approach aimed to effectively apply the best scientific knowledge.

**Locally Desired Result 1.5: The legal framework must facilitate the procedures required for agricultural irrigation with reclaimed water.**

**Action 1.5.1: Implement the “better regulation” concept**

The complex Italian regulation framework regulation water and environmental issues need to be simplified. This simplification process must be carried out through regulatory, administrative, organizational and technological interventions aimed at reducing the burden of bureaucracy on citizens and businesses. Consultation of citizens, businesses and their associations, stakeholders in all phases of the simplification policy is essential to gather new proposals, to improve ongoing activities and to verify their effectiveness according to the European “better regulation” concept.

The new EU regulation is promoting participative approaches carrying out the risk analysis, but the positive outcomes could be hindered or deadily slow down by excessive bureaucratic burdens. The main action to undertake is to broaden the application by public administrations of the Aarhus Convention and the Public Participation Directive 2003/35/EC. Farmers' Associations and ANBI, as well as large part of the stakeholders, are calling since time for a simplification.

**Locally Desired Result 1.6: Stakeholders participate in legislation discussion at EU level.**

**Action 1.6.1: Tighten the bonds with end users**

Irrigated agriculture and Farmers representative have been involved in the preparatory stage of the regulation 2020/741/EU and of the Guidelines since the earliest stage. The EU association representing stakeholders from various sectors and representative of Ministries in charge of water management in EU were actively engaged in the law-making process.

National organizations like Fenacore (ES), FENAREG (PT), IdF (FR), ANBI (IT), representing more than 75% of the irrigated areas in EU, have been involved in the discussion as well as CopaCogeca. Dg Environment established a CIS-ATG on water reuse working for years on the proposal.

In this second stage, cooperation and interaction between the various parties involved in the water reclamation process should be strengthened. In the Po valley ANBI representatives are involved with the different regional government and with the River Basin Authority. Nevertheless, a broad action of awareness raising need to be undertaken stimulating the engagement of the end users into the application phase of the EU regulation. This will allow also giving to EU the required feedbacks.

### 1.3 Administrative procedures

The administrative burdens are often relevant. The Wastewater Treatment Plant must be identified in the Regional Water Protection Planning (PTA), which are part of the River Basin Plan. Interactions with public administration occurs through the Agencies or Public Bodies responsible for environmental matters.

Moreover, the situation is also different among the Regions for those responsible for environmental matters. There are some that have established reference lists and others that have not identified the subjects to be considered. In general, the Environmental Agency (ARPA) is considered a competent subject in the environmental field.

In Piedmont with the DGR 29 February 2016, n. 25-2977 "Provisions for the integration of the strategic environmental assessment procedure into territorial and urban planning procedures, pursuant to the regional law of 5 December 1977, no. 56 (Protection and use of the land) "responsible bodies are identified according to the territorial level (regional, provincial, municipal) and the type of plan. Some of them must be consulted" in any case "and others can be consulted" in case".

However, the individual identification of the subjects with environmental competence is part of each single procedure. Arpa provides the technical and scientific support of the bodies involved in the procedure, pursuant to the instituting law of Arpa and the regional legislation on environmental assessments (LR 40/98).

In Lombardy the attachments to the D.g.r. n. 8/10971 of 30 December 2009 "Determination of the environmental assessment procedure for plans and programs - VAS (art. 4 of the Regional Law 12/2005; dcrn 351/2007) - Implementation of the provisions of Legislative Decree no. 16 January 2008, n. 4 define as competent environmental subjects "... public administrations and public bodies which, due to their specific environmental competences or responsibilities, may be interested in the impacts on the environment due to the implementation of plans / programs ...".

The list of the subjects includes: -ARPA; -ASL; -Bodies managing protected areas; -Regional Directorate for Cultural and Landscape Heritage of Lombardy; -Authorized Authority on SIC and SPA; -Authorized Authority on EIA; -Region; - Province; - Mountain Communities: - Municipalities concerned; - Basin Authority.

In Veneto the regional legislation does not draw up a real list of subjects competent in environmental matters. In the attachments of the DGRV n. 791 of 31 March 2009, the Park Authorities, the Basin Authorities, the Super Intendancies, the Provinces, the Municipalities, ARPA Veneto, etc. are indicated by way of example as environmental subjects.

In Emilia-Romagna, public administrations and public bodies are considered competent subjects in the environmental field, which, due to their specific environmental competences or responsibilities, may be interested in the effects on the environment due to the implementation of the plans (ex art. 5.1. s of Legislative Decree 152/2006).

### **Locally Desired Result 2.1: Harmonized standards for administrative requirements of water reuse are enforced at national level.**

#### **Action 2.1.1: Agreement on a standard procedure**

An important step toward bureaucratic simplification would be the agreement of a standard procedure at national level. This procedure could be integrated into the River Basin Management Plans, as a fulfillment of the Water Blueprint priorities and as a supplementary measure which Member States can adopt as part of the Programme of Measures required under Article 11(4) of the WFD. Standard procedures facilitating the reuse of treated wastewater can be considered as a fulfilment of the EU policy on resource efficiency (Communication on the Circular Economy, 2015). To achieve this goal all the stakeholders must engage themselves in putting pressure on the national and regional government. However, it's a broad political issue, which not involve only wastewater reuse but the whole functioning and efficiency of the local and national bureaucracy.

### **Locally Desired Result 2.2: The bureaucratic procedures to acquire the license for reuse in agriculture are clear brief and inexpensive.**

#### **Action 2.2.1: Public information about procedures**

This aspect is involving mainly TWWP managers. Any water reuse permit is required to irrigate as far the water is treated at the level foreseen by the national and EU laws.

A more agile and fast bureaucratic procedure shall facilitate the water agency upgrading the TWWP to the treatment level required for a safe reuse in agriculture.

## **1.4 Public and private incentives**

Having in mind the Italian legal framework on the reclaimed water matter and, in particular, the reported limitations connected to the restrictions to both water treatments and water quality for reuse, a clear underdevelopment of this segment is evident.

Aided by the awareness deficiency, and reinforced by the lack of a systematic need, the water reuse sector is currently characterized by scarce/inadequate public incentives, limited

public/private investments (as better described in the Par. 6.5) and absence of private incentives.

As a matter of facts, only the following limited forms of incentives can be reported:

- the National Ministerial Decree n° 185/2003 (for the waste water reuse) identified the possibility to adapt the new predicted WWTPs (included into the “catchments area planning”) for the water reuse with the possibility to benefit from economical support (but, up to date, only few WWTPs took advantage of this opportunity, namely a couple of plants located in Lombardia Region as better defined in D1.2);
- Within the EU’s funding program, some pilot plants took benefit of demonstrative projects on reclaimed water use (such as LIFE programme, FEASR, etc.).

This appear insufficient to sustain (and consolidate) such forms of sustainable reuse of treated waters. In particular, where conventional sources are available, incentives would be essential to make cost-effective the production and transportation of reclaimed waters.

### **Action 3.1: incentives to sustain the growth of reclaimed water use.**

Taking for granted the revision of regulatory framework (as better detailed in Par. 6.2), and inspiring to the success stories of others EU countries (such as Israel and Cyprus, but also Germany and Belgium), the following incentives should be evaluated to make reclaimed water an attractive alternative to the other conventional sources:

- a. Grants and/or low interest/long terms loans (or feed-in tariff system for reclaimed water production) for existing WWTPs infrastructures aimed at:
  - I. technological revamping to low energy demanding solutions (in relation to the expected final quality after treatment, and the purpose of the end-use of the reclaimed water);
  - II. logistic infrastructure adaptation for the delivery of reclaimed water to “water consuming” areas not far from treatment sites (e.g. green belts);
  - III. storage infrastructures adaptation to take into consideration the time differences between reclaimed water production and demand;
- b. Grants and/or low interest/long terms loans (or feed-in tariff system for reclaimed water production) for new decentralized WWTPs infrastructures integrating the complete water recycling infrastructures.

### **Action 3.2: incentives to make reclaimed water an attractive alternative source to the other conventional fonts**

Introduction and implementation of “reclaimed water programs” with economic and/or fiscal incentives for intermediate/end users for making the use of reclaimed water more appealing and attractive than conventional sources (e.g. early connections prizes; reclaimed water use discount rates; subsidies; etc).

## **1.5 Investments**

### **Action 4.1: Technological revamping**

Considering the overall situation of WWTPs in the Po valley, public and/or private investments should be employed to update and rationalize existing infrastructures. Most of the existing

plants are designed to perform only primary and secondary treatment, releasing water with quality parameters that are insufficient for agricultural reuse.

Moreover, the relative abundance of water resources in the region, and the existing constraints in terms of cost, do not allow to implement additional (and more expensive) treatment steps (tertiary, advanced tertiary), without a major increase of water tariffs to the public.

In this context, to pursue a quality increase of treated wastewater investments should implement on the existing WWTP the adoption of new and more efficient water treatment technologies, in particular those which can reduce power consumption as well as operation and maintenance costs (e.g. membranes, phytodepuration).

Actors involved in this objective would be the multiutility companies (such as IREN, SMAT, HERA, etc.) in charge of water distribution and treatments.

#### **Action 4.2: Foster the circular economy**

WWTPs should be considered as a part of a sustainable flow of water, waste, resource materials and energy of a circular economy. Investments shall focus on shifting wastewater treatment from today's standard treatment towards a sustainable reuse of wastewater-derived resources (Neczaj and Grosse, 2018, Kehrein et. al. 2020).

In fact, the organic matter, nutrients, and other substances dissolved into wastewater and wastewater sludge (van der Hoek et al. 2016), can be recovered and employed for several uses. Among them, the two main processes are:

- energy recovery (growing microbial or algal biomass for biogas production);
- nutrient recovery for agricultural uses (Phosphorus, Nitrogen);

However, several experiences have demonstrated that there are several more materials that can be recovered, such as cellulose, alginic acid, bioplastics.

Each resource recovery process leads to an increase in water quality parameters, and by combining them in a proper wastewater value chain can have a significant impact on both the financial viability of WWTPs and their impact on the environment.

Actors involved in this objective would be the multiutility companies (such as IREN, SMAT, HERA, etc.) as well as private companies (e.g. chemical pharmaceutical) using the recovered resources in their production process.

#### **Action 4.2: Decentralization**

One of the main issues in agricultural water reuse consist in the distribution systems. In practice, balancing costs and benefits, treated wastewater should be delivered within a maximum of 5 km from source WWTP.

Such conditions are more frequently met for medium-small towns (i.e. having a population of 10'000-20'000) located nearby existing agricultural areas. On the other hand, small WWTPs can't sustain to employ advanced (and expensive) treatment systems, capable of purifying

wastewater to meet quality standard suitable to be used on all type of crops and/or irrigation systems.

In view of this, to exploit at best water reuse practices, investments should be made to establish a tight integration between WWTPs, water distribution, irrigation districts and nearby farmers.

The main actions required to achieve that consist in:

- open a discussion with farmers associations and irrigation districts to choose crops tolerant to non-optimal water quality levels (Cirelli et al., 2012);
- provide financial support to upgrade and refurbish existing hardware to work with reclaimed water properties (e.g. salt accumulation in sprinkler heads);
- build storage basins to deal with daily and seasonal fluctuations depending on the source of wastewater (municipal, industrial) and the water demand by agriculture during the growing season;
- where possible, couple storage basins with a tertiary treatment through environmentally-friendly and low-cost phytodepuration techniques;

Actors involved in this objective are the private and/or public companies managing small WWTPs as well as irrigation districts and farmers associations.

## 1.6 European network

Strengthening EU network is an important step towards an effective implementation of the recently enforced EU Regulation. Exchange of experiences about novel technologies, socio-economic solutions, risk analysis methodologies and outcomes and trade off management allows fast progressing with water reuse all over EU.

### **Locally Desired Result 5.1: European countries promote international exchange and dialogue to expand the use of reclaimed water.**

#### **Action 5.1.1: Stakeholders proactive engagement**

The majority of the water stakeholders EU representative (Aqua Publica Europea, Eureau, Irrigants d'Europe, CopaCogeca, European Environmental Bureau, EUWMA, etc.) are promoting internal discussion on water reuse.

The bottom-up consensus and acceptance as well as the internal communication, especially with citizens and farmers, need to be enhanced by all the reference associations.

### **Locally Desired Result 5.2: European-based scientists and private companies have a specific network to share and exchange results and practices.**

#### **Action 5.2.1: Networking under institutional umbrella**

Networking among scientists and private companies occurred, and still occurs, in the framework of EU projects and CSA (i.e. INCOVER, FIT4REUSE, SuWaNu, etc.) or it was stimulated by the EIP Water Action Groups like WIRE or Rewat.

Unfortunately the EU Commission is no longer supporting EIP Water, so this important discussion arena is now missing.

**Locally Desired Result 5.3: Farmers’ organizations across Europe communicate and compare their experience with the implementation of reclaimed water for irrigation.**

**Action 5.3.1: Copa Cogeca activities and networking.**

The farmers’ organization across EU are sharing their experiences and vision in sein of CopaCogeca, which is the reference organization in EU for agricultural matters. CopaCogeca is actively engaged, beside Irrigants d’Europe, on the water reuse dossier. Specific communication on water reuse should be part of the internal discussion of both the reference organizations.

**1.7 Social acceptance**

We present some of the conclusions on stakeholders’ attitudes and acceptances made by the experts and attendees during the participatory working Groups held in Bologna, Rimini and in Rome the 24<sup>th</sup> of June, the 7<sup>th</sup> of November 2019 and the 12<sup>th</sup> of December 2019.

**Action 6.1: Authorities suggestions**

The main suggestions by the Authorities to remove social barriers:

- EU, National and, in particular, Regional Regulations have to help more the reclaimed water use and reuse;
- Social barriers sometimes are depending on legislative barriers, to take off before;
- The implementation plan and the executive actions need to be better harmonized through some norms and rules with a minimum standard to be shared by the stakeholders;
- Facilitating reuse systems of water not claimed by agriculture, in particular in peri urban areas or industrial districts.

**Action 6.2: Farmers suggestions**

Farmers contacted were more concerned by cost structures and final pricing of raw materials and agri food products treated by reused water:

- Farming products have to be better accepted by the consumers if treated by reused waters;
- Precaution principle is a cost driver: excessive increasing costs have to be reduced!
- Farmers engagement has to be more adopted from the beginning;
- Farmers role has to be central in the elaboration of the National and Regional regulations ;
- The administrative rules and sanctions have to be harmonized between different Regions and Authorities;
- Farmers suffer the new trade barriers on reuse water irrigated products, to be avoided;
- Shortening of the administrative procedures to reuse water in agriculture.

### **Action 6.3: Industries suggestions**

For Industries, investments in infrastructures and economic and financial policies are still their priorities:

- Financial policies have to identify incentives for the reuse
- Industries ask for more and better public Investments for infrastructures devoted to water treatment and water distribution of treated waters
- Industries look for lowering Energy tariffs for water treatments activities
- Last but not least, Public Authorities have to help the business operators on adopting measures for reuse water

### **Action 6.4: Research Agencies suggestions**

Research Agencies are clearly looking for more investments in Research & Innovation expenditures:

- Stakeholders in the public and in the private sectors need to invest more on R&I and on new Technologies for an increased and better use
- Public and Private sectors have to cooperate more on research on water quality, optimization of the network, reuse diffusion
- Establishing a Technical Round Table of the main stakeholders to disseminate new technologies and innovate on reclaimed waters
- Farmers need to be trained on new technologies for water treatments and water reuse on irrigation.

These are the main suggestions and social conclusions on different stakeholders' attitudes and acceptances made by the experts and attendees during the participatory working Groups held Bologna, in Rimini and in Rome the 24<sup>th</sup> of June, the 7<sup>th</sup> of November 2019 and the 12<sup>th</sup> of December 2019.

Following the suggestions get out from the experts and stakeholders representatives in the meetings and the Regional Working Group activities and the Core Group indications, we may identify 6 steps to build the Regional Action Plan of the Po Valley to be implemented:

1. Re elaborating local, regional and national norms, controls and sanctions and administrative burdens to facilitate water reuse;
2. Re- sharing strategic news and information on water reuse to build consensus policies and to influence policy makers and consumers attitudes and behaviours;
3. Revising spatial planning and locations and siting to promote new geo positions, standards and rules, helping the adoption of decisions, the right scale between centralized and decentralized solutions;
4. Planning a communication full territory activities to reinforce the consensus and to generate opportunities to farmers, agrifood industries, logistics and retailers;
5. Monitoring the research –actions and the concrete steps forward on water reuse and water management in the Po Valley, identifying boosters and barriers and generating positive attitudes in favour;
6. Developing case studies and good examples and best practices to stimulate a snow ball effect and championship to build confidence and to accelerate water reuse in production, rural and peri urban activities.

## 1.8 Conclusions

### 1.8.1 The Italian RAP building

We show the main general conclusions on RAP needs we may find out from the Italian experience we had for the Po Valley, through the 3 participatory workshops and the regional Working Group, and the RWG Core Group:

- A European/National network for dissemination and best practices sharing on reclaimed water;
- Member States have to facilitate sharing knowledges and technology transfer on water reuse;
- Building new networks in Europe and in Italy between public and private sectors and Academia and research Agencies
- Farmers Organizations have to share their experiences on water treatments and reuse
- Consumer benefits awareness on water
- Consumers have to accept reuse water treated products
- Public opinion needs to be informed about the benefits of reusing water in water scarcity or dryness or on environment protection

During Italian RWGs meetings, the critical discussion points and the axes towards which the RWG activities that the RWG Groups should be focused on, with the aim to build the Regional Action Plan for the Po Valley, were the following:

- a) In terms of regional information/data policies:
  - Incomplete/ not updated soil map
  - Irrigation water quality data monitoring systems
  - Swap crops for irrigation water
  - Measurable water saving elements.
  - Basin Management Plan coherence and compliance;
  - Reference to different water supply and irrigation networks
- b) In terms of harmonized methodologies and critical issues:
  - Reflections on difficulties in water volume management and services
  - Integration with main issues and subjects of the Regional Policy
  - EU regulations approved to be executed;
  - The new Agricultural Policy and Farm 2 Fork strategy, with strict restrictions and measurable terms, with constant and strict scrutiny of residues.
- c) In terms of the farming systems/stakeholders/users:
  - Information, behaviour and irrigation systems
  - Farming systems/ habits of farmers.
  - Regional and local controlling in agriculture.
  - Use of treated water in non-edible crops-concerns- difficulties
  - Industrial food processors water use/reuse
- d) In terms of local/regional rules:
  - Licenses and re-use licenses
  - Secondary treatment, effluent quality and reuse of treated waste.

- e) In terms of the economy:
- Design and problems in water transportation and unit costs
  - Water recycling from drainage canals-advantages and disadvantages.
  - Water treatments costs/efficiency/piloting plants
- f) In terms of management/new skills/gaps:
- Competencies, development planning
  - Best practices to share
  - Reference to remote management and its importance
  - Cross-compliance of operators and consumers on irrigation
  - Consumer/citizenship analysis/acceptance/willingness to buy.