



Project no. 319998

SUWANU



- Sustainable Water treatment and nutrient reuse options-

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Information Kit

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PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	X
CO	Confidential, only for members of the consortium (including the Commission Services)	

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INTRODUCTION

Deliverable 3.2 is framed in task 3.3 which is oriented to the “development of mentoring activities for targeted emerging European clusters”. This report aims to provide a basic information kit for the additional members of SuWaNu cluster which will join the initiative during and after the project. This document summarizes main results of the project and provides an overview of the water reuse sector in the five target countries as well as the strategies proposed by the SuWaNu clusters.

1. CONSORTIUM

SuWanu project is composed of 5 clusters:

Bulgaria

AGRICULTURAL COOPERATIVE EDINSTVO

MUNICIPALITY OF PLOVDIV

COUNCIL OF THE BULGARIAN AGRICULTURAL ORGANISATION

AGRICULTURAL UNIVERSITY

Germany

HYDRO-AIR INTERNATIONAL IRRIGATION SYSTEMS GMBH

STADT BRAUNSCHWEIG

ABWASSERVERBAND BRAUNSCHWEIG

VEREIN ZUR FOERDERUNG DES TECHNOLOGIETRANSFERS AN DER HOCHSCHULE BREMERHAVEN E.V. (TTZ-Bremerhaven)

Greece

TEREZI PINELOPI

PERIFERIA DYTIKHS MAKEDONIAS (Third party)

PANHELLENIC CONFEDERATION OF UNIONS OF AGRICULTURAL COOPERATIVES SOMATEIO (PASEGES)

ARISTOTELIO PANEPISTIMIO THESSALONIKIS

ΣΠΥΡΙΔΗΣ Α. – ΚΟΥΤΑΛΟΥ Β. Ο.Ε. «ΥΕΤΟΣ» (HYETOS)

Malta

AQUABIOTECH LIMITED

KOPERATTIVI MALTA

UNIVERSITA TA MALTA

THE MALTA COUNCIL FOR SCIENCE AND TECHNOLOGY

Spain

BIOAZUL (Coordinator)

CONSEJERIA DE AGRICULTURA, PESCA Y MEDIO AMBIENTE – JUNTA DE ANDALUCIA (Third party)

ASOCIACION FERAGUA DE COMUNIDADES DE REGANTES DE ANDALUCIA

INSTITUTO ANDALUZ DE INVESTIGACIONY FORMACION AGRARIA PESQUERA ALIMENTARIA Y DE LA PRODUCCION ECOLOGICA

AGENCIA DE GESTION AGRARIA Y PESQUERA DE ANDALUCIA

2. EXECUTIVE SUMMARY OF SUWANU PROJECT

Agricultural practices put the biggest pressure on fresh water resources for irrigation (55% of the water use in Europe) and on fertilizer usage. The European farmers face serious problems such as freshwater scarcity and nutrient availability, extreme climate conditions and the growing demand of the increasing population. This results in rising prices for mineral fertilizers and food, risky measures such as untreated wastewater applications on fields, and environmental damages from overexploitation of resources. Even though important local efforts have been made on research activities and initiatives for wastewater treatment and reuse in agriculture, an integrated approach is needed among regions which are developing such research, incentivizing scientific, governmental and business collaboration within wastewater reuse in Europe and supporting the establishment of common European guidelines and parameters for water and nutrient exploitation efficiency.

With a special focus on small- and medium-sized companies, the SuWaNu Project consortium will develop strategies to enhance the innovative capabilities on resource efficiency, agricultural and environmental sector, improving cooperation on the regional and European level, integrating research-driven clusters across Europe in order to promote regional economic development and worldwide competitiveness of European companies.

In this sense, clusters have been formed following the quadruple helix approach and involving academia, SME technology developers, SME farmers, and wastewater treatment and agriculture associations from five different countries: Germany, Spain, Greece, Malta and Bulgaria.

SuWaNu main objective is to support the cooperation and integration between five clusters in order to improve research and technological development and to encourage real implementation of technological solutions as well as to increase investments at regional level. Through SuWaNu project, the participating clusters will develop a Joint Action Plan (JAP) and Business Plans at European level to drive economic development in the selected topics of wastewater reuse and agriculture sector.

The specific SuWaNu innovation objectives are:

- Coordinating RTDs, regional authorities, SMEs and SME-AGs to take an integrated and more proactive approach towards wastewater and nutrient reuse, improving Europe's economic situation and environmental conditions;
- Strengthen the research potential of European regions by improving regional research-driven cluster development in wastewater treatment for water and nutrient reuse in agriculture;
- Strengthen the European agricultural sector, and creating business opportunities between SMEs, SME Associations and RTDs, enhanced via public authorities support through adequate policy formulations;
- Creating Public-Private Partnerships (PPPs) between authorities and SMEs (farmer, technology developers) for common investments in sustainable and resource efficient technologies;
- Create a win-win situation between the agricultural and the wastewater treatment sector;
- Providing a better use of structural funds in R&D by improving synergies between all regional stakeholders, mainly by developing research regional strategies to be integrated in their economic development strategies.

By implementing the SuWaNu activities, it is expected to achieve the following outcomes and impacts after project finalization:

- Reducing costs for SME farmers for irrigation water and fertilizers by 50%;
- Reducing current pressure on European fresh water resources by 20%;
- Developing sustainable irrigation schemes enabling safe agricultural production in water scarce regions in Europe and reducing negative environmental impact (soil and food contamination) of improper waste water disposal and reuse;

- Increasing the stabilization of food export market prices through food security;
- Protecting /increasing employment in the agricultural and wastewater sector;
- Increase skill levels knowledge, acceptance, and practices on water management and wastewater reuse practices;
- Supporting SMEs in the implementation of novel and efficient solutions for treatment and reuse of wastewater to present them to European's policy makers for further support.

Led by project coordinator Bioazul, 20 partners from five European regions (South, East and Central Europe) have been selected to join forces in a strong network to achieve the project objectives:

- **Spain** - SME: Bioazul (executive coordinator), Regional Authority: DGEA-JA, SME-AG: FERAGUA and RTD: IFAPA.
- **Greece** - SME: TPA, Regional Authority: RWM, SME-AG: PASEGES and RTD: AUTH.
- **Malta** - SME: ABT, Regional Authority: MCST, SME-AG: KM and RTD: UM.
- **Bulgaria** - SME: Edinstvo, Regional Authority: Plovdiv, SME-AG: CBAO and RTD: AU.
- **Germany** - SME: Hydroair, SME-AG: AVBS, Regional Authority: StadtBS and RTD: TTZ.

3. SWOT ANALYSIS ON THE USE OF RECLAIMED WATER IN AGRICULTURE

As summary of this study, the main strengths detected in the countries included in the project were:

1. The sector of SMEs focused on reclaimed water for agriculture has a great dynamism and initiative adapted to regional requirements and with high potential for further applications.
2. The sector of SMEs has an extensive experience in European Research and Development projects for developing new technologies as test fields for irrigation water or sanitation with ozone and UV.
3. Innovative technical solutions generated by the European SMEs in the field of reclaimed water for agriculture, allowing the nutrient recovery, the automatization of the processes and a greater control over the quality.
4. SMEs have long experience in the use of reclaimed water in numerous areas in Europe under excellent conditions (weather and soil) for a competitive agriculture.

Equally, the main weaknesses for the use of reclaimed water in agriculture determined in this study were:

5. The reclaimed water has high implementation and operation costs, such as the costs for monitoring for constant quality assurance of reclaimed water.
6. Serious limitations in infrastructures related with reclaimed water as the absence of tertiary treatment plants, the lack of irrigation networks or deficiencies in wastewater treatment plants.
7. Insufficient positive practice and experience in reclaimed water use in agriculture caused by previous negative examples with problems related with inferior crop quality or deficiencies in the reduction of some major pollutants.
8. Specific characteristics of the regional markets for SMEs, with small size limited to small number of users, non-well established and complex for small companies.

In the case of the opportunities of the reclaimed water in the European agriculture these have been determined in the SuWaNu project:

9. National regulations for water resources as limitations on surface water allocations or the valorization of alternative sources of water for agriculture.
10. Significant public awareness of the water scarcity as a global problem (promoted by climate change effects) considering the necessity to develop new alternative water supplies.

11. Improvement of the water management at basin scale integrating different water resources with reductions in groundwater extractions balancing the water deficit thanks to the use of reclaimed water.
12. The use of reclaimed water provides nutrient supply to crops avoiding the potential contamination of groundwater resources.
13. Costs saving obtained with the use of reclaimed water by the reduction in fertilization and expensive infrastructures in some areas.
14. Implantation of technical support for farmers for the use of reclaimed water in irrigated areas supported by research programs funded by national and European institutions.

Finally, the main threats of the reclaimed water used in the European agriculture are:

15. Regulations provide severe thresholds to use reclaimed water in agriculture.
16. Regulations have a high level of complexity and excess in bureaucracy caused by the interaction between different institution levels.
17. Lack of proper control and taxing in the water management with low level of synchronization of goals.
18. Elevated costs incurred in the process for obtaining reclaimed water, uncertainty of these costs (energy) and serious limitations in the financing of the required infrastructures, compared with the low value of the agricultural products.
19. Decreasing interest for the use of irrigation in the agriculture, not requiring alternative water sources as reclaimed water.
20. Crop water requirements are higher than the available reclaimed water, requiring an alternative source of water.
21. Lack of consumer acceptance of agricultural products irrigated with reclaimed water.
22. Environmental aspects affecting to the use of reclaimed water such as the ensuring of ecological flows (reducing water availability for agriculture) or the increasing of temporal variability in the availability of water resources by climate change effects.

4. RESEARCH AGENDA

The Research Agenda is a continuation of the work initiated with the SWOT analysis. Within this task, the SuWaNu cluster has identified those “research topics” or knowledge areas in which research activities shall be focused to pave the way for re-using waste water in agriculture. Research and knowledge development is a critical point to encourage market activities and it is the starting point to carry out innovations in products and/or services by European enterprises. This is also true in the field of waste water re-use, since private companies which aim to introduce new solutions in the market are facing important barriers which hinder the marketing and development of re-use technologies as we determined in previous tasks. Therefore the research topics identified, which constitute the research agenda, will be a road map for research centers within and outside the consortium in order to guide them to find solutions (technical and non-technical) and train practitioners in the necessary knowledge and skills for a widespread use of treated waste water in agriculture ensuring health and environmental standards are fulfilled.

Research Topic 1: Legislation on WW re-use

Obstacles and barriers	Country	Ideal Situation	Research Actions
Lack of an appropriate legal framework ensuring reclaimed water re-use under safe and controlled conditions	All	- Comprehensive legal framework on wastewater recycling setting clear reuse requirements, procedures, guidelines, and effluent quality standards for different purposes of reclaimed water - Setting up a new governmental body to operate under the auspices of the respective Ministries of Environment responsible for any water recycling activities, advice and authorizations	1. A legal framework(possibly also on an EU-level) to: (a) provide guidelines and specific regulations on the utilization of reclaimed water for different purposes (b) clarify procedures and responsibilities of different authorities for an efficient authorization scheme (c) facilitate direct reclaimed water provision to the fields
Lack of proper guidelines and criteria for wastewater recycling	GR, B		
Great bureaucratic complexity for concessions and/or authorizations for water reuse	S		
No direct reclaimed water provision to the fields	GR, B		

Research Topic 2: Financials and RTD needs:

needs of more accessible and economic, low-cost technologies for WW treatment and reuse, high quality of treated effluent, and for good control of the WWT process and reuse of water

Costs for technology implementation which would enable safe reuse of water on agricultural fields (e.g. tertiary treatment equipment) are too high for targeted users (farmers/ decentralized WWT plant operators), especially against the background of uncertain energy costs	All	Availability of simple, cheap technologies targeted at water reclamation and reuse in agriculture	2. <u>Low-cost, low-maintenance and energy efficient</u> wastewater treatment technologies targeted at increasing the economic viability of wastewater reclamation and reuse schemes 3. Development of integrated WWT systems which use alternative energy sources, such as solar panels
Insufficient effluent quality due to incorrect plant operation, inadequate self-monitoring, poor maintenance support or insufficient surveillance	GE, M	Guaranteed quality of treated effluent enabling its unrestricted, safe re-use on agricultural	4. Development of automated monitoring and maintenance support systems for continuous surveillance

		fields or discharge into the receiving environment	and optimized operation of WWT plants
Treated wastewater is currently used only for non-food production (e.g. energy crops) or for restricted irrigation only.	GR	Treated effluent can be re-used to irrigate food crops/ for unrestricted irrigation	5. Development of WWT technologies producing high quality effluent suitable for its re-use for unrestricted irrigation and sufficient testing to eliminate any public health concerns/ soil contamination fears

Research Topic 3: Consumer concerns & lack of communication

Farmers or end-consumers are opposed to the idea of WW reclamation and re-use on agricultural fields. Their reluctance is often only the result of lacking communication and information exchange

Lack of consumer acceptance of WW reclamation for agricultural purposes and of products irrigated with reclaimed water due to public health concerns, fear of soil and food contamination and other potential environmental hazards	All	Large-scale acceptance of wastewater reclamation and reuse for agricultural purposes	6. Development of new <u>communication channels</u> to enhance knowledge transfer between: (a) technicians and experts in the field of reclaimed water and farmers/ end-consumers (b) farmers, basin authorities and private companies for the detection of unattended demands from farmers and private companies (c) RTD institutes and SMEs to keep them acquainted with latest technologies
Farmers hold on to old habits and refuse to replace traditional resources by reclaimed water, which additionally complicates finding experimental plots for research and technology validation purposes	S, GE, M		
Lack of communication between farmers, basin authorities and sector companies	S, M, B		7. Market studies in order to determine the main concerns of farmers/ consumers regarding reclaimed water for irrigation and accordingly develop policy recommendations

			and awareness raising campaigns to promote the benefits of WW reuse systems and eliminate misconceptions
Research Topic 4: Mismatch between the amount of waste water and irrigation/ fertilization needs			
Application of nutrient-rich WW effluent on agricultural soils may exacerbate contamination of adjacent surface water bodies or groundwater	GE, S, M	Minimization of nutrient leaching from fertigation practices	8. Development of <u>smart fertigation technologies</u> to adapt nutrient supply to nutrient demands
Limited availability of wastewater to be treated compared to the water needs in irrigated areas	GE, S, M		9. Development of expert systems for conjunctive use of fresh and reclaimed water on agricultural soils

5. JOINT ACTION PLAN

An **action plan** is a structured set of objectives, results, actions and activities outlining the pathway to reach one or more goals. When we include the word “joint” and speak about **Joint Action Plans** (JAP) we understand that a group of actors define a **common strategy** creating and enhancing synergies which lead to the completion of the stated goals.

The JAP targets relevant stakeholders in the field of agriculture and waste water treatment including public authorities, private companies, universities and research centres as well as associations and NGOs. SuWaNu project participants, as key actors in those fields, is also targeted by the JAP and therefore committed in each region to the implementation of a set of joint actions aimed at promoting and supporting the waste water re-use in agriculture. The JAP contains strategies for future activities and collaboration among the partners and will ensure cooperation between the partners beyond the project time frame. In a nutshell, the JAP will target relevant actors within and outside the consortium in the field of waste water re-use.

The Joint Action Plan has been designed and organized into four distinct hierarchal levels:

First level	General objective	General objective of SuWaNu project.
Second level	PRIORITY AREAS	This level comes from the research topics identified in the research agenda. It comprises areas of action or “strategic lines” prioritized for the completion of the general objective.
Third level	ACTIONS	This level represents specific actions (i.e. groups of activities) defined to accomplish a common result within an area of action.
Forth level	Practical steps to implementation	This level comprises specific tasks or activities defined to achieve the result of the level above (i.e. the actions linked to each activity).

First level – GENERAL OBJECTIVES

The general objective of the JAP coincides with the general objective of SuWaNu project: to increase research and technology development (RTD), market uptake and investments in the re-use of treated waste water for irrigation. Results and activities of the action plan, defined in the subsequent levels, will contribute to the achievement of the general objective.

Second level – PRIORITY AREAS OF ACTION (STRATEGIC LINES)

Potential research topics identified the research agenda has been translated into four priority **areas of action** which not only took into consideration execution of the four general objectives but also streamlined and prioritized ways of achieving these objectives, taking into consideration overlaps that helped to address common needs between the consortium members. Indeed these priority areas of action or Strategic Lines (SL) are the result of assessing barriers and obstacles from the SWOT analysis. Each cluster identified obstacles and barriers in their region and worked out the ‘ideal situation’, which would overcome those barriers. This resulted in formulating the Strategic Lines – priority areas that will contribute to the promotion of waste water re-use practices in agriculture. The Priority Areas in level 2 therefore map out the strategic direction for the creation of Joint Action Plan.

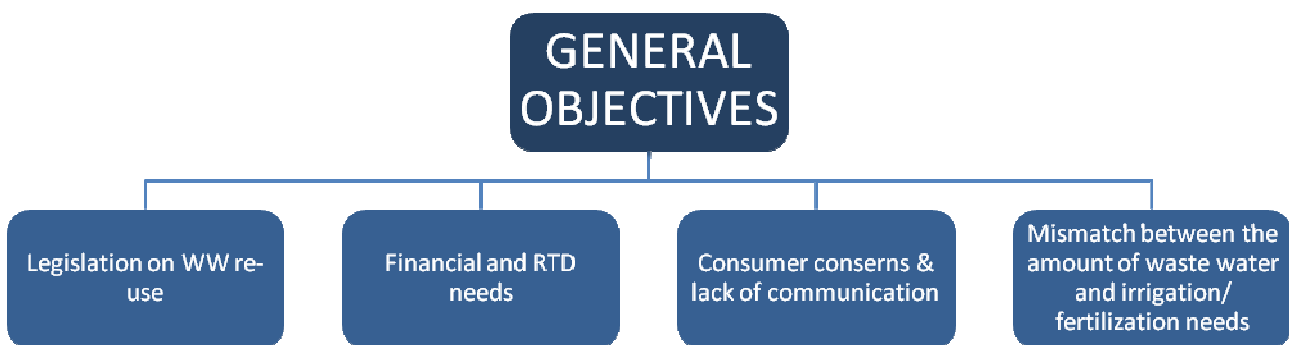


Figure 1: Priority Areas

Third level –RESEARCH ACTIONS

This level represents a series of research actions and activities defined by common agreement to reach goals within the priority areas of action or strategic lines. The five clusters of SuWaNu gathered in a special meeting in Plovdiv (Bulgaria) to present the research actions identified by each country and finally selected the most relevant ones. The table below shows the whole list of actions presented by each cluster:

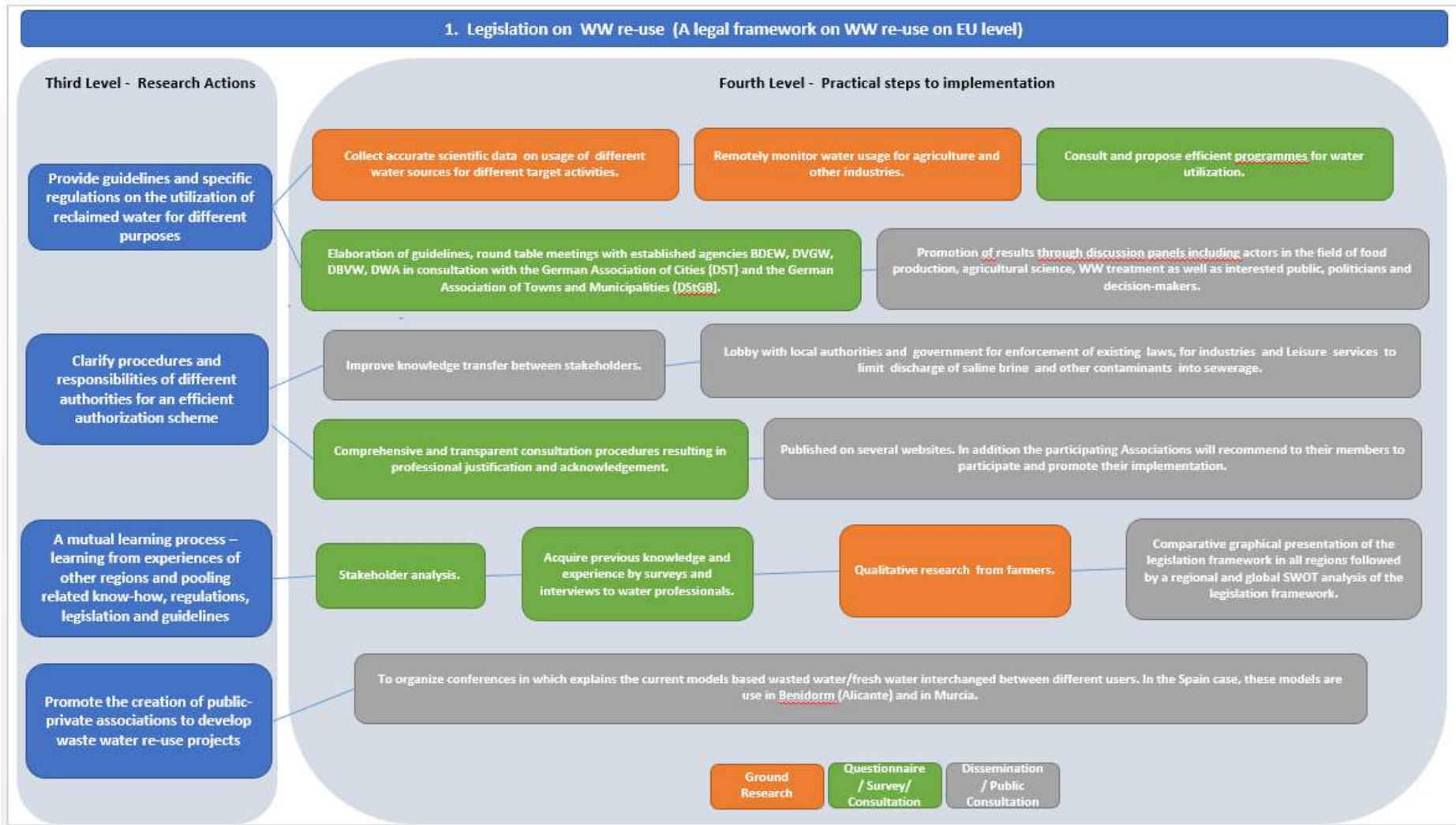
Table 1: Summary of research actions presented during Plovdiv meeting

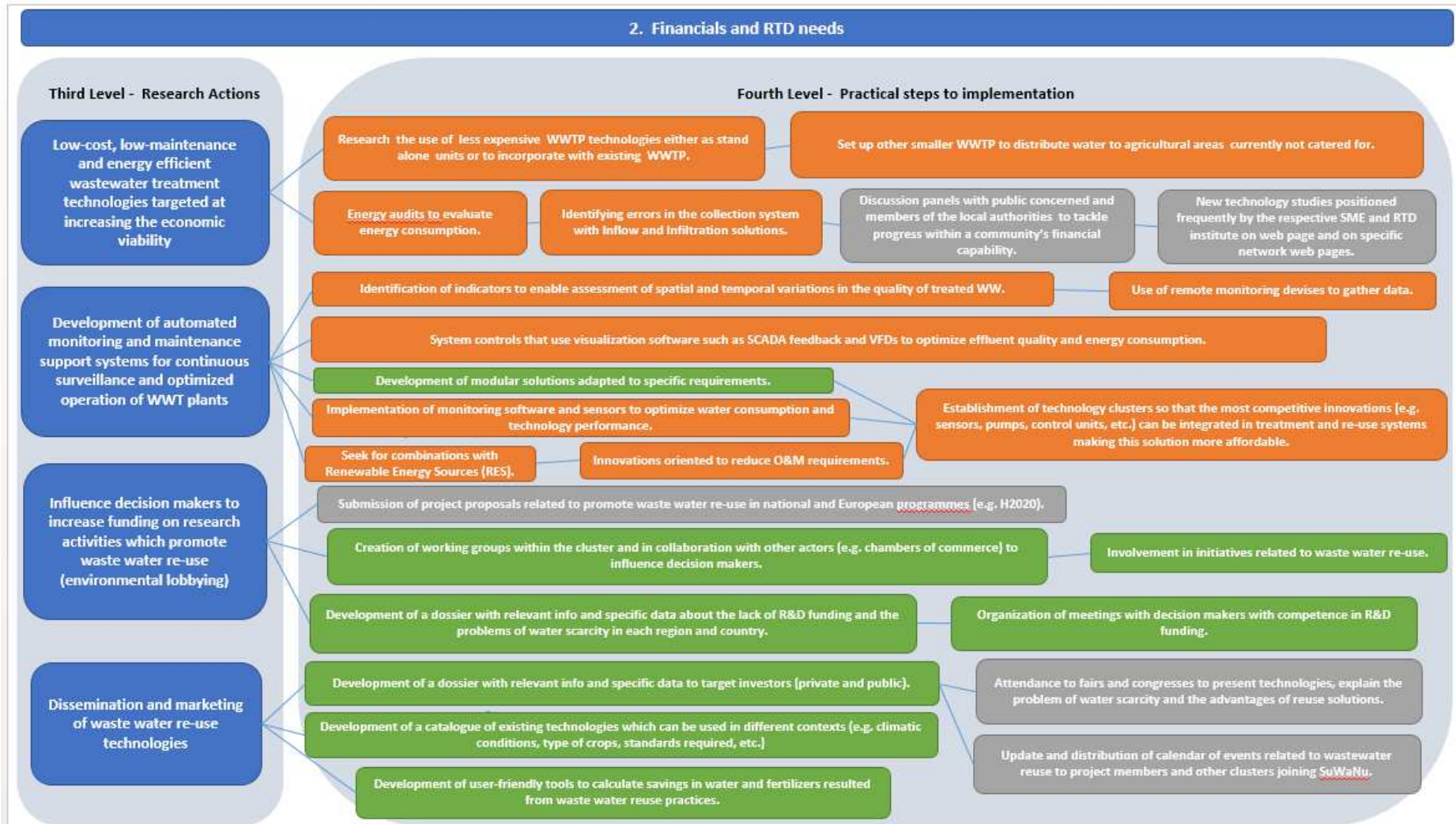
Priority Areas		Actions
1	Legislation on WW re-use	Provide guidelines and specific regulations on the utilization of reclaimed water for different purposes (GERMANY, MALTA)
		Implement amendments to plans for water basins management to include waters treated in WWTP to be reused for irrigation of agricultural crops and urban activities (BULGARIA)
		Introduction of conditions for permission for water discharge in water basins (BULGARIA)
		Make it mandatory for water users to use regenerated water from the existing hydromeliorative infrastructure of irrigation systems, making the usage of ground water more expensive and illegal without permission (BULGARIA)
		Allow for the creation and implementation of different standards for water quality to be used for irrigation of food crops and urban activities - uniform and imposed at European level (BULGARIA)
		Create a registry / list of eligible application techniques for regenerating water, similar to the reference document on Best Available Techniques (BREFs) (BULGARIA)
		Clarify procedures and responsibilities of different authorities for an efficient authorization scheme (GERMANY, MALTA)
		Simplification of the network of legal competence (GREECE)
		Establishment of a new administrative governmental body (GREECE)
		Facilitate direct reclaimed water provision to the fields (MALTA)
		Provide a state-funded technical assistance to upgrade irrigation systems for the development of quality projects and assistance in its direction, as a result of which companies will apply for external funding to carry out restoration of irrigation infrastructure (BULGARIA)
		A mutual learning process – learning from experiences of other regions and pooling related know-how, regulations, legislation and guidelines (GREECE)
		Securing resources to adequately control compliance with legislation on water use (GREECE)
		Promote a harmonization about waste water re-use at European, national, regional and local levels (SPAIN)
		Promote waste water re-use techniques in the hydrological planning process as resource alternative and complementary to other conventional sources (SPAIN)
Promote the creation of public-private associations to develop waste water re-use projects (SPAIN)		
2	Financials and RTD needs:	Low-cost, low-maintenance and energy efficient wastewater treatment technologies targeted at increasing the economic viability (BULGARIA, GERMANY, MALTA)
		Development of integrated WWT systems which use alternative energy sources (BULGARIA, GERMANY, GREECE, MALTA)
		Development of automated monitoring and maintenance support systems for continuous surveillance and optimized operation of WWT plants (BULGARIA, GERMANY, MALTA)
		Development of WWT technologies producing high quality effluent suitable for its re-use for unrestricted irrigation and sufficient testing to eliminate any public health concerns and soil contamination fears (BULGARIA, MALTA)
		Technical improvements of existing waste water re-use technologies (SPAIN)
		Establishment of a Decision Support System (DSS) (GREECE)
		Influence decision makers to increase funding on research activities which promote waste water re-use (environmental lobbying) (SPAIN)
		Dissemination and marketing of waste water re-use technologies (SPAIN)

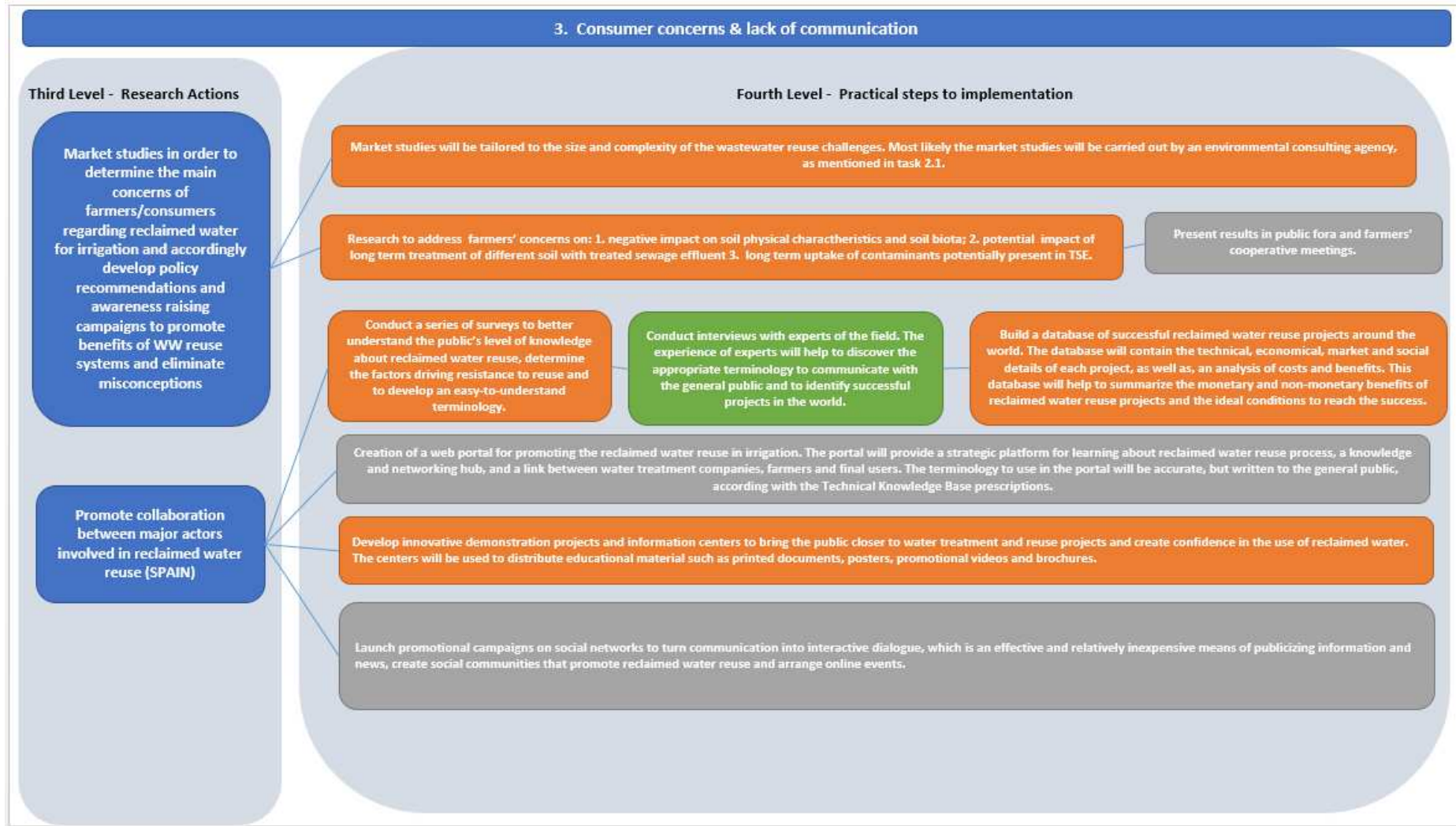
Fourth level: Practical Steps to Implementation

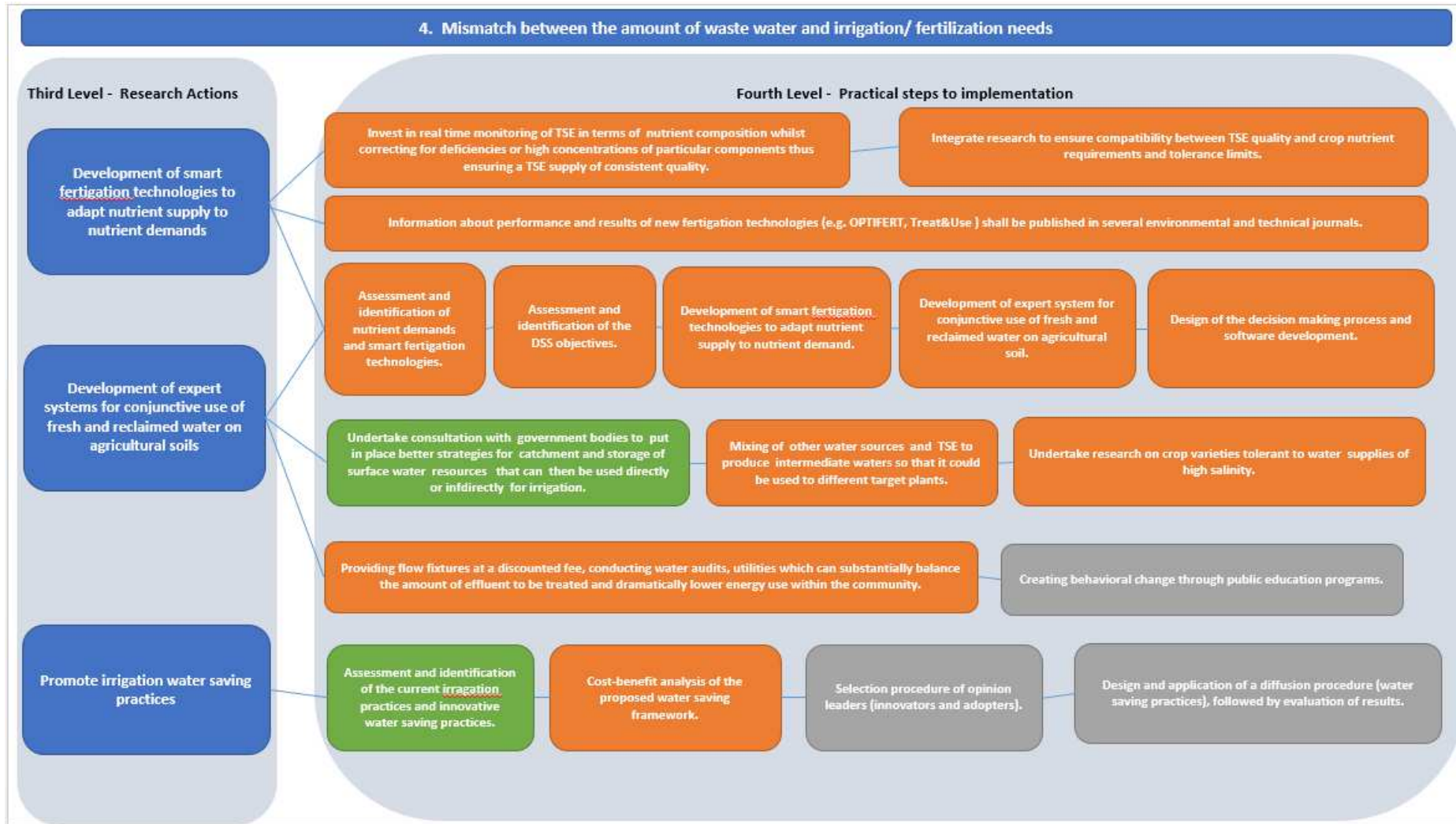
In order to bring the JAP to its logical conclusion each cluster also defined a series of practical steps towards the implementation of their suggested actions. We are presenting here the practical steps to implementation for the 13 chosen research actions which were selected in a participatory session during the meeting in Plovdiv.

The steps to implementation are highlighted in three colours depending on how the research action or parts of the action can be implemented. Parts highlighted in orange refer to implementation involving fact finding ground research with scientific laboratory- or field-based set ups for collection of data and analysis of results. Parts highlighted in green refer to implementation of the research action with the use of questionnaires, surveys or via an iterative consultation process with technical experts. Parts highlighted in grey involve a third approach to implementation of the research action via dissemination of information and public consultation. One has to note that the type of implementation strategy varies with the research action and in most cases a mix of the three has been applied. The results are shown in the following figures:









Further to the above, the clusters were also asked to specify further information on the steps to implementation through a questionnaire 2 on how the different SuWaNu partners could contribute, suggestions for funding and expected impact. The result is given in **the following table**.

RT1: Legislation on WW re-use (A legal framework on WW re-use at EU level)	
Action 1: Provide guidelines and specific regulations on the utilization of reclaimed water for different purposes	
QUESTIONS	ANSWERS
What will be the time frame?	Short term: 2 or less years
Which SuWaNu partners can contribute?	Lobbying: FERAGUA, CBAO, PASEGES, KM, AVBS, TPA, EDINTSVO, as users/providers of the reclaimed water. Direct influence: MCST, AGAPA, RWM, DGEA, PLOVDIV, StadtBS, as authorities with competence or direct contact with the policy makers.
How they can contribute?	Lobbying: Make the problem of water scarcity visible, demand legal solutions for better planning of wastewater reuse, show practical examples in other countries, etc. Direct influence: Include reuse in water management plans at different levels (national, regional, basin, etc.) and demand the use of clear guidelines.
Which organizations outside consortium can contribute?	River Basin Authorities, European Irrigation Community (EIC), Joint Programme Initiative (JPI).
How they can contribute?	Raise awareness on the problem of water scarcity and the need of clear guidelines to make reuse practices safe and reliable for the end users; Foster the development of guidelines by the competent authorities; Publish guidance documents which can be used as a reference by the competent authorities; Publish recommendations which can be used as a reference by the competent authorities.
What is the possible funding resource/donor?	State public budget EU Research Programmes (E.g. H2020)
What is the expected impact?	Safe use of wastewater; Less contamination of soil; Better social acceptance; More protection for exporters of agricultural products irrigated with treated waste water; More water resources available for other uses.
RT1: Legislation on WW re-use (A legal framework on WW re-use at EU level)	
Action 2: Clarify procedures and responsibilities of different authorities for an efficient authorization scheme	

QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	AU & Local authorities of each cluster
How they can contribute?	Involvement in task 2.1 in priority area: legislation on WW re-use.
Which organizations outside consortium can contribute?	Governmental authorities, environmental agencies, NGO's, European authorities.
How they can contribute?	e-focus group of experts to reply on a qualitative survey
What is the possible funding resource/donor?	European and national funds
What is the expected impact?	Simplification of legislation, regulations and guidelines. Clarification of procedures. Facilitate implementation.
RT1: Legislation on WW re-use (A legal framework on WW re-use at EU level)	
Action 3: A mutual learning process – learning from experiences of other regions and pooling related know-how, regulations, legislation and guidelines	
QUESTIONS	ANSWERS
What will be the time frame?	Short term - 2 years or less
Which SuWaNu partners can contribute?	most experienced partners
How they can contribute?	demonstration plants, pilot plants
Which organizations outside consortium can contribute?	WSC (Malta)
How they can contribute?	Knowledge transfer, consultation
What is the possible funding resource/donor?	Horizon 2020, ERDF funds, transborder cooperation programs - Interreg, FAO
What is the expected impact?	Better former understanding; increased plant/ faster transfer of knowledge and technology
RT1: Legislation on WW re-use (A legal framework on WW re-use at EU level)	
Action 4: Promote the creation of public-private associations to develop waste water re-use projects	
QUESTIONS	ANSWERS

What will be the time frame?	Short term: 2 or less years
Which SuWaNu partners can contribute?	All municipalities, and technology providers and SMEs. Germany: (Hydroair/StadtBs)
How they can contribute?	Partnerships can provide technical and economic feasibility of treatment and reuse. Privatizing projects otherwise taken up by public accounts.
Which organizations outside consortium can contribute?	Other technology providers and municipalities.
How they can contribute?	Release pressure from government for infrastructure delivery; Provide public sector with a commercial approach to infrastructure development.
What is the possible funding resource/donor?	PPP channels
What is the expected impact?	Developing public policies and incentives for wastewater reuse and facilitation of PPP formation; Encouragement of scientific and technology provider innovation; Financial allowances in the form of "tax breaks" and better value for money from technologies/projects to be developed.

RT2: Financials and RTD needs	
Action 5: Low-cost, low-maintenance and energy efficient wastewater treatment technologies targeted at increasing the economic viability	
QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	All RTDs: IFAPA, UM, TTZ, AU, AUTH. SMEs: ABT, HYDRO, BIOAZUL, EDINTSVO, HYETOS.
How they can contribute?	Performing research activities on: process optimization (identifying and improving high costs steps); use of Renewable Energy Sources (RES), modelling.
Which organizations outside consortium can contribute?	Technology providers of RES RTDs working on water treatment O&M, process optimization, etc.
How they can contribute?	Integration of RES in water treatment technologies (development of new systems for energy accumulation), development of more durable filters and membranes.

What is the possible funding resource/donor?	H2020, National research funding lines (e.g. CDTI in Spain)
What is the expected impact?	More competitive technology provided by European companies, job creation, less energy consumption, more incentives for spreading reuse solutions, more social acceptance, increase in water and fertilizer savings.
RT2: Financials and RTD needs	
Action 6: Development of automated monitoring and maintenance support systems for continuous surveillance and optimized operation of WWT plants	
QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	Hydro-Air , Stadt BS (legal concerns)
How they can contribute?	Development of mechanical components, integration of monitoring and support modules in the existing systems. Soil analysis, health indicators analysis, testing of technologies.
Which organizations outside consortium can contribute?	Ministry of environment / agriculture, technological R&D organizations., research institutions, Non EU companies
How they can contribute?	Clear legal framework, support technological developments (Sensors), Expertise in these areas, dissemination of non-EU projects' results, best practices..
What is the possible funding resource/donor?	SME funding schemes for technical development (Germany), own resources (SME company spending), European funds, PPPs
What is the expected impact?	Suitable technologies for the given legal framework developed, quality assurance, optimized solutions and cost-effectiveness
RT2: Financials and RTD needs	
Action 7: Influence decision makers to increase funding on research activities which promote waste water re-use (environmental lobbying)	
QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	Regional authorities , farmer associations, RTD.
How they can contribute?	Participation in implementation of the rural development program in EU. Lobbying through conferences and workshops together with Ministry of environment and Ministry of agriculture.
Which organizations outside consortium can contribute?	Association of municipalities Environmental associations NGOs.

How they can contribute?	Lobbying by elaboration and defending of positions by research evidence an analysis about future benefits for the society.
What is the possible funding resource/donor?	EU and local funding.
What is the expected impact?	Increasing of funding and improving the access for finding and more particularly the EU funds provided for R&D in the framework of Common agricultural policy in the EU.
RT2: Financials and RTD needs	
Action 8: Dissemination and marketing of waste water re-use technologies	
QUESTIONS	ANSWERS
What will be the time frame?	Short term - 2 or less years
Which SuWaNu partners can contribute?	Dissemination: All partners involved. Marketing of reuse technologies: BIOAZUL, HYDRO, ABT, EDINTSVO and HYETOS.
How they can contribute?	Dissemination: presentation of SuWaNu results and reuse concepts in general in events, distribution of leaflets, participation in social networks. Marketing: target alternative markets (e.g. North Africa), contact technology distributors, strong marketing campaign.
Which organizations outside consortium can contribute?	Farmers associations, big water corporations.
How they can contribute?	Dissemination reaching stakeholders at the highest level.
What is the possible funding resource/donor?	H2020, national funds
What is the expected impact?	Raise awareness: enhance public acceptance to agricultural products irrigated with treated water. Influence policy makers to increase competitiveness of EU SMEs by reaching new market niches.

RT3: Consumer concerns & lack of communication	
Action 9: Market studies in order to determine the main concerns of farmers/consumers regarding reclaimed water for irrigation and accordingly develop policy recommendations and awareness raising campaigns to promote benefits of WW reuse systems and eliminate misconceptions	
QUESTIONS	ANSWERS
What will be the time frame?	Short or Medium term – 5 years or less
Which SuWaNu partners can contribute?	Farmers cooperatives, farmers with hectares of irrigated lands, universities, RTDs

How they can contribute?	Elaboration of questionnaires in order to evaluate the existing knowledge about reclaimed water use among farmers; possibilities for funding; assessment of their concerns, surveys, plot experiments, workshops
Which organizations outside consortium can contribute?	Agricultural advisory services, resources authority, consumer organisations, National Authority for Food Standards, media personnel, WSC
How they can contribute?	Organizing training courses and programs for farmers; dissemination of information for sustainable water re-use. Scientific data collection, dissemination media campaigns, suggestion of new standards/ regulations.
What is the possible funding resource/donor?	ERDF, EAFRD, National Rural Development Fund, SMPPMA, National Research Foundation - MCST
What is the expected impact?	Elaboration of the recommendations in order to foster the reclaimed water usage and improve water management. Sensitize the farmers about the possibilities to improve their competitiveness. Address misconceptions and concerns, increase awareness about issues, future implication of not using water wisely; educate; promote use of treated water; influence government policy; address/ fill gaps in data.

RT3: Consumer concerns & lack of communication

Action 10: Promote collaboration between major actors involved in reclaimed water reuse

QUESTIONS	ANSWERS
What will be the time frame?	Short or Medium term – 5 years or less
Which SuWaNu partners can contribute?	TTZ:10 RTD performers, 10 policy makers. Hydro-air: 10 existing /potential clients. AVBS: 10 interested farmers. Stadt BS: 10 other authorities.
How they can contribute?	Create concrete demonstration projects and case studies.
Which organizations outside consortium can contribute?	Water authorities (Legal permission) agricultural authorities.
How they can contribute?	Give permission to demonstration projects; Create a working group (multi-sectorial approach).
What is the possible funding resource/donor?	Government bodies. Public funding.
What is the expected impact?	Real case application in several regions with a clear stakeholder group. Model for other regions.

RT4: Mismatch between the amount of waste water and irrigation/ fertilization needs

Action 11: Development of smart fertigation technologies to adapt nutrient supply to nutrient demands

QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	RTDs and private companies of each cluster (RND departments)(i.e. AU, HYDROAIR, BIOAZUL, IFAPA, ABT, AUTH, AVBS, UM etc).

How they can contribute?	Research results-information regarding the nutrient needs of crops, expertise in remote sensing, atomization and smart technologies in general.
Which organizations outside consortium can contribute?	Other private companies, research institutions and universities.
How they can contribute?	Expertise in smart technologies, dissemination of projects' results, best practices.
What is the possible funding resource/donor?	European funds, private companies, PPP's.
What is the expected impact?	Cost-effectiveness, limit the negative effects on environment (soil contamination).
RT4: Mismatch between the amount of waste water and irrigation/ fertilization needs	
Action 12: Development of expert systems for conjunctive use of fresh and reclaimed water on agricultural soils	
QUESTIONS	ANSWERS
What will be the time frame?	Medium term - around 5 years
Which SuWaNu partners can contribute?	RTDs & SMEs. Bioazul, AqiaBioTech
How they can contribute?	Real time monitoring of fresh/treated water parameters; smart dosing techniques; good practice/ technologies; field trials/ plot experiments.
Which organizations outside consortium can contribute?	Local authorities, companies involved in smart technologies - probes, other technology SME.
How they can contribute?	Better catchment of surface water, development of smart water mixing techniques, programmed to meet crop needs; WSC; animal husbandary farms.
What is the possible funding resource/donor?	Horizon 2020, ERDF funds, Rular Development Fund
What is the expected impact?	Reduction in ground water use; reduction in fertilizer use; increase use of treated wastewater in agriculture/landscaping; defining new wastewater resources (aquaculture, animal husbandary).
RT4: Mismatch between the amount of waste water and irrigation/ fertilization needs	
Action 13: Promote irrigation water saving practices	
QUESTIONS	ANSWERS
What will be the time frame?	Medium term – around 5 years
Which SuWaNu partners can contribute?	RTD
How they can contribute?	Identifying appropriate practices, which could be adopted by farmers; demonstrating the practices.
Which organizations outside consortium can	Private companies – producers of irrigation systems; agricultural advisory services.

contribute?	
How they can contribute?	Demonstrating the new water-saving technologies. Dissemination of the information among the farmers.
What is the possible funding resource/donor?	EU funding and own resources of private companies.
What is the expected impact?	Increase farmer's knowledge about water-saving irrigation system. Improvement of water management. Decreasing of quantity of water use for irrigation.