

AQUARES

Interreg Europe



AQUARES Action Plan for Region of Murcia



Región de Murcia
Consejería de Agua, Agricultura,
Ganadería, Pesca y Medio Ambiente

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DELGADO AMARO, SEBASTIAN

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1. PART I – GENERAL INFORMATION

Project:	AQUARES. Water reuse policies advancement for resource efficient European regions
Partner organisation:	Regional Government of Murcia, Ministry of Water, Agriculture, Livestock, Fisheries and Environment, General Directorate of Water (Spain).
Other partner organisations involved (if relevant):	
Country:	Spain
NUTS2 region:	Autonomous Community of the Region of Murcia
Contact person of partner organisation:	Manuel Boluda Fernández
Email address:	aquaresprojectmanager@gmail.com
Phone number	+34 651452483

2. PART II – POLICY CONTEXT

The Action Plan aims to impact:

Investment for Growth and Jobs programme:	
European Territorial Cooperation programme:	
Other regional development policy instrument:	X
Name of the policy instrument addressed: Regional Operational Programme 2014-2020 (ERDF) European Regional Development Fund and the next one.	



3. PART III – DETAILS OF THE ACTIONS ENVISAGED

The chosen actions in this action plan, are the product of the work carried out during the phase of the exchange experience of AQUARES. The tasks were undertaken internally, through the good practices identified in other regions of the project and consulted with our stakeholders, as well as, externally through the learnt lessons in the workshops, study and site visits and even through private discussions with the experts that attended to those events.

Murcia Region, since before of the beginning of the project, was already reusing every year, a percentage of water higher the 96 % of their waste- water (source <https://www.esamur.com/reutilizacion>). Indeed, the data in 2019 reached the 96,99 % (95,43 % for agricultural purposes and 1,65 % for indirect reused by infiltration to their groundwater).

Around a 65 % of this percentage is reused "directly", and it is obtained in Waste Water Treatment Plants (from now on, WWTP) that apply advanced tertiary treatments.

The other 33 % is reused "indirectly", in other words, the reclaimed water is discharged into the river, and an equivalent amount of water is taken out for agricultural purposes.

A key point to consider, revealed over the successive regional stakeholders meetings, celebrated every semester, is that due to the water scarcity of the River Segura (the 98 % of the Murcia Region surface is within its watershed), a lot of times, we are forced to use all that treated water to reach the ecological flow of the river, fact that happens very frequently.

This fact especially affect to the WWTPs nearby the water streams, and especially “the Murcia Este WWTP”, which is with a large difference, the biggest one of this Region.

That is why, at the moment, for Murcia Region it is not a priority to invest in improving all those WWTPs, considering that, an obtained water, with an so expensive tertiary treatment, as economically as energetically speaking, could end up being discharged into the river.

Apart from that, we should take into account the high technological grade of the WWTPs of Murcia Region wherewith it is not considered necessary to act at this point either.

In the Region of Murcia, we have not still found any case of water supply, only provided with reused water, being the common practice to mix all the water sources.



In this action plan, it has been prioritized an efficient management of the alternative water sources, so as to reduce the pressure over the aquifers, as well as the discharges to the water bodies, especially the salty lagoon of Mar Menor.

Those discharges are unavoidable especially in the case of flash flooding, that occur very frequently in this region, being a challenge to avoid which, these harvesting rains with usually contain drags pollution, reach the water bodies, and can cause human and material damages.

During those days, all the affected infrastructures become saturated, being necessary to act over this point, so as to reduce the overflows caused by the flash floodings.

For all of those reasons, it is intended that with the actions selected to achieve the following goals:

- 1) Prevent that the agricultural drainages reach the aquifers
- 2) Prevent that the grey waters, originated for the overflows produced during the flash floodings, can reach the Mar Menor salty lagoon.
- 3) Through an efficient management of the alternative water sources, reduce the overexploitation of the groundwater.



ACTION 1: FLOODABLE PARK IN DIFFERENT MUNICIPALITIES OF THE REGION OF MURCIA: SAN JAVIER, SAN PEDRO, LORQUÍ AND ALCANTARILLA.

1 - The background

As it has been said previously, our main goal is to improve in the reduction of discharges to wetlands, like Mar Menor.

In addition, during the development of the "Exchange of experience" phase of the AQUARES project, some municipalities in the Region of Murcia suffered a flash flood in 2019, with more than 300 mm of rainfall in a single day, causing unavoidable discharges into sensitive water bodies. Similar events occur in Murcia Region very frequently.

For this reason, since the beginning of the AQUARES project, Directorate General of Water (from now on, GDW) has been looking for similar cases in Malta, Greece and Lodzkie Region, to study the feasibility of the solutions implemented in these regions in the coastal area of the Region of Murcia.

As a first option, the implementation of artificial wetlands was considered, but was discarded after consultation with the stakeholders, due to low social acceptance (for the proliferation of mosquito plagues, unsanitary conditons...), and above all, given the difficulties to obtain a sufficient water quality for its reuse, according to the new European Regulation, since the Region of Murcia has no application for the reuse of this water with such low requirements around these coastal.

In the end, the chosen option was based on the Łódź rain gardens and being adapted to the special circumstances of Murcia Region, since this solution reduces the overflow in case of flash floods in urban areas, protecting people and water bodies from discharges at the same time. After filling the garden, this water will be conveyed to the wastewater treatment plant and then to the nearest communal irrigation facilities.

2 – Action

- Project objectives

This action includes the creation of different floodable parks in the Region of Murcia. The most important of these are in the municipalities of San Javier and San Pedro, as its aim is to minimise the discharge of effluents to the Mar Menor.

The located in Alcantarilla will have a dual purpose. On the one hand, it will be an area for urban use and environmental regeneration and, on the other, the creation of a storage volume and pre-treatment for protection of the Segura river, in case of eventual overflows of the sanitation systems. Later they are sent to treatment in WWTP.

The located in Lorquí aims to eliminate flooding problems in different areas of the municipality.

- Justification of the initiative: Main challenges and opportunities

During episodes of heavy rains in these areas, there are problems with the evacuation of runoff water. It is intended to avoid possible ponding, flooding, humidity and bad odours.

For this, it is intended to generate an efficient surface water sustainable drainage



infrastructure, that allows continuity to the natural drainage system, reduce the problems of dragging that are observed in the roads of the working area and include gardening and urban furniture that value the plots of free spaces on which it is acted. In the case of Alcantarilla, the current infrastructures are not capable of meeting the established requirements and in the event of rain overflows of the unitary system occur with some frequency. The choice of a “green” infrastructure (SUD) also has the advantage that, after the maintenance work, the citizen will be able to see the magnitude of the flows that are regenerated in each episode and the waste removed and not dumped, which is a component of environmental awareness.

- Lines of action
 - Reducing the vulnerability of natural areas and water resources against climate change.
 - Infrastructure aimed at reducing sensitivity to flood risks.
 - Promotion of integrated water management, coordinated water, land and resources.
 - Optimizing water infrastructure.

3 – Players Involved

Autonomous Community of the Region of Murcia :

- Financing.
- Project Execution.

San Javier, San Pedro, Lorquí and Alcantarilla City Councils:

- Land availability.
- Authorizations from the competent bodies.
- Infrastructure exploitation.

4. – Time Frame

San Javier – 2023.

San Pedro – 2023.

Alcantarilla – 2022.

Lorquí – 2022.

5. - Cost

San Javier – 3.200.000 €.

San Pedro – 4.100.000 €.

Alcantarilla – 2.600.000 €.

Lorquí – 2.600.000 €.

6. – Funding Sources

Autonomous Community of the Region of Murcia funds.

Next program of ERDF Fund.



ACTION 2: RAINWATER DRAINAGE IMPROVEMENT IN THE MUNICIPALITIES OF ARCHENA, BULLAS AND MORATALLA.

1 - The background

Discharge of greywaters is a serious problem in case of flash floods, since sand, pieces of paper and plastics are washed away and can end up in water bodies.

This greywater only requires a previous filtration to be subsequently sent to the irrigators community facilities, avoiding undesirable discharges and their separate collection allows a better planning of their use.

Regarding the AQUARES regions, the sustainable drainage systems have been mainly identified in Latvia and Greece, although as the Greek conditions are much more similar to the Region of Murcia, this action has been based on the Best Practices called "Combination of rainwater network and stormwater storage tanks ". As the sites chosen for implementation are inland areas, storm tanks were not considered to be entirely necessary.

2 - Action

- Project objectives

This action includes the construction of collectors to improve rainwater drainage from the separative networks in different municipalities of the Region of Murcia, and the treatment of these before discharge.

- Justification of the initiative: Main challenges and opportunities

During episodes of heavy rains, these areas have problems with runoff water evacuation. It is intended to avoid possible ponding, flooding, humidity and bad odours, producing affections to the development of normal activity in the population. To solve the existing problems, the collection of rainwater is proposed and their transports to the nearest streambed, such as: the Segura River and Mula, recovering those resources for irrigation.

- Lines of action
 - Reduce the vulnerability of natural areas and water resources against climate change.
 - Promote integrated water management, coordinated water, land and resources.
 - Optimization of water infrastructure.

3 – Players Involved

Autonomous Community of the Region of Murcia:

- Financing.
- Project Execution.

Archena and, Bullas City Councils:

- Land availability.
- Authorizations from the competent bodies.



- Infrastructure exploitation.

4. – Time Frame

Archena – 2022.

Bullas – 2023.

5. - Cost

Archena – 1.200.000 €

Bullas – 1.200.000 €

6. – Funding Sources

Autonomous Community of the Region of Murcia funds.

Next program of ERDF Fund

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ACTION 3: AGRICULTURE OF PRECISION IN THE SURROUNDINGS OF MAR MENOR

1 - The background

This project began to be outlined as a precision agriculture system focused only on providing exactly the water that the plant needs at every moment. After the Malta's Workshop about Private Public Partnerships, some of the expert attendants started to show how the Management Aquifer Recharge was being carried out in the most important agricultural Region of Malta.

The referred aquifer of Malta has the same features of the Campo Cartagena aquifer of Murcia Region. In the good practice of Malta, the aquifer is recharged artificially, controlling the quality of the inputs and outputs of groundwater.

In this action, it will be applied the same philosophy, considering that in Murcia Region it is not convenient to recharge aquifers due to the that water is necessary to agricultural purposes, that would imply to infiltrate to take out that same water for irrigation.

In this action, it has been included, some learnt improvements of this good practice, like the process of monitoring water quality and water level, geophysical investigations and modelling, considering that part of the infiltrated water to the aquifer proceeds from agricultural drainages.

2 - Action

- Project objectives
 - Quantify the infiltration from agriculture into the Campo de Cartagena aquifer, measuring the whole soil profile.
 - Set irrigation and fertilizer calculation measures.
 - Set a control network for such leachates of agricultural origin.
 - Show to society the possible affections of agriculture to the Mar Menor

- Justification of the initiative: Main challenges and opportunities

It is considered urgent to act on the state of the Mar Menor lagoon. In order to legislate, it is necessary to collect information on the most influential parameters.

In this way, it is intended at the same time to establish a methodology for water use in the agricultural sector to reduce their impact on the environment.

- Lines of action
 - Reduce the vulnerability of natural areas and water resources against climate change.
 - Promote integrated water management, coordinated water, land and resources.
 - Optimization of water infrastructure.
 - Reduce the agricultural impact in vulnerable areas due to nitrates.



3 – Players Involved

Autonomous Community of the Region of Murcia:

- Financing.
- Project Execution.

Irrigator Community of Campo de Cartagena:

- Land availability.
- Authorizations from the competent bodies.
- Infrastructure exploitation.

4. – Time Frame

2021-2022

5. - Cost

1.155.442 €

6. – Funding Sources

Autonomous Community of the Region of Murcia funds.
ERDF Fund (Program 2014-2020)

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ACTION 4: RAINWATER HARVESTING WITH SUBSEQUENT DISCHARGE TO THE SEPARATIVE NETWORK

1 - The background

This action is complementary to action number 2, since implement of a system for the collection and use of harvested rainwater, avoiding that greywater is discharged into water bodies.

Regarding to the sources of inspiration, in addition to those already named, identified in Latvia and Greece, this action is also based on best practice of Poland and the Czech Republic, in which rainwater is harvested from buildings for a variety of purposes.

The part of the action dedicated to act as a palliative against the effects of floodwater good practiced called “Dry polder” identified by RRAPK of Czech Republic, and that consists of the re-growth of the river's meanders to accumulate water in case of floods.

2 - Action

- Project objectives

This action consists of collecting harvesting rain to be taken to the municipality's separating network, avoiding the discharge of grey water into the Mar Menor Lagoon, being used for other purposes.

For this reason, a bypass of the drainage channel and a collection basin will be implemented in order to act as a palliative against the effects of flash floods. These two elements will be connected to the separated network of the municipality of Los Alcázares (coastal town on the shores of Mar Menor).

- Justification of the initiative: Main challenges and opportunities

During heavy rainfall episodes, damage is caused to houses near the wadis, where there have been problems with the evacuation of run-off water.

The aim of this action is to avoid possible ponding, flooding, humidity and bad odours in the lower part of the urban area, as well as to exploit these waters, mainly for agricultural purposes.

This water is conveyed to the separative network of the urban area, in order to avoid undesirable discharges to the water bodies.

For this purpose, the aim is to generate an efficient infrastructure for sustainable surface water drainage that will provide continuity to the natural drainage system, reduce the problems of dragging that are observed in the roads of the working area and include gardening and urban furniture that value the plots of free spaces on which it is acted.

- Lines of action
 - Infrastructure aimed at reducing sensitivity to flood risks.
 - Reduce the vulnerability of coastal natural areas (Mar Menor) and water resources against climate change.
 - Promote integrated water management, coordinated water, land and resources.
 - Optimization of water infrastructure.



3 – Players Involved

Autonomous Community of the Region of Murcia.

Watershed Authority of River Segura Basin.

Municipality of Los Alcázares:

- Land availability.
- Authorizations from the competent bodies.
- Infrastructure exploitation.

- Financing.

Funds of the Autonomous Community of Murcia Region.

Next program of ERDF fund.

- Project Execution

4. – Time Frame

2022-2023.

5. – Cost

1.198.000 €

6. – Funding Sources

Autonomous Community of the Region of Murcia funds.

ERDF funds.

Digitally signed by the General Director of Water

SEBASTIÁN DELGADO AMARO

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