



Partner del Progetto:



Gestione sostenibile delle acque nella bassa Val di Cornia attraverso la riduzione della domanda idrica, la ricarica della falda e la riqualificazione fluviale

(LIFE14 ENV/IT/001290)



**Deliverable E1:
AFTER LIFE PLAN 2022/2026**

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AFTER LIFE

PLAN 2022-2026



Project title	REWAT: THE SUSTAINABLE MANAGEMENT OF WATER IN THE LOWER CORNIA VALLEY THROUGH REDUCING DEMAND FOR WATER, RECHARGING GROUNDWATER AND RIVER RESTORATION
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Partner



Co-financers



Municipality of
Suvereto



Municipality of
Piombino



Municipality of
Campiglia Marittima



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THE OBJECTIVES OF THE PROJECT

The achievement of the general objective is based on four pillars:

- 1 The promotion of integrated awareness of the hydrological system by supplementing knowledge of the status of surface water with that of the groundwater and the different uses of water;
- 2 The promotion of the active involvement of the various players involved in the management of water resources;
- 3 The execution of five demonstration projects (river restoration, managed aquifer recharge, reuse of treated wastewater for irrigation, irrigation efficiency, reduction in losses from water supply network) whose objective is to present a series of possible innovative actions to improve the management of water;
- 4 The development of a participatory governance tool for the integrated management of water resources, which would lead to the drawing up of a voluntary agreement, the "River Contract", involving public and private entities and private citizens.



THE RESULTS OBTAINED

With the Life REWAT project, 5 demonstration projects have been carried out for the sustainable management of water resources in Cornia Valley as follows:

- Managed aquifer recharge scheme - Loc. Forni, Municipality of Suvereto
- Morphological restoration of a meander zone of the River Cornia - Municipality of Suvereto
- Reducing losses from the water supply network - town of Piombino
- Subsurface drip irrigation system for water saving in agriculture – Loc. Caldanelle, Municipality of Campiglia Marittima
- Wastewater reuse system for irrigating the sports field - Loc. La Pieve, Municipality of Campiglia Marittima.

Finally, the **Cornia River Contract** was signed and which provides for the implementation of 16 actions to be carried out through the cooperation of public institutions - the Region of Tuscany, the Municipalities of the Cornia Basin, the Water Authority, the District Authority and the Reclamation Consortium - the management of the Integrated Water Service, associations and private individuals, who all took part in the participatory process.

For more detailed information, please refer to the REWAT website (www.liferewat.eu) or the LAYMAN'S REPORT.

THE CAPITALISATION OF REWAT RESULTS

LIFE REWAT has yielded significant results relating to the objectives of the project and has generated a large amount of data. The results and data generated are in use and have already been used by the partners to carry out actions aimed at environmental sustainability and the socio-economic systems of the Cornia Valley. Moreover, further projects are underway as spin-offs from LIFE REWAT.

CONSORZIO DI BONIFICA 5 TOSCANA COSTA N° 5 RECLAMATION CONSORTIUM - TUSCANY COAST

The Consortium is the Lead Partner of the INTERREG ReS_EAU project, which will be launched in the coming months with the aim of strengthening the network of cross-border players established during the previous Interreg TRIG_Eau project.

ReS_Eau promotes the development of an international public-private network for the dissemination of knowledge and skills on green infrastructures as a tool for mitigating the flood risk related to the process of urbanisation of the cross-border area and consequent soil sealing of river basins, reduction of channelling times and increased runoff of rainwater. The project faces the common challenge of better management of the territory inspired by the principles of re-naturalisation of spaces through the diffusion of Nature Based Solutions, as tools for preventing flood risk and fighting climate change, with positive effects in terms of landscape restoration, increase of biodiversity, improvement of water quality, increase of the filtering surface of the riverbed or of the urban basin involved, reduction of the use of energy for pumping into the drainage network and reduction of greenhouse gas emissions.

SANT'ANNA SCHOOL OF ADVANCED STUDIES (SSSA)

In the EU ITN MSCA MARSOLUT project (SSSA partner, March 2019 - Feb 2023) the changes to the hydrodynamics and hydrochemistry of groundwater following recharging operations were studied. In this project, the Suvereto recharge scheme and the stretches of the Cornia River undergoing morphological restoration have been used by doctoral students from SSSA and UFZ, Germany, to carry out basic and applied research activities.

The EU H2020 PRIMA NEXUS-NESS project (SSSA partner, June 2021 - May 2024) aims to develop integrated resource planning methods relating to the connection between water, food production and energy in the context of climate change. In the project, SSSA advanced the Cornia Valley as a relevant case study, thereby capitalising on the results of the whole LIFE REWAT project. In this project, all LIFE REWAT partners are involved in the participatory process and research activities that aim to provide answers to three major challenges

THE CAPITALISATION OF REWAT RESULTS

(Grand Challenges) facing environmental sustainability and socio-economic systems.

SSSA also participated in the February 2022 presentation of a project proposal under the Horizon Europe programme, PROTECT-IT (for the protection of underground water resources), in which SSSA included the Cornia Valley case study for the development of research activities.

Moreover, SSSA, in collaboration with the other project partners, intends to develop projects that aim to consolidate the Cornia Valley as an open-air laboratory for the analysis of the impacts of climate change on water resources and social-economic systems and for evaluating the long-term effectiveness of the adaptation measures (including, above all, those implemented in the LIFE REWAT project).

REGION OF TUSCANY (RT)

Thanks to the excellent results achieved by the REWAT Project, in particular those relating to the Suvereto and Campiglia Marittima schemes, the Region of Tuscany has set itself the objective of promoting and encouraging within its planning and programming regarding the protection and management of water resources, groundwater recharge schemes, reuse of purified wastewater and river restoration, considering them as key win-win, multifunctional measures for achieving the environmental objectives of water bodies.

ASA S.p.a.

ASA has taken steps to include the qualitative-quantitative monitoring of the supplementary water resource from recharging in its Monitoring Plan on the collection and distribution of water, drawn up pursuant to Legislative Decree 31/01, as amended and supplemented. This Control Plan, as indicated by the legislation itself, has been discussed with the reference Entities and ASA is awaiting formal approval. This monitoring will ensure the quality of the water distributed through the supply network to users in the Municipality of Suvereto and will supplement the data that is sent to the Regulatory Authority for Energy, Networks and the Environment (ARERA) annually.

The activities to be undertaken at the end of the Life REWAT project therefore do not only foresee the maintenance of the results achieved, but also the deve-

THE CAPITALISATION OF REWAT RESULTS

lopment of further objectives and actions. Moreover, the Cornia River Contract will provide an organic framework for future actions.

The planned activities are described below as follows:

- Activities related to the knowledge package and decision support;
- Environmental monitoring activities;
- Activities related to the management of the five demonstration projects for the sustainable management of water resources;
- Activities for integrated governance of water resources (Cornia River Contract);
- Communication and dissemination activities.



INFOGRAPHICS RELATING TO THE H2020 PRIMA NEXUS-NESS PROJECT IN WHICH SSSA IS THE LEADER OF THE NEXUS ECOSYSTEM LAB COASTAL TUSCANY, DEVELOPED IN THE CORNIA VALLEY.

ACTIVITIES RELATED TO THE KNOWLEDGE PACKAGE AND DECISION SUPPORT

REFERENCE ACTIONS OF THE LIFE REWAT PROJECT

A1	implementation of an information system on integrated water management in the lower Cornia Valley
A2	implementation of a hydrogeological model for the lower Cornia Valley
B10	implementation of decision support system (DSS) for water management in the lower Cornia Valley

CONNECTION TO THE CORNIA RIVER CONTRACT ACTION PLAN

1.1	REUSE OF WASTEWATER (CIRCULAR ECONOMY)
1.2	MANAGEMENT, DEVELOPMENT AND INTEGRATION OF THE MANAGED AQUIFER RECHARGE SCHEME IN LOC. FORNI - SUVERETO
1.4	PILOT SCHEME FOR MANAGED AQUIFER RECHARGE IN THE COASTAL AREA
2.2	STUDIES AND SURVEYS AIMED AT THE SITING OF DEVELOPMENT SCHEMES (WIN-WIN) IN THE CORNIA RIVER BASIN
2.3	DEFINITION OF THE MASTERPLAN OF DEVELOPMENT SCHEMES IN THE CORNIA RIVER CATCHMENT BASIN

The results of actions A1, A2 and B10 together produced an information package and decision support tools that have been beneficial the definition of the demonstration actions and, more generally, all activities during the LIFE REWAT project.

The TIS (Territorial Information System) developed in project action A1 will also remain operational in the post-project monitoring phase. Maintenance will be handled by ASA, with the addition of any updated datasets deemed necessary and scheduling in the data catalogue. The TIS and data repertoire will be accessible to parties concerned. Furthermore, appropriate training may be carried out to ensure optimal use of the information assets.

Both the **Integrated Decision Support System** and the **Hydrogeological Model**, based on open source tools, are available to public sector technicians operating in water resource management in the lower Cornia Valley, who, than-

ACTIVITIES RELATED TO THE KNOWLEDGE PACKAGE AND DECISION SUPPORT

ks to the courses carried out as part of the LIFE REWAT project and the tutorials produced, are able use the data independently. The hydrogeological model was shared at the end of the project with ASA and the Region of Tuscany and with any of other entity (e.g. Hydrographic District of the Northern Apennines) requesting use. Furthermore, SSSA is already using the hydrogeological model for research purposes in other ongoing projects, such as EU ITN MSCA MAR-SOLUT and EU H2020 PRIMA NEXUS-NESS.

SSSA will use the decision support system (B10) as part of the planning activities envisaged in the NEXUS-NESS project, especially in relation to the implementation of additional green infrastructures, in collaboration with the University of Florence.

ENVIRONMENTAL MONITORING ACTIVITIES

REFERENCE ACTIONS OF THE LIFE REWAT PROJECT

C1 quantitative monitoring

C2 ecological monitoring

C3 qualitative monitoring

CONNECTION TO THE CORNIA RIVER CONTRACT ACTION PLAN

1.1	REUSE OF WASTEWATER (CIRCULAR ECONOMY)
1.2	MANAGEMENT, DEVELOPMENT AND INTEGRATION OF THE MANAGED AQUIFER RECHARGE SCHEME IN LOC. FORNI - SUVERETO
1.6	MANAGEMENT OF THE MORPHOLOGICAL RESTORATION OF THE CORNIA RIVER CARRIED OUT AS PART OF THE LIFE REWAT PROJECT (NATURAL RECHARGING OF THE WATER TABLE)
1.7	REDUCTION OF WATER LOSSES IN PIOMBINO AND ON ISLAND OF ELBA
2.2	STUDIES AND SURVEYS AIMED AT THE SITING OF DEVELOPMENT SCHEMES (WIN-WIN) IN THE CORNIA RIVER BASIN
3.2	ACTIVITIES TO RAISE AWARENESS ABOUT THE APPROPRIATE USE OF WATER RESOURCES AND THE SAFEGUARDING WATER QUALITY IN AGRICULTURE

With regard to quantitative monitoring C1:

- RT will continue periodic measurements of flows to evaluate the effect of the river restoration schemes carried out and those required periodically;
- ASA will continue to collect data from the water supply network losses and the reuse of waste water pilot projects;
- SSSA will continue quantitative monitoring of the recharging scheme throughout the Cornia River valley;
- CBTC will monitor the data from the sub-irrigation system once it is reasigned for use by the new farm.

As the effects of the morphological restoration schemes can only be surveyed over the medium and long-term, the ecological and hydromorphological monitoring C2 / A3 will be continued by CBTC with periodic surveys after the end of the project.

ENVIRONMENTAL MONITORING ACTIVITIES

With regard to qualitative monitoring C3:

- the monitoring of the recharging scheme will be guaranteed by ASA on the basis of a sampling and analysis plan to be agreed with ARPAT and attached to the scheme management plan (see point 2.4) for groundwater and surface water in the River Cornia Valley; the partners have started talks with ARPAT so that these activities can be conducted by ARPAT. In this case, SSSA will take the samples and deliver them to the ARPAT laboratories.

With regard to **C1 and C3 monitoring**, SSSA will have the task of coordinating, sharing and drafting an **annual report**, based on the data and information collected by all the partners (who will therefore need to share their data with the SSSA).

ACTIVITIES RELATING TO THE FIVE DEMONSTRATION PROJECTS

FOR THE SUSTAINABLE MANAGEMENT OF WATER RESOURCES

AZIONI DI RIFERIMENTO DEL PROGETTO LIFE REWAT

B4	implementation and operation of demonstration project MANAGED AQUIFER RECHARGE SCHEME
B5	implementation and operation of demonstration project MORPHOLOGICAL RESTORATION OF A MEANDER ZONE OF THE RIVER CORNIA
B6	implementation and operation of demonstration project REDUCING WATER LOSSES IN THE WATER SUPPLY NETWORK THROUGH PRESSURE REGULATION
B7	implementation and operation of demonstration project SUB-IRRIGATION SYSTEM FOR WATER SAVING IN AGRICULTURE
B8	implementation and operation of demonstration scheme WASTEWATER REUSE

CONNECTION TO THE CORNIA RIVER CONTRACT ACTION PLAN

1.1	REUSE OF WASTEWATER (CIRCULAR ECONOMY)
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1.6	MANAGEMENT OF THE MORPHOLOGICAL RESTORATION OF THE CORNIA RIVER CARRIED OUT AS PART OF THE LIFE REWAT PROJECT (NATURAL RECHARGING OF THE WATER TABLE)
1.7	REDUCTION OF WATER LOSSES IN PIOMBINO AND ON ISLAND OF ELBA
3.2	ACTIVITIES TO RAISE AWARENESS ABOUT THE APPROPRIATE USE OF WATER RESOURCES AND THE SAFEGUARDING WATER QUALITY IN AGRICULTURE

The B5, B7 and B8 structural schemes of the REWAT project will be kept in operation after the end of the project for an expected duration of 5 years. The B4 and B6 structural schemes of the REWAT project will be kept in operation after the end of the project for an expected duration of 3 years.

ACTIVITIES RELATING TO THE FIVE DEMONSTRATION PROJECTS

FOR THE SUSTAINABLE MANAGEMENT OF WATER RESOURCES

The managed aquifer recharge scheme (action B4) will be managed by the partners according to a **new management plan**, which will update the plan signed on 3 December 2018 and which will be stipulated between the partners by September 2022.

The **river restoration** schemes (action B5) will be maintained by CBTC through maintenance work on the River Cornia to be established on the basis of the indications provided in the report of 29 January 2020, "*Integrated management guidelines for the stretch of the River Cornia between Località Forni and Roviccione bridge*" and the results of ecological and hydromorphological monitoring.

The scheme referred to in action B6 (**reducing water losses in the water supply network**) will be kept in operation by the partner ASA using the company's resources.

The Scheme B7 (**sub-irrigation system**) will be kept in operation by means of an agreement between CBTC and the farm to which the system can be supplied on loan.

The scheme B8 (**waste water recycling and reuse**) is managed by ASA spa, whereas the distribution network is managed directly by the Municipality of Campiglia Marittima under the agreement for the "supply of reused water and for the management of the distribution network" of the sports field, stipulated on 13 February 2020 with the Municipality.

ACTIVITIES FOR INTEGRATED GOVERNANCE OF WATER RESOURCES - CORNIA RIVER CONTRACT

REFERENCE ACTIONS OF THE LIFE REWAT PROJECT

B9 – Basin Contract

CONNECTION TO THE CORNIA RIVER CONTRACT ACTION PLAN

All actions included in the *1st Action Plan*

The Cornia River Contract, shared and signed as part of the LIFE REWAT project, constitutes an ongoing process rather than an isolated governance initiative. In this sense, the participatory decision-making approach tested in LIFE REWAT will be adopted on an ongoing basis by the parties involved and will become the standard working practice for the management of water resources in the Cornia Valley.

The Cornia River Contract provides for specific governance through the establishment of a Basin Assembly (body of participation made up of all public and private entities that sign the agreement), a Steering Committee (institutional body of public decision-makers with political-decision-making and coordination functions) and a Technical Secretariat (operational body supporting the Steering Committee and the Assembly).

For each of the 16 actions that make up the plan, the related action schedule identifies the party responsible, parties involved and other useful information.

The Action Program has a 3-year term.

The Contract provides for a mechanism for monitoring and continually updating the objectives and actions. In fact, the adoption of a monitoring system on three levels (strategic, operational and action) is envisaged and which will rely on an array of indicators to be defined within 60 days of signing the Contract itself.

CBTC guarantees the implementation of the decisions undertaken by the Basin Contract.

Furthermore, SSSA, as part of the NEXUS-NESS project, will carry out a series of participatory meetings, which, capitalising on the experience of LIFE REWAT and the Cornia River Contract, will expand the approach of the River Contract to planning based on the integrated management of water and energy resources and benefits to soil management and crop production. The first meeting took place on 29 June 2022..

COMMUNICATION AND DISSEMINATION ACTIVITIES

REFERENCE ACTIONS OF THE LIFE REWAT PROJECT

- D1 COMMUNICATION
- D2 DISSEMINATION
- D3 NETWORKING

CONNECTION TO THE CORNIA RIVER CONTRACT ACTION PLAN

All actions included in the 1st Action Plan

The project website and the various social media channels will be kept active (with proprietary resources) by the coordinating partner for a period of at least 5 years post-LIFE. The page of the website relating to the Cornia River Contract will be kept up-to-date.

The dissemination hardware products (brochures, publications, digital media, etc. ...) will be distributed until all surpluses at the end of the project have been depleted.

The educational visits by university students and members of the public to the schemes built and works carried out on the River Cornia will continue.

The dissemination action will continue beyond the end of the initiative, in order to encourage further capitalisation of the projects. In this sense, an annual program of initiatives (summer school, workshop organisation, participation in national events, training courses) on the topics addressed in the LIFE REWAT project will be agreed between the partners. SSSA will produce at least two scientific papers, in addition the one already published, on the basis of the data obtained from and the experience gained during the LIFE REWAT project.

With regard to action D3 and CB5, SSSA will continue networking activities with other ongoing projects regarding the issue of the sustainability of water resource management and, more generally, of environmental sustainability.

COST OF THE AFTER LIFE PLAN



Each partner will contribute with its own resources, comprising labour made available and through budget commitments or financing already in place, to the implementation of the After Life Plan, which will progress from 2022 to 2026 in line with the indications made in the project.

The following table quantifies, for each REWAT action, the cost incurred by each partner in the reference period. As can be seen, this has been a very significant commitment for all partners.



ACTION	PARTNERS INVOLVED	FUNDS COVERING EXTERNAL COSTS	PERIOD	TOTAL COST STAFF COSTS + EXTERNAL COSTS
A1	ASA	Budget	2022 – 2023 – 2024 – 2025 - 2026	11.200,00 €
A2	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024 – 2025 - 2026	56.250,00 €
B10	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024 – 2025 - 2026	15.750,00 €
C1	ASA reuse, losses	Budget	2022 – 2023 – 2024 – 2025 - 2026	38.400,00 €
	RT River Restoration	Budget	2022 – 2023 – 2024 – 2025 - 2026	5.000,00 €
	CBTC sub-irrigation	Budget	2022 – 2023 – 2024 – 2025 - 2026	46.000,00 €
	SSSA recharging and whole plain	Progetti già finanziati e in via di finanziamento	2022 – 2023 – 2024 – 2025 - 2026	9.000,00 €
C2	CBTC	Budget	2022 – 2023 – 2024 – 2025 - 2026	46.000,00 €
C3	ASA analysis of recharging area	Budget	2022 – 2023 – 2024 – 2025 - 2026	69.200,00 €
	SSSA sampling APAT analysis of river valley	Projects already financed and in the process of being financed	2022 – 2023 – 2024 – 2025 - 2026	22.500,00 €
B4	ASA	Budget	2022 – 2023 – 2024	46.800,00 €
	CBTC	Budget	2022 – 2023 – 2024 – 2025 - 2026	45.500,00 €
	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024 – 2025 - 2026	24.750,00 €
B5	CBTC	Budget	2022 – 2023 – 2024 – 2025 - 2026	30.400,00 €
B6	ASA	Budget	2022 – 2023 – 2024	19.200,00 €
B7	CBTC supply on loan to farm	Budget	2022 – 2023 – 2024 – 2025 - 2026	14.000,00 €
B8	Comune di Campiglia Marittima convenzione con ASA	Budget	2022 – 2023 – 2024 – 2025 - 2026	50.000,00 €
B9	CBTC	Bilancio	2022 – 2023 – 2024	50.400,00 €
	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024	29.250,00 €
	RT	Budget	2022 – 2023 – 2024	18.750,00 €
	ASA	Budget	2022 – 2023 – 2024	24.000,00 €
D1	CBTC	Budget	2022 – 2023 – 2024	22.800,00 €
D2	RT	Budget	2022 – 2023 – 2024	16.250,00 €
	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024	9.000,00 €
	CBTC	Budget	2022 – 2023 – 2024	14.400,00 €
	ASA	Budget	2022 – 2023 – 2024	6.720,00 €
D3	CBTC	Budget	2022 – 2023 – 2024	8.400,00 €
	SSSA	Projects already financed and in the process of being financed	2022 – 2023 – 2024	9.000,00 €

TOTAL COSTS OF THE AFTER LIFE PLAN

TOTALE AFTER	758.920 €
CBTC	277.900 €
ASA	215.520 €
SSSA	175.500 €
RT	40.000 €
MUNICIPALITY OF CAMPIGLIA	50.000 €