



# NETWAP

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NETwork of small "in situ"  
WAsTe Prevention and  
management initiatives



*With common engagement to  
sustainable innovations!*

## Title: THE NETWAP PROJECT: A NETWORK OF SMALL "IN SITU" WASTE PREVENTION AND MANAGEMENT INITIATIVES

### Abstract:

The NETWAP project generated a set of guidelines for national and local governments, concerning biowaste management and optimisation of marine litter prevention of beached waste production, with particular attention to the local and community dimension.

### Description:

The NETWAP project generated a set of guidelines concerning biowaste management and optimisation of marine litter prevention of beached waste production, with particular attention to the local and community dimension. In case of biowaste management, this approach stimulates a spirit of participation in people who can consider waste not as something to get rid of, but a valuable resource to be exploited for the good of the community.

In two territories of Ist Island in Zadar county, Croatia and Fossalto village in Campobasso county, Italy, selected to carry out the pilot action, a "local composting" scheme was set up where the local administration directly managed a small scale composter settled within the municipal area: this choice avoided the periodical biowaste transportation to an industrial plant which would imply high logistical costs and environmental impacts.



The methodology provided both administrations of all needed regulation schemes in order to involve not only single households but also free associations of citizens and touristic businesses into fiscal and environmental benefits : 1) a model for a register of home and community composting users; 2) regulations of home, community and local composting, 4) a manual for the management of composting operations.

In case of waste plastic management, a methodology of valorization of plastics from marine and beach litter was established. Volunteers of environmental associations and local waste management operators were given criteria to recognize and separate

recyclable plastic products; after selection, adequate washing procedures were presented in order to make the selected plastics ready to be recycled. The application of this methodology attributes plastics from marine and beach litter a European waste catalogue number for recyclable plastics allowing to divert plastics from landfilling and incineration.

In the followong pages the main project results are described.

## WP3 - DATA ANALYSIS, BASELINE ELABORATION AND METHODOLOGY DEFINITION ON ORGANIC WASTE AND PLASTIC MANAGEMENT

The methodology , developed in the framework of NETWAP Project, is aimed at defining a new approach for the autonomous and sustainable waste management in small communities and foresees procedures for:

- Biowaste management;
- Recycling of waste plastics collected from beach and marine litter

In case of biowaste management, this approach stimulates a spirit of participation in people who can consider waste not as a refuse but a precious resource to be exploited for the good of the community.

In both targeted territories (Ist Island in Zadar county, Croatia and Fossalto village in Campobasso county, Italy) a "local composting" scheme was set up where the local administration directly manages a small scale composter settled within the municipal area: this choice avoids the periodical biowaste transportation to an industrial plant which would imply high logistical costs and environmental impacts. The methodology provided both administrations (Zadar county for Ist Island and Fossalto council) of

all needed regulation schemes in order to involve not only single households but also free associations of citizens and touristic businesses into fiscal and environmental benefits : 1) a model for a register of home and community composting users; 2) regulations of home, community and local composting, 3) application and discharge forms. 4) practical operating composting manuals.

In case of waste plastic management, a methodology of valorization of plastics from marine and beach litter was established (Figure 2). Volunteers of environmental associations and local waste management operators were given criteria to recognize and separate recyclable plastic products; after selection, adequate washing procedures were presented in order to make the selected plastics ready to be recycled. The application of this methodology attributes plastics from marine and beach litter a European waste catalogue number for recyclable plastics allowing to divert plastics from landfilling and incineration.



## WP4 - CAPACITY BUILDING AND AWARENESS RAISING ACTIVITIES ON WATER POLLUTION PREVENTION

Capacity building and awareness raising activities were considered crucial for project's success. NETWAP project aimed to improving waste management policies and practices in selected territories, preventing environmental risks and implementing pilot actions in small and remote communities. These results could only be reached with an active participation of the involved local public institutions and with significative changes in citizens' behaviors, regarding the way how they consider and they treat waste in their communities. For these reason, an intensive program of capacity building and raising awareness activities has been designed by project partners and has been implemented in the communities chosen for the pilot actions. In Italy, the capacity building program has been developed through 2 webinars and 2 regional events in Molise region. In Croatia, 3 online workshops for capacity building of local authorities, economic stakeholders and civil society organizations has been implemented, focusing on waste management in small communities and marine litters.

Also, specific technical training days on the use of the composting machine have been realized in Fossalto (Italy) and Ist Island (Croatia), involving the people in charge of the composter functioning and maintenance. Around 200 people have participated to the different capacity building activities.

Awareness activities have focused on different target groups in Italy and Croatia. In Italy, activities were directed to primary and secondary school students of Fossalto, the small municipality where the pilot action has been implemented. Online workshops and a final field event have involved around 60 students, their families and teachers.

In Croatia, the target group were inhabitants of the Ist island. 3 face to face workshops have included waste collection on the beach, domestic organic waste management and marine pollution.

During the NETWAP Final Conference all project partners shared and signed a Memorandum of Agreement/ Understanding, with the purpose of building a permanent cross border cooperation network at political and technical level, in order to promote and disseminate innovation in waste management methodologies, models and practices, to increase the transnational activity between Italy and Croatia and to support the NETWAP partnership in providing effectiveness and sustainability to its actions.

## Events organized within the project

### In Italy

2 Webinars:

"Methodologies and practices in the waste management in internal and remote areas"  
27/05/2021

60 participants

"Microplastics in food and bioplastics in compost: a challenge in the circular economy"  
9/07/2021

15 participants

2 Regional events:

Seminar:

"Promote sustainable habits and solutions for waste management aimed at citizens and tourists"  
Campomarino, Molise Region, Italy

18/11/2019

40 participants

Regional Conference:

"Local composting and circular economy" – Inauguration of the first "small scale" composting machine in Molise Region"

5/11/2021

Fossalto, Molise Region, Italy

30 participants

2 online workshops (awareness activities) with primary and secondary school of Fossalto (Molise Region).  
Plastic: how to use, reuse and recycle.

May 2021

60 participants (students and teachers)

1 final event in Fossalto: practical workshop about use, reuse and recycle of plastic with primary and secondary school students

5/06/2021

60 participants (students and teachers)

## In Croatia

### Implementation of an online workshop for capacity building of local authorities D4.2.2.

Online 4/11/2021

-Waste in small communities - management and education (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)

- Composters in small communities - the example of Ist (Hrvoje Čižmek, MSc of Biology, Janolus Ltd)

9 participants including representatives of City of Zadar and Čistoća Ltd (5 participants representatives of local municipalities: City of Zadar, Stankovci, Sali, Kali)

### Implementation of an online workshop for capacity building of economic stakeholders

Online 4/11/2021

Waste in small communities - creation, collection and management (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)

Recycling devices and composters in small communities (Hrvoje Čižmek, MSc of Biology, Janolus Ltd)

9 participants including representatives of City of Zadar and Čistoća Ltd

5 participants representatives of interested companies (Ciklon Ltd, Čistoća Pag Ltd, Čistoća Ltd Zadar, Sali)

### Implementation of an online workshop for capacity building of regional experts and civil society organizations

Online 5/11/2021

Waste in small communities - the role of individuals and organizations / institutions (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)

Marine litter - collecting, processing and promoting volunteering (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)

In total 11 participants including representatives of City of Zadar and Čistoća Ltd

7 participants representatives of interest experts (National Park Paklenica, City of Mali Lošinj, Okrug municipality, NGO Samotvorac from the Island of Silba, NGO 20000 Leagues from Zadar, NGO Tarabuži from the Island of Iž, University of Zadar)

### Implementation of a public awareness raising event (three workshops) for the local community on Island of Ist 12/11/2021

Workshop 1:

Awareness raising workshop on organic waste and composting:

Short pilot project presentation

Biowaste and composting: a pilot project of a mini composting plant on the island of Ist (Hrvoje Čižmek, MSc of Biology, Janolus Ltd and Filip Starešinić, Master Composter)

Workshop 2:

Awareness raising workshop on marine and coastal pollution

Marine litter and the role of technology: SEABIN (Marta Zুরু, student at University of Zadar under mentorship of Dr. Nuša Cukrov, Dr. Neven Cukrov and Dr. Anamarija Frankić from Institute Ruđer Bošković)

Microplastic research in NETWAP (Lucijan Ljubičić, student at University of Zadar under mentorship of Dr. Nuša Cukrov, Dr. Neven Cukrov and Dr. Anamarija Frankić from Institute Ruđer Bošković)

Workshop 3:

Plastic waste and Community Awareness Raising Workshop – Clean-up Action

Plastic waste and the role of an individual (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)

Beach Clean Up action and marine litter monitoring (Barbara Čolić, MSc of Ecology and Nature Protection, Janolus Ltd)



## Cross border cooperation network

During the NETWAP Final Conference, held in Padova (Italy) the 14/12/2021, all project partners shared and signed a Memorandum of Agreement/Understanding. The purpose of this MoU/A is to build a permanent cross border cooperation network at political and technical level, in order to promote and disseminate innovation in waste management methodologies, models and practices, to increase the transnational activity between Italy and Croatia and to support the NETWAP partnership in providing effectiveness and sustainability to its actions.

NETWAP Project partners shall undertake the following activities:

- Promote the main results and outputs of NETWAP project.
- Promote events organized and related to the sustainable waste management sector
- Continue the organisation of training seminars / webinars related to the implementation of innovative waste management methodologies and technologies;
- Support the networking of members of NETWAP partnership in Italy and Croatia;
- Promote the development of collaborative projects at regional, national and cross-border level;
- Present financial channels and funding opportunities to the members of the cross-border network;
- Support and promote transnational partnerships / synergies between members;
- Ensure the sustainability of the cooperation network.

Other stakeholders signing the MoA/U shall undertake the following activities:

- Participate in events and activities organized by the NETWAP partnership;
- Share activities / take initiatives for the promotion of innovative models of sustainable waste management;
- Increase awareness about NETWAP activities and results;
- Organise events related to waste management sector
- Promote/implement cooperative projects and synergies between public and private sector
- Upgrade existing policies and financial instruments related to waste management sector (concern governmental bodies)

All project partners are promoting the signature of the MoA/U among their territories and stakeholders, through the online format:

<https://docs.google.com/forms/d/e/1FAIpQLSfbc3ltMQs0hNpVmV-5lW4vH1mZiAEeVHglreWk9a6t3BXjg/viewform>

## WP5 - NETWAP PILOT-ACTIONS AND SUSTAINABILITY EVALUATIONS

Pilot-actions were carried out in the following territories:

- Ist Island (Croatia);
- Fossalto (Italy)

And consisted of setting up of good practices concerning small scale composting. An electromechanical composter provided with an input capacity of 30 t/yr was installed and operated in both locations. A compliance scheme of "local composting" was followed, which implied the direct management by the local administration. In Croatia a monitoring campaign of microplastics on the sea was also organized: floating litter in Zadar harbor was observed and quantified by a floating garbage bin, while offshore microplastics were collected on the sea along the coasts of Zadar and Šibenik, using the net towing method.



Ist island, with just 182 residents and more than 3.000 visitors on summer, represents the first case in Croatia of biowaste treatment on site; moreover, the introduction of small scale composting promoted biowaste separate collection, which is - once more - the first case in a small island of Dalmatian Archipelagus. In almost three months, more than three tons were turned into 1 ton of compost, which will be able to be used for agriculture and gardening. This practice also allows to save costs and environmental impacts bound to waste transportation by ship to the local landfill.

Fossalto village is the first municipality in Molise overlooking the Adria sea, adopting a small scale composting practice. Thanks to this initiative all the produced biowaste was diverted from the regional facility leading to a saving of 1700 km run by the local waste transportation service.

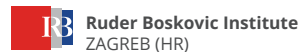
Microplastics monitoring campaign ascertained a concentration range of 0,3- 1,8 microplastics/m<sup>3</sup> offshore; floating litter turned out to be heterogeneously composed and microplastics of 2-5 mm covered a percentage of 26%. A new filtering apparatus was also realized and put in operation in order to improve the up to now achieved performances

Environmental damage costs were meaningfully reduced in both territories: about 5000 €/t (biowaste treated) for Fossalto and 6500 €/t for Ist Island. Global warming potential, thanks to savings in transportation decreased for a quantity of 910 kg CO<sub>2</sub> eq./t (biowaste treated) in Ist Island and 1600 kg CO<sub>2</sub> eq./t (biowaste treated) in Fossalto.





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VENICE (IT)



**Municipality of Zadar**  
ZADAR (HR)



**Cistoca**  
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**Fondazione Fenice**  
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**ENEA**  
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