

## ECOMAP project

# “Analysis of the current waste management system in touristic ports in Italy and Croatia”

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## Introduction

The ECOMAP project gathers small touristic ports along the Adriatic Sea:

- Maritime Sport Society “SPINUT”, Croatia
- Sports Fishing Society “STROZANAC”, Croatia
- Bibione Mare S.p.A., Porto Baseleghe, Italy
- Marina Dorica, Ancona, Italy

Small touristic ports are directly involved in the maintenance and protection of sea and coastal ecosystems, being key actors for the following aspects:

1. Waste Management: need to manage mixed urban waste together with special waste, with great seasonal differences in waste quantity and quality production; presence of abroad users (lack in knowledge of local normative, scarce interest and collaboration);
2. Education of both locals and tourists;
3. Connection between marine waste and inland waste;
4. Transnational attitude (abroad tourists) and need to standardize procedures between countries (i.e., colours of bins for separate waste, multi-language labels, etc);
5. Need of simplification for users and enhance control and sanctions;
6. Connection between tourism and fishery (often small ports are both for fisherman and pleasure boats)

Waste management in touristic ports has been analysed from information gained by direct contact with Bibione Mare Porto Baseleghe, Ancona Marina Dorica, Maritime Sport Society “SPINUT” and Sports Fishing Society “STROZANAC”.

It is not the intent of this report to verify compliance of activities towards respective national legislation, nor to highlight shortcomings or bottlenecks in the transposition and application of EU into national regulation, but rather to investigate attitudes and strategies set up to face waste management issues in strategic realities such as small ports, so to define possible common strategies.

## 1. Reference Legislation

Waste and waste management underlies a complex legislation, both at EU and national levels, with recent updates and guidelines. It is here presented a summary of relevant normative framework significant for waste management in small ports and marinas, mainly municipal waste and marine litter, but also waste reduction policies.

### EU

The Waste Framework Directive provides for review clauses on prevention measures, food waste, and waste oils. The European Green Deal includes a political commitment to 'simplify waste management for citizens and ensure cleaner secondary materials for businesses. Furthermore, the Circular Economy Action Plan commits to significantly reducing total waste generation: it aims to halve the amount of residual (non-recycled) municipal waste by 2030, promote safer and cleaner waste streams, and ensure high-quality recycling. This initiative will integrate the initiative for the reduction of food waste, as the latter constitutes a significant share of municipal waste.

Besides, the Marine Strategy Framework Directive (MSFD) requires EU Member States to ensure that, by 2020, "properties and quantities of marine litter do not cause harm to the coastal and marine environment". Pollution of the seas from plastics and microplastics is one of the three major areas of the Strategy for Plastics, adopted by the Commission in 2018; most of the proposed Actions are directly or indirectly related to marine litter, including its international dimension.

- **Waste Framework Directive** (Directive 2018/851 of the European Parliament and the Council on amending Directive 2008/98/EC on waste). It sets the basic concepts and definitions related to waste management, such as definitions of waste or recycling. It introduces the waste hierarchy, the Polluter Pays principle and the Extended Producer Responsibility and sets out separate collection targets. This includes the Waste Oil Directive 75/439/EEC, which was repealed as of 12 December 2010.
- **Landfill Directive** (Directive 2018/850 of the European Parliament and of the Council amending Directive 1999/31/EC on the landfill of waste). It aims to prevent or reduce the adverse effects of the landfill of waste on the environment. It defines the different categories of waste and applies to all landfills. It also classifies the types of landfills and obliges Member States to minimize biodegradable waste to landfills.

- **Packaging and Packaging Waste Directive** (Directive 2018/852/EC 2018/852 of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste). It sets out measures and requirements for the prevention, re-use and recovery of packaging wastes in Member States. Member States must ensure that packaging placed on the market complies with the essential requirements. The Directive implies the Producer Responsibility principle.
- **Single Use Plastic Directive** (Directive 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment). It intends to reduce the consumption of this type of plastics and states that Extended Producer Responsibility is involved in the targets as well as calls the Member States to ensure separate collection. It also sets out a list of SUP products. Details on the EU plastic strategic.
- **Plastic Bags Directive** (Directive 2015/720 of the European Parliament and of the Council 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags). It is an amendment to the Packaging and Packaging Waste Directive (94/62/EC) and was adopted to deal with the unsustainable consumption and use of lightweight plastic carrier bags.
- **Batteries Directive** (Directive 2018/849 of the European Parliament and of the Council amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment). It establishes rules regarding the placing on the market of batteries and accumulators and, and a prohibition of those which contain hazardous substances. It also includes rules for the collection, treatment, recycling and disposal. The European Commission is currently working on a proposal for a regulation.
- **WEEE Directive** (Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) (recast 2018/849/EC)). The WEEE Directive establishes an obligation to collect WEEE separately for sorting and recycling, it sets a detailed framework for Extended Producer Responsibility and aims to provide incentives to improve the design of electrical and electronic equipment to facilitate recycling. It was introduced to prevent the generation of WEEE and to promote reuse, recycling and other forms of recovery.

- **Waste Shipment Regulation** (Regulation (EC) No 1013/2006 of the European Parliament and of the Council on shipments of waste). It specifies the procedures for controlling waste shipments to improve environmental protection and sets out a system of control for the movement of waste. It concerns almost all types of waste shipped. The European Commission is currently working on a proposal for revision.
- **Basel Convention on the control of transboundary movements of hazardous wastes and their disposal.** It is an international treaty that aims to reduce the movements of hazardous waste between nations.
- **Ecodesign Directive** (Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products (recast)). It provides EU-wide rules for improving the environmental performance of products, such as household appliances, information and communication technologies or engineering. It sets out minimum mandatory requirements for the energy efficiency of these products.
- **Waste Statistics Regulation** (Regulation (EC) No 2150/2002 of the European Parliament and of the Council on waste statistics). It creates a framework for the production of waste management statistics at EU level, which provides the EU with data in order to monitor the implementation of the Community policy on the generation, recovery and disposal of waste.

Moreover, there are a number of relevant European Commission's communications which are worthy of particular attention due to the strong link to the EU waste policy and circular economy:

The European Green Deal (11/12/2020) provides the overall EU strategy to achieve the efficient use of resources by moving from a linear to a circular economy model and aims to restore biodiversity and cut pollution. In particular, it identifies a need to reduce waste generation and foresee changes in the EU waste collection.

The Circular Economy Action Plan 2.0 (11/03/2020) announces specific strategies to move from a linear to a circular model on a wide range of materials (plastics, textiles, food, batteries, construction, etc.) and foresees waste reduction targets as well as actions to promote reuse, repair and recycling.

8Th Environment Action Programme (14/10/2020). This is a proposal for a Decision of the European Parliament and the Council of the European Union that will guide the European environment policy until 2030. It establishes 6 priority objectives linked to the transition to a circular economy, the zero-pollution ambition, the restoration of the biodiversity or a climate-neutral continent by 2050, to mention just a few.

## Italy

The national reference normative for waste is the **D.L. 152/2006**, “Environmental Law”, updated in relation to the new sector directives, in particular Directive 2008/98 / EC relating to waste, which repealed the previous sector directives.

EU Directive 2000/59/EC, incorporated by **D. Lgs. of 24 June 2003 n. 182** aims to reduce discharges into the sea of ship-generated waste by requiring all ships to deliver their waste to port reception facilities before leaving port. Now substituted by Dlgs 197/2021, which transposes Directive 2019/883/UE regarding portual waste deliver from ships.

**Ddl AS. 1571/2022 “Legge Salvamare”** “Provisions for the recovery of waste at sea and in inland waters and for the promotion of the circular economy”: this regulation has been finally approved in Italy and among other permits to fisherman to dispose of plastic debris which are accidentally caught in the fishnets or otherwise collected in the sea in the destination port. Temporary stocking facilities for those debris are provided in the ports and delivery from fisherman is free of charge.

## Croatia

On 15<sup>th</sup> July 2021 the Parliament adopted the **Waste Management Act**, which will ban the sale of single-use plastic products, including plastic cotton buds, straws, cutlery. As of 2022, a marketing ban on lightweight plastic carrier bags will be implemented, with the exception of very lightweight plastic carrier bags, and as of 3 July 2024 a marketing ban will apply to products with a plastic lid or stopper. According to the new law, the state and counties, including the City of Zagreb, will be obliged to draft a waste management plan, an obligation they have not had so far, but local government units have.

Waste management implementation is decentralized predominantly to local government units, although regional government units play a role.

Regional Government Units – Counties is responsible for preparing reports on the implementation of national and local waste management plans and their submission to CAEN -



Croatia Agency for Environment and Nature (must ensure that conditions and implementation of measures are being met); determines locations for waste management facilities (WMCs) in county spatial plans; provides input for the information system in a timely manner and without compensation; issues licenses for the management of non-hazardous waste, with the exception of licenses for thermal treatment processes, and ensures the conditions and implementation of measures to manage non-hazardous waste.

Local Government Units - Cities and Municipalities (plus municipal waste companies) determines locations (through development plans) for waste management facilities and installations; adopts local waste management plans in line with the national waste management plan; organizes collection and safe disposal of municipal waste in accordance with the WMP; enables separate collection of waste; and organizes transport to WMCs.

The greatest number of WMP measures fall under the responsibility of LGUs, which are obliged to ensure that the conditions and implementation of national waste management measures are met in their area. About 60% of LGUs have their own WMPs in line with Law on Sustainable Waste Management.

## 2. Methods

A questionnaire has been submitted to the participating small ports, in order to investigate on waste management procedures and attitudes and to compare Italian and Croatian situation through a panel of topics.

The whole waste chain has been considered, so to highlight possible weaknesses and bottlenecks in the process. The aim is to understand current situation and focus on real necessities so to perform a shared strategy. The following are the topics of the questionnaire.

- **Waste typologies and responsible:** waste is defined under EU code EWC, a list of principal waste codes produced by Italian and Croatian small ports. Responsible figures should be present for correct code identification, registration of loading/unloading and registers keeping.
- **Temporary waste storage:** all wastes produced should be grouped in suitable areas within each structure; those areas are well delimited and are equipped with special bins differentiated by type of waste and well identified with special signs showing the type of waste and the relative EWC code. Storable quantities and time should be defined.

- **Waste collection:** waste produced by tourists should be separated, deposited in special bins and baskets identified by affixing labels. For such waste, separate collection for wet, dry, paper, plastic, batteries and glass should be done. Working areas should have separated waste collection area, which is not accessible to the customers of the structures. Also, water purification implants should be foreseen, for the treatment of water from boat hulls washing, with accumulation tanks and purification systems. Painting plant should have authorization for emissions in atmosphere and be equipped with filters and aspirators.
- **Beach/Leisure facilities:** in case of the presence of beach facilities in the port structure or nearby, beach should be arranged for waste collection, with bins for separate collection of waste identified by labels and constantly managed
- **Marine litter waste:** marine litter is often collected by boats (both fishing boats and pleasure boats) and it can be collected in specific bins and container, a specific national legislation could define kind of marine litter and facilitate disposal.
- **Sending waste for recovery or disposal:** The collection and disposing service should be carried out by specific authorized concessionary companies. Responsible should be individuated for compilation and keeping of records relating to waste management (i.e. loading / unloading register and conformity declarations). Also, authorization for transport by the contractor companies should be checked.

### 3. Results and discussion

All four small ports filled the questionnaire: Maritime Sport Society “SPINUT”, Croatia; Sports Fishing Society “STROZANAC”, Croatia; Bibione Mare S.p.A., Porto Baseleghe, Italy; Marina Dorica, Ancona, Italy.

In the following part a summary of the most relevant questions and answers are displayed, with a commented comparison between situations.

## Waste typologies and responsible

Which type of waste is mainly produced and managed in your marina?

4 risposte

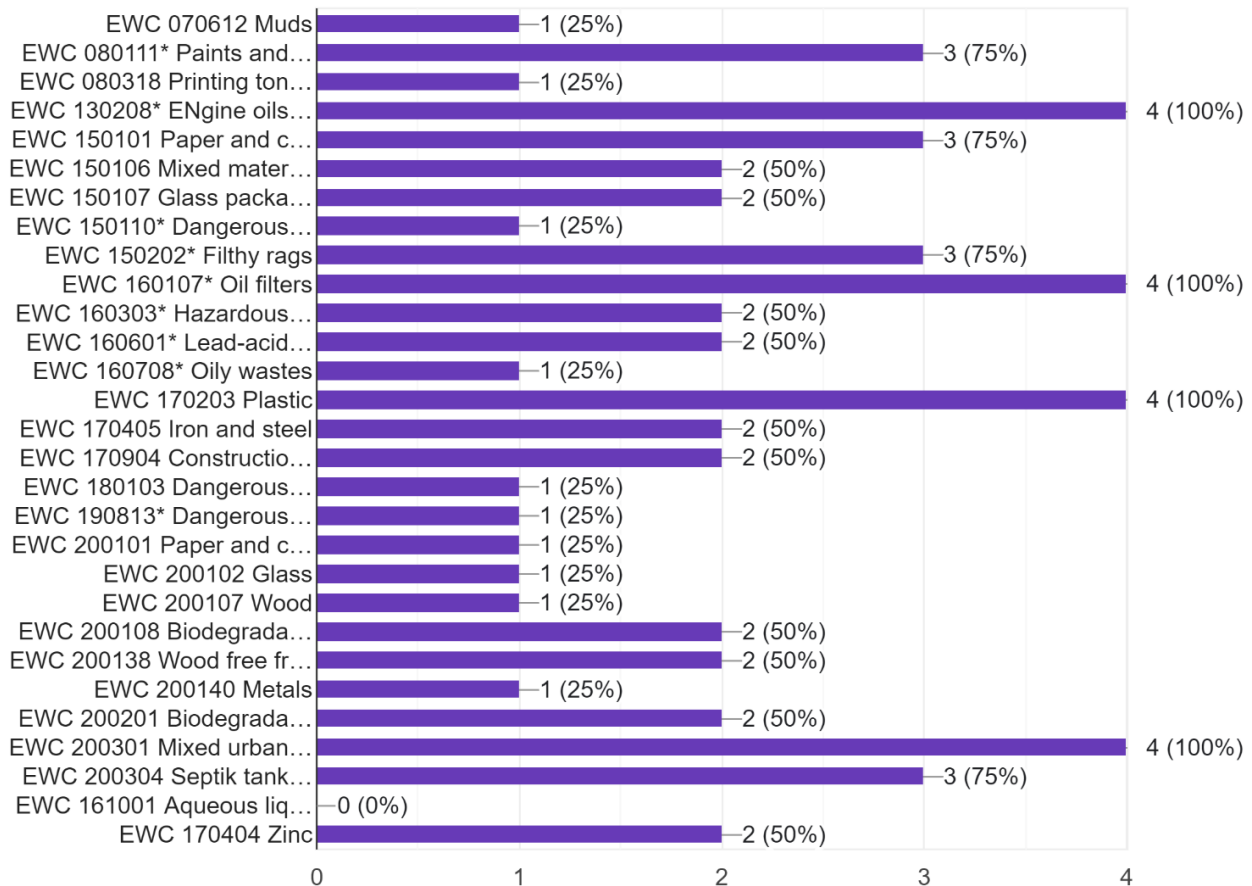


Figure 1. Types of waste identified by marinas

From the responses it clearly appears that small ports have to deal with a great number of different EWC waste codes, some of them categorized as dangerous waste (\*). Relevant in all marinas is the presence of oily wastes (oil filters and oil wastes). Only Italian marinas declare the category lead/acid batteries.

Wastes derive from boats maintenance work, tourism and general users.

By the way, none of the marinas finds it difficult to manage hazardous wastes (4/4 responses).

Staff dedicated to waste management is in variable number, but in the majority of cases is considered enough for the workload.

All marinas have experienced an increase in waste types over the last 10 years, and all consider EU and respective regulatory framework aligned with the waste situation.

### Temporary waste storage

A temporary storage location for different types of waste is always present and considered useful, with specific areas separated and labelled for different EWC codes.

All marinas ensure management and collection of wastes also in the nearby of bins/dedicated waste areas.

### Waste collection

Wastes from tourists and from port activities are separated in 50% of the considered marinas, as shown in the graph below. In detail, Italian marinas do separate from port activities and touristic wastes, while Croatian don't.

Is waste produced by port activities separated from waste produced by users?

4 risposte

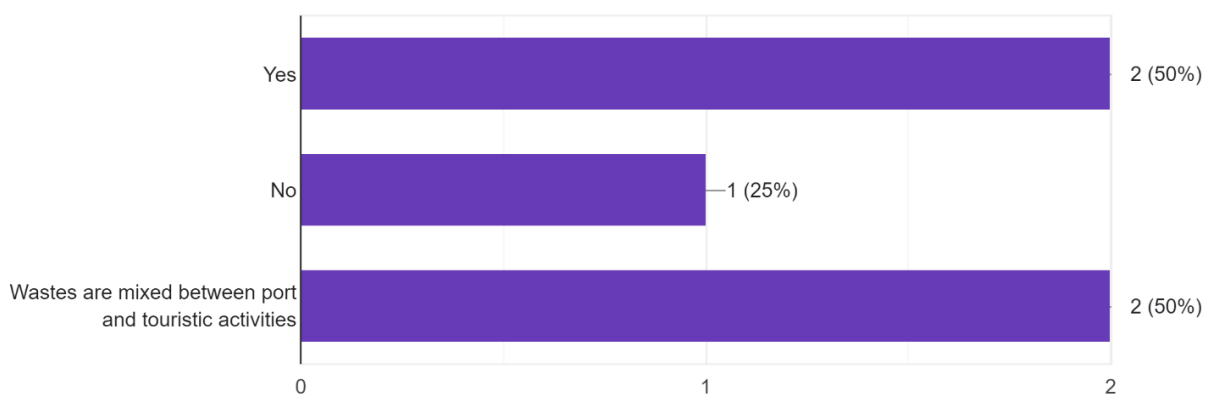


Figure 2. Waste separation based on origin

Only marina Strozanac doesn't have a specific waste collection area dedicated to the cleaning services to the boats, but all ensure a specific waste collection related to the working activities.

All ensure differentiated waste collection with specific labelled bins for the main urban waste categories (plastic, glass, paper 4/4; organic 3/4, unsorted 3/4). Two marinas offer the collection for oily wastes (Marina Dorica and Spinut). Marina Dorica also ensures collection of batteries.

It must be highlighted that all marinas collect and treat separately the water derived from boat hulls washing. Croatian marinas installed facilities for processing water with the Ecomap project.

As for another potential environmentally impacting activity, boat painting, there is in all marinas a spatial organization, with aspirators and filters (2/4), only with aspirators (1/4) or in a dedicated area with no spray varnishing permitted.

All marinas, both Italian and Croatian, agree that tourist cooperate non continuously with waste managers. This aspect is linked to the note that waste equipment needs often restoration because of damages by users (2/4), as indicated by Marina Stozanac and Spinut. As for a possible solution to ameliorate collaboration all proposed solutions are chosen, as showed in the graph below.

What do you think is the best way to inform tourists and locals on waste management?

3 risposte

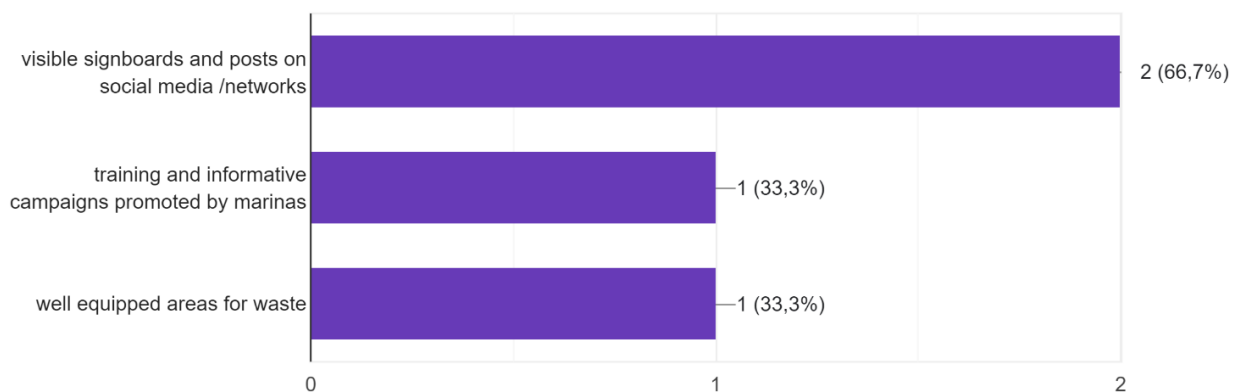


Figure 3. Preferred informative tools

### Beach facilities

Only one marina is directly involved in leisure beach management (Bibione Mare), therefore this aspect will be no longer indagated in the present report.

### Marine litter waste

All marinas declare to know respective national legislation regarding marine litter.

### Sending waste of recovery or disposal

As for disposing of waste, all marinas rely on public collection service (4/4) and on certified service providers (3/4). Only Spinut doesn't have and keep a register for produced and disposed

waste (Spinut relies only on public waste collection service). For those who keep a register, information gained are labelled in the following graph.

Which is/are detailed information that disposing waste management should register in the waste identification form?

3 risposte

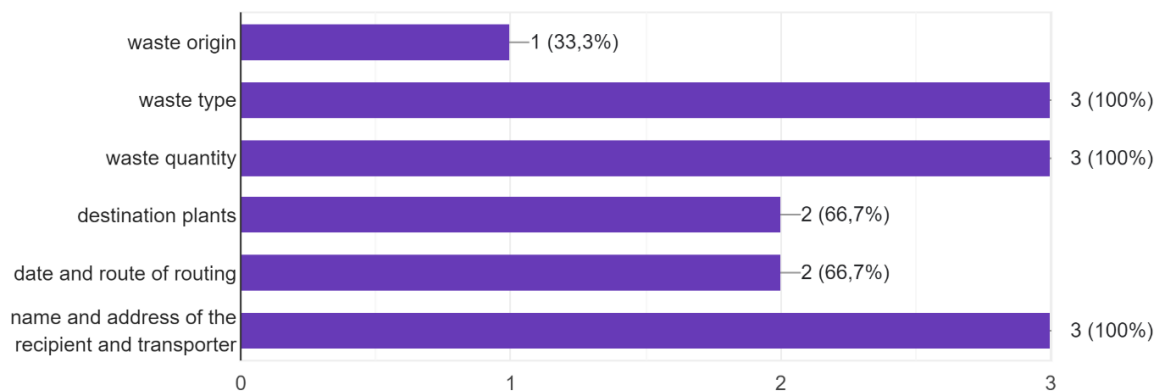


Figure 4. Information kept on waste registers

All marinas check the authorization of whom is collecting wastes, all are aware of final destination of their own waste. Only Bibione Mare experienced outages/inefficiencies regarding some disposing services.

### Main differences between Italy and Croatia


- Separation of wastes between port/marina work activity and touristic source (Italy does, Croatia doesn't).
- Damages to the waste management equipment (mainly in nearby beaches) in Croatia. This aspect could be linked to the different beach management (HR mostly free beaches, I only Bibione Mare has a nearby resort beach, which is presidiated).

### Informative action and virtual tools

Marinas developed and exposed informative material for the public, on which a QR code sends to a link of a small sensibilizing video (<https://www.youtube.com/watch?v=2Y4pBy-aWT4>).



Figure 5. Bibione Mare, eco-showers for water recycling



EUROPEAN UNION

**ECOMAP PROJECT 2019 - 2022**

**IT** Il progetto Interreg Ecomap riguarda l'installazione di vasche nelle docce spiaggia per il recupero dell'acqua per destinata ad irrigazione presso gli stabilimenti balneari in concessione a Bibione Mare Spa a Bibione Pineta di San Michele al Tagliamento (Ve).

Il recupero dell'acqua delle docce spiaggia è un elemento molto importante del continuo impegno della Bibione Mare spa per diminuire l'impatto sull'ambiente, e particolarmente sulle risorse idriche difficilmente rinnovabili, quali la falda poco profonda prossima alla costa.

Il progetto consiste nella realizzazione di n.4 "impianti" di recupero mediante l'installazione di n. 2 vasche in pvc per gruppo di docce. La prima vasca viene posizionata subito sotto la doccia ed avrà la funzione di recuperare gran parte dell'acqua che viene erogata, mentre l'altra verrà installata subito a fianco e fungerà da bacino di contenimento. Al suo interno una pompa ad immersione, consentirà l'irrigazione sopraccitata.

Gli impianti sono stati individuati nelle zone più vicine a piante ed arbusti ed in maniera "eocentrica" in modo tale da distribuire l'irrigazione a più essenze arboree.

**DE** Das Inter-Regionale Projekt "Ecomap" betrifft die Installation von Becken in den Strandduschen, zur Wiederverwertung des Wassers, welches daraufhin in den von Bibione Mare Spa in Bibione Pineta bei San Michele am Tagliamento gepachteten Badeanlagen (Ve), zur Bewässerung genutzt wird.

Die Verwertung des Wassers der Strandduschen ist ein wichtiges Element im Engagement der Bibione Mare Spa, die sich beständig bemüht ihre Umweltbelastung zu verringern, insbesondere hinsichtlich der verantwortungsvollen und nachhaltigen Nutzung der Wasservorkommen, da die unterirdischen Wasserreserven in den Küstengebieten nicht sehr tief sind und somit eine nur schwer erneuerbare Ressource darstellen.

Das Projekt besteht aus der Einrichtung von 4 „Verwertungsanlagen“ in der Form von 2 Becken in PVC in den Strandduschen. Die erste Wanne wird direkt unter der Dusche angelegt und dient dem Auffangen des Duschwassers, die zweite Wanne wird an die Erste angrenzend angelegt und fungiert als Eindämmungsgefäß. Die darin befindliche Immersions-Wasserpumpe soll für die oben genannte Bewässerung sorgen.

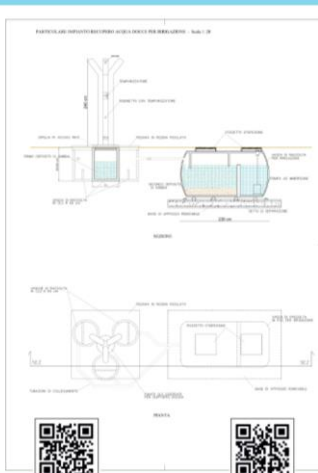
Die Lage dieser Einrichtungen wurde nach „Ökozentrischem“ Kriterium in der unmittelbaren Nähe von Pflanzen und Büschen gewählt, um gleichzeitig mehrere Baumarten bewässern zu können.


**EN** The Inter-Regional Project „Ecomap“ consists in the installation of tanks at the beach showers in order to recover water, which is then to be used in the irrigation systems at the beach resorts that are in concession to the Bibione Mare Spa in San Michele upon Tagliamento (Ve).

The recycling of shower waters is an important element to the commitment of Bibione Mare Spa, to continuously reduce their environmental footprint. Especially in regards to a responsible and sustainable fruition of water, which is not an easily renewable source due to the fact that the veins of groundwater near the coast are not very deep.

The project foresees the installation of 4 "recovery systems", in the form of 2 tanks in PVC at the beach showers. The first tank will be positioned directly under the showers to collect as much water as possible, whereas the second will be placed next to the first and will serve as a retaining tank. A submersible pump placed at the inside will make the above-mentioned irrigation possible.

The locations of these recovery systems have been chosen in consideration of an "Eco-centric" criteria, in close proximity to plants and bushes to ensure the irrigation of more plant species simultaneously.





Educational video

[www.italy-croatia.eu/web/ecomap](http://www.italy-croatia.eu/web/ecomap)




Figure 6. Bibione Mare, informative billboards



Figure 7. Spinut, informative billboards



Figure 8. Strožanac Marina, informative billboards





Figure 9 and 10. Strožanac Marina, informative billboards



Figure 11. Marina Dorica, informative billboards

### Final considerations and suggestions

This survey highlights a general positive attitude of small ports regarding waste management and responsibility about waste management. In particular it seems that marinas are well aware of their role towards marine ecosystem health and the potential negative effect of their activities and their users' behaviour on the environment. The main goals about waste collection, storage and disposal are achieved, even if with some local differences. In both countries the EU regulation is set as reference in the national legislations. The main bottleneck is represented by the tourist's behaviour and attitude, which can only in part be justified by their being in a foreign country. As now waste separate collection is similar if not the same over all Europe, and Adriatic tourists in small ports are in good percentage from Europe countries. Therefore, it seems that not collaborative behaviours are more linked to an attitude instead than poor knowledge. For this reason, good communication campaigns and the setup of user friendly and well distributed throughout the territory waste collection facilities can be the right approach. This consideration underlines the importance of the communication campaign set up in the Ecomap project in the

marinas, with informative billboards enriched by virtual tools, in detail a QR code linking to a simple but effective sensibilizing video for all ages.

Regarding water quality and potential impact on marine ecosystems derived by working activities in the marinas, the installation of systems for the treatment of water derived by the washing of boat hulls, also achieved in the Ecomap project, is highly significant.

#### 4. References

Boromisa, A., Golubovac, N., & Vetma, N. (2022). Governance of the waste management in Croatia. *Journal of Legal, Ethical and Regulatory Issues*, 25(S4), 1-10.

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<https://www.cial.it/quadro-normativo-rifiuti/>  
<https://www.parlamento.it/parlam/leggi/deleghe/06152dl3.htm>  
<https://www.reteambiente.it/normativa/rifiuti/indici/vigente/?p=all>

#### Attachment to this report

- Annex 1: ZIP folder of all smart photos in Ancona (Marina Dorica, Passetto and Portonovo coastal sides)