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A1.3 Report on measures to curb aquatic litter and facilitate clean-up efforts

PLASTEKO
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Executive summary

The aim of this report is to present the most effective proven measures to curb aquatic (i.e. fresh and marine water) litter and facilitate clean-up efforts, as well as to elaborate on different areas of human activities linked to both waste generation and prevention. More specifically, to explore potential solutions to the problem of plastic pollution, the present report has evaluated and presented 12 case studies that could significantly contribute to both waste management and prevention. The cases provided by each partner involved in the PLASTECO project cover the following relevant thematic areas: solid waste management, education/awareness-raising, litter removal and biodegradable/edible packaging.

The report provides a detailed description of the methodology that has led to the identification of twelve (12) best practices with a specific focus on transferability, namely the potential of a practice to be applied in other countries as part of a cost-efficient and impact-oriented approach to curbing plastic waste. The last section of the report presents the conclusions drawn from the best practices discussed.

1. Introduction

Around 25.8 million tonnes of plastic waste is generated in the EU every year, of which less than 30% is collected for recycling purposes. Plastic production and incineration produce 400 million tonnes of CO₂ annually; in EU regions, 150.000 to 500.000 tonnes of plastic waste enter the oceans every year, and 75.000 to 300.000 tonnes of microplastics are released into the environment, polluting food, air, and water¹. In light of these environmental and health threats, the EC has launched in 2018 the European Strategy for Plastics in a Circular Economy, which calls public authorities, the industry, and the public to implement and support measures towards a new ‘plastics’ economy². In 2020, the European Commission updated the previous version and adopted a new Circular Economy Action Plan that now constitutes one of the main building blocks of the European Green Deal, Europe’s latest agenda for sustainable growth³.

This transition prescribes both the curbing of plastic pollution, as well as boosting EU competitiveness through innovation and sustainable growth measures, in the context of a “reduce, reuse and recycle” economy that will eventually eradicate single-use plastic packaging by 2030¹. EU territorial authorities and agencies are central in managing the threats of widespread plastic pollution, to reduce the impact on their citizens and environment. They need to work and advance their policies, contribute to a comprehensive framework at different government levels, and promote all necessary measures and investments to spur regional growth, jobs, and innovation.

The “PLASTECO - Supporting EU regions to curb plastics waste and littering” project seeks to improve regional environmental policies and stimulate Eco-innovation and green growth under the “new plastics economy”, especially through measures to maximise the efficient use of resources (i.e., minimise single-use plastics). PLASTECO will enable partners and key stakeholders to a) assess the current situation, potential, and barriers in their regions, b) identify pathways for sustainable growth in plastics value-chains, and c) design and put into effect new policy measures and regulations. In particular, the PLASTECO partners, as the relevant EU public authorities, need and are expected to:

1. Improve the economics and quality of plastics recycling (waste management plans, public procurement, use of economic instruments, Extended Producer Responsibility schemes, uptake of recycled plastics).

¹ Plastics Europe, 2017

² COM, 2018

³ COM, 2020

2. Curb plastic waste and littering (regional plans against aquatic litter, fines, awareness-raising, coastal waste collection, eradication of non-compliant landfills, recycling of agricultural plastics, deposit refund schemes).
3. Drive investments and innovation towards circular solutions (raising landfill and incineration costs, funding, incentives for plastic prevention, and recycling).

2. Thematic background

Plastics are highly durable non-biodegradable materials made from petroleum products, with a lifespan ranging from hundreds to thousands of years. Their versatile nature and durability make them indispensable in everyday life, prompting its high demand and use both in the EU28 and globally. They have multiple functions: light and innovative materials in cars or planes save fuel and cut CO2 emissions; high-performance insulation materials help us save on energy bills; in packaging, plastics help ensure food safety and reduce food waste; combined with 3D printing, bio-compatible plastic materials can save human lives by enabling medical innovation.

In the EU, the plastics sector employs 1.5 million people and generated a turnover of EUR 340 billion in 2015. Although plastics production in the EU has been stable in recent years, the EU's share of the global market is falling as production grows in other parts of the world¹. Over 300 million tons of plastics are produced annually around the world. This is a significant increase from the 1.7 million tons produced in 1950. Around 25.8 million tonnes of plastic waste is generated in Europe every year¹. The widespread use of plastic materials causes widespread pollution affecting different components of the Eco-system because less than 30% of such waste is collected for recycling. Of this amount, a significant share leaves the EU to be treated in third countries, where different environmental standards may apply¹.

The potential for recycling plastic waste remains largely unexploited. Reuse and recycling of end-of-life plastics is very low, particularly in comparison with other materials such as paper, glass, or metals. At the same time, landfilling and incineration rates of plastic waste remain high, 31% and 39%, respectively, in the EU28. It is estimated that plastics production and the incineration of plastic waste give rise globally to approximately 400 million tonnes of CO2 a year. Using more recycled plastics can reduce dependence on the extraction of fossil fuels for plastics production and curb CO2 emissions. According to estimates, the potential annual energy savings that could be achieved from recycling all global plastic waste is equivalent to 3.5 billion barrels of oil per year².

In addition, very large quantities of plastic waste leak into the environment from sources both on land and at sea, generating significant economic and environmental damage. In the EU, 150,000 to 500,000 tonnes of plastic waste enter the oceans every year. This represents a small proportion of global marine

litter. Yet, plastic waste from European sources ends up in particularly vulnerable marine areas, such as the Mediterranean Sea and parts of the Arctic Ocean⁴.

Regarding the economic losses due to the low uptake of plastics recycling, around 95% of the value of plastic packaging material, i.e., between EUR 70 and 105 billion annually, is lost to the economy after a very short first-use cycle. Demand for recycled plastics today accounts for only around 6% of plastics demand in Europe. In recent years, the EU plastic recycling sector has suffered from low commodity prices and uncertainties about market outlets. Investments in new plastic recycling capacity have been held back by the sector's prospects of low profitability⁴.

Alternative types of feedstock (e.g., bio-based plastics or plastics produced from carbon dioxide or methane), offering the same functionalities of traditional plastics with potentially lower environmental impacts, are also being developed, but at the moment represent a very small share of the market. Increasing the uptake of alternatives that according to solid evidence are more sustainable can also help decrease our dependency on fossil fuels.

New sources of plastic leakage are also on the rise, posing additional potential threats to both the environment and human health. Microplastics, tiny fragments of plastic below 5 mm in size, accumulate in the sea, where their small size makes it easy for marine life to ingest them. They can also enter the food chain. Recent studies also found microplastics in the air, drinking water and foods like salt or honey, with yet unknown impacts on human health. In total, it is estimated that between 75,000 and 300,000 tonnes of microplastics are released into the environment each year in the EU. While a large number of microplastics result from the fragmentation of larger pieces of plastic waste, significant quantities also enter the environment directly, making it more challenging to track and prevent them⁴.

Key European Legislation on aquatic litter

The European Union has introduced a number of directives that affect the issue of aquatic litter. Although this legislation addresses a wide range of issues, these can be categorized into directives that address the sustainable use of the aquatic environment; directives that focus on reducing ship-based pollution and directives that address the wider issue of waste in general. The key pieces of European legislation are outlined below.

⁴ PLASTECO(2020)

- **EU Directive (2019/904/EC)** of the European Parliament and of the Council of 5 June 2019 that aims to prevent and reduce the impact on the environment of certain plastic products. More info can be found here: <https://eur-lex.europa.eu/eli/dir/2019/904/oj>
- **EU Directive on Packaging and Packaging Waste (2018/852/EC)** amending Directive (94/62/EC) that restricts the presence of certain heavy metals in packaging (Hg, Pb, Cr6+, Cd) with the goal of protecting the environment from hazardous substances and materials. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018L0852>
- **EU Marine Strategy Framework Directive (2008/56/EC)** that was put in place to protect the marine ecosystems upon which our health and marine related economic and social activities depend. More info can be found here: <https://www.eea.europa.eu/policy-documents/2008-56-ec>
- **EC Urban Waste Water Treatment Directive (91/271/EEC and 98/15/EC)** that sets standards in the collection and treatment of wastewater as well as the monitoring requirements for wastewater discharges from urban areas. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31991L0271>
- **EU Waste Framework Directive (2018/851/EC)**, amending Directive (2008/98/EC) that seeks to protect human health and the environment, against the damaging effects of the 'collection, transport, treatment, storage and tipping of waste' and to provide consistent regulation of waste disposal and recovery. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32018L0851>
- **EU Directive on port reception facilities for ship-generated waste and cargo residues (EC2000/59)** which requires that EU ports provide reception facilities for the waste generated by ships. More info can be found here: <http://emsa.europa.eu/implementation-tasks/environment/port-waste-reception-facilities.html>
- **EU Bathing Water Directive (76/160/EEC and 2006/7/EC)** that aims to safeguard public health and to protect the aquatic environment in coastal and inland areas from pollution. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006L0007>
- **EU Environmental Liability Directive (2004/35/EC)** that aims to establish a framework of environmental liability, based on the 'polluter-pays' principle, to prevent and remedy environmental damage. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004L0035>
- **EU Waste Framework Directive (2018/851/EC)**, amending Directive (2008/98/EC) that seeks to protect human health and the environment, against the damaging effects of the 'collection, transport, treatment, storage and tipping of waste' and to provide consistent regulation of waste

disposal and recovery. More info can be found here: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32018L0851>

Effective measures to curb aquatic litter

During the last years, there is a growing international mobilization for reducing litter leakage in aquatic environments. For instance, the G20 members recently recognized the increasing urgency to tackle the issue of marine litter, especially marine plastic litter and micro plastics, on a global scale⁵. Additionally, the United Nations Agenda 2030 for Sustainable Development aims to “prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including aquatic debris and nutrient pollution” by 2025⁶. The present report as part of the PLASTECO project aims to contribute towards this direction by examining in detail how measures to curb aquatic litter have been implemented in partners’ countries. The different types of measures examined are presented in the next section of the report.

⁵ G20, Ministerial Meeting, 2019

⁶ UNGA, 2015

3. Methodology overview

3.1. Study objectives

The scope of this research was identified as part of Activity A1.3 “Methodological framework for the identification of measures on how to curb aquatic litter and facilitate clean-up efforts” and constitute areas that could significantly impact the amount of plastic waste produced. These are:

- **Solid waste management**
- **Education/awareness-raising**
- **Litter removal**
- **Biodegradable/edible packaging** through the assessment of the relevant practices in partners’ territories.

The best practices presented in this report are in accordance with these thematic areas. In particular, project partners collected a number of different practices based on the aforementioned thematic areas, with a specific focus on their local regional and national territories. Each documented practice was assessed and ranked individually. In this report, the “best” practices – that which scored the highest (cases with scores 17 or above), are presented and evaluated.

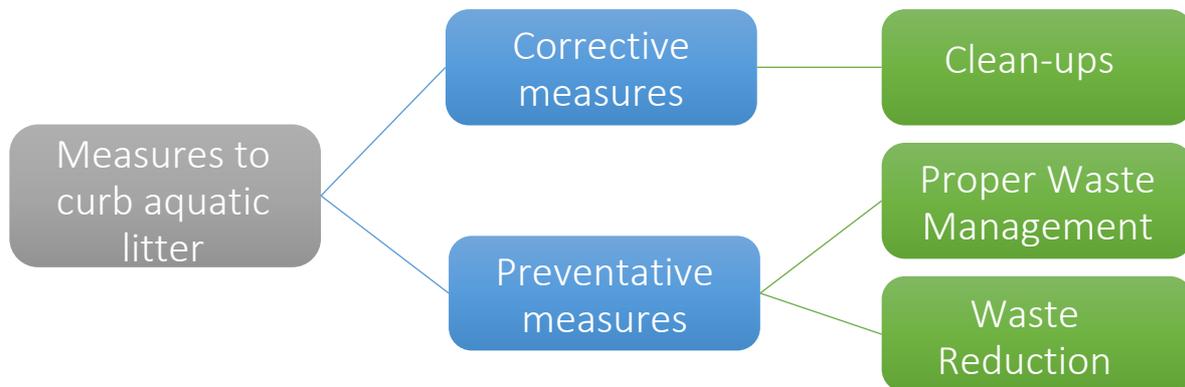
3.2 Research Questions

The objectives of the present study were also identified as part of Activity A1.3 “Methodological framework for the identification of measures on how to curb aquatic litter and facilitate clean-up efforts” and have been formulated as a series of research questions that guided the collection of best practices:

- Which policy interventions have been proven effective in curbing aquatic litter in the EU?
- Which are the most effective proven measures to curb aquatic litter? What are their key features?
- What are the main issues encountered prior to and during the implementation of these processes and practices?
- What benefits and in what other fields, sector have these measures delivered?
- Can these measures be easily replicated in other areas?

3.3 Measures to curb aquatic litter

Figure 1. Measures to curb aquatic litter, Source: PLASTEKO, Activity A1.3



The practices to curb plastic waste were classified as a) corrective measures that aim to directly reduce the amount of waste in specific areas through cleanups, and b) preventative measures that aimed to directly affect the amount of waste produced, such as proper waste management and waste reduction measures/techniques (Figure 1). A detailed description of corrective and preventive measures (and relevant examples) can be found in the context of PLASTEKO’s activity A1.3 (Methodological Framework for the identification of measures on how to curb aquatic litter and facilitate clean-up efforts). The practices were evaluated according to their effectiveness, with scores ranging from 0 to 20. Based on these scores, practices were classified as either poor, promising, or good.

A **poor** practice entailed constraints during implementation and poor results. More specifically, its relevance, effectiveness, and potential for transferability for other EU regions could not be adequately supported. As such, the score obtained in these cases ranged from 5 to 9 (with 20 classified as excellent).

A practice classified as **promising** has worked for an EU region and has produced some tangible, measurable results thus it constitutes a practice that can be transferred in other regions. The score obtained from these cases ranged from 10 to 13 (with 20 classified as excellent).

Lastly, a **good** practice is a measure that has proven to work well within a specific context, has succeeded in achieving its strategic and operational objectives. In short, a good practice is one that has already brought positive results on curbing aquatic litter and facilitating clean-up efforts and can be easily transferable to other EU regions. The scores of these practices ranged from 14 to 20 (with 20 classified as excellent). All 12 cases presented in this report constituted good practices.

3.3.1 Corrective measures

Short description

Corrective refers to measures that focus on the identification and elimination of the causes of problem by direct interventions. Specifically, corrective measures involve techniques that aim to prevent the recurrence of a specific problem by directly addressing its source. As such, corrective measures have an immediate positive impact on the environment by removing litter before it spreads into larger coastal and open water areas. Lastly, the use of these measures is a direct way to prevent litter effects and can also serve as a mean to involve the affected community by directly participating in the efforts.⁷

Clean-ups

A common corrective measure to the aquatic litter problem is the cleaning up of the trash using paid employees and volunteers. This is a widely spread activity, and many environmental protection companies all over the world are working daily as contractors on cleaning up projects. On top of these, several other volunteering groups also organise clean-up to contribute with their efforts in cleaning up streams and coasts⁸. Lastly, large scale ocean clean-ups are also quite common practice⁹. Efforts to clean up aquatic litter are important, but this can be only a short-term solution if the sources of debris remain unchanged. It should also be mentioned that the costs associated with clean-ups can be particularly high. While both pollution clean-up and prevention are needed, when it comes to the problem of aquatic litter, emphasizing prevention will produce longer-term and more permanent results rather than short-term solutions that primarily focus on cleaning heavily affected areas.

3.3.2 Preventative measures

Short description

Preventative actions include actions taken to reduce or eliminate the probability of specific undesirable events from happening in the future. In general, preventative actions are less costly than mitigating the negative events after they occur, yet they can also be evaluated as wasted resources especially in cases that the predicted event does not take place or during early stages of implementation. To assess the effectiveness of these methods, institutions employ risk analysis and assessment techniques. Measures in this category include techniques of proper waste management and waste reduction.¹⁰

⁷ Journal of Coastal Research (2019)

⁸ Ocean Conservancy, 2017

⁹ Pollard et al, 1999

¹⁰ Chen, 2015

Proper Waste management

The majority of the aquatic litter comes from everyday items such as cigarette butts, newspapers, fast-food wrappers, bottles and cans, and are particularly important as they constitute more than 80% of the litter found in aquatic environments. Research work has highlighted that if waste management does not improve greatly in the near future, by 2025 the amount of plastic waste entering the oceans will increase by an order of magnitude¹¹. Furthermore, it has been argued that waste management must be improved by 85% in the top 35% countries of mismanaged plastic waste in order to achieve a 75% reduction in overall plastic waste. To this end, research has highlighted that low and middle income countries should invest money and time so as to improve their waste management infrastructure¹² and achieve the designated target.

In short, the improvement of waste management is of paramount importance and should be focused on the source (e.g. solid waste collection, good land, waste management, recycling opportunities, plastic bag bans). However, as in all other measures, the impact will still be rather limited unless it is also accompanied by raising awareness campaigns and diffusion of knowledge in the general public.

Waste Reduction

Waste reduction is considered one of the long term solutions to the increasing problem of plastic waste. To achieve this outcome, the primary focus of all countries should be on applying in practice the principles of the circular economy and raising the awareness of citizens in the increasing threat of plastic waste. To this end, improvements could aim at the reduction, re-usage, recycling, redesign, and recovering of material from plastic waste¹³. In addition, behavioural changes of consumers and producers could also prove instrumental to the shift from single-use plastic to other more environmentally friendly and sustainable materials⁴.

¹¹ Jambeck et al, 2015

¹² Löhr et al, 2017

¹³ Corcoran et al, 2010

4. Identification of best methods to curb the production and pollution of plastic waste

4.1 Evaluation criteria

The evaluation criteria of the cases presented were focused on the relevance of the identified cases, their impact, the problems encountered during implementation, and finally how transferable they are. Out of the 4 evaluation criteria, high transferability potential, and low problems encountered (criteria 3&4) were considered as the most important factors to take into account when evaluating the cases provided by partners. This was primarily due to the fact that these two criteria could significantly assist in replicating similar practices in other European countries, which is of core importance for INTERREG Europe projects.

4.3 Sample size

The sample size consisted of 40 cases from all partners' countries participating in the PLASTEKO project. More specifically, participating organizations collected various cases that could be classified as promising practices and were evaluated according to the aforementioned criteria. Out of 39 cases, 12 cases were corrective, 17 were preventative and 10 combined both aspects of plastic waste management (Figure 1). Out of the total of these cases, 12 were selected and evaluated with the highest scores and were subsequently included in the present report. Figure 2 presents the number of cases collected and analysed. In turn, Figure 3 presents all the cases collected in the context of the report.

Figure 1. Number of cases collected according to their type.

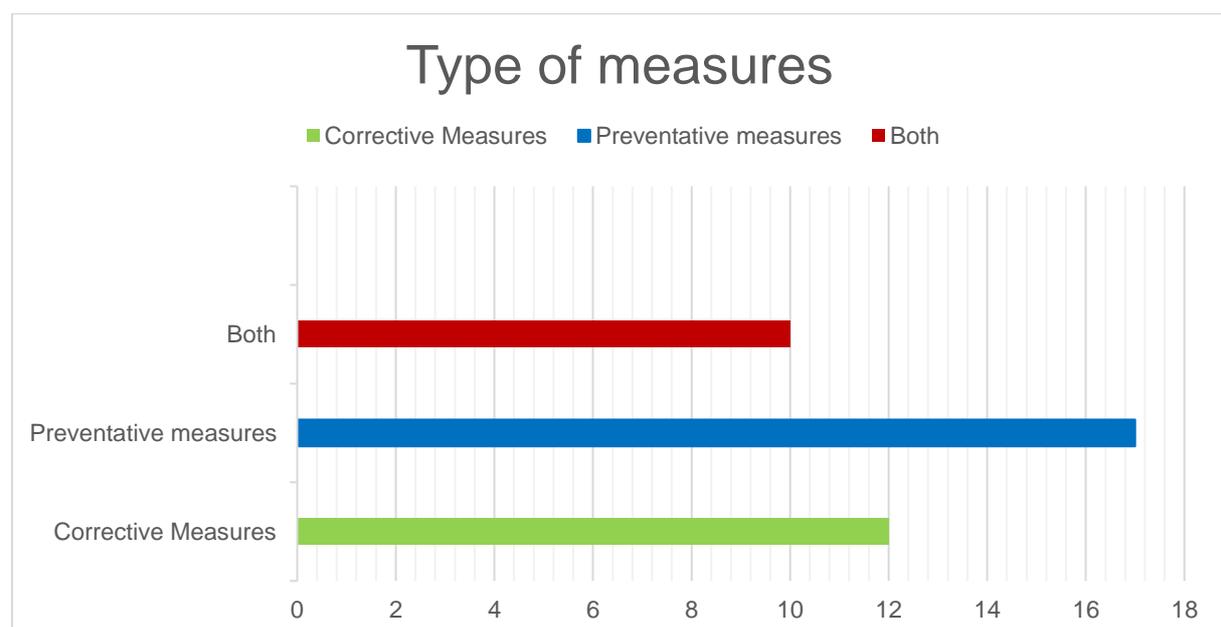


Figure 2. Cases collected and analyzed per partner

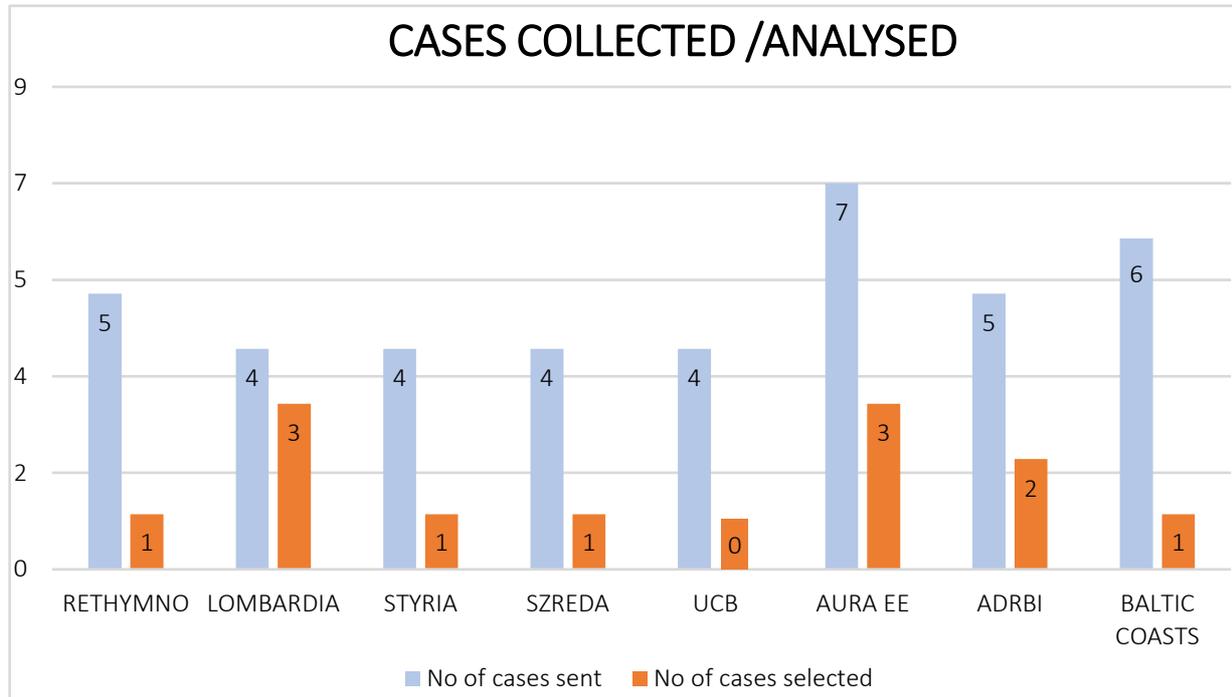


Table 1. All cases collected and ranked per partner

| Case | Type | Start Year | Short Description | Country | Total score |
|---|--------------|------------|--|---------|-------------|
| Turning bottle caps into wheelchairs | Preventative | 2011 | The objectives of this initiative are to use recycling to cover material needs and raise public awareness about plastic recycling. | Greece | 14/20 |
| ENALEIA | Corrective | 2016 | The main objective of this initiative is to address the reduction of fish stocks and the plastic pollution in the oceans. | Greece | 17/20 |
| Let's do it Greece | Corrective | 2009 | The main objective of the campaign is to activate people, particularly students to participate in environmental actions and public awareness campaigns. | Greece | 13/20 |
| Campaign for raising public awareness on marine litter in the Mediterranean | Preventative | 2006 | The main objective of this public awareness and education campaign is to contribute to the protection of the environment and sustainable development of the Mediterranean. | Greece | 14/20 |
| Memorandum | Preventative | 2020 | The main objectives of the project are reducing coastal and marine environmental pollution, reducing the impact of environmental | Greece | 16/20 |

| Case | Type | Start Year | Short Description | Country | Total score |
|----------------------------------|--------------|-------------------------------------|---|----------|-------------|
| | | | pollution on public health and enhancing innovative plastic management solutions. | | |
| Bill "SalvaMare" | Corrective | In the process of evaluation (2019) | The bill governs the management and recycling of general and plastic waste accidentally collected at sea during fishing operations and all the other plastic waste collected. | Italy | 8/20 |
| CLEAN SEA Life | Both | 2016 | The project aims to increase public attention on the amount of waste present in the sea and beaches and promote active and constant commitment to the environment. | Italy | 17/20 |
| Po d'Amare | Corrective | 2018 | The project involves innovative techniques for intercepting waste in the river waters and its subsequent selection and transportation for recycling. | Italy | 17/20 |
| SAVAGER | Corrective | 2019 | The SAVAGER system offers measurement techniques and a georeferenced modelling framework for data collection to monitor landfill sites deemed illegal/criminal or critical. | Italy | 18/20 |
| Burgas recycles | Both | 2014 | Burgas Recycles' mission is to generate a positive change in the attitude and behaviour of fellow citizens. | Bulgaria | 12/20 |
| Less plastic Bulgaria | Both | 2016 | Less Plastic Bulgaria initiative started as blog with the aim to offer information related to environmental pollution and environmentally friendly lifestyle. | Bulgaria | 15/20 |
| Let's Clean Bulgaria Together | Corrective | 2012 | "Let's Clean Bulgaria Together" is a campaign and the largest volunteer initiative in Bulgaria that aims to raise public-awareness and facilitate clean-up efforts. | Bulgaria | 16/20 |
| Plastic cups for future | Preventative | 2015 | The initiative is focused on the collection of plastic caps that are suitable for recycling and channel the income generated for medical equipment (e.g. baby incubators). | Bulgaria | 18/20 |
| Checklist for sustainable events | Preventative | 2020 | The checklist provides information on sustainability of events to organizers. The main goal the checklist is to reduce the amount waste generated during events. | Germany | 8/20 |
| Company Network "Zero Waste" | Preventative | 2019 | A company network established with the goal to reduce unnecessary plastic waste and disposable plastic items in the participating companies. | Germany | 12/20 |
| Forum Plastic-free Augsburg | Both | 2017 | The Forum Plastic-free Augsburg – paths to a sustainable and resource- | Germany | 8/20 |

| Case | Type | Start Year | Short Description | Country | Total score |
|---------------------------------|--------------|------------|---|---------|-------------|
| | | | saving living was initiated by engaged citizens who want to promote a sustainable lifestyle. | | |
| RECUP | Preventative | 2016 | The start-up RECUP established a deposit scheme for reusable coffee-to-go-cups called RECUP. The main objective is to reduce the amount of disposable coffee-to-go cups. 320.000 disposable cups per hour are used in Germany. | Germany | 9/20 |
| RiverSe | Preventative | 2020 | RiverSe project proposes implementing harmonized monitoring indicators of litter. Additionally, it aims to evaluate the protocols, stakeholders and logistic means for implementing the indicators. | France | 12/20 |
| Fisherman practices | Preventative | 2005 | The idea of the project was introduced by Éric Jacquier, a fisherman on Lake Geneva, who developed several processes to extend the lifespan of his nets, to reuse certain parts of the net several times, and to facilitate the recyclability of the fishing nets he uses on a daily basis. | France | 18/20 |
| No Plastic challenge | Preventative | 2019 | “No Plastic challenge” is a large awareness campaign on plastic waste reduction where can register and try to implement 15 eco-gestures in a period of 15 days | France | 16/20 |
| Action Plan for the Rhone River | Preventative | 2019 | The aim of this project is to create a collective awareness of waste management on the scale of a river and to draw up an action plan that meets the needs of the stakeholders and territories involved. | France | 13/20 |
| TEHP project | Preventative | 2018 | The TEHP project (Positive Human Energy Territory) aims to create a network of industrialists, public authorities, associations, volunteer citizens and the entire educational community. | France | 12/20 |
| TRIVEO | Preventative | 2015 | TRIVEO is a company created in 2015 to recycle plastic waste currently destined for landfill, while helping people in difficulty to return to work. | France | 17/20 |
| Yoyo | Both | 2017 | Yoyo is a solution to improve the recycling rate of plastic bottles in Lyon and five more French cities (Bordeaux, Mulhouse, Marseille, Lille, and Le Havre) by promoting citizenship responsibility with the use of a reward system. | France | 18/20 |

| Case | Type | Start Year | Short Description | Country | Total score |
|------------------------------------|--------------|------------|--|---------|-------------|
| "With the Clean Waters" | Both | 2019 | "With the Clean Waters" program aims to combat and prevent the increasing threat of plastic pollution in Danube River that is particularly important for aquatic biodiversity and water quality. The main activities include organizing clean-up events and information campaigns with the involvement of volunteers, local and national environmental NGOs, and public authorities. | Romania | 17/20 |
| We act for waters | Both | 2019 | The intervention "We act for waters" aims to create a working group with personnel specialized in water, cleaning and legislation, and define a strategy to combat water pollution in Romania. | Romania | 15/20 |
| Clean waters in Romania | Both | 2019 | The project "Clean Waters in Romania" aims to help raise awareness of the problem of plastic pollution of the oceans, to inspire consumers to participate in clean up events. | Romania | 15/20 |
| After Us it's up to Us to clean up | Preventative | 2018 | "After Us it's up to Us to clean up" is an educational program of awareness-raising on selective collection, launched in July 2018 by Coca-Cola HBC Romania, as part of the company's vision of environmental responsibility. | Romania | 17/20 |
| LET'S DO IT, ROMANIA! | Both | 2009 | Let's Do It, Romania! Association implements a series of environmental protection initiatives to raise public awareness and invite people to get actively involved. | Romania | 16/20 |
| Cave cleaning | Corrective | 1977 | The "Styrian Mountain and Nature Rescue Guardians" launches cave patrols, monitors natural caves and carries out clean-ups in caves | Austria | 9/20 |
| The Big Styrian Spring Clean-Up | Corrective | 2008 | The environment-cleaning campaign is an important component of awareness-raising measures for anti-littering, waste avoidance and environmental protection. | Austria | 18/20 |
| Clever Feasting | Preventative | 2001 | The main objective is to reduce the waste volume generated at events by using reusable containers, tableware and cutlery. | Austria | 12/20 |

| Case | Type | Start Year | Short Description | Country | Total score |
|--|--------------|------------|--|---------|-------------|
| Action Clean Styria | Corrective | 2008 | The “Action Clean Styria” is a well-established campaign for environmental protection in the region. | Austria | 15/20 |
| “My Sea” – “Mana Jūra” | Corrective | 2012 | The campaign “My Sea” is a successful example of reducing plastic waste in the coastal area. The campaign was launched to raise public awareness on the problem of marine litter. | Latvia | 19/20 |
| The landfill “Getlini” | Both | 1997 | The landfill “Getliņi” was created during the Soviet period. In 2001 the sanitization of the site started in order to prevent further environmental pollution, to ensure new environmentally-friendly waste management standards and create alternative energy sources | Latvia | 14/20 |
| Waste management in the Liepaja region | Both | 2000 | The waste landfill “Skede” was created in 1960. In 2003 an intervention was started to sanitize the area and prevent any further pollution | Latvia | 12/20 |
| SOS Environment | Both | 2015 | “SOS Environment” is a mobile application to introduce a centralized collection of daily environmental reports, thus ensuring public participation and feedback in solving environmental problems. | Latvia | 12/20 |
| Campaign “For me my own” | Preventative | 2020 | This raising awareness campaign was implemented through social media posters inviting citizens to think about their everyday habits and on their role in reducing the use of disposable plastic products. | Latvia | 16/20 |
| THE BIG CLEANUP IN LATVIA | Corrective | 2008 | The Big Cleanup is the largest group of volunteers in Latvia. The movement is organized through the involvement of local coordinators by implementing event management techniques based on area/city coordinators and site leader’s involvement. | Latvia | 15/20 |

5. Best methods to curb aquatic litter: 12 cases

Overview of cases selected

The cases included in this report are presented in the following table.

Table 2. Overview of the cases presented (ranked according to their score)

| # | Case | Type of Measure | Region | Geographical Scale | Start year | Score |
|-----------|-------------------------------------|-----------------------------|--------------------------|--------------------|------------|-------|
| 1 | “My sea” “Mana Jūra” | Corrective | Latvia | National | 2012 | 19/20 |
| 2 | Fisherman Practices | Preventative | Lake Geneva | Local | 2005 | 18/20 |
| 3 | The Big Styrian Spring Clean up | Corrective | Federal State of Styria | Regional | 2008 | 18/20 |
| 4 | Yoyo | Preventative/ Corrective | Lyon and 5 French cities | Local | 2017 | 18/20 |
| 5 | Plastic cups for the future | Preventative | Bulgaria | National | 2015 | 18/20 |
| 6 | SAVAGER | Corrective | Lombardy | Regional | 2019 | 18/20 |
| 7 | TRIVEO | Preventative | Commune of Izernore | Local | 2015 | 17/20 |
| 8 | CLEAN SEA Life | Preventative/ Corrective | Italy | National | 2016 | 17/20 |
| 9 | Enaleia | Corrective | Greece | National | 2016 | 17/20 |
| 10 | Pro d’ Amare | Corrective | Italy | Regional | 2018 | 17/20 |
| 11 | “After Us it’s up to Us to clean up | Preventative | Romania | All levels | 2018 | 17/20 |
| 12 | “With the Clean Waters” | Corrective | Romania | National | 2019 | 17/20 |

Case study 1: “My Sea” – “Mana Jura”

Location: Latvia

Summary

The campaign “My Sea” was launched in coordination with the Foundation for Environmental Education (Vides izglītības fonds) in 2012 and signifies a successful example of reducing plastic waste in the coastal area. The campaign runs annually for the last 8 years and has significantly assisted in raising public awareness on the problem of marine litter.

Objectives

The campaign aims to bring together different agents and actors such as citizens, municipalities, entrepreneurs, and to coordinate a joint effort to protect the Latvian coastal area and the Baltic Sea.

Results

- Establishment of the beach litter monitoring programme, which provides data that can be used both for national and international datasets according to EU legislation, as well as an instrument for tracking municipal developments and progress on sustainable coastal management.
- Increased public awareness and participation – each year campaign events gather 300-700 direct participants and media attention on the issue of marine litter.
- Increased stakeholder awareness and engagement – the availability of data has ensured wider cooperation among stakeholders, national institutions, and municipalities aiming to implement new solutions. The campaign also functions as an expertise bank for the promotion of solutions at local and national levels, elaborating and publishing guidelines for actions and measures, often in collaboration with other Baltic Sea region NGOs and through participation in different international projects.
- Shaping national policies in the marine litter field. More specifically, data and analysis of the campaign are currently being used as the backbone of national policies in the field (Programme of Measures under MSFD, Coastal Spatial planning, etc.).

Transferability Potential: High

The most important contribution of this awareness-raising activity is the synergistic effect emerging as a result of the coordination between municipal and governmental levels. Such synergies are particularly important as they could lead to the elimination of single-use plastics, the introduction of eco-innovations, and the promotion of biodegradable packaging. At a broader level, this can also foster changes in public attitudes towards single-use plastic items, packaging and sorting habits. In particular, this “cultural” change could be facilitated through a combination of different types of activities (data gathering, awareness-raising, citizen science promotion, cultural events)

Further Information

- **Project Site**

<http://www.manajura.lv/lv/par-kampanu/>

- **Articles and press releases:**

<https://www.norden.lv/jaunumi/120418-kampanai-mana-jura-pieskirta-baltijas-juras-fonda-2018-gada-galvena-balva/>

<http://www.videsfonds.lv/lv/piev-rs-sies-plastmasas-atkritumu-probl-mai-baltijas-i-r>

http://www.varam.gov.lv/lat/aktual/preses_relizes?doc=26296

Overall Score: 19/20

Case Study 2: Fisherman Practices

Location: Lake Geneva, France

Summary

The idea of the project was introduced by Éric Jacquier, a fisherman on Lake Geneva, who developed several processes to **extend the lifespan of his nets, to reuse certain parts of the net several times, and to facilitate the recyclability of the fishing nets he uses on a daily basis**. More specifically, Éric Jacquier has developed a machine to automatically assemble the three parts of the fishing net. **The machine assembles the nets more efficiently, which in turn increases their durability.**

Objectives

The objectives of this practice aimed at four areas: Prevention, re-usability, reduction of waste, and awareness-raising. More specifically, the objectives of this project were:

- To reduce for the fisherman the drudgery of assembling and disassembling fishing nets, while saving time;
- To reduce the quantities of fishing net waste generated;
- To find recycling solutions for used fishing nets that are currently buried (or incinerated)
- To disseminate these good practices to other fishermen.

Results

From an environmental point of view, the benefits of this innovative practice were multiple:

- Reusability of 35km of ropes per year instead of being buried.
- 4 or 5 times more usable head ropes and 10 times re-usable headline by allowing re-assembly
- Longer lifespan (+15% to 20% according to Eric) because the netting is more sturdily fixed to the ropes and the launching of the nets is further simplified.

In terms of other advantages, the specific practice has also economic and working-related advantages for the fisherman. More specifically, the benefits are:

- Time-saving, as the net is automatically assembled in 45 minutes by a machine. In addition, the fisherman also saves time on the dismantling of the net once the net is worn out (45 min currently against approximately 2 hours before). Lastly, the new nets can be launched 25% faster than the previous ones.

- Recycling of the net. The potential is very important because each fisherman produces around 500kg of fishing net waste per year.

Transferability Potential: High

The use of polyamide nets, offer a great potential for duplication both locally (between other fishermen) and globally (between countries) as their use is widespread among both sea and lake fishermen. Taking into account that these local fishermen constitute the majority of fish producers in EU, replacing the nets currently used with those used by Éric Jacquier will significantly contribute to decreasing the environmental impact of fishing net waste and will also increase their productivity. In short, replacing the nets presents both an environmentally-friendly option and an economic opportunity for local fishermen.

Further Information

- <https://lafabriquedesinnovations.wordpress.com/2017/06/10/triveo-a-la-peche-au-filet-plastique-sur-le-leman/>
- <https://lafabriquedesinnovations.wordpress.com/2017/11/07/triveo-a-la-peche-aux-filets-du-leman/>

Overall Score: 18/20

Case study 3: The Big Styrian Spring Clean-Up

Location: Federal State of Styria, Austria

Summary

This environment-cleaning campaign was launched in the Region of Styria in 2008. Since then it has become an important component of awareness-raising measures for anti-littering, waste avoidance, and environmental protection. Since its inception and implementation in 2008, the "Spring Clean-Up" has been carried out annually over a period of about four to six weeks. This campaign is supported by the active and voluntary participation of numerous municipalities, and institutions or other organizations such as the Directorate of Education (schools), kindergartens, various clubs, associations, and private.

In terms of organization, registration to the annual campaign is done via a special online tool and is also used for the rewarding system implemented (distribution and collection of garbage bags and prize cards). Following, the winning cards are handed out together with the pink garbage bags and are handed in at the municipality's office or at the waste collection centre. Finally, the campaign ends with a final event with awards for the best collection reports, and the prize-giving ceremony.

Objectives

The central objective of the campaign is to protect the environment by clean-up actions and raising awareness to reduce littering and waste throughout the year. Overall, the "Big Styrian Spring Clean-Up" aims to raise public awareness on the topic of littering and actively involve citizens of all age groups to participate in the campaign.

Results

Between 2008 and 2019 the quantities of waste collected fluctuated between 3.1 and 5.9 kg of waste per person participating. All kinds of waste are collected during the campaigns, including illegally deposited bulky waste; sometimes even batteries or WEEE-items were found. The main "bulk" of collected waste is packaging (mainly cans, PET bottles, glass bottles, and packaging of food for consumption outside the home) and cigarette ends. In terms of involvement, the latest campaign brought together more than 55,000 participants, thereof 54 kindergartens, 329 schools with almost 24.000 pupils, ca. 5.000 participants coordinated by the Styrian Mountain and Nature Guard, ca. 1.000 members of the voluntary fire brigades and many others. In terms of the geographical areas, waste collection activities of the campaign took place in the majority of (285 out of 287) municipalities of

Styria. Overall, over the course of the campaign from 2008 to 2019, more than 2,000,000 kg of waste were collected by about 540.000 people.

Transferability potential: High

The campaign appears to have a high transferability potential as it tackles the widespread issue of littering with a clean-up effort and awareness-raising initiatives. The costs associated with the organization of the initiative are relatively low, compared to the output achieved (number of people involved in participation and amount of waste collected). Finally, the implementation risk is negligible as it is primarily a campaign that can be organized in other partner countries accordingly.

Further Information

Comprehensive information on the Big Styrian Spring Clean-Up is published on the homepage of the Office of the Styrian Regional Government at www.saubere.steiermark.at.

- **Archives of past events**

www.abfallwirtschaft.steiermark.at/cms/beitrag/12727656/153989719/

www.abfallwirtschaft.steiermark.at/cms/beitrag/12725509/73033083/

- **Facebook page**

<https://www.facebook.com/steirischerfruehjahrsputz>.

Overall Score: 18/20

Case Study 4: Yoyo: Reward system for improving recycling in cities

Location: Lyon and 5 French cities

Summary

Yoyo is a solution to improve the recycling rate of plastic bottles in Lyon and five more French cities (Bordeaux, Mulhouse, Marseille, Lille, and Le Havre) by promoting citizenship responsibility with the use of a reward system. By providing this incentive, Yoyo aims to promote the reduction of plastic bottles, as well as other forms of littering. The Yoyo system is essentially a role-based system that uses a reward system to increase and retain engagement. The two main roles for individuals are coaches and sorters and the process follows a series of steps: These are:

- People register on the website as a coach or a sorter.
- The sorters choose a coach and pick up a Yoyo bag.
- Sorters start collecting PET bottles (from their home, at work, or in the streets).
- When the bag is full, they bring it back to their coach and get points for it.
- The coach registers the full bag and receives points.
- An online dashboard allows sorters and coaches to follow their personal and community progress.
- Yoyo offers rewards on its online store in exchange of points (movie tickets, books, food, discounts for shops, subscription to an electric car rental service, and many other sustainable objects and services).

A specific quality of Yoyo is that focuses mainly on disadvantaged neighborhoods, where the sorting rate is often lower when compared to other areas. The approach makes it possible to mobilize the residents and cultivate emotional bonds between community members. In addition, the company offers an educational course on sorting and recycling (training and visits). Lastly, the traceability of the bag allows participants in the Yoyo system to trace the plastic bottles delivered, ensuring transparency of the process as well as demonstrating the value of sorting.

Objectives

The main objective of the Yoyo system is to increase the rate of recycling of plastic bottles. Yoyo presents itself as an innovative solution to optimize waste management in cities and reduce plastic pollution. Through this source sorting, the bags go directly to recycling, further increasing the collection rate of plastic bottles. Yoyo does not claim to replace the current plastic recycling system, but is part of

a complementary approach, to especially improve recycling in disadvantaged areas. Additionally, Yoyo system aims to promote virtuous behavior and increase the ways that citizens can be further involved in the recycling process.

Results

In general, Yoyo raises public awareness and informs on the benefits of the sorting process for recycling. More specifically, since its launch in 2017, the quantifiable results of the Yoyo system are the following;

- 1.99 million plastic bottles collected
- 44.269 yoyo bags collected
- 9.703 sorters (4.093 as of June 2020) and 112 coaches.
- An increase in the recycling rate(90%) for those that are actively involved in the project

A summary of the results of the Yoyo system is presented in the image below (Image 1).

Image 1. Summary of results, Source: <https://yoyo.eco/>



Transferability Potential: High

The main advantage of the Yoyo system is the idea of rewarding to the act of sorting. This type of “reward” system creates the necessary incentive for citizens to engage with the recycling process and promotes citizen responsibility. Thus, by implementing similar practices in other EU countries (where legislation permits), the practice could significantly affect the amount of waste recycled, as well as inform the public on the merits of sorting.

Further Information

- Website

<https://yoyo.eco/>

Overall Score: 18/20

Case study 5: Plastic cups for the future

Location: Bulgaria

Summary

The initiative is focused on the collection of plastic caps that are suitable for recycling and channel the income generated for medical equipment (e.g. baby incubators). In terms of the collection process, plastic caps from all kinds, colours, and origins are being collected by families, institutions or private companies. In turn, every six months, they organize a big gathering event where people and organizations bring all the plastic caps they have collected. The organizers collect them and transport them to the recycling plant by trucks.

Objectives

Plastic caps for the Future have a single objective: to collect the maximum amount of caps and use the money obtained for incubators to small hospitals in every municipality. At the same time, the initiative aims to raise awareness on how plastic recycling can be implemented to curb plastic waste and use the income generated for important causes.

Results

In terms of quantifiable results, the campaign has obtained and donated 22 baby incubators to small towns 'hospitals in the peripheral municipalities of Bulgaria. Additionally, through this initiative, more than 250 tons of plastic caps have already been recycled.

Transferability Potential: High

The initiative is worth transferring in partners 'countries as it promotes a series of positive citizenship values and sustainable environmental practices. Additionally, it can be easily adopted (where legislation permits), as there are no significant costs related, and citizens can easily adopt this practice at home.

Further Information

- **Facebook page**
<https://www.facebook.com/kapachkizabudeshte/>
- **Website**
<https://bit.ly/3et45qD>

Overall Score: 18/20

Case Study 6: SAVAGER (Advanced Waste Management Surveillance)

Location: Lombardy

Summary

The SAVAGER (Advanced Waste Management Surveillance) is a pilot project of the Lombardy Region, which introduces the use of Geospatial Intelligence technologies to combat illegal waste landfills in Lombardy, through the effective identification of “suspect” cases, namely cases that appear as non-compliant with environmental regulations. To do so, SAVAGER uses geospatial intelligence to acquire data through observations by satellites, airplanes, and drones.

The SAVAGER project intends to develop a control strategy that goes beyond the traditional models that target already known sector operators. More specifically, SAVAGER **extends surveillance to the whole territory**, in cooperation with authorities, **to investigate cases of illegal waste management and abusive abandonment.**

Objectives

The SAVAGER system offers measurement techniques and a geo-referenced modelling framework for data collection on potential sites of illegal landfills. More specifically, SAVAGER aims to:

- Identify and monitor potential sites of illegal waste activity and inform the authorities.
- Identify and establish control points, meaning areas that are particularly important for the region and have to be preserved as they are critical to local biodiversity, economy, and public health.

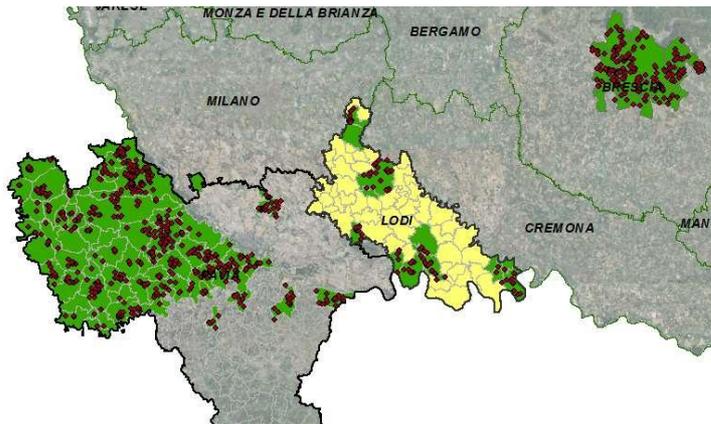
Results

The results of this measure are:

- Time savings for the investigation activity, with accurate results in the identification of illegal and criminal waste management.
- 744 sites have been photo-interpreted. and about 2% of the sites have already been checked by ARPA or law enforcement agencies. On-the-spot checks confirmed the abandonment of waste, as detected by the photointerpretation of the territory.

The preliminary results of the SAVAGER are also presented in the map below(Figure 3), depicting the progress of implementation of the SAVAGER project in a number of areas to detect landfills status and abusive/illegal waste areas.

Image 3. Map of SAVAGER activity



Transferability Potential: High

The main advantage of the present project is its potential to be integrated with other projects, a quality that increases its transferability. For example, SAVAGER could be integrated into the context of the CLEAN SEA LIFE project (Case study 8), to assist in finding the most polluted areas and indicate potential collection points. Similarly, SAVAGER could also be transferred in other EU countries where access by foot or vehicles is particularly difficult. An example of such a case is Greece with the large number and widespread dispersion of islands, where some of them are not accessible by conventional means making it even easier to dump waste without any repercussions.

Further Information

- <https://www.arpalombardia.it/Pages/Ecoreati,-istituto-a-Pavia-il-Pool-Ambiente-per-contrastare-e-prevenire-la-gestione-illegale-dei-rifiuti-.aspx>
- <https://www.arpalombardia.it/Pages/GiussagoPV,-scoperta-discarda-abusiva-di-4000-metri-cubi-in-un%E2%80%99area-di-14-000-metri-quadri-.aspx>

Overall Score: 18/20

Case Study 7: TRIVEO

Location: Commune of Izernore

Summary

TRIVEO is a company created in 2015 with two aims. First, to recycle plastic waste currently destined for landfill, and second to help impoverished people return to work. The creation of TRIVEO was decided following a national study that highlighted the potential in the commune of Izernore, due to the closure of the Chinese market for waste imports, the inevitable future restrictions on access to landfill, and the serious difficulties currently encountered by automated industrial facilities as concerns the treatment and recovery of this plastic waste.

The original purpose of the company was to collect and recycle plastic waste destined for landfills. However, over the years, the company has progressively diversified its activities through multiple innovations. For example, technological innovations now enable it to recycle marine plastic waste in partnership with the Reseaclons initiative, and certain parts of fishing nets in partnership with Éric Jacquier, a fisherman from Lake Geneva (Case study 1).

Objectives

The main objectives underlying the creation of TRIVEO are:

- Recycle post-production plastic waste destined for landfills.
- Contribute to the transition to a sustainable economy.
- Remain competitive.
- Facilitate access to employment and the acquisition of new skills for people in difficulty.

Results

The benefits of TRIVEO's operation are both environmental and social. More specifically, from an environmental point of view, TRIVEO has made it possible to recycle and re-use 80% of the collected plastic waste. From a social responsibility point of view, the company employs around 20 people in rehabilitation. In addition, with the working experience from TRIVEO, 46% of the employees who have left have found a job on a permanent or fixed-term contract, or a training course leading to a qualification.

TRIVEO has also received several awards for its contribution. For example:

- Trophy for the Lyon Progress Company, Sustainable Development category

- 6th Rhône-Alpes Social and Solidarity Economy Trophies, Employment category

Transferability Potential: High

The potential of transferring the present practice in other countries is particularly high, yet a number of prerequisites have to be first addressed in order to replicate the same practice in other countries.

These are:

- Recycling companies should be ready to supply plastic waste and to buy back the sorted plastics
- A technical institute to solve technical problems
- A committed territory ready to co-finance the project.

Further Information

- <https://lafabriquedesinnovations.files.wordpress.com/2017/04/triveo-prc3a9sentation-2017.pdf>
- <https://lafabriquedesinnovations.wordpress.com/triveo/>
- <https://lafabriquedesinnovations.files.wordpress.com/2017/01/triveo-document-prc3a9sentation-presse.pdf>
- <https://www.reseaclons.org/>

Overall Score: 17/20

Case study 8: CLEAN SEA Life

Location: Italy

Summary

Clean Sea Life is a project co-funded by the European Commission through the LIFE program. CLEAN SEA LIFE is coordinated by a consortium of 6 partners with Asinara National Park as their leader. The project aims to raise public awareness on the amount of waste in coastal regions, and promote active involvement and sustained commitment to environmental ethics and practices. In addition to the awareness-raising activities, the project is also compiling a map highlighting the areas where the accumulation of waste poses a risk for biodiversity.

Objectives

The main objective is to raise awareness on the issue of aquatic litter and explore potential preventive measures. More specifically:

- CLEAN SEA LIFE aims to involve all “seaside actors” (e.g. divers, fishermen, boaters, lifeguards, bathers, teenagers, workers of the sea and all citizens) and unite them in a single campaign to prevent and clean coasts and other areas. The population target of this specific project is 300,000 people to be actively involved, of which at least 20,000 will sign the Manifesto committing themselves to adopt a more respectful behavior towards the environment and contribute to the cleaning of coasts and backdrops.
- In order to combat the dispersion of cigarette butts, more than 40,000 cigarette holders will be distributed, special plexiglass containers will be installed for the bathing establishments, and the receptive capacity of waste will be enhanced in 15 ports and marinas.

Results

The project assisted to identify the source of marine litter such as illegal landfills or malfunction of equipment (e.g. purifiers) recreational activities (e.g. tourism) or professional fishing.

Transferability Potential: High

The knowledge accumulated from this specific project could be used in conjunction with other mapping technologies to create a database that contains highly-polluted areas in Europe. An example of such

synergy could be with SAVAGER (presented as case study 6), which also maps the highly-polluted areas of Lombardy, Italy. In short, the project could be implemented in all European countries with coastal areas (seaside, beaches, rivers, and lakes), as it is a low-cost project and the required technology is already available.

Further Information

- **Website**

<https://cleansealife.it/>

- **Social media pages**

<https://www.instagram.com/CleanSeaLife/>

<https://www.facebook.com/CleanSeaLIFE/>

https://www.youtube.com/channel/UCyN-Y_HZbP8UxP5ggekPhw

<https://twitter.com/CleanSeaLife/>

Overall Score: 17/20

Case study 9: ENALEIA: Fishing, Ocean clean-ups, environmental awareness and prevention

Location: Greece

Summary

ENALEIA is a social enterprise, established in 2016, that aims to make the marine eco-system sustainable through educational and training courses on professional fishing, to ensure that present and future fishing will follow an eco-friendly approach while ensuring high-quality products. ENALEIA also promotes corrective practices such as the collection of plastic from oceans.

Objectives

The main objectives of the project are:

- **Decrease of plastic pollution of the oceans.**
- **Increase of fish stocks.**

Results

The most significant advantage of this approach is its diversity, as it combines **raise awareness campaigns, practical implementation, and financial benefits.**

More specific results include:

- Training courses in sustainable fishing for more than 179 fishermen.
- Sustained and coordinated corrective measures resulting in the collection of 16 tons of marine litter.
- 5.000kg of fishing nets recycled.

Transferability Potential: High

The intervention is easily transferable as it is a low-cost initiative and could be partially implemented via the internet through e-learning lessons about sustainable tourism and environmental awareness.

Further Information

- **Website**

<https://enaleia.com/en/homepage/>

- **Articles**

https://www.theguardian.com/environment/2019/mar/30/plastics-waste-sea-greek-fishermen-recycling?fbclid=IwAR2JPOXV_J457F9n0lhXx6VdkRPjI3IXJF4MTg4hNVm-JRRAgWZcD4MLUAM#maincontent

Overall Score: 17/20

Case Study 10: “Po d’ Amare” – Project of Collection and recovery of plastic waste on Po River.

Location: Italy

Summary

The initiative called “Po d’ Amare”, is one of the pioneering projects aimed at preventing marine litter. The project pilot was developed in coordination with Po River District Authority and AIPO (Inter-regional Agency for the River Po) in the region of Lombardy, Italy. The project involves innovative techniques for intercepting waste in the river waters, selection of the waste, and sorting it, preparing it for recycling. To do so, the project deploys a special filter on rivers which prevents floating and underwater waste reaching the sea.

More specifically, the initiative makes use of “Sea sweepers” – a system of fixed nets and shallow draught craft (Sea Hunters), to limit and collect floating or partially submerged plastic arriving from rivers or any other aquatic areas. In the case of “key” locations, such as rivers, the application of such measures is particularly important, directly affecting all regions that the river crosses on its path to the sea. For example, River Po crosses the whole of Northern Italy, through 4 regions and 13 provinces. As such, the implementation of this measure will benefit both the regions crossed by the river, and will also ultimately help to reduce the amount of waste in the Adriatic and Italian sea.

Objectives

The objectives of this project are:

- To collect volumes of plastic across inland waters rivers and to recycle this kind of waste.
- Identify other geographical points of the Po River, where the aquatic filter can be implemented to increase overall efficiency.

Image 2. .Waste recovery operations. Credits: TeleAmbiente



Results

The pilot project has been implemented between 18 July and 16 November 2018 and functioned "fully" for almost one hundred days. During this period, it collected 8 big bags, of which 92.6 kilograms (40%) were plastic waste. This is a particularly important result, considering that 80% of waste at sea comes from rivers (source: WFO). An example of a clean-up is presented in the image above (Image 2).

Transferability Potential: High

This case presents a highly transferable measure to prevent plastic waste from reaching the open sea. More specifically, similar nets could be placed in other EU countries, in particular those with rivers that cross urban areas or other highly populated areas. In turn, this could assist in reducing the growing threat of plastic pollution by assisting in their collection and disposal.

Further Information

- **Pilot Project details**

https://www.fondazionevilupposostenibile.org/wp-content/uploads/2019/03/presentazione-risultati-progetto-sperimentale_Il-Po-dAmare-compresso.pdf

- **EarthWatch Institute**

<https://earthwatch.org.uk/get-involved/plastic-rivers>

- **WWF report**

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=2ahUKEwiK_v3_1prpAhWdURUIHa42CJ8QFjAEegQIBRAB&url=https%3A%2F%2Fwww.geoplastglobal.com%2Fen%2Finsights%2Fwwf-report-2019-on-plastic-waste-pollution-critical-issues-and-action-plan%2F&usg=AOvVaw3BEbQcd9I7LgN5TkLjM73G

- **Plastic in North Sea**

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/634433/Future_of_the_sea_-_plastic_pollution_final.pdf

Overall Score: 17/20

Case study 11: “After Us it’s up to Us to clean up”

Location: Romania

Summary

“After Us it’s up to Us to clean up” is an educational program of awareness-raising on the selective collection, launched in July 2018 by Coca-Cola HBC Romania, as part of the company's vision of environmental responsibility. “After Us it’s up to Us to clean up” is not a unitary project, but encompasses several sub-projects with a specific focus on plastic pollution. The most prominent examples of these sub-projects are:

- **The Big Belly Network**
- **The Recycling map**

1. “The Big Belly network” project

“The Big Belly network” is an ongoing local initiative in Bucharest, initiated in February 2019, and implemented in partnership by Coca-Cola Company HBC Romania, the City Hall of the 3rd District in Bucharest, and the Green Point Management organization. “The Big Belly network” involves the procurement and functioning of 30 Big Belly type smart containers (15 for recyclable waste and 15 for other municipal waste) that were installed in the central area of the Bucharest (Unirii Square - University Square), as part of the program, to encourage selective collection.

2. “The Recycling Map” project

“The Recycling Map” project is an ongoing national initiative, initiated in 2019 and implemented in partnership by Coca-Cola Company HBC Romania and the Organization ViitorPlus (“FuturePlus”). The purpose of this platform is to promote at a national level the reduction, reuse and recycling of all types of waste, from paper, plastic, and metal, to household appliances, tires, hazardous waste and much more. The project started in May 2018 and involved the development of a new tool that will help Romanians selectively collect waste: an interactive platform that allows the identification and location of selective collection points of recyclable waste in Romania, offering users the opportunity to contribute to the map database by adding new selective collection points.

Objectives

Broadly speaking, the main objective of “After Us it’s up to Us to clean up” program is to educate and help people understand the importance of selective waste collection for Romania, and further encourage the adoption of a responsible attitude towards the environment.

Results

Overall, through the “After Us it’s up to Us to clean up” program, in 2019 approximately 615.000 people interacted with campaign messages and separate collection solutions promoted. Even though the program was not addressed directly to the improvement of water quality, it indirectly addresses water quality through educational courses on proper waste management.

1. “The Big Belly network” project

In less than three months, from the beginning of February until the middle of April 2019, through the Big Belly network, 8.4 tons of recyclable materials (plastic, paper, aluminium etc.) were collected. This volume represents 64% of the total amount of waste collected in the Big Belly containers. In addition, 80% of the total amount collected in the containers was in accordance with the environmental objectives of the project, revealing high compliance and commitment of consumers to get involved in the selective collection initiatives.

Big Belly is one of the most innovative selective waste collection systems, successfully implemented in many European Union countries. One of its main advantages is that it includes an intelligent waste compaction system, powered by solar energy through photovoltaic panels, which increases the storage capacity of these containers, achieving the storage of a quantity 5 times larger than their volume. Big Belly containers also have an in-built reporting system that automatically transmits the amount of waste currently in the bin until it is full.

2. “The Recycling Map” project

During 2019, 130.000 unique users created and accessed their accounts, out of which 36.000 periodically return to the platform. In terms of infrastructure, there are over 7.800 separate collection points on the map throughout Romania. Lastly, in terms of raising awareness, educational sessions were organized in 37 schools during 2019, with the participation of 15.500 students and 550 teachers. More information can be found here: <https://www.youtube.com/watch?v=abfmuLNjVg>.

Transferability Potential: High

This specific project could also be transferred to other partner countries, as it mainly involves the coordination between authorities and companies to amplify the message of environmental practices. Such forms of cooperation between different representative bodies could also assist in raising awareness of citizens and their subsequent involvement in a coordinated effort. Thus, similar forms of cooperation in other European countries could significantly increase the amount of waste collected and recycled.

Further Information

Information about “The Big Belly network” project

<https://dupanoi.ro/campania-dupa-noi-strangem-tot-noi-64-din-deseurile-colectate-prin-sistemul-de-pubele-inteligente-big-belly-din-centrul-capitalei-redirectionate-catre-reciclare/>

<https://greenpoints.ro/blog/proiect-big-belly>

Information about “The Recycling Map” project

<https://localizare.hartareciclarii.ro/?material=Plastic%20%26%20PE>

<https://dupanoi.ro/s-a-lansat-harta-reciclarii-o-platforma-interactiva-si-educativa-pentru-localizarea-punctelor-de-colectare-selectiva-a-deseurilor-reciclabile-din-romania/>

<https://www.youtube.com/watch?v=btpQM3YKvQ8>

<https://www.viitorplus.ro/bcp-project/harta-reciclarii/>

Overall Score: 17/20

Case study 12: “Cu Apele Curate” - “With the Clean Waters”

Location: Romania

Project Summary

The intervention “Cu Apele Curate” - “With the Clean Waters” is a private initiative launched by the Association “Mai Mult Verde” (“Much More Green”), a non-governmental organization, and LIDL Romania, the Romanian branch of the German retailer. “With the Clean Waters” program aims to combat and prevent the increasing threat of plastic pollution in Danube River that is particularly important for aquatic biodiversity and water quality. The main activities of the program consist of organizing clean-up events and information campaigns with the involvement of volunteers, local and national environmental NGOs, and public authorities.

Objectives

The main objective of the “With the Clean Waters” program is to intervene and decrease the plastic pollution of the Danube waters. More specifically, “With the Clean Waters” targets both existing pollution, through corrective measures (i.e. collecting the plastic already present in the riverbed), as well as preventive measures to curb future pollution. Additionally, it promotes new and/or innovative initiatives that significantly contribute to reducing plastic consumption and measures of sustainable waste management. Lastly, “With the Clean Waters” also aims to increase the involvement of NGOs and initiative groups in the decision-making process at the local level by increasing volunteers’ level of involvement in these local initiatives.

Results

The results of the project so far are:

- 11 clean-up activities (in Danube Delta, Giurgiu, Drobeta-Turnu Severin, Cernavodă, Zimnicea, Turnu Măgurele, Oltenița, Brăila, Galați, Tulcea and Călărași), with 500 volunteers who managed to collect 6.5 tons of plastic.
- 10 initiative groups formed around the problem of plastic pollution, with 20 community events organized, which gathered more than 700 participants.
- Development of good practice models in 10 communities such as informative boards, trash art, and separate waste collection bins through which 100 tons of plastic were collected so far.

Transferability Potential: High

“With the Clean Water” program addresses a common problem across different EU regions, as aquatic littering and plastics pose a threat not only to the biodiversity of seas and coasts but also to the economy and local communities. The presence of synergies and coordination between representative bodies and the private sector could contribute to the alleviation of this threat, and stimulate local economies through employment in clean-up efforts. Taking as a granted that the same private companies (i.e. LIDL) have branches in other European countries, transferring this practice in coordination with these branches is relatively low-cost and particularly easy.

Further Information

- Website

<http://cuapelecurate.ro/>

<http://maimultverde.ro/leap-portfolio-project/cu-apele-curate/>

<https://corporate.lidl.ro/sustenabilitate/mediu/prevenirea-poluarii-cu-plastic>

Overall Score: 17/20

6. Key conclusions

The 12 cases presented in this report comprise different practices that can assist in reducing the amount of plastic waste in aquatic environments through the implementation of preventative, corrective, or a combination of both types. More specifically, out of 12 cases, 4 were preventative, 6 were corrective, and 2 were both corrective and preventative, highlighting the prevalence of corrective over preventative measures. This is to be expected, as the primary problem with preventative measures is the **impact** of their implementation, meaning that quantifiable results could not be easily obtained, neither assessed if the measure is on the early stages of implementation. This is also evident by the presence of more corrective measures in the present report, and their highest scores when compared to the preventative measures. However, it should be noted that impact is not a unitary criterion of assessment, as it is typically depends on a number of factors one of which is the duration of implementation of a specific measure. Accordingly, impact is essentially divided between short-term and long-term; this is particularly important for the present report, as the corrective measures included scored higher precisely because their results are more easily quantifiable and produce visible results even at the early stages of their implementation. On the other side, preventative measures may be equally or even more efficient to curb aquatic litter, yet their results typically emerge at the later stages of their implementation, making them harder to assess especially in cases where the project has started only recently. A table with the scores for each case collected can be found in Annex B.

Taking all these into account, the present report suggests the adoption of preventative rather than corrective measures, as the former constitute longer-term solutions to the increasing threat of aquatic litter. However, these have to be accompanied by the necessary changes in the policy frameworks that will create the necessary common ground for a unified approach in waste treatment and collection, which in turn will allow for the adoption of the proposed “pro-active “measures. To facilitate that adoption of preventative measures, the present report highlights four key areas that could be further explored by stakeholders and policy makers. These are:

- **Development of synergies between different ‘key’ actors**
- **Awareness-raising and application of technological tools**
- **Promotion of citizen responsibility and involvement**
- **Financial stimulation of ‘green’ initiatives and research**

Development of synergies between different 'key' actors

The most effective practices address the problem of aquatic litter holistically, combining different forms of engagement with the public, as well as policy frameworks and technological tools. Thus, a key finding of this report is the added-value of synergies in the efforts to curb aquatic litter; such synergies could be further expanded in the EU-27, through the integration of relevant technologies that 'map' and detect areas of pollution, and the coordination of authorities, private actors and citizens to clean the area and preserve it through continuous monitoring. An example of such a synergy could be the combination of SAVAGER (Case study 6) as a technological tool that can pinpoint illegal landfills or other areas of high pollution with targeted clean-up campaigns such as "After us, it's up to us to clean up" (Case study 11). After the area has been cleared, the details of the operation could be stored in a database for future use. Another example of such a synergy could be between SAVAGER (Case study 6) and ENALEIA (Case study 9). In particular the use of SAVAGER as a technological tool can be expanded to pinpoint aquatic areas of high pollution and coordinate clean-up efforts with the assistance of experienced divers, fishermen or any other groups that could participate in coordinated efforts to reduce the spread and impact of aquatic litter. These type of synergies could be further expanded to include private companies or organizations that focus on waste recycling. With their cooperation, the waste collected could be re-used or channeled in other forms and uses (e.g. energy production). The extent of these synergies could also expand in the form of a jointly-signed code of conduct, meaning a voluntary code of practice for retailers, consumers and manufacturers aiming at rationalizing the issuance of plastics, increasing the usage of plastic bags made from recycled material, creation of convenient and accessible recycling stations to customers, and setting up of better standards for imported packaging plastics.

Awareness raising and expansion of smartphone applications

The use of technological advancements to assist in the reduction of plastic in aquatic environments was also highlighted with the use of smartphone applications and reward systems such as Yoyo (Case study 4) and TRIVEO (Case study 7) still, these involve mainly people who are already environmentally aware. Therefore, there is a need to increase the people involved with these smartphone applications through awareness raising campaigns, info points, promotion through social media or use of environmentally friendly containers as in case study 5 (Plastic cups for the future). In turn, the technological tools could further assist in the reduction of plastic waste as practices that could be relatively easily applied in everyday life, since they only rely on the use of smartphones and the presence of incentives (i.e. rewards system) to maximize their impact. However, these have to be implemented in conjunction with educational resources (i.e. training, awareness classes), especially in countries where public awareness

on the increasing threat of aquatic litter is particularly low. This increased use of technology could also be applied in the creation of the next generation of plastics, designed to be more biodegradable further decreasing their persistence and their potential to accumulate in the marine environment and biota. In addition, the use of technology could assist in the creation of a labelling system so consumers can identify products with end-of-life recyclability, inviting citizens to be even more actively involved in the process of reducing aquatic litter. An example of such a case could be with the use of a reward system similar to Yoyo (Case study 4) that has already been implemented in parts of France and could be further upgraded with extra features (QR scanner, online database) so citizens can identify the plastic products by scanning them and upload all the relevant details in an online database.

Promotion of citizen responsibility and involvement

There is also a need for a continuous involvement of citizens in these efforts through raising awareness campaigns, as well as voluntary clean-ups in areas most affected by littering. Examples of such cases presented in this report include; My Sea (Case study 1), the big Styrian spring clean-up (Case study 3) and After Us, it's up to Us to clean up (Case study 11). This could eventually facilitate the emergence of a 'culture of responsibility', with citizens becoming also responsible to communicate the need for waste reduction in their social groups. More importantly, the involvement of children in these campaigns will ensure that the values of environmental responsibility will have long-lasting effects not only in the current generation but also in future ones. This should also be reflected in the level of policy formulation and implementation for plastic waste management with measures and directives that take into account the needs of all levels of the community (i.e. local, regional, national).

This essentially means that social responsibility for plastic waste management should be initiated at all levels, including the education system, right from the primary school and onwards to universities with the promotion of values and environmental ethics to promote sustainability and environmentally friendly practices and ensure that these will have long-lasting effects visible both in the current generation as well as future ones. An example of such a case could potentially be with the use of TRIVEO (Case study 7) that already promotes social responsibility by employing people from disadvantaged and impoverished groups. More specifically, TRIVEO (Case study 7) could expand to also include training courses that provide information and deliver knowledge to the public, especially in impoverished areas that environmental awareness is significantly lower than other more affluent ones.

Financial stimulation of 'green' initiatives and research

In terms of barriers that may hinder the implementation of practices to curb the spread and impact of aquatic litter, these mainly involve the lack of economic incentives to industries and other key actors to replace their current practices with more sustainable and environmentally friendly models. For example, in Fisherman practices (Case study 2), the use of eco-friendly fishing ropes could be a sustainable solution that could be further expanded by providing incentives for the manufacturers to shift to this production model. This could be facilitated through the stimulation of 'green' initiatives and companies that provide re-usable or recyclable equipment or materials to professionals. Similarly, initiatives that promote environmentally friendly solutions such as Plastic cups for the future (Case study 5) could be financially supported to expand the use of plastic cups and facilitate a "turn" from single use plastics to re-usable containers. In short, incentive schemes such as subsidies, concessional loans and tax incentives could prove particularly beneficial to attract assemblies and private investors in research, training and demonstration projects for increased recyclability or energy resource recovery. This type of financial incentives in conjunction with educational courses could further assist in reducing the growing threat of plastic waste. In addition, funding opportunities in the recycling industry could facilitate the emergence of new technologies that increase the use of recycled materials in product design or increase the end-of-life recyclability of existing products or methods that could improve collection and separation of plastic waste and can be integrated in current industrial production chains.

Lastly, the promotion of interdisciplinary research (e.g. relationship between customer behavior and plastic waste management) could provide with more insights on the ways social factors (such as socio-economic background, level of education etc.) could affect the level of recycling of plastic or the amount of waste generated. In short, research should assess the impact of persistent material on the oceans in conjunction with technological tools that focus on the data collection on the amount, distribution and impact of pollution as well as strategies that focus on prevention, removal, and ways of recycling. To be able to clearly understand the marine debris problem and in order to implement efficient and realistic programs it is also important to have data on the amount, distribution, and impact of such pollution.

Concluding Remarks

To sum up, although marine debris, is not precisely quantifiable in all its aspects, efforts should focus on commitment, technological tools, and public awareness on the problem of aquatic litter. Research and new technology developments are essential in order to assess next steps, address gaps, and reduce

plastic from entering the marine environment yet these have to be accompanied by a more holistic approach that address the problem of aquatic litter in all different levels (such as awareness building campaigns, educational courses and interdisciplinary research). Such a holistic approach could be also accompanied by the necessary changes in the institutional and regulatory framework through a consideration of all the different regional policies as well as the ways that different regional policies could be unified in a single framework. In turn, this multi-level response could foster the emergence of a ‘critical mass’ of practices, technological tools, research advancements and citizens’ involvement that address the problem of aquatic litter methodically and holistically. Taking a step towards this direction, the practices presented in this report can be considered as particularly promising, as they demonstrate a high transferability potential, meaning that with the adequate advancement or revision of policy frameworks and an increased commitment of the authorities and institutions, the results could be implemented in the rest of EU-27 and significantly contribute to the effort of reducing and preventing the amount of plastic waste in the aquatic environment.

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8. Annex A: Questionnaire

| | |
|---|--|
| Title of the practice | |
| | |
| Practice Identification | |
| Category of measures | <input type="checkbox"/> Corrective/ Clean up <input type="checkbox"/> Preventive/ Waste management <input type="checkbox"/> Preventive/ Waste reduction |
| Geographical scale | <input type="checkbox"/> National <input type="checkbox"/> Regional <input type="checkbox"/> Local |
| Location | |
| Start year of operation | |
| PRACTICE DESCRIPTION | |
| Summary of intervention | |
| | |
| What are the main objectives and needs addressed by this measure? | |
| | |
| Who initiated the intervention? | |
| | |
| IMPLEMENTATION OF THE PRACTICE | |

What was the legislation and policy context followed?

- National
- International
- European
- No legislation/ policy context followed
- Other (please specify)

Please comment on your selection

Who implemented the intervention? Who are the key actors involved and support its operation?

What was the cost? How was the measure funded?

What were the main problems encountered during implementation? (For instance: conflicting regulation, funding requirements/sources, lack of interest/uptake)

RESULTS AND TRANSFERABILITY POTENTIAL

What are the main benefits these measures delivered? (For instance: raised public awareness, reduction of plastic waste, increased recycling, adoption of alternatives to single-use plastics).

Please provide quantitative results such as reduction of waste generation (% or absolute numbers), volume of waste collected, improvement in water quality.

What are the main features that make this intervention transferable? (For instance: it addresses a common need/problem across different EU regions, low cost, low requirements in terms of skills needed for implementation, not specific to a type of pollution or aquatic body, low implementation risk)

Further information (links, sources of information)

9. ANNEX B Cases with scores

| Case | Type | Relevance | Impact | Problems encountered | Transferability | Total score |
|---|--------------|-----------|--------|----------------------|-----------------|-------------|
| Turning bottle caps into wheelchairs | Preventative | 3 | 2 | 4 | 5 | 14/20 |
| ENALEIA | Corrective | 4 | 4 | 4. | 5 | 17/20 |
| Let's do it Greece | Corrective | 2 | 3 | 4. | 4 | 13/20 |
| Campaign for raising public awareness on marine litter in the Mediterranean | Preventative | 3 | 3 | 4. | 4 | 14/20 |
| Memorandum | Preventative | 4 | 4. | 4. | 4 | 16/20 |
| Bill "SalvaMare" | Corrective | 4 | . | . | 4 | 8/20 |
| CLEAN SEA Life | Both | 4 | 4 | 4 | 5 | 17/20 |
| Po d'Amare | Corrective | 5 | 4 | 3 | 5 | 17/20 |
| SAVAGER | Corrective | 4 | 5 | 4 | 5 | 18/20 |
| Burgas recycles | Both | 2 | 2 | 4 | 4 | 12/20 |
| Less plastic Bulgaria | Both | 4 | 3 | 4 | 4 | 15/20 |
| Let's Clean Bulgaria Together | Corrective | 3 | 4 | 4 | 5 | 16/20 |

| Case | Type | Relevance | Impact | Problems encountered | Transferability | Total score |
|--|--------------|-----------|--------|----------------------|-----------------|-------------|
| Plastic cups for future | Preventative | 4 | 4 | 5 | 5 | 18/20 |
| Checklist for sustainable events | Preventative | 3 | . | . | 5 | 8/20 |
| Company Network "Zero Waste" | Preventative | 2 | 2 | 4 | 4 | 12/20 |
| Forum Plastic-free Augsburg | Both | 2 | 2 | . | 4 | 8/20 |
| RECUP | Preventative | 3 | 2 | . | 4 | 9/20 |
| RiverSe | Preventative | 4 | 4 | . | 4 | 12/20 |
| Fisherman practices | Preventative | 5 | 4 | 4 | 5 | 18/20 |
| No Plastic challenge | Preventative | 4 | 4 | 4 | 4 | 16/20 |
| Action Plan for the Rhone River | Preventative | 4 | 2 | 3 | 4 | 13/20 |
| TEHP project | Preventative | 3 | 3 | 3 | 3 | 12/20 |
| TRIVEO | Preventative | 4 | 3 | 4 | 5 | 17/20 |
| Yoyo | Both | 5 | 5 | 3. | 5 | 18/20 |
| "With the Clean Waters" | Both | 4 | 5 | 3 | 5 | 17/20 |
| We act for waters | Both | 4 | 3 | 3 | 5 | 15/20 |
| Clean waters in Romania | Both | 4 | 3 | 3 | 5 | 15/20 |
| After Us it's up to Us to clean up | Preventative | 4 | 5 | 4 | 4 | 17/20 |
| LET'S DO IT, ROMANIA! | Both | 4 | 4 | 4 | 4 | 16/20 |
| Cave cleaning | Corrective | 2 | 2 | 3 | 2 | 9/20 |
| The Big Styrian Spring Clean-Up | Corrective | 4 | 5 | 4 | 5 | 18/20 |
| Clever Feasting | Preventative | 3 | 3 | 3 | 3 | 12/20 |
| Action Clean Styria | Corrective | 5 | 3 | 3 | 4 | 15/20 |
| "My Sea" – "Mana Jura" | Corrective | 5 | 5 | 4 | 5 | 19/20 |
| The landfill "Getlini" | Both | 4 | 4 | 3 | 3 | 14/20 |
| Waste management in the Liepaja region | Both | 3 | 3 | 3 | 3 | 12/20 |

| Case | Type | Relevance | Impact | Problems encountered | Transferability | Total score |
|---------------------------|--------------|-----------|--------|----------------------|-----------------|-------------|
| SOS Environment | Both | 3 | 3 | 3 | 3 | 12/20 |
| Campaign "For me my own" | Preventative | 4 | 4 | 4 | 4 | 16/20 |
| THE BIG CLEANUP IN LATVIA | Corrective | 4 | 4 | 3 | 4 | 15/20 |