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Seville, Spain, 8-10 April 2019

Agenda item 5: Socioeconomic Analysis on Marine Litter Key Best practices to Prevent/Reduce Single Use of Plastic Bags and Bottles

Socioeconomic Analysis of Marine Litter Key Best Practices to Prevent/Reduce Single-Use of Plastic Bags and Bottles

UNEP/MAP
Athens, 2019

Note by the Secretariat

The present activity is prepared in the context of the UN Environment/Mediterranean Action Plan (MAP) Program of Work (PoW) 2018-2019, adopted by the Contracting Parties in December 2017 in Tirana, Albania. More specifically, this activity contributes to the implementation of key Output 2.1.1. “Targeted measures of the regional plans/strategies facilitated and implemented”, Activity 2.1.1.1. “Prepare reports on the implementation of the existing regional Plans/Measures: (i.e. Mercury and WWTP) including socio economic analysis” in the UN Environment/MAP programme of work.

Socio-economic analyses can contribute to convince stakeholders on the feasibility and benefits of a specific action, compare different measures to prioritize from, anticipate and identify possible bottlenecks in implementation, avoid costs and ensure their « just » distribution, identify when and where flanking measures would be most beneficial, correct existing measures.

This activity is prepared through the Memorandum of Understanding between the UN Environment/MAP and the Italian Ministry for Environment, Land and Sea Protection (IMELS), and implemented by MAP/Plan Bleu Regional Activity Center.

This activity builds on the outcomes of the ActionMed Project (2014-2017) and will feed several actions at national and regional levels, including through the MedRegion project under the overall coordination of the Hellenic Centre for Marine Research (HCMR).

This activity combines two levels of analysis: the level of the Mediterranean Sea via a regional socioeconomic analysis of selected plastic prevention/reduction measures; and the level of case studies of key practices already implemented, covering various natural, socioeconomic and institutional/policy contexts in the Mediterranean.

This activity will contribute enlightening stakeholders and decision makers involved trade-offs between or among ecological objectives and economic activities and public costs/benefits as well as with varying distributional effects of key measures for the prevention or reduction of single use plastic bags and bottles. In addition the study provides methodological insight for national or local studies.

A draft outline of this report was introduced during the Regional Meeting on Marine Litter Best Practices in Izmir, Turkey (9-10 October 2018). The present report includes a more elaborated, advanced version and also summarizes the scoping report for this study and introduces case study and regional factsheets under development. The present report is brought to the attention of the participants of the Second Regional Meeting on Marine Litter Best Practices in Seville, Spain (8-10 April 2019), for their comments and feedback to be incorporated during the preparation of its final version for submission to the Plan Bleu and MEDPOL Focal Points meetings.

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1 SETTING THE SCENE

1. Plastics are one of the main materials of the modern economy due to their multiple properties, applications and low cost. Their use has been growing exponentially since the 1950s and it is expected to double in the next 20 years. It is estimated that roughly 5 trillion plastic bags are consumed worldwide each year (almost 10 million plastic bags per minute - UNEP/MAP, 2018[1]). Europe is the second largest producer of plastics in the world - after China - with an estimated discharge to the sea of between 70 000 and 130 000 tons of microplastics (pieces <5mm) per year with macroplastics discharged to the sea amounting to 150 000 to 500 000 tons per year (WWF, 2018[2]). In the Mediterranean Sea region, plastics represent 95% of waste in high seas, on the seabed and on beaches (WWF, 2018). Plastic pollution is causing significant costs to the economy, estimated at about $ 13 billion a year in damages to marine ecosystems, including direct financial losses for the fishing and tourism industries, as well as significant time spent/resources allocated for cleaning beaches (WWF, 2018). In front of this situation, UN Environment has position in 2018 the issue of **plastics in the ocean** among **the top six most pressing environmental emergencies**.

2. One of the main causes of plastic pollution is the management of plastic waste in most of the Mediterranean countries. Only one third of plastics in Europe is recycled (a number higher still than the average worldwide 14% value) and half of the plastic waste in Italy, France and Spain ends up in landfills site (WWF, 2018).

3. In recent years, several initiatives have been put in place at different scales to **improve the management of plastic waste and reduce its discharge to the sea** by different actors, including regulatory bodies, civil society, Non-Governmental Organizations (NGOs) and the private sector. However, many of these measures are not yet implemented at their full potential in the Mediterranean Sea region. And drivers to support wider implementation of these measures are urgently required for addressing plastic bag/bottle challenges.

4. In this context, Plan Bleu UN Environment/MAP Regional Activity Center has launched a study for developing **sound economic arguments on the reduction and prevention of single use plastic bags and bottles**. More specifically, the study aims at addressing the following questions:

- What are the **costs** of measures/actions that help reducing and preventing single use plastic bags and bottles? And who bears the costs?
- What are the **benefits** associated to such measures – for marine ecosystems and economic operators impacted by plastics (be it directly or via impacts on ecosystem services that would be established/re-established as a result of improvements in marine ecosystems? Who benefits from the implementation of such measures? ; and
- **How do measures rank** overall in terms of **cost-effectiveness**, the **balance of costs and benefits** – and more globally when considering all positive and negative impacts, but also feasibility and acceptability (**multi-criteria analysis**)?

5. The study takes place in the context of the UN Environment/MAP Program of Work (PoW) 2018-2019, adopted by the Contracting Parties to the Barcelona Convention in December 2017 in Tirana (Albania).

[1] UNEP/MAP, 2018: Agenda item 4: Main elements for Regional Guidelines for Selected Marine Litter Prevention and Reduction Measures. Phase out single use plastic bags in the Mediterranean Region (Main Elements).
[2] WWF. 2018: Out of the plastic trap. Saving the Mediterranean from plastic pollution!,

6. This summary note provides an overview of the **approach to socio-economic analysis** developed for this study, which includes the following steps:

i. An understanding of the pathways followed by plastic bags and bottles from producers to the sea, thus taking into account the value chain of these plastic products;

ii. The socio-economic groups involved in the plastics value chain, and thus playing a role in plastic pollution; and

iii. An overview of the costs and benefits to be taken into account when assessing the socio-economic impacts of available measure to reduce plastic pollution.

7.
In addition, this note presents an **overview of case studies and measures** which are being assessed as part of this study.

2 PLASTIC POLLUTION, MEASURES TO ADDRESS THE ISSUE AND SOCIO-ECONOMIC IMPLICATIONS: WHAT ARE WE ASSESSING?

2.1 Plastic bags and bottles: pathways to the sea

8. Plastic pollution in oceans and seas is just the final step of a long pathway, which starts with plastic production, continues with plastic uses and ends with waste disposal. To tackle plastic pollution, it is thud crucial to understand this pathway, as measures to reduce pollution can intervene along different steps of this pathway.

9. For the purpose of this study, the focus is on plastic bags and bottles. Understanding the pathways of these products to the sea means looking at the different steps of the value chain – from the production of raw plastic to the sale of finished bottles and bags to retailers and supermarkets – and then at the different pathways from consumers to the sea. The full pathways are hereunder presented in the Figures 1 and 2.

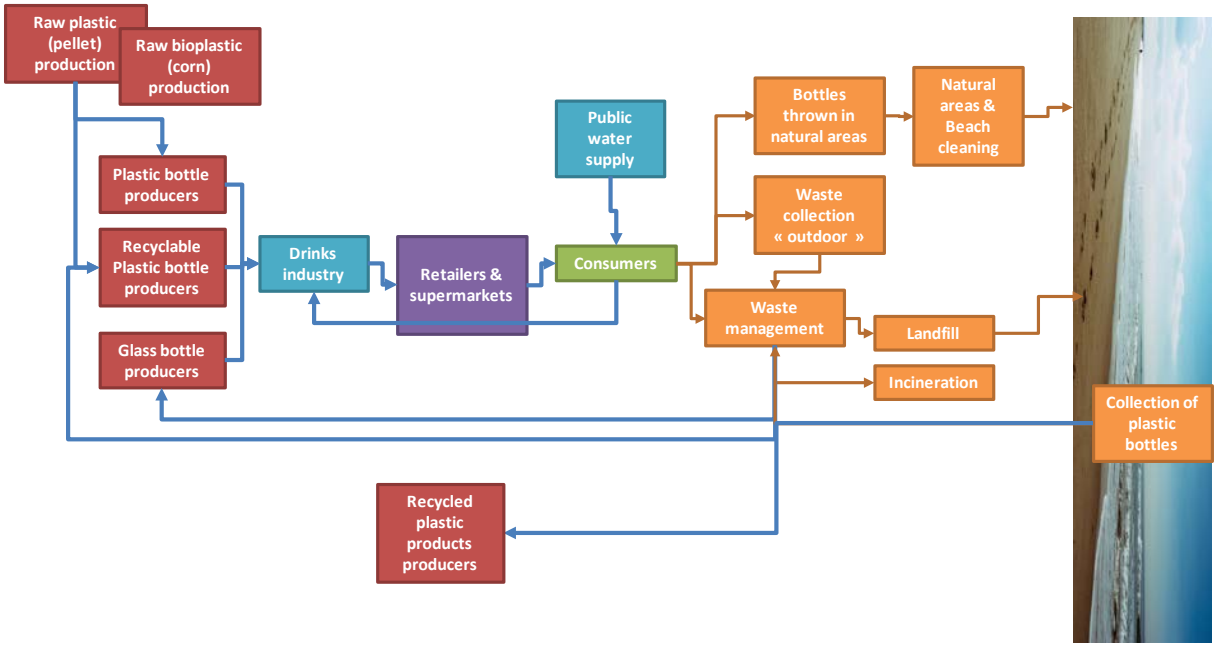


Figure 1: Plastic bottles: pathways to the sea

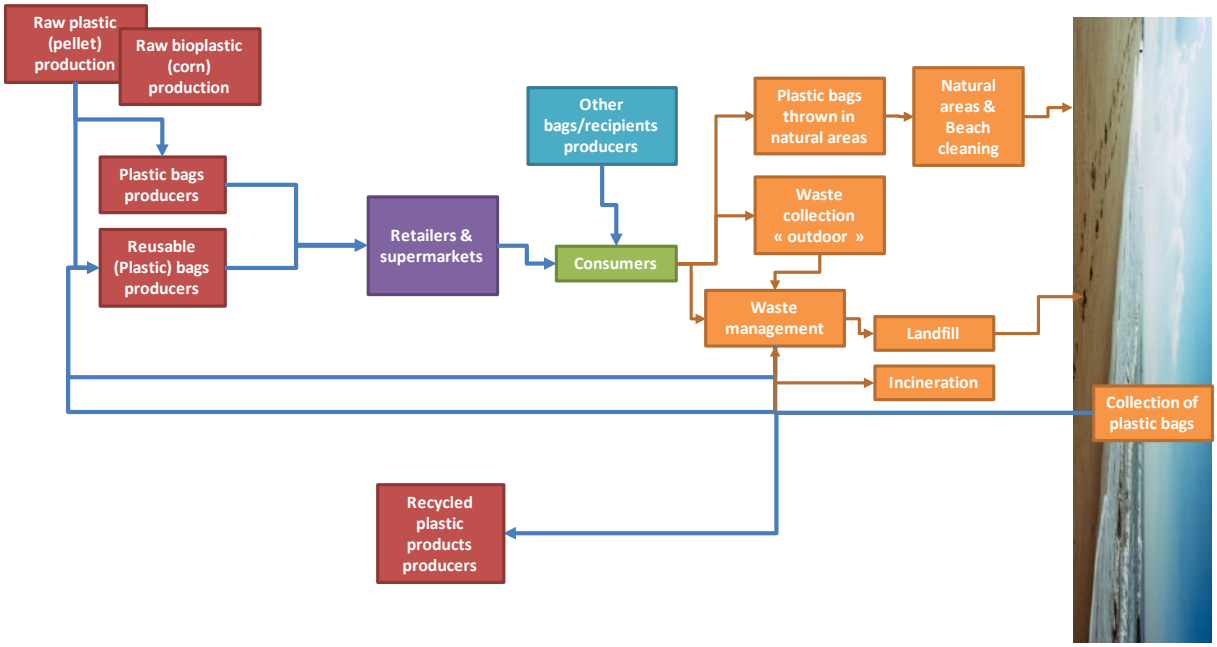


Figure 2: Plastic bags: pathways to the sea

2.2 Tackling pollution: who gains and who loses?

10. Identifying the pathways followed by plastic bags and bottles to our seas allows for identifying the key socio-economic groups involved. As different steps of the pathways can be tackled by measure aiming to reduce plastic pollution, this also means that different socio-economic groups will be either affected or will benefit depending on the measure and on the step of the pathway that is specifically targeted. For example, cleaning the beach for removing plastic bags and bottles lead to cleaning cost for local authorities and beach managers, but does not affect all other actors of the chain/system. To the contrary, a bottle deposit scheme will impact consumers, retailers, agro-industry producing drinks, and bottle producers.

11. Thus, identifying the socio-economic groups involved in these pathways is a key step of the socio-economic analysis carried out by this study: in fact, the study does not only assess the costs and benefits of each measure and case study, but it will also conduct a distributional analysis of these costs and benefits – in other words, who wins and who loses?

12. The key socio-economic groups involved in pathways to the sea are illustrated in Figure 3.

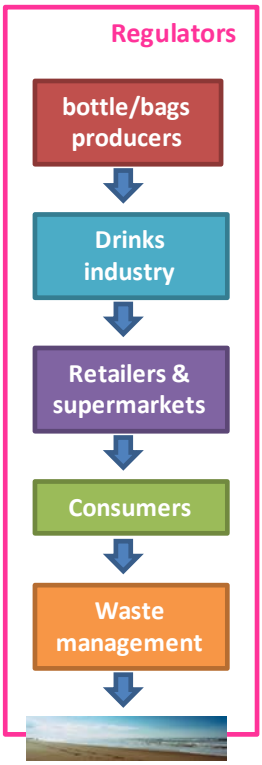


Figure 3: Key socio-economic groups involved in the pathways to the sea of plastic bags and bottles

2.3 Socio-economic analysis: which costs and benefits should be considered?

13. As indicated above, the study investigates the socio-economic impacts (costs and benefits) linked to the implementation of measures for preventing/reducing single use of plastic bags and bottles.

14. The socio-economic analysis at the level of both case studies and measures is the heart of this study, and the identification of which costs and benefits should be considered is thus crucial. To ensure comparability and continuity with previous Plan Bleu activities, this study applies a slightly adapted version of the classification of costs and benefits adopted in Plan Bleu, 2017[3], which includes:

- **Direct costs and benefits**, including all financial costs and benefits linked to design, implementation and enforcement of the measure, as well as compliance;

- **Direct economic impacts** – on the cost side, this category includes economic losses or gains for one specific sector following the introduction of a measure (e.g. increase/decrease of production/sales), as well as employment impacts of the measure;

- **Indirect benefits resulting from environmental improvement**: reduced plastic waste into the sea can result in economic benefits for some economic groups, such as for example Savings in the fishing sector due to less cleaning and repair operations;

- **Benefits linked to an increase in ecosystem services**: measure against plastic pollution can result in increased delivery of ecosystem services.

15. In addition, these categories of costs and benefits are assessed with specific reference to the socio-economic groups which are bearing the costs or enjoying the benefits, to include the distributional dimension to our analysis. The socio-economic groups involved in the pathways of plastic from production to the sea are all considered in the assessment, but other groups can be included in the analysis, as well as society as a whole – in fact, plastic pollution control measures aim at benefiting society at large in the first place.

16. The resulting assessment template for costs and benefits is illustrated in Table 1 in the following page. It will be applied to both case studies and measures. The table includes a final qualitative assessment of:

- Overall **impact on each specific socio-economic group** (including society); and
- Overall **balance of costs and benefits for each category** (direct, indirect, benefits from environmental improvement, and ecosystem services).

17. This will allow for identifying at a glance who wins and who lose, as well as whether the measure delivers more benefits than costs.

18. Costs and benefits are assessed combining qualitative and quantitative aspects, including in terms of impacts on employment, development of new economic activities/industries and contributions to the overall socio-economic development. Availability of, and access to, sound socio-economic data and information is key to assessing socio-economic impacts of measures (be it at regional scale or for individual case studies). In some cases, measures are only recently implemented and thus impacts on the quality of marine ecosystems and wider socio-economic impacts are not yet materialized. Also, the information available for linking measure implementation to quantities of plastic bags/bottles on the

[3] Plan Bleu (2017). Socio-economic tools for supporti ng the achievement of Good Environmental Status of Mediterranean marine waters. Valbonne, Plan Bleu. (Technical Report)

coast or at sea might not be available. The description of the socio-economic importance of a sector for the territory or the economy (in terms of total employment, revenue, value added and importance in balance of payment/experts & imports) will be used in some cases for stressing the importance of a sector negatively or positively affected by plastic bags/bottles pollution or measures aimed at reducing pollution, as this might be the only socio-economic data available for characterizing potential impacts.

Table 1: Template for assessing costs and benefits of case studies and measures, as well as their distributional aspects – The table includes examples of possible costs and benefits

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
Plastic industry	Compliance costs (e.g. expenditure in a new tax)	Likely: no gains	Economic losses (e.g. decrease in sales/ production)	Likely: no gains But maybe: investments in innovation and corresponding gains?			
Retailers	Compliance costs (e.g. expenditure in a new tax)	e.g. monetary rewards or fiscal incentives	e.g. increased expenditures in bio-plastic bags	e.g. Savings linked to largely reduced purchase of plastic bags and linked storage costs			
Consumers	Yearly expenditure (e.g. for new tax/charge)	e.g. monetary rewards	Unlikely	Unlikely			
Waste management	Compliance costs (if any, but could be unikely)	Unlikely (only in case of additional funding for recycling facilities)	Investments in new recycling facilities? (unsure)	Savings for waste management due to less waste to be managed			
Society	n/a	n/a	Employment losses	Employment gains	e.g. Saving of resources (mainly hydrocarbons, water and energy needed in the	e.g. Provisioning services: Reduced death, illness, intoxication and injury	

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
					manufacturing process of plastic bags)	of fish, shellfish and turtles caused by marine plastic bag waste; Cultural services: aesthetic and recreational services and non-use value increased	
Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning and repair operations		
Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

2.4 Cost-effectiveness, feasibility, acceptability: how to capture the different dimensions of the measures?

19. Costs and benefits, as well as distributional aspects, are not the only considerations to be made when assessing a measure to address plastic pollution in oceans and seas. As it will be shown in more detail in the following sections, other important aspects include:

- Cost-effectiveness: how does the measure perform as compared to its costs?
- Feasibility: when looking at practical implementation, is the measure feasible? Which constraints must be addressed?
- Acceptability: has the measure been easily accepted by stakeholders and, if not, why? Would accompanying measures increase acceptability?

20. These aspects are duly captured in the measures and case study factsheets (see section 3 below), and they represent important criteria to evaluate each measure and also to compare the different measures.

3 THE ASSESSMENT IN PRACTICE: MEASURES AND CASE STUDIES

21. The socio-economic analysis illustrated in the previous section is conducted at two different levels:

a. At the level of the **Mediterranean Sea** via a regional socio-economic analysis of **selected plastic prevention/reduction measures** that can be proposed by individual Mediterranean countries or at the regional scale; and
b. At the level of **practical case studies** that have implemented key practices, covering the diversity of natural, socio-economic and institutional/policy contexts that exists within the Mediterranean Sea region.

22. This study focuses on measures tackling specifically plastic bags and bottles. In addition, selected measures:

- Were identified as being relevant for the regional action plan;
- Are of particular interest for national policy makers;
- Can be easily replicated; and
- Can make significant differences – whereas other “softer” measures are being considered here rather as accompanying actions required for ensuring smooth and effective implementation.

23. As a first step, existing prevention/reduction measures, as well as examples of practical applications were inventoried through an extensive literature review, which allowed for building the necessary knowledge base for supporting this study. The literature review is detailed in Annex I to this summary note.

24. According to the literature, measures to address the littering issue can be divided into three types:

- Measures aiming at **reducing littering by raising awareness of selected target groups** (behavioral measures, aimed at changing the attitudes and perceptions that drive littering) with for example public and professional awareness raising campaign (“Ocean's Zero”, “European Week for Waste Reduction, “Let’s do it! Mediterranean” etc.);

- Measures aimed at **preventing littering** (preventive measures, aimed at improving the quality of infrastructure and product and packaging design) with direct cost and indirect cost; and
- Measures aiming at **cleaning up litter** in the environment (clean-up measures).

25. This study focuses on **measures tackling specifically** prevention and reduction of single use **plastic bags and bottles**. In the literature, a wide array of measures is available, including ban, taxes and charges, deposit-refund systems, awareness campaigns, reduction of plastic packaging, voluntary agreements, recycling, price differentiation, etc.: an overview of all available measures is provided in Annex II of this summary note.

26. In the context of this study, six measures were selected for the socio-economic analysis. In particular, **selected measures**:

- Were identified as being relevant for the regional action plan;
- Are of particular interest for national policy makers;
- Can be easily replicated; and
- Can make significant differences – whereas other "softer" measures are being considered here rather as accompanying actions required for ensuring smooth and effective implementation.

27. The selected measures are presented in Table 2 below.

Table 2: Measures selected for this study, assessed at the level of the Mediterranean Sea

Measure	Description	Who takes action?	What is targeted
Ban on plastic bags	Bans can forbid certain types of single-use plastic bags or rather focus on free distribution.	National policy makers	
Taxes and levies on plastic bags	Taxes and levy are used as an economic incentive to influence producers and consumers choices	National policy makers Industry	
Deposit-refund system	Deposit-refund schemes reward those consumers who return packaging material in exchange for cash or vouchers via a vending-type machine	National and local policy makers Industry	
Voluntary agreement approach	An agreement is signed between the State and retailers / supermarkets to reduce the sale of plastic bags	Policy makers and retailers	
Adopt-a-beach scheme	Actions to raise awareness and encourage tourists to take action to clean up the beaches.	Tourism and leisure sectors	All plastics
Fishing for litter	Remove marine litter from the marine environment and to raise awareness of marine litter issues, particularly within one of its main stakeholders: the fishing sector.	Fishermen, NGOs, Tourism and leisure sector	All plastics

28. A variety of practical applications of these measures can be found in the Mediterranean region: an overview of available case studies is provided in Annex III to this summary note.

29. The socio-economic analysis is conducted for six **selected case studies**, identified based on the following criteria

- The relevance of the case study for the regional action plan (to ensure measures considered in the case study are listed in the plan);
- Ensuring case studies cover a diversity of measures, of socio-economic contexts and of actors (at different scales: national to local, stressing that everybody can contribute at its own level to solving the problems);
- The availability of socio-economic data and assessments.

30. The selected case studies are presented in Table 3 below. A case study from Southern Mediterranean might be added to this list later on, depending on consultations with the Steering Committee of the study.

Table 3: Case studies assessed in this study

Country	Case study	Brief description
	**Ban on plastic bags**	Italy was the first European country to ban non-compostable single-use plastic bags in 2011. Originally, the ban only concerned shopping bags, whereas starting from January 2018 the ban has been extended to lightweight and ultra-lightweight plastic bags for fruits and vegetables.
	**Ban on plastic bags**	The law on the energy transition for green growth has imposed the ban on single-use plastic bags, operational since March 31, 2016. In addition, lightweigth and ultra-lightweight plastic bags are banned since January 2017, and they must be substituted with compostable plastic bags.
	**Tax on plastic bags**	The ban was established in 2016 as part of a wider policy on waste reduction and public participation. Tax revenues are deposited in the Maintenance and Cleanliness Fund. In addition, ultralightweight plastic bags in large supermarkets. are banned
	**Deposit-refund system for beverage packaging**	A deposit-refund system pilot project was set up in the tourist village of Cadaqués in Spain (Cap de Creus MPA). It implemented prevention measures related to the establishment of mandatory Deposits, Return and Restoration Systems for beverage packaging, prioritizing their recycling when possible
	**Life DeBag - Voluntary agreement and awareness raising**	The Life DeBag project implemented a pilot integrated awareness campaign for the reduction of plastic bags in the marine environment in the Syros island. The campaign also included training courses for teachers and replacement of plastic bags.
	**MARVIVA – Fishing for litter**	MARVIVA is a fishing for litter project promoted by the Catalan Waste Agency in 14 Catalan fishing ports (in collaboration with Barcelona Fishers Associations and the Port Authorities). The main objectives are to increase knowledge in the amounts, types and sources of marine litter; to raise awareness on marine litter issues and to promote best practices within the fishing industry.

31. The socio-economic analysis of measures and case studies is presented in the form of **measure and case study factsheets**. The templates, as well as some examples of factsheets in development, are provided in Annex IV and V to this summary note.

32. More in detail, the **measure factsheets** include the following section:

- Context: why this measure? Issues with plastic bags/bottles in Mediterranean Sea, environmental impacts, and on the sector(s) that is (are) targeted by the measure;
- The measure in the Mediterranean and beyond: scale at which it is applied of is under discussion, in the Mediterranean and elsewhere and debates around the measure;
- Implementing the measure: Description on the measure and accompanying measures whenever required; who is targeted, who is in charge of implementation/enforcement, opportunities and challenges for implementation, feasibility and acceptability of the measure, pre-conditions for successful implementation;
- Impacts: Description of different types of impacts and estimates of costs and benefits (qualitative, quantitative, monetary terms), with practical illustrations of benefit(s) or cost(s) that is seen as key – including the summary table on costs and benefits (Table 1 of this summary note); and
- Conclusions: advantages and challenges to implementation.

33. Similarly, the **case study factsheets** include the following sections:

- The context (localization, issues and challenges with the plastic bag/bottles in Mediterranean Sea);
- The process that has led to the implementation of the action: the different attempts to solve problems, the issues that led to the emergence of the measure and the actors involve in this initiative with their respective roles
- The proposed measure: description of the measure (actors involve, history of implementation if it evolved over time etc), accompanying measures that have been put in place for ensuring implementation and effectiveness, funding provided, etc.;
- Impacts: Description of different types of impacts and estimates of costs and benefits (qualitative, quantitative, monetary terms), with practical illustrations of benefit(s) or cost(s) that is seen as key – including the summary table on costs and benefits (Table 1 of this summary note);
- Pre-conditions for successful implementation: key factors, pre-conditions for success and discussing the transferability of proposed approaches to other places/countries that differ from cultural, socio-economic and waste context.

The assessment of the costs and benefits of specific measures and in case studies is on-going. Annex IV and V to this summary notes provide some example of the on-going work on measures and case studies.

The outcomes will be analysed and summarized in a structured way in the final report of the study.

4 REFERENCES

Plan Bleu (2017). Socio-economic tools for supporting the achievement of Good Environmental Status of Mediterranean marine waters. Valbonne, Plan Bleu. (Technical Report)

UNEP/MAP, 2018. Agenda item 4: Main elements for Regional Guidelines for Selected Marine Litter Prevention and Reduction Measures. Phase out single use plastic bags in the Mediterranean Region (Main Elements).

WWF, 2018. Out of the plastic trap. Saving the Mediterranean from plastic pollution!

Annex I
Building the knowledge base

Literature review

Much efforts have been put in identifying relevant literature. And the list of references will be progressively updated and complemented as activities dealing with case study and measure assessments are implemented. The references collected so far provide information and knowledge for different geographic scales: Mediterranean, Europe and other countries (International/outside Europe). Without listing all references collected, the main sources used to collect information on the situation in the Mediterranean as well as to evaluate the relevant measures and case studies are presented below:

- 3 studies on marine litter performed in parallel for the European Commission *Pilot project '4 Seas':* Case studies on the plastic cycle and its loopholes in the 4 EU regional seas (ENV.D.2/ETU/2011/0041). Anti-Littering Instruments: Feasibility study of introducing instruments to prevent littering (ENV.D.2/ETU/2011/0042). Plastic Packaging Loopholes: Loopholes in the flow of plastic packaging material (ENVD.2/ETU/2011/0043);
- Socio-economic tools for supporting the achievement of Good Environmental Status of Mediterranean marine waters (Plan Bleu, 2017);
- ActionMed Project: D3.1 Regional Programme of Measures Analysis - Analysis of the Regional PoM Gap analysis carried out in the framework of the UNEP/MAP EcAp initiative; D3.3 Action Plan on Implementing the PoM and the NAPs by integrating regional and MSFD requirements; D3.7 Medium and Long-term Regional PoM Action Plan (UNEP/MAP, 2016);
- Report of MED POL Focal Points meeting (Rome, May 2017) listing key measures under the priority cluster of Marine Litter;
- Working documents of the meeting on the main elements for the First Regional Meeting of Experts on the Six Pollution Reduction Regional Plans (Athens, Greece, 20-21 November 2018);
- Pollution plastique en Mediterranean. Sortons du Piège ! (WWF, 2018);
- Feasibility study of introducing instruments to prevent littering (EC DG ENV, 2013);
- Marine Litter Assessment in the Mediterranean (UNEP/MAP, 2015);
- Etude de diagnostic et remise à niveau de la filière de production des sacs en plastique en Tunisie. Phase 1 : Diagnostic de la situation actuelle et Benchmarking (Ministère des Affaires Locales et de l'Environnement. Direction Générale de l'Environnement et de la Qualité de Vie, 2018) ;
- Agenda item 4: Main elements for Regional Guidelines for Selected Marine Litter Prevention and Reduction Measures. Phase out single use plastic bags in the Mediterranean Region (Main Elements) (UNEP, 2018).

Additionally, there are several documents that present evidence on examples of measures and case studies such as:

- 25 innovative and inspiring solutions to combat plastic marine litter in the Mediterranean Region (SCP/RAC, 2017);
- List of showcases of marine litter measures (ACT4litter project);
- The Declaration of the Global Plastics Associations for Solutions on Marine Litter – Progress Report (Solutions on Marine Litter, 2016);
- The MARLISCO Guide for Reducing Marine Litter: Get Inspired and Become Innovative Through Best Practices (Marlisco, 2014).

Annex II
Review of potential measures

Measure	Who can carry the action ?	Type of litter	Short description of the measure
Ban	Policy makers at country level	Plastic bag	Two types of bans : Bans that forbid certain types of single-use plastic bags and ban on free distribution.
tax/levy	Policy makers at country level / Industry	Plastic bag	Taxes and levy are used as an economic incentive to influence producers and consumers choices
Deposit-refund system	Industry / Policy makers at country/local level	Bottles and plastic bag	Deposit-refund schemes reward those consumers who return packaging material in exchange for cash or vouchers via a vending-type machine
Public and professional awareness raising campaign / Clean-up campaign	Tourism and recreational sector / Policy makers at country/multilateral level / Waste management professionals	Bottles and plastic bag	Campaign to change consumers' behavior to phase out plastic bags in Mediterranean.
Reduce plastic packaging	Industry	Bottles and plastic bag	Reduce plastic packaging to the minimum required for safety, hygiene and consumer acceptance (essential requirements from packaging directive)
Voluntary agreement approach	Between Policy makers and retailers	Bottles and plastic bag	An agreement is signed between the State and retailers / supermarkets to reduce the sale of plastic bags
Providing alternatives to reduce single-use plastics	Industry / Policy makers at country	Bottles and plastic bag	Promote and propose alternatives to plastic in terms of practices and materials (eg. paper bags instead of plastic bags or glass bottles instead of plastic bottles)
Recycling / reuse plastic	Industry / Policy makers at country		Promote the recycling of plastic and the reuse of plastic bags and bottles
Price differentiation	Policy makers at country/local level	Plastic bag	Price differentiation can be used to encourage consumers to choose products and services that lead to less environmental damage.
Optimization of the waste collection system	Waste management professionals	Bottles and plastic bag	Develop and improve the waste collection and sorting system
Adopt-a-beach scheme	Tourism and recreational sector	All type of plastic	Actions to raise awareness and asking people to take action to clean up the beaches. For example, for "My beach" imitative the beaches contain signs, waste bins and flags to inform visitors to collect and dispose their own rubbish but to do the same for any litter washed up on the beach.
Fishing for litter	Fishermen, NGO, Tourism and recreational sector	All type of plastic	Remove marine litter from the marine environment and to raise awareness of marine litter issues, particularly within one of its main stakeholders : the fishing sector.

Annex III
Review of potential case studies

Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
Tax of single use of plastic bags	Malta	Fee/tax/levy	Malta has an eco-tax of €0.15 in place since 2009.
	Cyprus		Lightweight plastic bags are charged €0,05 as of 1 July 2018. The law was adopted in November 2017 and came into effect on 1 January 2018, with a 6 month transition period.
	Greece		Since January 2018, there is an ecotax of €0,04 tax in place for lightweight plastic bags. The tax will rise to €0,07 as of 2019. Kiosks and open-air markets are exempted.
	Portugal		A tax of €0.10 on plastic bags is in place since February 2015
	Slovenia		It will be prohibited to give lightweight plastic bags for free from January 2019. The minimum price is the purchasing price by retailers. Many supermarkets have already taken the initiative to not hand out free plastic bags anymore
	Catalonia (Spain)		A decree from May 2018 prohibits the free distribution of lightweight plastic bags from July 2018. It excludes very lightweight and ticker recycled bags. The amount of the tax has not been set yet, and the regions are yet to adopt the appropriate measures to transpose and implement this decree. The same decree foresees a ban on lightweight and very lightweight plastic bags (except for compostable bags) as of 2021.
	Turkey		In January 1st, 2019, plastic bags will be charged. There is also a national zero waste program that is being put in place
Ban of single use bags	Italy	Ban	A ban on lightweight plastic bags is in place since 2011. This led to a reduction of plastic bags consumption of more than 50% since 2011
	France		A prohibition of single-use plastic bags at cash points was put in place from 1 July 2016. Since 1 January 2017, a prohibition of plastic bags, including other than cash bags, is effective. Plastic bags that are totally or partially bio-based and home compostable are exempted
	Morocco		A Ban in place since 2016. It's the law "zéro mika"
	Belgium		Since 2017
Implementing deposit-refund scheme for beverage packaging	Catalonia (Spain)	Deposit-refund system /reverse vending machines	A deposit-refund system pilot project was set up in the tourist village of Cadaqués in Spain (Cap de Creus MPA). It identified and implemented prevention measures related to the establishment of [mandatory] Deposits, Return and Restoration Systems for beverage packaging, prioritizing their recycling when possible
Deposit fund system for beverage packaging at UB	Catalonia (Spain)		The University of Barcelona has put in place a deposit-refund system (Retorna UB) for cold beverage containers. With this system, the beverages sold in vending machines and soda water incorporates a deposit of € 0.10, which can be recovered by returning the empty container to the machines.
Implementing deposit-refund scheme for beverage containers	Israel		Two laws in Israel deal with beverage containers: the law on deposits and the law regulating the treatment of packaging. The Deposits Act stipulates that for each 1.5 liter beverage and any

Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
			material, the consumer must pay a deposit of 30 agorot, which will be returned when the empty container is returned to the collection point. In 2012, about 700 million containers for family drinks were sold in Israel, of which about 335 million were collected. The collection target for large beverage containers as soon as the law enters into force in 2014 on deposits is 65% for the first two years and 71% for the next two years.
The "We win by recycling" initiative, providing businesses with Reverse Vending Machines	Spain		A Spanish SME commercialise Reverse Vending Machines (RVMs) to provide certain businesses (mainly retailers) under a franchise agreement and later buy the beverage containers collected. The user is incentivized by receiving money or discounts at participating businesses.
Green Med Initiative	Egypt, Italy, Lebanon, Tunisia, France and Spain		The Green Med Initiative is a European ENPI CBC project managed by the Chamber of Commerce, Industry & Agriculture of Beirut and Mount Lebanon (CCIA-BML) in partnership with 11 Mediterranean organizations from 6 Euro-Med countries: Egypt, Italy, Lebanon, Tunisia, France and Spain. This initiative has tested RVMs systems in pilot projects at universities in Catalonia (Spain), Egypt, Italy, Lebanon and Tunisia. The machines placed at these universities gave out raffle tickets for leisure activities for each beverage container returned.
Bottle Bill Resource Guide	Croatia		Waste are separate at home and people participate in systems for separate collection and deposit refund systems, Croatia's Ordinance on Packaging and Packaging Waste is a broad-sweeping law that covers stewardship policies for all types of packaging materials. Beverage containers receive special consideration in the law, with their own fees and policies
Operation Clean Sweep	Mediterranean and international	Promoting EPR	Examples of training measures for workers include the UK CIWEM waste awareness course, training for employees of plastics manufacturing companies under the international Operation Clean Sweep and the ProSea Marine Environmental Awareness course. The campaign's goal is to help manufacturers and operators to implement good practices to work towards achieving zero pellet, flake, and powder loss.
DeFishGear project	The 7 countries of the Adriatic-Ionian macro region	Fishing for Litter	Within the framework of the IPA Adriatic DeFishGear project, fishing for litter activities were implemented in the 7 countries of the Adriatic-Ionian macro region.
Ecopuertos	Spain		The objectives of the Eco-ports (Ecopuertos) project in Motril (Spain) are: collection, classification and quantification of all the waste generated in the course of daily fishing activities (both produced on board or in the port area), awareness campaigns and clean-up campaigns with schoolchildren, walkers, centres and diving clubs

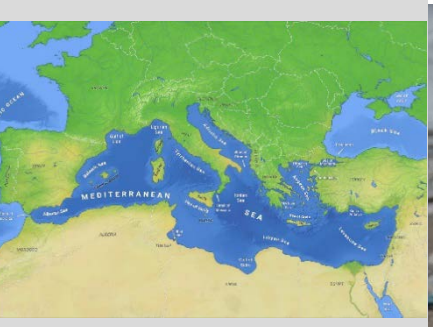
Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
Fishing for Litter - KIMO	8 countries : Netherlands, UK, Faroe island, Ireland, Norway, Germany, Spain and Belgium		In 2004 KIMO International started a simple yet imaginative project to tackle the problem of marine litter. Fishing for Litter aims to reduce marine litter by involving one of the key stakeholders, the fishing industry. Fishing boats are given large bags to collect the plastics, ghost gear and other debris that gathers in their nets during normal fishing activities. When the fishing boats come into port, they can unload the bags of litter. These bags are collected regularly and the rubbish is recycled or disposed of on land. All the fishermen who participate in the project are volunteers. On a daily basis, they are out at sea removing rubbish from the ocean. Fishing for litter activities were implemented in the 8 countries : Netherlands, UK, Faroe island, Ireland, Norway, Germany, Spain and Belgium.
The MARVIVA	Spain		MARVIVA is fishing for litter project promoted by the Catalan Waste Agency in 14 Catalan fishing ports (in collaboration with Barcelona Fishers Associations and the Port Authorities). The main objectives are to increase knowledge in the amounts, types and sources of marine litter; to raise awareness on marine litter issues and to promote best practices within the fishing industry.
"Adopt a beach/Sponsor your beach" campaign	Spain	Adopt-a-beach	The «Sponsor your beach» campaign aims to include schools in the conservation of marine ecosystems as part of the annual teaching activities through the sponsorship of a beach in their municipality.
Surfrider Beach Tour	France		After a first edition that reached more than 80,000 people on beaches and social networks in France, and face the success met, Surfrider Foundation Europe decided to launch the second edition of the Surfrider Beach Tour. The Tour will therefore crisscross 2 French coastal regions, over 4 stages, in order to reach holidaymakers and make them aware of the eco-gestures essential for the preservation of the oceans.
My Beach Initiative	Netherlands		Currently there are 6 stretches of beach in the Netherlands that have implemented the My Beach Initiative. The beaches contain signs, waste bins and flags to inform visitors to collect and dispose their own rubbish but to do the same for any litter washed up on the beach.
LIFE DEBAG project	Greece	Voluntary agreement approach and Public and professional awareness raising campaign	Integrated information and awareness campaign for the reduction of plastic bags in the marine environment. The basic "pilot" of the implementation's actions is the island of Syros. Training courses for teacher, campaign for the replacement of plastic bags etc.
The Ocean Washing-Up Liquid Bottle	France	Recycling / recovery plastic	Integrated information and awareness campaign for the reduction of plastic bags in the marine environment. The basic "pilot" of the implementation's actions is the island of Syros.

Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
			Training courses for teacher, campaign for the replacement of plastic bags...
The Blue Lid Campaign	Turkey		A plastic bottle made from bioplastics, recycled plastics and plastics fished from the oceans .Recycling plastic bottles to make new bottles with 50% plastic bottles in the ocean
ECOALF	Spain		It is a social responsibility project that was widespread all over the country (Turkey) for supplying wheelchairs in exchange of plastic bottle lids to those who need a wheelchair but cannot afford to have one.
Clickeat		Providing alternatives to reduce single-use plastics	ECOALF was created in Spain in 2012. Since then and to this day, it produces a collection for men and women made of recycled marine debris. Collected with the help of Spanish fishermen, it is 100% traceable, 100% recycled and manufactured in Spain. The yarn is the only one on the market that comes from the bottom of the ocean and allows ductile clothing to be made by covering the filament with Tencel®, linen and recycled cotton. The yarn made from the waste from the bottom of the ocean saves 20% in water, 40% in energy and reduces CO2 by 50%.
DEC, designing with cardboard	Spain		Simplo® is a company dedicated to innovate through design and promote sustainability by replacing single use plastics. Our mission is to create new products and solutions that improve the experience of use, performance and once disposed, are harmless to the environment and, of course, cost effective.
LIFE PlasTex	Croatia	Optimization of the waste collection system	Through this project a Plastics Waste Platform will be established. The main aim of this Platform will be to join all stakeholders interested in finding the best available solutions for plastics waste management issue in Croatia, promote and drive activities to prevent plastics entering the marine environment, and work on educational and research programs. The Platform should help to establish plastic waste trade activities collecting the data from utility companies with collected amount by sort of plastic waste and the industry willing to buy it for use in the production of new products. The output of this project will be new products made from collected plastic waste.
The MSC Cruises trial	Italy	Optimization of the waste collection system and Deposit-refund system	The MSC Cruises trial is an annual plastic packaging recycling initiative. MCS cruises separately collect plastic packaging on board and cruise ships dock at Italian ports to direct the collected waste to the nearest After the operational costs are deducted, the additional revenue, that is generated, will be given to charity (Italian Red Cross).recycling facilities.
Riciclaestate (Summerecycling)	Italy	Public awareness raising campaign /	Riciclaestate (Summerecycling) is a historic Legambiente awareness campaign, that started in 2005, on sustainable tourism and recycling in 90 coastal municipalities of Campania and Liguria. During the three months of the campaign, a real

Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
		Clean-up campaign	tour takes place, involving a playful recycling lab with the distribution of information material at the beaches of the localities involved, with the aim of increasing the percentage of differentiated collection by improving the quality, collection and recycling of waste at Municipalities.
"Let's do it! Mediterranean"	Med		Initiative on clean up and raising awareness, For example one of their last campaign have gathered more than Half a million volunteers for the waste Cleanups in 9 countries.
Ocean's Zero	Europe		Do it yourself, simple actions to adopt and good reflexes, Ocean's Zero accompanies you to a zero waste lifestyle with 25 challenges to reduce your impact on the environment and the oceans. At your own pace, you will be able to follow your progress and measure the positive effect of each of your actions. Whether you are new or advanced in the zero waste approach, you will find all the information you need to significantly reduce your waste production.
"European Week for Waste Reduction" initiative	Europe (France, Italy, Spain…)		Reduction project has been developing communication tools to support awareness-raising actions about sustainable resource and waste management.
Marlisco	Europe	Public and professional awareness raising campaign / Clean-up campaign	MARLISCO was a European initiative, which developed and implemented activities across 15countries. It worked towards raising social awareness and engagement on marine litter, through a combination of approaches (public exhibitions, a video competition, educational and decision-supporting tools, events with Stakeholders).
Keep the Mediterranean Litter Free Campaign	Mediterranean		Different types of activities were implemented in several Mediterranean countries such as beach clean-ups, exhibitions and workshops, photo contests, etc. with the participation of educators and students, seafarers and staff of ships' managing companies, national and local authorities, port authorities, NGOs and the civil society at large. The main "vehicles" of the campaign included: a poster/pamphlet presenting the various causes and impacts of marine litter but also highlighting the role and responsibilities of all actors concerned, produced in 10 languages (Albanian, Arabic, English, French, Greek, Italian, Maltese, Portuguese, Spanish and Turkish);
"Ecogeste in the Mediterranean" campaign	Mediterranean		The 'Côte Bleue Marine Park' is involved in a campaign for environmental education entitled «Ecogeste in the Mediterranean". The EcoGeste campaign also raises the awareness of all sea users about the issue of marine litter.
Plastics: Too Valuable To be Thrown Away	Croatia		Is an educational project for citizens and public administration, promoted by the Croatian Chamber of Economy (CCE), and Association of Plastics and Rubber Industry. It's aimed to the marine environment protection, to enhance recycling and

Name of the case study	In which geographical area ?	Measure(s) concerned	Brief description of the case study
			energy recovery, also promoting the selective collecting of household waste, especially plastics

Annex IV
Measure Factsheets: Proposed Templates and Examples in development



NAME OF THE MEASURE

1-2 sentence description of the measure

Why this measure?

The state of plastic bags/bottles in Mediterranean sea, environmental impacts, and on the sector(s) that is (are) targeting by the measure (e.g. the quantity of plastic bottles produced or imported if the measure target plastic bottle producers => the text will need to target what is relevant for the measure

Quote from the expert

Key sentences stressing why this measure is desirable in the MED basin (preferably from interviews, but also from key publications if any?)

The measure in the Mediterranean and beyond

Med countries where the measure is already in place, under which form and since when

Med countries where the measures is under discussion

Rest of the world: is it in place somewhere else?

Relevant public debate(s) around this measure

Implementing the measures

Who is involved in implementation, and with which role(s) + particular institutional/ Who has been involved so far in implementation, and with which role(s) + particular institutional/ governance arrangements needed to set up the measure?

Approach to plastic reduction: regulatory, voluntary, etc.

If voluntary approach: would incitative approaches (e.g. financial incentives but also others) be needed, or have they been put in place?

Accompanying measures that have been put in place, including for monitoring and evaluating impact/ effectiveness and including incitative approaches in the case of voluntary measures

Implementation costs

Existing or desirable financing mechanisms (if needed/ relevant)

Pre-conditions for successful implementation

Key factors that explain effective implementation and delivery of results, pre-conditions for success (e.g. willingness of actors to be involved, favorable governance/ institutional settings, etc.)

Potentially: identifying Mediterranean Sea region countries where the measure would be seen as having a clear potential (and explain why) as compared to alternative measures

Main challenges to implementation

Main challenges and how these have been or could be overcome

Key facts
Key point(s) to be highlighted

The measure
Description of the measure

Feasibility and acceptability
Key messages emerging from this page

Effectiveness of the measure and related benefits

Benefits: key figures
Please summarize key monetary or quantitative figures on the benefits of this measure

Effects of the measure on use of plastic bags and bottles (or other types of plastics if relevant)

Effects on discharges to the sea and marine ecosystems

Changes in ecosystem services

Other positive effects of the measure(s), in particular socio-economic effects

Corresponding monetary benefits → If this is not available, please look for quantitative information (e.g. jobs gained, but also indicators mentioned above)) → if this is not available, we'll have to make ourselves happy with qualitative information

BUT, as much as possible: practical illustrations with examples of benefits that have been estimated and monitored in countries where the measure is already implemented for a benefit that is seen as key. For example: benefits for the ecological status of the sea and related ecosystems, avoided costs (e.g. cost of cleaning beaches that will not be required anymore), impact on employment and on the emergence of new economic sectors (e.g. producers of glass bottles or companies making new waste separation equipment…)

Who benefits from this measure? Operators/ actors/ sectors, and where

(this can be up to 1 page)

Negative impacts and related costs of the measures

Costs: key figures
Please summarize key monetary or quantitative figures on the costs of this measure

Description and (whenever possible) quantification of negative impacts of the measure(s), including environmental (hopefully none) but in particular socio-economic negative effects + operators/ actors/ sectors that are impacted, and where – also, are vulnerable groups impacted?

Corresponding monetary costs → If this is not available, please look for quantitative information (e.g. jobs lost) → if this is not available, we'll have to make ourselves happy with qualitative information

BUT, as much as possible: practical illustrations of costs that have been estimated and monitored in countries where the measure is already implemented for a cost that is seen as key. For example: costs of the measure (for the regulatory, for the private operator, for consumers…) including administrative costs and indirect costs (potentially loss of employment for some sectors), impact on employment and on the emergence of new economic sectors (e.g. plastic producers)

(this can be up to 1 page)

In synthesis…

Overview of costs, benefits and distributional impacts

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
Plastic industry	Compliance costs (e.g. expenditure in a new tax)	Likely: no gains	Economic losses (e.g. decrease in sales/ production)	Likely: no gains But maybe: investments in innovation and corresponding gains?			
Retailers	Compliance costs (e.g. expenditure in a new tax)	e.g. monetary rewards or fiscal incentives	e.g. increased expenditures in bio-plastic bags	e.g. Savings linked to largely reduced purchase of plastic bags and linked storage costs			
Consumers	Yearly expenditure (e.g. for new tax/charge)	e.g. monetary rewards	Unlikely	Unlikely			
Waste management	Compliance costs (if any, but could be unikely)	Unlikely (only in case of additional funding for recycling facilities)	Investments in new recycling facilities? (unsure)	Savings for waste management due to less waste to be managed			

Overview of costs, benefits and distributional impacts (cont'd)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Society	n/a	n/a	Employment losses	Employment gains	e.g. Saving of resources (mainly hydrocarbons, water and energy needed in the manufacturing process of plastic bags)	e.g. Provisioning services: decreased ingestion of marine plastic bag waste by animals; Cultural services: aesthetic and recreational services	
Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning /repair		
Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion…

Advantages and challenges to implementation

Table listing advantages and implementation challenges for the measure – helping to grasp easily both some benefits and practical implementation challenges

Want to know more ?

Key publication/ article/ website (1-2 maximum) for people interested in knowing more

References

Deposit-refund systems for single-use beverage packaging

In short

Deposits are charged for beverage packages which consumers get back when they return empty packages to the retailer.

Why this measure?

Studies show that over 80% of ocean plastics derive from land-based sources. Hereof, close to 40% are beverage container (bottles/cans) or beverage container related (caps/straws) items (Morgenstern 2017). It is in particular in the Mediterranean (and Black) Sea that beverage containers tend to be among the most common marine litter items found (Van Acoleyen et al. 2014).

Deposit-refund systems (DRS) put value on waste, and provide economic incentives to consumers to return beverage packages to retailers. They are a proven tool to collect high quantities of empty beverage containers for reuse and high-quality recycling (CM Consulting and Reloop 2016). A study made for the EU territory (Van Acoleyen et al. 2014) estimates that the total number of beach litter items would be reduced by 11.9% for the Mediterranean Sea coast in case of implementing a DRS for single-use beverage packaging in all Mediterranean EU countries.

"Deposit-return systems (DRS) are a proven tool to collect high quantities of empty beverage containers for reuse and high-quality recycling, and are vital to achieving a circular economy" (CM Consulting and Reloop 2016).

The measure in the Mediterranean and beyond

Among Mediterranean countries, deposit-refund systems are in place in Israel (since 2001) and Croatia (since 2005). In both countries, the beverage packaging system model includes plastic (in particular PET), metal (in particular aluminum), and glass. A deposit refund system is planned to be introduced in Malta by December 2019 (Maltese Ministry of Environment, 2018). The scheme will apply to metal cans, plastic and glass bottles. Furthermore, pilot applications have been conducted in Catalonia, Spain: in the city of Cadaqués, and in the University of Barcelona.

In the EU, in addition to Croatia, a mandatory deposit-refund system for PET and other single-use beverage packaging is in operation in another seven countries (Drab and Slučiaková 2018), which are home to over 130 million people (CM Consulting and Reloop 2016). DRS are furthermore in place in parts of the US, Canada and Australia.

The establishment of mandatory deposit, return and restoration systems for beverage packaging forms part of the measures for preventing marine litter which have been identified by the United Nations Regional Plan for the Marine Litter Management in the Mediterranean (UNEP/MAP, 2013; Article 9).

Implementing the measures

Most deposit-refund systems include PET, cans and glass, some schemes involve reusable packaging. Systems differ from each other for example regarding the type of beverages which are concerned. Most countries exclude packaging with milk and fruit juices, due to hygienic reasons. Very small (less than 0.1 litres) and very big (over 3 litres) beverage packaging are usually excluded as well. Deposit amounts in Europe vary from EUR 0.07 in Croatia to EUR 0.40 for certain beverages in Finland (Drab and Slučiaková 2018).

Existing systems are not always directly mandatory for producers. In some cases, environmental taxes are used to indirectly motivate producers to include their packaging into the deposit-refund system. In Finland, for example, producers are obliged to pay the an environmental tax of EUR 0.51/litre unless they are involved in the system (Drab and Slučiaková 2018).

Implementing a DRS affects several stakeholders: individual consumers (which pay the deposit and are asked to return packaging to the retailer), retailers, producers of beverages and beverage packaging, and entities/companies in charge of recycling the collected material. There is also a social effect of the measure, as evidence shows that non-deposited bottles are picked up to recover the deposit.

All deposit-refund systems have a so-called "**central system**". It is an organisation coordinating the activities of individual actors. Its powers differ depending on the country. In the Scandinavian countries, for example, it is also the accounting unit, in Germany it does not balance the deposits and has no records of actually returned bottles (Drab and Slučiaková 2018)

Retail is a central part of the DRS. As they are not a polluter (like the producer placing the packaging on the market and the citizen who does not return the packaging), individual schemes pay to the retail a **handling fee**, which covers the costs linked to collection. In particular for bigger stores, collection takes place through reverse vending machines. In Norway, their purchase costs are included in the handling fee. In Sweden, one machine per shop is reimbursed, whereas no compensation takes place in Finland. In Lithuania, the central system leases the machines (Drab and Slučiaková 2018).

In Croatia, unlike traditional deposit systems, the system operates with fees which are paid by producers. Consumers do not pay a deposit on beverage containers, but they do receive compensation from sellers when they return the empty containers.

Key facts

In many cases return rates for packaging material subject to deposit-refund systems are over 90%, making the measure very effective in preventing littering.

The measure

Within deposit-refund systems customers pay a deposit in addition to the product price when buying a beverage in a PET bottle or can. The shop pays the money back when the empty packing material is returned. Subsequently it is recycled.

Feasibility and acceptability

A survey on the deposit system for plastic bottles of mineral water was conducted in Algeria in 2010 with 165 participants. It showed that the majority (89%) supported a deposit system for this type of bottle (Djemaci, 2011).

Furthermore, a survey made in the pilot case of the city of Cadaqués, Spain, to assess the level of acceptance and public perception showed that 61% of the respondents perceived improved cleanliness in a number of public spaces and streets during the pilot and 85% of the respondents supported the implementation of a DRS (Van Acoleyen et al. 2014).

Pre-conditions for successful implementation

Deposit-refund schemes for beverage containers are often legally binding for producers and/or retailers, and provide at the same time **economic incentives** for consumers to participate. Individual benefits or disadvantages seem to be very effective in increasing collection rates of good quality material for recycling, and a quite **fast change in behavior** can be observed. However, the introduction of the system needs to be accompanied by good communication, emphasizing the effectiveness of the measure as well as the sense-of-urgency to act with regards to the environmental problem of littering. This will increase social acceptance of the instrument (Van Acoleyen et al. 2014, Djemaci, 2011).

To ensure that cross-border movement of beverage packaging is not accompanied by littering of the imported packaging, care should be taken to ensure coherence between different schemes (Van Acoleyen et al. 2014).

A way to further increase the effectiveness of DRS to avoid littering would be to extend them to bottle caps/lids. In this case the refund would be valid only when the bottle includes its lid/cap, or alternatively a premium can be paid for bottles with lids/caps. This could be expected to have a positive impact on the occurrence of this type of litter item (which is among the top items in every regional sea) (Van Acoleyen et al. 2014).

The main objective of systems of redemption and recycling of beverage packaging is usually attaining high return rates and recycling rates as well as a high quality of the collected packaging material. When introducing such systems, existing recycling markets, but also the political will to extent recycling markets, constitute hence important framework conditions (Albrecht et al. 2011). In addition, in order to ensure the efficiency of the plastic bottle deposit system, this system must be combined with other economic instruments, in particular recycling subsidies and packaging taxes (Djemaci, 2011).

Main challenges to implementation

The main disadvantage of the DRS lies in the high costs for the installation of reverse vending machines as well as following operational (in particular transport) costs (Drab and Slučiaková 2018; RPA, Arcadis, and ABPmer 2013). These costs are often only partly covered by revenues through uncollected deposits as well as by selling the collected raw materials.

In addition, concerns in particular of retailers can be expected at least in the first phase of the DRS implementation. However, according to the experience made in Cadaqués, Spain, “concerns regarding the loss of space due to the storage of empty containers have almost entirely dissipated, as have concerns related to an increased workload. Fears of a decrease in sales have also been reduced, with the prevailing position that the system would not have a negative effect and that it would not affect the number of customers. […] All shopkeepers and retail outlet managers interviewed support the implementation of the system in Catalonia” (Van Acoleyen et al. 2014).

Effectiveness of the measure and related benefits

Applications of deposit-refund systems show high return rates (e.g. 89% in the Danish system, and 98% in the Norwegian system). As a consequence, low rates of littering of single-use beverage packaging can be expected when a DRS is in place. The system encourages on the one hand people not to throw their used containers or bottles out, and at the same time provides incentives to collect undeposited or "stray" bottles (Van Acoleyen et al. 2014).

Different benefits of the measure can be identified:

- Cleaner public spaces due to less littering, and less need for cleaning activities. The latter is linked to reduced costs of cleaning. In the case of Slovakia, the estimated (potential) saved costs of littering removal following the introduction of a mandatory DRS lie between EUR 630,000 and EUR 2,710,000 (for the cleaning of protected areas, roads, streets and rivers) (Drab and Slučiaková 2018).
- Reduction of bin volume occupied by plastic bottles, which leads to lesser costs for waste collection. In the Cadaqués pilot application, reduction on collection costs has been estimated to be between 6.5-9.5% of the annual cost of collection of light packaging and undifferentiated waste (Van Acoleyen et al. 2014). In addition, less collected waste ends up in landfills.
- Higher recycling rates for beverage packages. Revenues from the secondary raw material will increase, as the collected PET and aluminium cans have a positive market value in contrast to many other waste types. In addition, the collection system allows for high quality recycling material, as the packaging material is presorted. This will on the one hand increase its market price, and on the other hand create societal benefits, as fewer raw materials are needed for new production processes.
- Nearly all mandatory deposit-refund systems work with barcode-based recording systems, which allow exactly **monitoring** how many products were placed on the market, and how many were collected (Drab and Slučiaková 2018; CM Consulting and Reloop 2016).
- Positive effects on **employment** can also be expected, through additional jobs created in the central administrative system, the collection system, as well as linked to reprocessing/recyclers. For the UK, the additional employment benefit from a country-wide DRS implementation was estimated to lie between 3,000 and 4,300 full-time equivalents (Hogg et al. 2011).
- In comparison to primary PET, recycling can reduce the **use of primary energy** by 54 % and **emissions of greenhouse gases** by 23 % (Kuczenski and Geyer 2009, in Drab and Slučiaková 2018). The total impact on CO_2 emissions is usually evaluated as positive, but has to be opposed to additional costs of transport which causes additional emissions of CO_2 (Drab and Slučiaková 2018).
- Other positive environmental effects based on less littering are stated in WWF (2018): Polythene, which is used for example in

Benefits: key figures

The rate of return of deposit-refund systems often reaches more than 90%.

plastic bottles, accumulates more organic pollutants than any other type of plastic. These pollutants can then be absorbed by marine animals which ingest pieces of plastic. Reducing the input of plastic bottles in the sea reduces the risk of plastic ingestion by marine animals.

Van Acoleyen et al. (2014) emphasise that assessing the impact of a DRS requires assessing the amount by which the recycling of this kind of packaging is increased. In countries where current recycling levels are already quite high due to existing separate waste collection systems, the effect of introducing a DRS will be lower than in countries which do not have separate waste collection systems in place. A report from 2014 states that in the southern shores of the Mediterranean there is virtually no sorting of waste at source, and recycling rates for municipal waste are quite low, compared to EU countries (8% in Morocco in 2010; 7% in Algeria in 2012) (Boudra 2014). The room for improvement is hence very high in these countries.

Negative impacts and related costs of the measures

Description and (whenever possible) quantification of negative impacts of the The main disadvantages of DRS are the high costs to install the system. Revenues from uncollected deposits and raw material sold are not enough to cover the costs of its operation (Drab and Slučiaková 2018). According to a recent feasibility study carried out for Slovakia, three quarter of the total installation costs (about EUR 80 million) would concern the purchase, installation and service of **reverse vending machines**. The rest will cover the costs of system security, and manual collection, but also the establishment of the central system (Drab and Slučiaková 2018). In Scotland, one-off/setup costs have been estimated to be around EUR 42 million (Hogg et al. 2015). In addition, **operating costs** need to be considered, which include in particular **transportation costs,** as collected material needs to be sent back to the recycling company, as well as **retail costs**.

In case there is a negative balance between revenues and costs, it is often paid **by producers** through **administrative fees**. In the case of Slovakia, the feasibility study estimated that total producers' costs of packaging collection would more than triple from the current annual costs (Drab and Slučiaková 2018).

Other costs of the introduction of a deposit-refund system will depend on whether a separate collection system is already in place. In this case, by handling PET bottles and cans through the DRS, the separate collection scheme will lose valuable raw materials, which will increase the costs of the system.

The academic literature comparing the total costs and benefits of the deposit-refund system is ambiguous, citing cases in which benefits exceed costs, and other cases where costs seem to be higher than the benefits gained from the introduction of the system (Drab and Slučiaková 2018). Revenues from uncollected deposits are often not sufficient to cover the costs of operation of the system, and benefits from improved collection and recycling rate depend on whether a separate collection system has already been in place before (and how it performs). The adequacy of introducing a DRS in a country needs hence to be evaluated case by case.

Costs: key figures

Important costs are linked to the installation and operation of reverse vending machines

In synthesis…

Overview of costs, benefits and distributional impacts (to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
Plastic industry	Compliance costs (e.g. expenditure in a new tax)	Likely: no gains	Economic losses (e.g. decrease in sales/ production)	Likely: no gains But maybe: investments in innovation and corresponding gains?			
Retailers	Compliance costs (e.g. expenditure in a new tax)	e.g. monetary rewards or fiscal incentives	e.g. increased expenditures in bio-plastic bags	e.g. Savings linked to largely reduced purchase of plastic bags and linked storage costs			
Consumers	Yearly expenditure (e.g. for new tax/charge)	e.g. monetary rewards	Unlikely	Unlikely			
Waste management	Compliance costs (if any, but could be unikely)	Unlikely (only in case of additional funding for recycling facilities)	Investments in new recycling facilities? (unsure)	Savings for waste management due to less waste to be managed			

In synthesis…

Overview of costs, benefits and distributional impacts (cont'd – to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Society	n/a	n/a	Employment losses	Employment gains	e.g. Saving of resources (mainly hydrocarbons, water and energy needed in the manufacturing process of plastic bags)	e.g. Provisioning services: decreased ingestion of marine plastic bag waste by animals; Cultural services: aesthetic and recreational services	
Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning /repair		
Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion...

Advantages and challenges to implementation

- The outstanding advantage of a mandatory deposit-refund system for single-use beverage packaging is its provable performance. The rate of return often reaches more than 90%. This makes the measure very effective.

- However, costs of introducing and operating the system are high, in particular linked to reverse vending machines.

- The decision on introducing the system in a country needs to consider the current recycling rates of material included in the system (in particular PET and aluminum).

Want to know more ?

http://www.bottlebill.org/legislation/world/croatia.htm
The planned DRS in Malta: www.bcrs.gov.mt
Estimated costs for a DRS in Spain: http://www.retorna.org/mm/file/Implementing%20a%20Deposit%20Refund%20System%20in%20Spain%20Technical%20Appendix.pdf

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Annex V
Case Study Factsheets: Proposed Templates and Examples in development

CASE STUDY TITLE

1-2 sentence description of the case study

The context

Challenges with plastic/bottles and bags with regards to marine and wider issues – in particular: specific to the site

Institutional/ societal demands for action (if any)

Quote from stakeholders Key sentences stressing a benefit, a challenge that was solved, pre-conditions for success… to give a very practical focus of the case study.

The process

Different attempts to solve – did not work or only partially, and led to the need for a new measure

Issue that led to the emergence of a process/Key factor that have led to emergence of the measure

Who was involved (at different scales), which, which role – who has driven the process and the emergence of the measure, which opportunities have been seized for ensuring its implementation

Willingness to be involved of key actors

Trial and pilots before actual implementation (if any)

Implementing the measures

Who is involved in implementation, and with which role(s) + particular institutional/ governance arrangements needed to set up the measure?

Approach to plastic reduction: regulatory, voluntary, etc.

If voluntary approach: have incitative approaches (e.g. financial incentives but also others) been put in place?

Accompanying measures that have been put in place, including for monitoring and evaluating impact/ effectiveness and including incitative approaches in the case of voluntary measures

Implementation costs

Funding financing provided (if relevant)

Pre-conditions for successful implementation

Key factors that explain effective implementation and delivery of results, pre-conditions for success (e.g. willingness of actors to be involved, favorable governance/ institutional settings, etc.)

Main challenges to implementation

Main challenges and how these have been overcome in the case study

Key facts

- *Who put the measure(s) in place*
- *Who is targeted*
- *When it was put in place*

The measures

Description of the measure(s)

Feasibility and acceptability

Key messages emerging from this page

Effectiveness of the measures and related benefits

Effects of the measure on use of plastic bags and bottles (or other types of plastics if relevant)

Effects on discharges to the sea and marine ecosystems

Indicators used to measure effectiveness

Changes in ecosystem services

Other positive effects of the measure(s), in particular socio-economic effects

Corresponding monetary benefits → If this is not available, please look for quantitative information (e.g. jobs gained, but also indicators mentioned above)) → if this is not available, we'll have to make ourselves happy with qualitative information

Who benefits from the implementation of this measure? Operators/ actors/ sectors, and where

Key parameters influencing effectiveness of the measures and related benefits

(this can be up to 1 page)

Benefits: key figures
Please summarize key monetary or quantitative figures on the benefits of this measure

Negative impacts and related costs of the measures

Description and (whenever possible) quantification of negative impacts of the measure(s), including environmental (hopefully none) but in particular socio-economic negative effects + operators/ actors/ sectors that are impacted, and where – also, are vulnerable groups impacted?

Corresponding monetary costs → If this is not available, please look for quantitative information (e.g. jobs lost) → if this is not available, we'll have to make ourselves happy with qualitative information

Key parameters influencing negative impacts and costs

(this can be up to 1 page)

Costs: key figures
Please summarize key monetary or quantitative figures on the costs of this measure

In synthesis…

Overview of costs, benefits and distributional impacts

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
Plastic industry	Compliance costs (e.g. expenditure in a new tax)	Likely: no gains	Economic losses (e.g. decrease in sales/ production)	Likely: no gains But maybe: investments in innovation and corresponding gains?			
Retailers	Compliance costs (e.g. expenditure in a new tax)	e.g. monetary rewards or fiscal incentives	e.g. increased expenditures in bio-plastic bags	e.g. Savings linked to largely reduced purchase of plastic bags and linked storage costs			
Consumers	Yearly expenditure (e.g. for new tax/charge)	e.g. monetary rewards	Unlikely	Unlikely			
Waste management	Compliance costs (if any, but could be unikely)	Unlikely (only in case of additional funding for recycling facilities)	Investments in new recycling facilities? (unsure)	Savings for waste management due to less waste to be managed			

Overview of costs, benefits and distributional impacts (cont'd)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Society	n/a	n/a	Employment losses	Employment gains	e.g. Saving of resources (mainly hydrocarbons, water and energy needed in the manufacturing process of plastic bags)	e.g. Provisioning services: decreased ingestion of marine plastic bag waste by animals; Cultural services: aesthetic and recreational services	
Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning /repair		
Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion…

How does measure(s) perform overall in terms of **cost-effectiveness**, the **balance of costs and benefits** – and more globally when considering all positive and negative impacts, but also feasibility and acceptability?

Want to know more ?

Key publication/ article/ website (1-2 maximum) for people interested in knowing more

References

ITALY: BAN ON PLASTIC BAGS

Single-use plastic bags are banned from shops since 2011

Italy was one of the first European countries to introduce this ban, anticipating and inspiring European norms on plastics

The context

Nowadays, it is a well-established fact that single use plastics – and, in particular, single-use plastic bags – are one of the major causes of global marine pollution (e.g. 2014).

Until 2011, due to well-rooted consumption habits, Italy ranked first among European countries for consumption of single use plastic bags – corresponding to 25% of all plastic bags used in Europe as a whole. Looking more widely at plastic packaging materials, until 2011 Italy also showed the highest per capita consumption in Europe – 137 kg against a EU average of 74 kg. This corresponded to around 300 plastic bags per capita, for a total of 20 million plastic bags distributed annually in the country, as well as to a total consumption of 27 million oil barrels per year (several sources in Blasi, 2011).

In addition, Italy is located in between the Mediterranean Sea, which is already strongly affected by plastic pollution: thus, a high consumption of plastic bags in the country has direct consequences on Mediterranean marine ecosystems (ARPAT & Daphne, 2011).

The process

The first attempt at regulating the use of plastic bags in the country was the introduction of a plastic bag production fee (100 Italian liras per bag), introduced in 1988. This instrument was applied for 10 years (until 1997, when it was ruled out), but it proved to be ineffective in reducing the consumption of plastic bags. Moreover, some municipalities introduced the ban already before the introduction of the legal ban at the national level; similarly, some supermarket chains also took initiatives to reduce single use plastic bags before the legal ban entered into action (Markonet, 2018).

The national ban was introduced with the Law 296/2006, but it became operational on January 1st, 2011 – thus anticipating European norms (Blasi, 2011): according to the ban, single-use plastic bags had to be replaced by bio-degradable, compostable bags, provided to consumers upon payment of a small charge – the amount to be charged can be established by sellers. The ban also included fines for uncompliant sellers, ranging from EUR 2 500 to 25 000 – scalable up to EUR 100 000 for particularly serious violations (de Leonardis, 2015).

From January 2018, the ban was extended to light and ultralight plastic bags for food pakaging through D.Lgs. 91/2017 – so that also these bags are now substituted by bio-degradable, compostable light and ultralight bags, charged 1 to 3 EUR cents – also in this case, sellers are free to set the charge level (UNEP/MAP, 2018).

Implementing the measures

The charge of compostable plastic bags – both shopping bags and light/ultralight bags for food packaging – must be clearly indicated in the receipt, to give a clear signal to customers on the implications and costs of single-use packaging materials – in terms of disposal and environmental impact, even now that bags are made of compostable plastics.

Although the measure looks relatively simple, its practical application encountered some issues. First of all, in the original Law the definition of technical standards to identify bio-degradable and compostable bags was not precise; similarly, a precise definition of captions to be reported on compostable bags was also missing. This required additional technical norms, included in D.Lgs. n. 2/2012 and then Law 28/2012; still, these norms did not include light and ultralight plastic bags, which were only included in the ban by the 2017 Law. These technical issues resulted in implementation delays – for example, fines could only be applied since 2014 (e.g. de Leonardis, 2015; CNA Biella[i]). In addition, these technical issues were used as a starting point for legal appeals against these norms, as for example the appeal moved against the Ministries of Environment and Economic Development by Unionplast, the association representing the plastic industry in Italy – controversies further slowing down implementation of the ban (Blasi, 2011).

Furthermore, whereas supermarket chains immediately complied to the ban, several other operators – such as for example open air markets operators – are often breaching the law, due to inadequate enforcement – scarce compliance checking in particular. According to Assobioplastic, the national producer association of compostable plastics, in 2014 around 75% of the demand for plastic bags was met by uncompliant bags and, in particular, by bags with an uncompliant thickness or with misleading captions[ii]. Similar figures are reported by Markonet (2018), who conducted a first-hand survey in street markets and shops in several Italian cities in 2018. In open air markets, 72% of plastic bags sold to consumers were found to be irregular, 12% were reporting misleading captions, and only 16% were fully compliant to the Law. Similar data were observed in street shops, with percentages of 67%, 13.5% and 19.5% respectively.

The same research interviewed consumers on their perceptions regarding the ban: in many cases, consumers denounced the lack of an effective information and communication campaign accompanying the ban. The most common doubts and unanswered questions concerned the actual environmental impact of compostable bags, the charge they have to pay on each bag, the possibilities for reusing compostable bags, how to recognize illegal bags, among others. In addition, the survey highlighted a lack of trust in the actual capability of public institutions to manage recycling, and in particular recycling plastics.

The lack of appropriate information campaigns, together with the consumer charge on light and ultralight compostable bags for food packaging, provoked quite some mediatic opposition and arguments at the beginning of 2018, when groups of citizens perceived the charge on these bags (1 to 3 EUR cents per bag) as an unfair and abusive norm, and protested on social media (e.g. Markonet, 2018).

Key facts

- *The ban is established by a national law*
- *All retailers are concerned*
- *The ban entered into force on January 1st, 2011*

The measures

- *Single use plastic shopping bags are banned*
- *Since January 2011, only bio-degradable, compostable plastic is allowed for single use shopping bags*
- *Since January 2018, also light and ultralight single-use bags, used for food packaging, must be made out of bio-degradable and compostable plastic*
- *All single-use compostable plastic bags must be paid by consumers – although the charge can be lower than the cost of the bag actually paid by retailers*

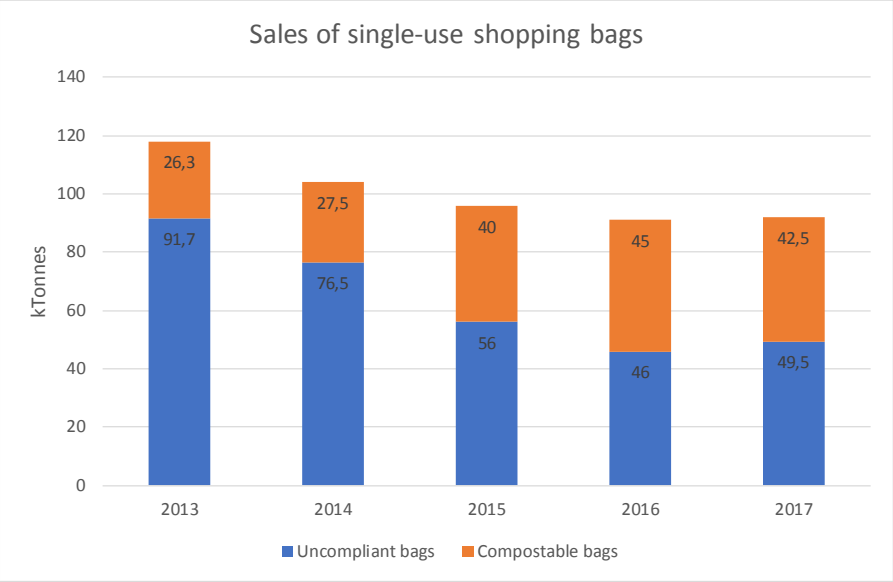
In short: key accompanying measures for an effective ban

- *Charge consumers for each single-use compostable bag, as a signal*
- *Enforcement and compliance checking are essential*
- *The ban (and the charge) must be accompanied by a proper information campaign targeting consumers, to prevent opposition*

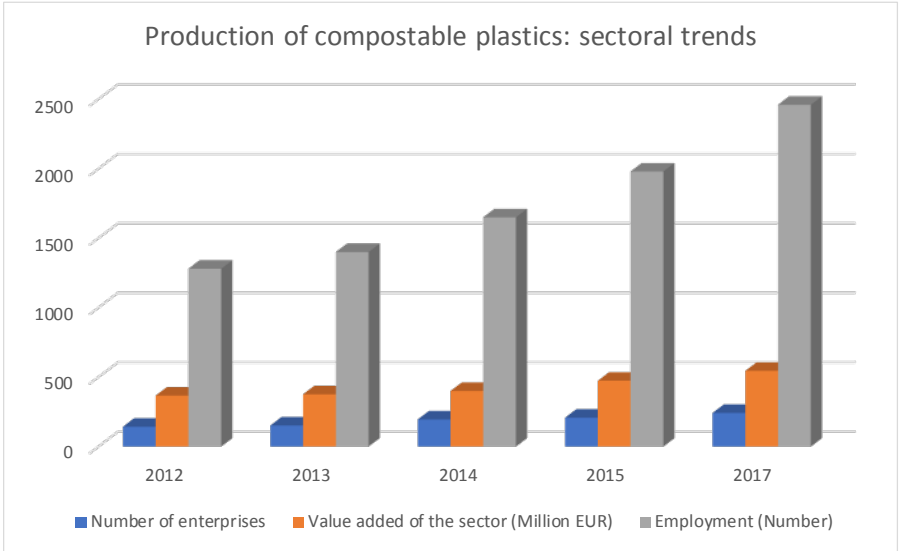
Effectiveness of the measures and related benefits

Although compliance to the norm is still far from being widespread (see above), thanks to the introduction of the ban the consumption of plastic bag in Italy fell by more than 50% in the period 2011-2018 – and this result is particularly positive in a country previously ranking among the largest consumers of plastic bag in Europe (Surfriders Foundation Europe, 2018).

The graph below presents in more detail the sales of compostable and non-compliant plastic shopping bags in the period 2013-2017: sales of uncompliant bags have decreased steadily until 2016, to slightly increase again in 2017; in addition, data also show a ore general decrease of single-use, disposable bags over the observed period (Plastic Consult, 2018).



The favored the emerging so-called bio-plastic sector: actually, Italy is a leading producer of bio-degradable and compostable plastics in Europe, and the sector includes innovative producers and products with registered trademarks, such as for example the so-called Mater-Bi. Available data show an important growth of the sector over the period 2012-2017, in terms of number of enterprises (+69%), value added (+49%) and employment (+92%) – these data are provided in the graph below (Plastic Consult, 2018).introduction of the ban in favor of compostable bags have clearly



Following the introduction of the ban, consumption of single-use plastic bags in the country fell by more than 50% in 7 years

Negative impacts and related costs of the measures

On the consumers' side, Italian news outlets reported that the annual cost per family averaged between EUR 4 and EUR 12.50 per year (UNEP/MAP, 2018); this corresponds to 0.02-0.06% of adjusted gross disposable income of household per capita (own calculation on Eurostat income data[iii]): thus, it can be said that the impact on consumers is negligible.

No information was found on other costs – more research is being conducted, in particular on the following costs:

- Implementation costs;
- Costs for "conventional" plastic producers – i.e. less profits
- Costs for retailers, as often the retail price of compostable bags is lower than their actual costs for retailers.

Costs: key figures

The costs per family amount to 0.02-0.06% of adjusted gross disposable income of household per capita

In synthesis…

Overview of costs, benefits and distributional impacts (to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
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In synthesis…

Overview of costs, benefits and distributional impacts (cont'd – to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
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Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning /repair		
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Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion…

The measure has proven to be effective in reducing the use of single-use plastic shopping bags, in favor of bio-degradable and compostable plastic bags – both types of bags are disposable and for single use, but compostable bags can be fully degraded in composting plants.
To boost effectiveness of the ban, recommended accompanying measures include: (i) consumer charged for single-use compostable plastic bags; (ii) proper enforcement and compliance checking; and (iii) information and awareness campaigns for consumers.

Want to know more?

Key publication/ article/ website (1-2 maximum) for people interested in knowing more

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Marviva fishing for litter project in Catalonia

The Marviva Project is a fishing for litter scheme targeting the Catalonian coast

"It is a project we don't spend a lot of money on, but the impact in terms of communication are very good. […] The image of the fishermen changed in the public opinion"

Coordinator of the project at the Catalonian Waste Agency

The context

The Catalonian coast is especially stroke by marine litter pollutions. High population density and tourism drive a lot of waste potential. The Institute of Environmental Science and Technology of the Universitat Autònoma de Barcelona estimates that 200.000 to 450.000 items of litter/km² are left daily on Barcelona's beaches during the touristic season, which corresponds to the upper average of EU Mediterranean touristic coasts. Plastic items and cigarette butts respectively make a third of the items found. (ICTA-UAB 2018)

The Agència de Residus de Catalunya (ARC) or Catalan Waste Agency is responsible for managing the waste generated throughout Catalonia. Prior to the Fishing for litter project, it suffered from a lack of knowledge and data on the status of marine litter pollutions.

The Fishing for litter scheme came up in a context of raising awareness around plastic consumption reduction. Since 2009, the Plastic Bag Agreement has been seeking voluntary agreements of actors involved in products distribution to reach consumption reduction targets. A pilot deposit-refund system has also been tested in Cadeques, Catalonia (see corresponding case study).

The process

The Fishing for litter scheme was launched on the basis of a synergy between three major actors: the ARC, volunteering fishermen of Barcelona and the Authority in charge of the port of Barcelona. The project started in 2016 with a pilot scheme targeting the Port of Barcelona and was extended in 2017 to 13 ports in Catalonia.

The three stakeholders were interested in the project for specific reasons:

- The fishermen, to improve their image in the public opinion: according to them, they used to be mostly perceived as damaging the marine environment (overfishing).
- The ACR, to collect data on the quantity, type and sources of marine litter.
- The Port Authority of Barcelona, to reduce the amount of litter in the port.

As the project was extended in 2017, two partners joined the project: the Catalonian Fishing Authority and Upcycling the Oceans, an initiative supported by three private organizations (Foundation Ecoalf, de la Foundation HAP and Ecoembes) aiming at recycling marine litter into textile products.

Implementing the measures

During the pilot project, 4 trawlers out of 12 were involved. Fishermen collected the litter caught in their nets and brought it back ashore, where the Port Authority was in charge of collecting the waste in containers gathered and sent to recycling plants or landfills by the ARC.

The scheme is based on fishermen's voluntary participation. There exists yet no economic incentive for them to get involved.

Pre-conditions for successful implementation

The pilot project led since 2015 has built on several key mechanisms:

- **Fairly share the cost and benefits**: the three first actors to take part in the Marviva project had interest in its outcomes: reducing marine litter in the port, improving fishermen's image in the public opinion, raising public awareness on marine litter and collecting data on the extent of marine pollution. As such, they shared the costs of the project (administration, waste collection, waste management) in a manner which was perceived fair by all the stakeholders. In this respect, compensation mechanisms to share the economic benefits generated by the valorization of litter recycling should be investigated.
- **Ensure a minimal additional workload for fishermen**: in the pilot project, litter brought back to the Port by fishermen was directly collected by the Port Authority. The monitoring of the litter type and quantity was insured by the ARC.
- **Ensure media coverage of the initiative**: in the case of Barcelona, public opinion was targeted twofold: first to improve fishermen's image regarding environmental issues, second to raise public awareness on marine litter. For both the ARC and fishermen, the impacts on public opinion are the main outcome of the project.

Main challenges to implementation

Two main challenges were identified by the ARC:

- **Collaboration between the ARC and fishermen**: the ARC was not used to fishermen working routines in the first place and had to adapt to start the collaboration.
- **To avoid associating fish and plastic in the public opinion**: the fishing for litter scheme sheds light on both fishermen and marine litter. It was feared that this may lead to confusion in the public opinion regarding fish sanitary quality (such as fish full of plastic). The issue was especially touchy as fishermen's first interest in the project was to polish their public image. A lot of effort was invested in the management of the project media coverage to insure there would be sent no misleading messages.

Key facts

- *Implementation : Catalonian Waste Agency*
- *Target : fishermen and public opinion*
- *Date of implementation: 2016*

The measures

A fishing for litter scheme based on a partnership between fishermen, waste management and port authorities

Feasibility and acceptability

- *Challenge on the involvement of the fishermen into the scheme : a carefull balance between the costs (additional work) and benefits (better image in the public opinion) is necessary*
- *Interest of waste management and port authorities*
- *Technically and economically affordable*

Effectiveness of the measures and related benefits

During the 2015-2016 pilot campaign, the 4 trawler boats involved in the campaign collected some 2700kg of marine litter, containing 56% of plastic. Plastic bottles and bags made up 30% of the plastic litter.

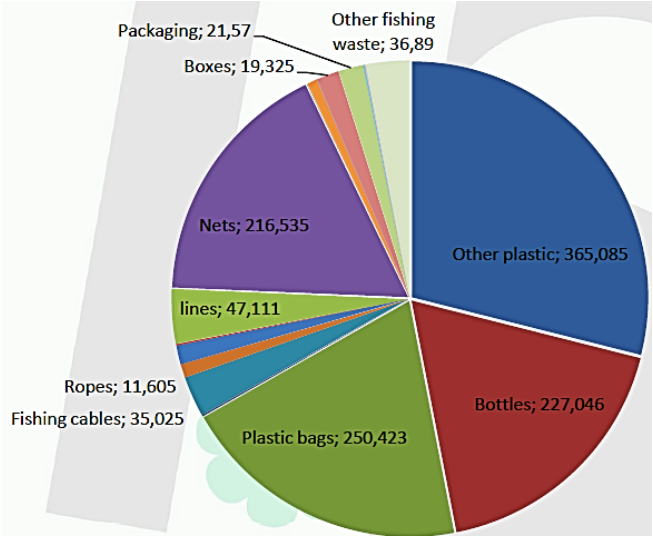

Figure 4 Composition of plastic collected during the Marviva 2015-2016 Fishing for litter campaign (Agencia de Residus de Catalonia 2017)

Benefits: key figures

- *2700kg of litter retrieved from the sea in 2016*
- *Of which about 300.000 plastic bags and bottle items*
- *A large media coverage*
- *Revenue generated from litter recycling*

The measure effectiveness regarding the status of the marine and coastal environment is unknown. As a curative measure, it cannot fully address the issue of marine litter. For the ARC however, the purpose of the fishing for litter scheme was more focused on data collection: it allowed exploring the type and quantity of marine litter collected by fishermen, and thus to upgrade the knowledge base on the extent of damages caused by plastic pollutions to the marine environment.

Another purpose of the initiative was to improve fishermen's public image and public awareness on marine litter. According to one stakeholder of the ARC, the initiative has been very successful in terms of media coverage, with significant impact on the public awareness regarding marine litter, and on the perception of fishermen.

Generating economic value for the collected waste, was not an aim of the pilot project launched in 2016. With the extension of the Fishing for litter scheme to other ports in Catalonia however, private stakeholders joined the partnership, recycling the marine litter collected to turn them into textile products, thus generating additional value to the activity.

It must be noted however, that not all the litter collected can be valued through recycling. The remaining share is sent to landfills or incinerator plants.

Negative impacts and related costs of the measures

The costs of the measure are shared across the actors involved in the Fishing for litter scheme:

- **Collection costs** : fishermen are in charge of bringing back marine litter to the port. As such, they may not be a direct economic cost for them in a Fishing for litter initiative but additional time and effort to be spent to pack and unload the litter ashore. The ARC is seeking a way to compensate economically the fishermen for this effort, especially because it has become clear to them that private businesses generate revenues from the litter they collect.
- **Administration costs**: the ARC is in charge of coordinating the project, but also monitoring the results (amounts and types of waste collected), collect the data and treat them to upgrade the knowledge base on marine litter. Following the pilot project, the monitoring has been done by the company in charge of waste recycling, which forwards the data to the ARC. The ARC is also in charge of mainstreaming the initiative to increase public awareness on marine litter, which means press releases, organization of punctual events with local stakeholders, schools, etc. (UNEP, MAP, et Plan BLeu 2017) socio-economic study of fishing for litter schemes evaluates administration costs to around 900€/ton of litter retrieved from the sea.
- **Waste management costs:** the Port Authority of Barcelona funds the management of the waste collected by fishermen hiring private companies to handle and recycle or dispose it (depending on the type of waste). With the extension of the project, Upcycling the Oceans has become the main actor of plastic waste management.
  No precise data on the cost of the Marviva Project has been found.

Costs: key figures

- *Additional work for fishermen*
- *Administration costs for the scheme coordinator*
- *Waste management costs*

In synthesis…

Overview of costs, benefits and distributional impacts (to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
Plastic industry	Compliance costs (e.g. expenditure in a new tax)	Likely: no gains	Economic losses (e.g. decrease in sales/ production)	Likely: no gains But maybe: investments in innovation and corresponding gains?			
Retailers	Compliance costs (e.g. expenditure in a new tax)	e.g. monetary rewards or fiscal incentives	e.g. increased expenditures in bio-plastic bags	e.g. Savings linked to largely reduced purchase of plastic bags and linked storage costs			
Consumers	Yearly expenditure (e.g. for new tax/charge)	e.g. monetary rewards	Unlikely	Unlikely			
Waste management	Compliance costs (if any, but could be unikely)	Unlikely (only in case of additional funding for recycling facilities)	Investments in new recycling facilities? (unsure)	Savings for waste management due to less waste to be managed			

In synthesis…

Overview of costs, benefits and distributional impacts (cont'd – to be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Society	n/a	n/a	Employment losses	Employment gains	e.g. Saving of resources (mainly hydrocarbons, water and energy needed in the manufacturing process of plastic bags)	e.g. Provisioning services: decreased ingestion of marine plastic bag waste by animals; Cultural services: aesthetic and recreational services	
Other sector: … (e.g. fishermen)	e.g. cleaning up cost (fishing for litter)	e.g. rewards (fishing for litter)			e.g. Additional earnings in the fishing sector due to improved health and biodiversity of marine species; Savings in the fishing sector due to less cleaning /repair		
Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion...

The outcomes of the Marviva project in Catalonia are focused on improvement of public awareness and of the knowledge base on marine litter in the environment (and not in terms of direct reduction of waste into the environment).
The costs of the project are mostly related to the monitoring and management of the waste collected by fishermen, while the benefits are mostly related to media coverage and data collection. Their distribution between the different stakeholders is perceived by them as fair. The upscaling of the pilot project to 12 other ports of the Catalonian Coast and the involvement of private actors can affect this balance in both directions depending on the ability to fairly share the additional benefits generated by litter recycling.

Want to know more ?
Visit the project page on the website of the Catalonian Waste Agency

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Map of the Med sea with dot showing location of case study

ISRAEL PLASTIC BAG LAW

Israel introduced in 2017 a set of ban and levy measures on plastic bags in large retail

"The data shows an overall success in reducing the use of disposable bags. The decrease in the major supermarkets - 80% - is the EU target for 2020"
Israel Environmental Protection Minister
Zeev Elkin

The context

Prior to the Plastic Bag Law (2017), the total annual consumption of plastic bags in Israel was 2.7 billion bags (Israel Ministry of Environmental Protection 2017b). The average Israeli used 325 bags/year; the average household 1,200 bags(Israel Ministry of Environmental Protection 2017b). These figures were in line with EU Mediterranean countries not having implemented plastic bags reduction mechanisms (e.g. Greece or Bulgaria, respectively 269 and 421 plastic bags/year/person (Kerstens 2017)) but far above Western European countries with reduction mechanisms (e.g. Ireland 18 bags/year/person). In Israel, a large share of these plastic bags was distributed by supermarkets: 1.6 billion plastic bags/year prior to the Plastic bag Law(Israel Ministry of Environmental Protection 2017b). A quarter of all plastic bags were estimated to be thrown away immediately after use. Supermarket bags made up 25% of municipal waste volume and 10% of its weight(Israel Ministry of Environmental Protection 2017b).

Before 2017, the Clean Coast Programme was the main instrument in Israel to combat plastic litter in the marine environment.. It was launched in 2005 at the initiative of the Ministry of Environmental Protection following the observation that coastal municipalities legally in charge of beaches cleanliness were not maintaining the beaches correctly. The Plastic Bag Law also followed a more general law on the Protection of the Coastal Environment (2004) which introduced more stringent measures against damages to the coastal environment (inspections and penalties).

The Clean Coast Programme included several complementary components aiming at generating a change in public awareness of the importance of beach cleanliness : routine cleanup activities by local authorities responsible for the beaches and volunteers; enforcement measures against polluters and authorities that fail to comply with their obligations; information and public media campaigns and educational efforts by NGOs and communities; educational activities in Israeli schools and other information and publicity campaigns. (Israel Ministry of Environmental Protection 2018).

While the programme helped improving beaches cleanliness, it mostly failed to address the sources of plastic litter. Despite its implementation in in 2005, the annual average Clean Coast index[4], that is, the share of Israeli beaches which can be considered clean, remained below 50 %. Pasternak et al. (2017) state that 90% of the litter found on Israel beaches between 2012

[4] The Clean Coast Index measures the degree of beaches cleanliness on the basis on the amount of debris found by surface (Alkalay, Pasternak, et Zask 2007). Following this indicator, beaches are ranked in five categories of cleanliness. Israel ministry for Environmental protection generally bases the evaluation of its plastic reduction programs on the number of beaches considered clean and very clean by the Clean Coast Index.

and 2015 was plastic. Food wrappers, disposable plastic bags and cigarette butts were constituting the bulk of the plastic debris.

The process

From 2013 onward, specific attention has been paid to plastic bags In order to review the most relevant instruments to tackle plastic bag use, the Ministry of Environmental Protection set out a survey in 2013. The survey examined different alternatives for the reduction of carrier bags including a complete ban on the use of carrier bags in retail stores; a ban on the free distribution of disposable carrier bags in retail stores; imposition of a levy on the sale of carrier bags; and development of cooperative programs aimed at launching an educational process that would change public attitudes toward packaging waste in general and disposable carrier bags in particular.

Furthermore, the Ministry conducted a public opinion poll in2013 which showed that a majority of Israelis was concerned with the indiscriminate use of carrier bags and was willing to pay for a reusable bag as an alternative to the single-use carrier bag (Israel Ministry of Environmental Protection 2015). In July 2014, following consultations with stakeholders including consumers, plastic bag producers, supermarkets, government officials and other stakeholders, the Israeli Parliament approved the bill (Israel Ministry of Environmental Protection 2015).

Implementing the measures

The Plastic Bag Law came into effect on January 2017 and targeted exclusively "carrier bags". It thus excludes plastic bags that come in direct contact with food. It relies principally on four measures:

1. Prohibition of the distribution or sale of single-use carrier bags less than 20 microns thick to consumers by a retailer, including internet sales.
2. Prohibition on the distribution to a consumer of a single-use carrier bag, between 20 and 50 microns, by a large retailer, including in internet sales, unless a minimal fee is collected which is not less than the rate of the levy (minimum of 0,1 Local Currency Unit or LCU). A large retailer may collect a sum higher than this rate for each bag.
3. Requirement that invoices issued by large retailers, including for internet sales, list the number of single-use carrier bags bought and the price paid.
4. Obligation for large retailers to pay a levy of 0.0854 LCU (i.e. 0.1 LCU with inclusion of the VAT) for each single-use carrier bag sold.

   Between the approval of the Plastic Bag Law and its enforcement (i.e. 2014 to 2016), the Ministry of Environmental Protection launched the distribution of 6.5 million multi-use carrier bags to Israeli households . The measure was funded by the contribution of supermarkets for a cost totaling their expenses for the free distribution of plastic bags before the Law (i.e. 80 millions LCUs). It was supported by a national public awareness campaign on the effects of the Law on consumers.

The funds collected from the levy are deposited in the **Maintenance of Cleanliness Fund** of the Ministry of Environmental Protection and are managed in a separate account for encouraging the reduction of single-use carrier bags and for reducing the negative environmental impacts associated with such use by the following means:

- Encouraging the use of multi-use carrier bags with less environmental impact;
- Education and information on the aims of the law;
- Clean-up activities aimed at removing plastic bag waste from beaches and coastlines;

The Plastic Bag Law has been enforced at a time when the budget for the Clean Coast program was being tripled to over 2 million USD. The Plastic Bag Law thus came as a good complement to the existing marine litter reducing scheme: on the one hand it came into effect within a public opinion already aware of the issue, on the other hand the revenue generated by the levy allowed fund raising for cleaning and awareness campaigns.

Furthermore, in response to opposition by lightweight carrier bag manufacturers, the Ministry proposed that part of the funds generated by the levy would be used to assist carrier bag producers in adapting themselves to the law's provisions "to transition to more environmentally-friendly production." (Israel Ministry of Environmental Protection 2015)

Key facts

Implementation : Ministry ofEnvironmental Protection
Target : End consumers (levy), and supermarkets (ban, reporting)
Approved in 2014
Enforced in 2017

The measures

1. **Prohibition on the distribution or sale of single-use carrier bags less than 20 microns thick**
2. **Mandatory fee on the distribution of other carrier plastic bags**
3. **Mandatory reporting of plastic bags sales by supermarkets**
4. **Mandatory levy for large retailers on the sale of plastic bags**

Feasibility and acceptability

- *Involvement of the stakeholders in the design of the mechanism*
- *Generated revenues feed the management of environmental damages caused by plastic pollution*
- *Public: Awareness campaigns and free handouts of multi-use carrier bags*

Pre-conditions for successful implementation

The implementation of the Plastic Bag Law in Israel highlights several key features of implementation for a mixed ban and levy measure on plastic bags:

- **Involvement of the economic actors affected by the measure**: supermarkets are the main target of the Law and were involved since the very beginning in the process of designing the plastic bag reduction mechanism.
- **Synergies with already existing policies**: the revenues generated by the levy are partly used to increase the funding of the Clean Coast Program, thus supporting more beach cleaning operation and awareness campaigns.
- **Support alternatives to plastic bags** : prior to the enforcement of the law, free multi-use bags were handed over to consumers as a substitute to plastic bags.
- **A particular attention paid to public awareness and acceptance**: since 2005, the Clean Coast Programme runs information campaigns on plastic litter on the marine environment. In 2013, a survey on the social acceptance of different design for plastic bag reduction mechanisms was launched. An information campaign took place in 2014 to explain the impacts of the Law on consumers

Main challenges to implementation

The design of the law does not allow it to fully address the plastic bag issue. Because it solely covers downstream actors (retailers, excl. small retailers from the levy and "non-carrier" plastic bags, consumers), its maximum reduction potential (somewhat 40% of the annual plastic bag consumption) is limited and will soon be reached. The Plastic Bag Law does not contain mechanisms aiming at reducing small retailers plastic bag consumption.

The choice of a levy for part of plastic bags induces the need for close monitoring of its enforcement for retailers. For small retailers scattered across the country, this could be extremely difficult and/or costly to implement. Thus, the choice has been made to target only large retailers (mainly supermarkets) which leaves part of the plastic bag distribution out of scope.

The levy only targets end-consumers behavior. Because the level of the levy for retailers is fixed at a rate equal to the minimum fee paid by consumer on plastic bags, the cost of the measure is entirely passed through to consumers. Thus, there is no economic incentives for large retailers to reduce the distribution of plastic bags. Plastic bag producers and small retailers are not targeted by the law.

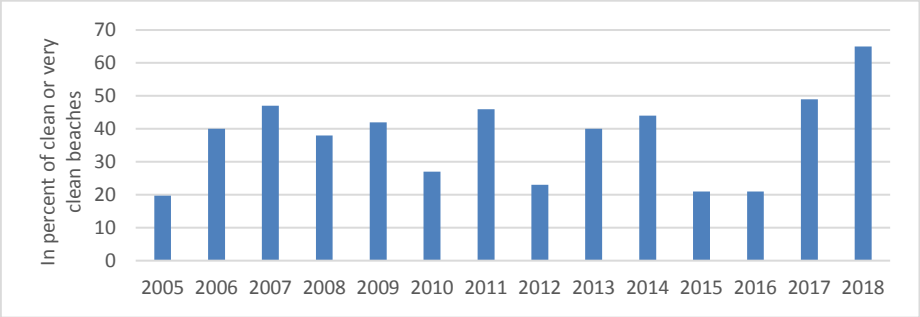
Benefits: key figures

- *80% drop in single-use plastic bags distributed by large retailers*
- *Increase in beaches cleanliness (at least 15 points)*
- *Increased funding for the Clean Coast Programme*
- *Waste management costs reduction*

Effectiveness of the measures and related benefits

Within the first quarter of 2017, large retailers generally reported reductions in plastic bag consumption ranging from 80% to 90%, The difference in the number of bags distributed in the last quarter of 2016 and first quarter of 2017 was about 230 million (i.e. 2.000 tons of plastic waste) (Israel Ministry of Environmental Protection 2017a). The 80% level of reduction has remained consistent during all quarters of 2017. The potential impact on the total number of plastic bags distributed in Israel in 2017 could therefore be a 40% drop. This would be a net benefit for large retailers. Before 2017, they used to pay a yearly 80 million LCU for plastic bag handouts, which they will now save, aside of their initial obligation to deliver multi-use carrier bags to customers (about 40 million LCU).

It is not clear to what extent the Plastic Bag Law has impacted the state of Israel's beaches. However, beaches cleanliness has improved during the period following the Law's introduction. The Ministry of Environmental Protection's Clean Coast Index found that beaches across Israel were cleaner than they have been since the monitoring began in 2005. 65% of beaches were defined as "clean" or "very clean" at least 70% of the time in 2018 (Israel Ministry of Environmental Protection 2019). As Figure 1 shows between 2005 and 2016, the index annual average was ranging between 20 and 47% with high year-to-year variability; and went up to 54.5% in 2017.



The index shows the percentage of beaches considered clean or very clean

Figure 5 Israel Clean Coast Index 2005-2018 (Source : Ministry of Environmental Protection)

Beaches cleanliness is an important factor of beaches frequentation (Krelling, Williams, et Turra 2017; Botero, Cervantes, et Finkl 2017) and thus of local tourism revenues. Tourism, is an important sector, of the Israeli economy. It contributed directly to 1.9% and indirectly to 6.8% of the country's GDP in 2016 and to 7.2% of the employment. (World Travel and Tourism Council 2017). The sector has been growing in the last years : from 2006 to 2016, about 3 million tourists arrival were registered yearly, they grew to 3.5 and 4.4 million in 2017 and 2018 (Central Bureau of Statistics 2019a). Since the Blue Flag Program began in Israel in 2013, the number of beaches labelled has increased from 9 to 36 (Ecoocean 2017), showing the interest of beach tourism actors to communicate on beaches environmental quality. In the last years, the country has been trying to diversify its tourism strategy from religious to more leisure and touring oriented activities.(OECD 2018). The positive impact of reduced litter on beaches is thus an asset to Israel Tourism strategy increasingly relying on its landscape and leisure sites.

Another positive impact of the Plastic Bag Law is that waste management costs are potentially reduced by the drop in plastic bag consumption. It so far succeeded to decrease the total amount of bag consumed by about a quarter (80% of the large retailers distribution), which constitute somewhat 2.5% of the total weight of waste treated in Israel prior to the Law.

The impact on marine wildlife is difficult to assess in Israel. At the Mediterranean Sea level, 134 species are assessed to be victims of plastics ingestion, including 60 species of fish, all 3 species of sea turtle, 9 species of seabird and 5 species of marine mammal (WWF 2018). Some 344 species are been further found trapped into plastic litter. In Israel coastal waters, high levels of micro plastic are found on marine biota (Vered et al. 2019). Addressing the source of plastic bag litter into the sea thus has a direct impact on wildlife exposure to plastic pollution.

Negative impacts and related costs of the measures.

Retail chains have been obliged to fund the distribution of reusable shopping bags to the public for a limited time period before the enforcement of the Plastic Bag Law. This cost was however entirely covered by the funds saved on the purchase of single-use plastic bags, which were distributed for free to customers before (i.e. 80 million LCUs). Large retailers were financially supported by the Ministry for Environmental Protection in the distribution of free multi-use carrier bags, based on defined criteria relating to size, recyclability, durability, and washability of the bag distributed to the consumers.

The levy on plastic bags is paid by Israeli households (a minimal fee of 0.1 local currency unit/bag). Considering the total consumption of carrier bags concerned by the levy under the Plastic Bag Law, it can be approximated that the measure costs about 16 LCUs per household per year. This represents about 0.08% of the annual gross average household income or 0.10% of the average annual household expenditures (Central Bureau of Statistics 2019b). The fee retrieved on consumers fully covers the levy paid by supermarkets on the distribution of plastic bags.

Large retailers and the Ministry for environmental protection have been bearing the cost of monitoring plastic bags sales to customers. This additional administrative cost is however not estimated.

Costs: key figures

- *Increased monitoring costs for large retailers and the administration*
- *Levy paid by consumers and retailers on carrier bags*

In synthesis…

Overview of costs, benefits and distributional impacts (o be filled in)

Socio-economic groups	Direct costs and benefits: Implementation & Compliance		Direct economic impact		Indirect benefits inked to environmental improvement	Ecosystem Services	Overall impact on socio-economic group (+/0/-)
	Costs	Gains	Costs	Benefits			
Regulators	e.g. launching costs, information campaigns, implementation costs, enforcement costs	Revenues (e.g. from a new tax, or from fines)	Likely to be irrelevant	Likely to be irrelevant	e.g. Savings linked to less beach cleaning and litter picking		
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In synthesis…

Overview of costs, benefits and distributional impacts (cont'd – to be filled in)

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Other sector: … (e.g. tourism)					e.g. Increase in revenues in the recreation and tourism sector due to cleaner beaches		
Other sector: … (e.g. bioplastic producers)				e.g. increased sales/ profit, growth of the sector			
Overall balance (+/0/-)							

In conclusion...

Although it only covers one aspect of the full value chain, the Plastic Bag Law leads to decreasing consumption of plastic bags in Israel, decreasing waste management costs and reduction of damage to the coastal environment. The levy also raises revenues for the Clean Coast program, improving the capacity to address the impacts of marine litter on the environment.

The costs of the measure especially fall on the end-consumer, but this is balanced by the distribution of multi-use carrier bags. The costs induced for large retailers (monitoring) are compensated by the funds saved on the free distribution of plastic bags.

There is still room for improvement with about 60% of plastic bags not being addressed by the Plastic Bag Law. “Non-carrier” bags are not targeted, neither does a large part of carrier bags handed out at small retailers shops.

Want to know more?

Visit the website of the Ministry of Environmental Protection

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