BL.EU Climate - Climate Innovation in Southern Waters

CHANGE ROADMAP 2030

Work Package 4 - Change Roadmap Production

Climate-KIC is supported by the EIT, a body of the European Union

FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

ATHENA Research & Innovation Information Technologies

Zelena Energetska Zadruga

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1. Foreword

BL.EU Climate - Climate Innovation in Southern European Waters culminates in the development of the **Change Roadmap 2030**, in order to provide a roadmap for plastic free southern European seas for the next 10 years.

All information obtained from the activities developed in the BL.EU Climate project was the basis to build this roadmap.

This document presents the following sections:

- **Vision** - this section gathers statements for a more sustainable plastics industry
- **Current status and stakeholders' analysis** - this section shows key findings, best practices and barriers identified in each case study in Croatia, Greece and Portugal.
- **Map of the actions** - in this section statements are defined in order to explain how to get there.
- **Recommendations** - mostly related with behaviour, mentalities change and communication tools are presented as recommendations in this roadmap.
- **Lessons learnt** - in this section are identified the lessons learnt in each location and the results as a Southern EU consortium.

2. Introduction

This roadmap identifies steps to reduce the negative effects caused by plastic waste in the future, supporting governments, industries, consumers and civil society to improve the awareness campaigns, systems design, replacement, refuse, recycling and reuse of plastic. This roadmap also shows potential action scenarios for the future, creating conditions for circular economy, innovative materials, reusable materials and replacement of plastic.

The roadmap is a consequence of all Work Packages developed, and of the Future Radars (tool from the Visual Toolbox for System Innovation by Climate-KIC) [1], exercise held during the BL.EU Climate project (see Annex).

3. Vision

Plastic reduction is urgent, and the vision encompasses avoiding unnecessary packaging, elimination of non-recyclable plastic and creation of new business models, with the support of regulatory measures from governments as well.

By 2030, plastic will not become waste, will be reused and recycled. Some actions are necessary to achieve this vision and are presented by year.

2020

Governments

Governments can act as regulators of the plastics industries by promoting policies focused for example on reusable plastics, incorporation of recycled plastic in new plastics products and promoting other environmental and sustainable strategies according to EU regulations.

Governments fund research projects in partnership with private companies (e.g. European structural and investment funds by European Commission), in order to study the best available techniques for alternative materials to replace single-use plastics. Sustainability criteria are established as a requirement for all projects funded by public funds.

Once again education is key to understand the damages of plastic and how it affects public health, the whole educational system needs to be rethought at the government level, leading schools and universities to avoid plastic, promoting discussion and change. Equally, education of policy-makers and decision-makers is considered important.

Public agencies can provide public fountains for citizens, and promote the use of safe drinking water and reusable bottles. Advertising information regarding water quality should be provided, in order to inform locals and tourists.

The public debate about plastics can be fostered and incentivized by public entities that can send youth delegations such as “Zero Plastic” ambassadors for international events, enlarging the discussion about plastic, in order to have more active citizens, specially the youngest generations.

Give the positive example by banning (after educating) single use plastic on public spaces like universities and schools. Create the first plastic free campus.

In a regional and European level, it’s important to consider ourselves **as an inseparable part** of the natural ecosystem, taking up responsibility, embracing climate-friendly actions in order to prevent harmful effects to our seas and oceans.

The Paris agreement should be seen as a navigator to investment and financing opportunities around climate change, strengthening the role of the private sector in taking climate action.

Private sector

It is necessary to create and innovate on new business models that promote social and environmental standards, to shift change on the society. Models such as circular economy, sharing economy and blue economy are already becoming reality but there is a need to expand and apply those models on traditional sectors such as food industry.

The private sector could be a pioneer and increase competition by providing guidelines for tourists, encouraging good environmental standards, such as zero waste and recycling practices.

Private companies could also be involved in deposit-return schemes, acting against the trough-away culture.

Ban the multilayered packaging that cannot be recycled. Design state of a product can reduce waste up to 80% (Ellen MacArthur Foundation).

Try to change mentality and create models and structures for sustainable business with in order to promote business ideas relating to the local sea and aquatic resources through a range of environmental, economic and social responsibility initiatives.

Civil society

Non-governmental organizations and youth-led movements can create awareness campaigns that target different audiences at different levels. It is important to create communication for high-level politicians and industry as well.

Non-governmental or civil sector organizations should lead and help establish a platform for sharing information and supporting change-makers.

It is necessary to engage communities in order to increase citizen-science and promote recycling methods and informational campaigns (various targeted groups, from schools to popular tourism destinations).

2025

Governments

Governments have an essential role to regulate packaging that cannot be recycled such as multi-layered plastic. Governments can also apply fines and taxes to plastics, such as non recyclable plastics (current technologies available) don’t have recycling technique in place yet.

Public sector can organize regional and multi-sectoral forums, to discuss not only plastic pollution but measures and actions for plastic reduction.

Governments can also provide funds for civil society organizations and facilitate funding process on the first years for “zero plastic” initiatives that aim to work on behavioral change.

Governments must to provide motivation and funds to the private sector and especially to those who sell plastic products in order to create an alternative product with social and environmental impact.

Private sector

Markets and food retailers can invest in bulk distribution and refill options for the most used goods and products (e.g. water, seeds, pasta, cleaning products, and cosmetics), giving option for consumers to buy plastic free products.

The private sector can also fund new Research & Development (R&D) on new materials, technologies and alternatives to disposable plastics, avoiding environmental and public health impacts.

If certain industries are seen as causing the marine litter problem, companies in these sectors may want to be seen to be contributing to the solution. Other companies may wish to provide support as part of their broader corporate social responsibility programme. Some private sector companies may also wish to support your project if they benefit directly or indirectly from cleaner seas and beaches.

Civil society

Civil society organizations can lead plastic-free events in different scales, at neighborhood level, or plastic-free campus on Universities.

Partnerships with private sector in order to established plastic-free events and make an effort to pressure the governments for more funds and investments to develop innovative methods for a zero waste and recycling practices.

2028

Governments

Governments must to develop a common strategy will be mandatory about the marine litter in the general framework of Bluegrowth strategy.

Private sector

Beyond the bulk systems and refill stations for most used goods, companies also need to have accessible deposit-return systems for different types of goods, improving their service design and consumer awareness.

The same system that works for PET packaging return can be done with other types of plastic that can be recycled, increasing plastic waste segregation. Communication and labels can also serve as an educational platform for consumers (e.g. larger labels are easier to understand).

Companies need also to internalize their environmental cost and investment funds on alternative and effective solutions for disposable plastics, such as compostable or safe-edible polymers products made of plants or seaweed.

The private sector has the knowledge of the needs and cal also find and develop alternative solutions in order to produce sustainable products and cultivate of the environmental consciousness in order to make a major impact “trend”.

2030

Government

By 2030 the idea is to have no single-use or plastic packaging products. However, the transition to a “zero plastic” society has to be made during previous years. The idea is to create tools for adjustment and behavior change. Hotlines such as 112 (emergency telephone number), are useful to support citizens to solve common doubts regarding single-use plastics.

More funds need to be allocated for investment, R&D and adaptation phase.

Tougher environmental laws and regulations have to be established and implemented.

Private sector

Private sector adapt to recycling increment and plastics reduction, due to less consumption. Bulk stores, deposit-return schemes and systems and products with ecodesign are in place. Products packaging are made to be recycled, reused or reinvented.

Traditional sectors of the society are highly dependent on plastic products such as fishing, need to reinvent techniques that can be inspired on current technology and traditional knowledge (e.g. clay instruments or other alternative materials with same properties as plastic). Fishing nets must be retrieved by law, by a private or public company.

Private sector has to keep going on recycling and plastics reduction and Scale up industry-wide solutions.

2030 and beyond

There is no plastics in waste streams at all, everything gets reused, recycled or energy recovered and/or avoided at the design stage. When plastics are used, they are reusable or in deposit-return schemes. No more single-use plastics are in place, including packaging or disposable tableware (e.g. cups from cafeterias).

There is a constant need for development. We have to increase the R&D and try to create markets, business and products with environmental and social impact. The whole effort in general is something dynamic not static. We must keep going although we have achieved some goals.

4. Current status and stakeholders' analysis

Croatia

A. Key findings

Croatia is a country that receives a large amount of tourists especially during summer. Most part of tourists, may behave at their home countries taking the environmental procedures into account, however when travelling, tourists may pay less attention to environmental issues, including the use of plastics.

Tourists also rely on recycling, however there is a trend to shift to “refuse, reuse, reduce” practices. Concerning plastic, most tourists would readily abandon plastic bottles, plates and cutlery. Plastic bottles are the most used item in Croatia according to BL.EU Climate survey in Croatia.

B. Case studies

- Zlarin Plastic Free Island
- Rovinj Adriatic Plastic Free Hotel
- Zero Waste Apartment
- Cres Island

C. Best practices

The Terra Hub NGO acts as a platform promoting best practices and providing information and advocacy for change makers. TerraHub also uses its position to create a uniformed set of steps to be taken by the local community, reaching several levels of plastic-free or eco-responsible groups, such as:

- Information provided by tourists about recycling habits and waste segregation
- Interventions that change behaviors: live 8 or more hours without plastic
- Recycling bottles: a good functioning deposit -return system for PET or glass

D. Barriers

- There is a strong lack of resources for plastic-free initiatives
- The label of “plastic-free’ island created unprecedented visibility and raise expectations on tourists, that at the same time found plastic on the beaches and around the island
- For small-scale tourist service providers the small amounts of replacement items had to be ordered, and there are challenges with costs and with the suppliers
- Difficult to tap/mobilize the budget and resources for facilitation and support-type of activities for beneficiaries/changemakers.

Greece

A. Key findings

- Most survey participants were aware of the environmental degradation and were able to make the bridge between it and the anthropogenic effects.
- Age, educational level and income are factors that affect awareness and perception towards the environmental protection.
- The perceived link between environmental sustainability and socio-economic aspects is weak, whereas the importance of achieving good environmental status in relevant ecosystems (e.g. marine).
- Fishermen in Cyclades Islands say that the marine litter problem it's not very present, in terms of how it's affecting their fishing activities, because the sea currents takes them away. It is present in terms of people that pollute the beaches. Also they are aware that climate change (rise of the temperature) makes the fish go to other areas to reproduce.
- Every local society interacts with the environment and the economy. Mismanagement of waste means a degraded quality of life.

B. Case studies

- Port of Piraeus
- Island of Andros and Milos

C. Best practices

- Fishermen: can contribute to the problem, by being more environmental aware and not throwing garbage or their fishing gear in the sea. If we work with citizens and tourists that they are environmentally sensitive, they make us too. Also there has to be a serious hunt to companies and ships that pollute the sea.
- Also, a motivation (like what Enaleia is doing in Piraeus) for the fishermen to collect the plastic would be great, as they have proven it. Fishermen can play a big part in collecting but also preventing more plastic ending up in the sea.
- Environmental Foundations: Change will come through knowledge, scientific assistance and activation that will act proactively. Human and financial resources are always welcome to see a faster change in a bigger scale. Every local society interacts with the environment and the economy. Mismanagement of waste means a degraded quality of life.

D. Barriers

- Significant knowledge gap on European policy documents (e.g. Directives) in general identified in the interviews.
- Elderly people are less supportive to the environmental cause, despite identifying the importance of having good environmental status.
- Almost all fishermen know about the marine litter problem but not in detail – it's actual/long term impact. Especially about the microplastics and how they end up in the food change.

- We need to create serious solutions about managing and storing this plastic. Big companies and ships they throw them to the sea because they don't know what to do it.

Portugal

A. Key findings

- The research about most common plastic products used inside cruise ships showed bottles, bags, containers and film. However, 76% of the tourists would choose, with any doubt, a plastic-free destination if they had a choice.
- Fishermen in Portugal are worried and aware about plastic, however more than 50% of fishermen interviewed, pointed out that their main concerns are stocks (28%) and environmental degradation (25%), regarding their professional activity.
- In the Portuguese coast, fishermen indicated fishing gears, plastic bottles, bags and food packaging, as the most found items.
- The Portuguese team also carried out a physical characterization in order to obtain waste compositional data regarding plastic waste. Data analysis pointed out 100% of waste was plastic including packaging and non packaging waste, for waste collected in one cargo ship. Concerning one cruise ship, only 36% of waste was plastic. And from waste compositional campaign carried out on Port of Sesimbra, only 31% represented plastic waste (including bags, bottles and fishing nets).

B. Case studies

- Cruise ships and cargo ships - Port of Lisbon.
- "Fisheries for a sea with our litter" - project adhering ports.

C. Best practices

- Cruise ships: Royal Caribbean Cruises, Carnival Cruises and TUI Cruises have internal policies to reduce waste and plastic disposables.
- Fishermen: in cooperation with Docapesca and the Portuguese Association of Marine Litter (APLM), the project "Fisheries for a sea without litter" promotes environmental education and waste collection on ports. The project also provides small containers for fishermen boats, aiming to fishermen source segregated plastic generated on board and for those who are able to collect marine litter.

D. Barriers

- Communication and awareness is a need.
- There is a lack of knowledge on the environmental impact on the plastic alternatives such as biodegradable or other alternative materials that may replace plastics.
- Economic incentives are needed to ensure research and to create new business models focused on circular economy.

5. Map of the actions on how to get there

2020

Government actions

- Set clear targets for the plastic industry sector (limiting amounts produced and increase recycling) with policy regulation.
- Improve communication and awareness with local communities by implementing flexible and non conventional teaching techniques that create empathy with the audience.
- For local-level self-government units (municipality, island, city): set a clear vision with ambitious targets, provide leadership, provide incentives/invite private and civic sector to test new solutions to help close the waste circulation/plastic use reduction gaps.

Private sector actions

- Create hubs of connections with designers that design plastic products, providing innovative solutions.
- Replace fishing techniques for less harmful techniques, combined with innovative and sustainable fishing.

Civil society actions

- Boost “viral” social media campaigns about plastic pollution with local artists, visible personalities and youth environmental activists.

2025

Government actions

- Enforce taxes on plastics.
- Fund research for sustainable packaging.
- Ban the multilayered packaging that cannot be recycled.
- Promote a phased discontinuation of plastic production products (e.g. single use plastics, harmful plastics and fishing instruments).
- Create policy to retrieve fishing nets.
- Facilitate access for “zero waste” youth ambassadors to events such as the Conference of Parties (COP) and other international events such as United Nations Conferences.
- Monitor the impact of plastics that are still on the environment.
- Ensure that there are public drinking stations and fountains in place everywhere. Ensure water is safe to drink, and incentive the use of reusable bottles.

Private sector actions

- Engage in a dialogue between food producers and distributors to create bulk distribution systems for islands and remote places with local refill stations for the most used materials and goods (e.g. grains, water, cosmetics, and cooking oil).
- Engage with tourism boards/ associations/ booking platforms to enable that every tourist service provider publish a set of rules about zero waste and/or plastic free, and recycling procedures.

Civil society actions

- NGOs: open the dialogue with the ministry of education, in order to work together for training and awareness campaigns.
- Social presence at climate strikes and promotion of reaction to enforce the decision-making process.

2028

Government actions

- Create drone surveillance with technology to track marine litter, especially plastic waste.
- Promote safe drinking water.

Private sector actions

- Strength sectors such as innovative startups, science with the public sector with events.
- Substitute fishing techniques for sustainable fishing (e.g. using electric signals for targeted species, no need to use fishing nets).

2030

Private sector actions

- Use blockchain technology solutions to ensure materials circularity.
- Promote creative hubs for circular economy, blue economy and incentivize entrepreneurship.

6. Recommendations

Change of mentalities

The perception that the environment is a sector of the economy is still common. It is necessary to change mentalities, improving environmental literacy in all levels, but special focused on politicians and decision-makers, private sector and civil society.

Communication tools

The communication tools can also evolve, from paper recommendations to other communication tools that generate change of mentalities. Impactful tools can be used, such as art installations, design thinking strategies and commercials, that provide behavior change on a massive level.

7. Lessons learnt in each location and as a Southern EU consortium

The plastic problem and plastics supply-demand/production-consumption lifecycle and value chains are extremely complex and different in every country. The externalities in terms of damage costs caused in nature, ecosystems and human health are still not counted-in thus keeping the current was of (over)use and misuse of plastics cheaper than using replacements or securing proper re-use or recycling. In some countries insufficiently educated people about the problem represents the main issue, as in other countries not enough recycling structures are missing to support the amount of plastic generated inside the country. So, those particularities may represent different types of challenges depending on the context.

However, Southern Mediterranean countries face identical challenges such as:

- Population decrease: younger generations migrate to high income countries and aged population remains, especially in the context of islands and small cities, where low social capital is a challenge.
- Massive tourism during summer: seasonal uses of the territories. Tourism is a strong sector for the economy of Croatia, Greece and Portugal, but large amounts of plastic waste generation are consequence and negative environmental impact.
- Local communities are strongly impacted by plastic pollution (e.g. fishermen communities).

Unique challenges are associated with each country, as showed below.

Croatia

Recycling rates are low in Croatia and there is no waste-to-energy recovery. Most of types of separately collected waste on islands have to remain and be stocked. It is often too expensive to transfer it to land for recycling or landfill disposal. Furthermore, the country also faces high prices for disposal and other waste management treatments.

There is also insufficient control of regulation implementation, which allows illegal acts.

Societal challenges include lack of structured education about sustainable development in the formal educational system and for other society sectors. For example tourists have insufficient awareness and low confidence about the drinking water quality, giving preference to bottled water in plastic packaging. Plastic bottles represent the largest amount of plastic collected on the islands.

Technological challenges include alternative materials for plastic replacement that are still unknown and affordability of recycling (costs and technologies).

Greece

Some islands in Greece such as Andros and Milos have recycling structures. The country faces societal challenges such as plastic consumption and littering reduction during touristic seasons. However the plastic generated could serve as base for new business models based on circular economy and recycling principles.

Portugal

Plastic discussion embraces several sectors of the society in Portugal, but the challenge faced in this project was strictly focused on tourism, cargo ships and fishing sectors.

In general, all sectors are aware for plastic problem. However, there is a lack of targeted training and awareness campaigns and the reinforcement of waste collection in ports. There is also a lack of alternative and reusable materials research and development for innovative solutions that promote some plastics replacement.

8. References

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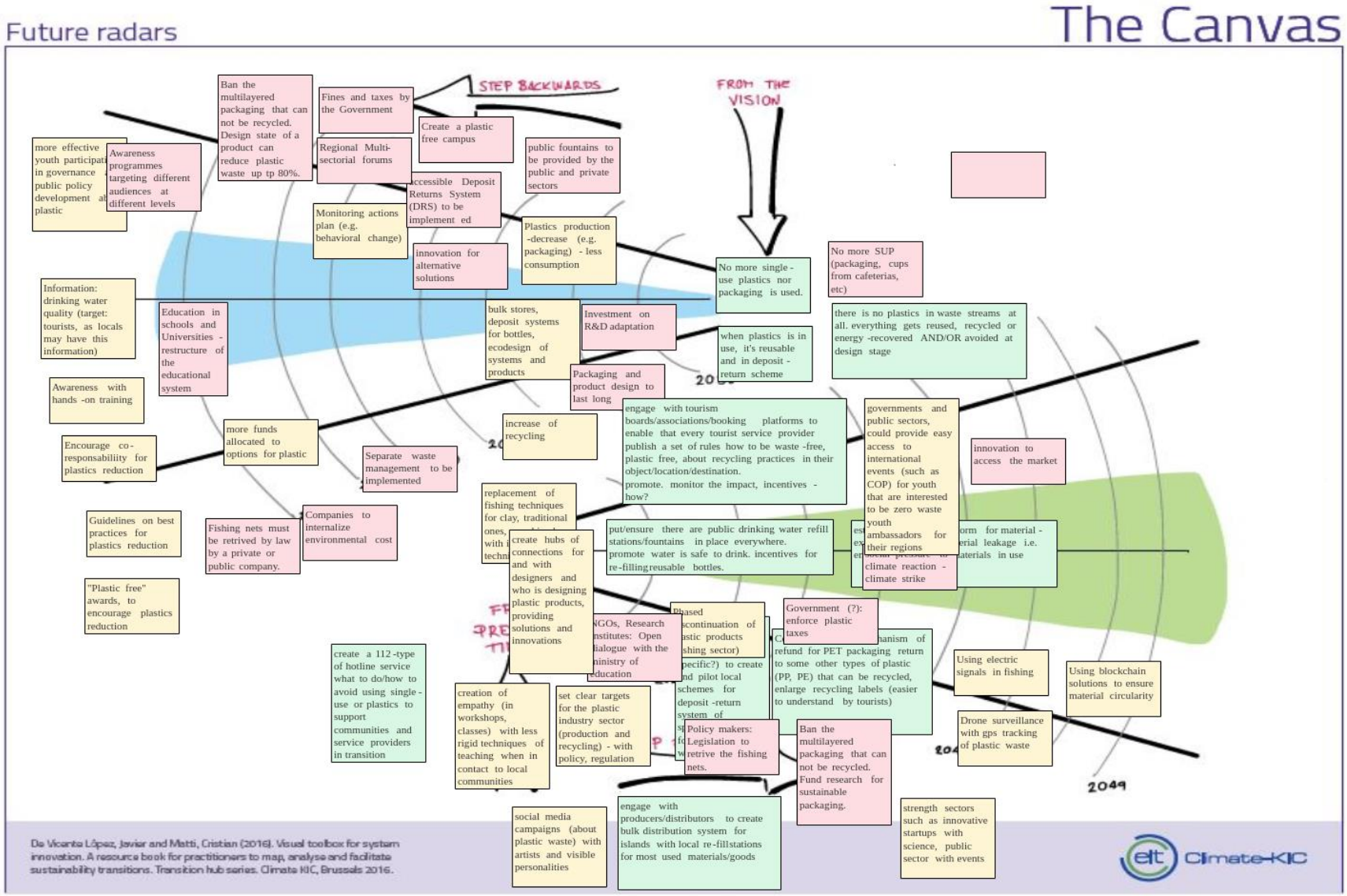
Annex


Future radars
The Canvas
STEP BACKWARDS
FROM THE VISION
Ban the multilayered packaging that can not be recycled. Design state of a product can reduce plastic waste up tp 80%.
Fines and taxes by the Government
Create a plastic free campus
Regional Multi-sectorial forums
public fountains to be provided by the public and private sectors
more effective youth participati in governance public policy development al plastic
Awareness programmes targeting different audiences at different levels
accessible Deposit Returns System (DRS) to be implement ed
Monitoring actions plan (e.g. behavioral change)
Plastics production -decrease (e.g. packaging) - less consumption
innovation for alternative solutions
No more single - use plastics nor packaging is used.
No more SUP (packaging, cups from cafeterias, etc)
Information: drinking water quality (target: tourists, as locals may have this information)
Education in schools and Universities - restructure of the educational system
bulk stores, deposit systems for bottles, ecodesign of systems and products
Investment on R&D adaptation
when plastics is in use, it's reusable and in deposit - return scheme
there is no plastics in waste streams at all. everything gets reused, recycled or energy -recovered AND/OR avoided at design stage
Awareness with hands -on training
Packaging and product design to last long
Encourage co - responsabiliity for plastics reduction
more funds allocated to options for plastic
increase of recycling
engage with tourism boards/associations/booking platforms to enable that every tourist service provider publish a set of rules how to be waste -free, plastic free, about recycling practices in their object/location/destination. promote. monitor the impact, incentives - how?
governments and public sectors, could provide easy access to international events (such as COP) for youth that are interested to be zero waste youth ambassadors for their regions
innovation to access the market
Separate waste management to be implemented
replacement of fishing techniques for clay, traditional ones,
Guidelines on best practices for plastics reduction
Fishing nets must be retrived by law by a private or public company.
Companies to internalize environmental cost
create hubs of connections for and with designers and who is designing plastic products, providing solutions and innovations
put/ensure there are public drinking water refill stations/fountains in place everywhere. promote water is safe to drink. incentives for re -filling reusable bottles.
climate reaction - climate strike
"Plastic free" awards, to encourage plastics reduction
Government (?): enforce plastic taxes
refund for PET packaging return to some other types of plastic (PP, PE) that can be recycled, enlarge recycling labels (easier to understand by tourists)
Using electric signals in fishing
Using blockchain solutions to ensure material circularity
create a 112 -type of hotline service what to do/how to avoid using single - use or plastics to support communities and service providers in transition
creation of empathy (in workshops, classes) with less rigid techniques of teaching when in contact to local communities
set clear targets for the plastic industry sector (production and recycling) - with policy, regulation
Policy makers: Legislation to retrive the fishing nets.
Ban the multilayered packaging that can not be recycled. Fund research for sustainable packaging.
Drone surveillance with gps tracking of plastic waste
2049
social media campaigns (about plastic waste) with artists and visible personalities
engage with producers/distributors to create bulk distribution system for islands with local re -fillstations for most used materials/goods
strength sectors such as innovative startups with science, public sector with events
De Vicente López, Javier and Matti, Cristian (2016). Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transition hub series. Climate KIC, Brussels 2016.