

MEDIUM TERM PUBLIC AWARENESS AND EDUCATION CAMPAIGN ON MANAGEMENT OF MARINE LITTER IN THE MEDITERRANEAN

A proposal to UNEP/MAP

by

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Preamble

The Mediterranean Action Plan of UNEP with the support of the Regional Seas Programme of UNEP aims to develop a medium-term public awareness and education campaign on the management of marine litter in the Mediterranean with the overall objective to contribute to the protection of the environment and the sustainable development of the Mediterranean. UNEP/MAP opted to work with partner NGOs of the region, namely the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE), the Hellenic Marine Environment Protection Association (HELMEPA) and Clean Up Greece - Environmental Organisation, in the context of a memorandum of understanding and within the framework of regional campaign entitled "Keep the Mediterranean Litter-free Campaign" being run by the three partner organizations with the support of UNEP/MAP.

This medium-term public awareness and education campaign on management of marine litter in the Mediterranean is therefore a draft proposal of MIO-ECSDE, HELMEPA and Clean Up Greece to UNEP/MAP and is a common regional approach on how to raise awareness and appropriately educate about marine litter with implementation at national and local level. It has been developed for the general public as well as for all other stakeholders such as the maritime industry, the tourism sector, agriculture, regional and national authorities, NGOs, the media, etc.

The next step is to present this draft proposal to representatives of the various target groups it focuses on for consultation, finalise the medium term campaign and explore the best mechanisms for its implementation.

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Introduction

Despite international, regional and national efforts, there are clear indications that marine litter is increasing worldwide and in the Mediterranean. National and local efforts to prevent the incidence of marine litter are ineffective without regional and international collaboration to address the sources of the problem.

Marine litter knows no boundaries and is a problem that must be tackled by all countries of the Mediterranean region, and for as speedy results as possible, within a common framework. Everyone is responsible for solid waste that ends up in the Mediterranean Sea. From the individual coastal inhabitant, the visiting tourist, the lacking integrated waste management policy, the weak enforcement of existing related policy, unsustainable production and consumption patterns, to the business or industry dumping directly into the sea. The awareness and education component of addressing the problem is very crucial in achieving a reversal of the current increasing trends of marine litter, not only in the Mediterranean but worldwide. Coupled with compliance and enforcement measures and enhanced technical capacities of coastal communities, the key to solving the problem is to change the attitudes, behavior and performance of:

- individuals directly or indirectly affecting the Mediterranean sea
- key groups/sectors using the Mediterranean coasts and sea or directly or indirectly affecting them

A regional common framework for effectively raising awareness and changing behaviors about marine litter inclusive of basic principles for all actors/sectors at regional, national and local levels and guidelines for each targeted actor/sector is what will be put forth in the following pages along with few main tools/modes of implementation. It is not the purpose of this text to provide detailed guidelines on how waste and marine litter specifically should be managed. It aims to provide a framework for encouraging each actor to be informed of responsibilities and options, to develop voluntary action and build key partnerships in effectively addressing the marine litter problem of the region.



MIO-ECSDE, HELMEPA and Clean-up Greece with the support of UNEP/MAP have launched the "Keep the Mediterranean Litter-free Campaign" to raise public awareness on the causes and impacts of the pollution of the sea from solid waste. In the framework of this campaign a useful brochure has been produced presenting not only the various causes and impacts of marine litter but also highlighting the role and responsibilities of all actors concerned, including the public at large, in protecting the coastal and marine environment from solid waste.

The brochure has been produced in Arabic, English, French and Greek

Marine litter in the Mediterranean

Marine Litter is defined as any persistent, manufactured or processed solid material disposed of or abandoned in the marine and coastal environment. It is waste produced by human activities, either on land or at sea, that finds its way into the marine environment. Plastics, rubber, paper, metal, wood, glass, etc. can be found floating on the surface of the sea, beneath the surface of the sea, washed up on the beaches or lying on the seabed.

The Mediterranean Sea faces a very serious marine litter problem and unless concerted action is taken to reduce this type of pollution the situation will only become worse.

Main sources of marine litter in the Mediterranean

The main sources of marine litter are domestic, industrial, shipping and agricultural activities that deliberately or by accident dispose of their waste directly or indirectly into the sea. Waste can travel big distances from its source by runoff, winds or sea currents.

The main sources of marine litter in the Mediterranean	
80% from land-based activities	<i>from run-off, littered rivers emptying into the sea, rainwater sewers and sewage outlets, air-borne garbage, industrial waste, poorly managed landfill sites, careless disposal of rubbish by beach users, campers and tourists.</i>
20% from activities at sea:	<i>from cargo and passenger vessels of all sizes (from cruisers to yachts and sailboats), commercial and recreational fishing vessels (fishing lines and nets, polystyrene fish storage containers, etc.), offshore oil and gas rig/platform debris.</i>

The impacts of marine litter

Even the remotest parts of the Mediterranean are affected by marine litter. The impacts of marine litter on the environment and coastal communities are multi-faceted. It spoils the landscape and may affect the marine ecosystem. Pollutants contained in litter are extracted and diluted into rainwater, freshwater or marine water and may enter the food chain.

More specifically,

- Marine litter poses a major threat to wildlife. Marine mammals, sea turtles and birds can be injured or killed either through entanglement in or ingestion of garbage items. Globally, it is estimated that over 1,000,000 seabirds and 100,000 marine mammals and sea turtles die each year from marine litter.
- Much of the marine litter eventually reaches the coastline, constituting a major source of aesthetic pollution that may deter tourists and impact local economies. Not only does marine litter cost coastal communities lost revenues from tourism, but cleaning up beaches from litter can also be very expensive.
- Lost or discarded fishing gear can have financial implications for the fishing industry, which will have to replace it. In addition, “ghost fishing” (entrapment of marine life in discharged fishing gear) from lost nets also kills thousands of fish.
- Marine litter may cause costly or irreparable damage to boats. Fishing nets can wrap around propellers, plastic sheeting can clog cooling water intakes, and lost nets or lines can entangle vessels.

Abandoned, lost, and derelict fishing gear is a significant and very persistent form of marine litter. It poses a threat to the marine environment, as well as human life and activities.

- Marine litter may also endanger human health and safety. Sharp objects, such as broken glass and rusty metal, may cause serious injuries when people step on them on the beach or seabed. Contaminated medical and sewage wastes may pose a public health hazard through disease transmission. Abandoned fishing nets and lines may entangle scuba divers.

The problem is compounded by the fact that almost 90% of floating marine litter is plastic-based and therefore does not degrade quickly in the environment. This allows garbage in the marine environment to continue increasing over time and to travel vast distances with ocean currents and winds, impacting the remotest parts of the world's oceans and coasts.

The Table below provides an indication of the necessary time for the decomposition of various litter items in the marine environment.

How long does it take for marine litter to decompose?	
glass bottle	1 million years
fishing line	600 years
plastic bottle	450 years
aluminum can	80-200 years
rubber boot sole	50-80 years
plastic cup	50 years
tin can	50 years
nylon fabric	30-40 years
plastic bag	10-20 years
cigarette filter	1-5 years
woolen clothes	1-5 years
plywood	1-3 years
waxed milk carton	3 months
apple core	2 months
newspaper	6 weeks
orange peel	2-5 weeks
paper towel	2-4 weeks

source: *The Ocean Conservancy, "Pocket Guide to Marine Debris", 2006.*

Main reasons why the problem of marine litter has not been successfully addressed in the Mediterranean

- The lack of international legal instruments (except for IMO/MARPOL Annex V which deals only with garbage from ships) or Global Programmes – makes it difficult to tackle the problem.
- There is non-existent, insufficient or ineffective coordination among the various institutions and authorities, national and regional, involved in environmental management and more specifically in waste management. It is thus necessary to:
 - (i) ensure the involvement and cooperation of administrative stakeholders at different levels and regional/national scales,
 - (ii) obtain the vertical integration and cooperation among the various sectoral branches of the administration (fisheries, tourism, environment, industry, port activities etc.).
- In several Mediterranean countries, there is no adequate regulatory framework to organize the management of coastal waste. Most commonly there is a lack of:
 - liability for bad practices of handlers of waste (producers, transporters, or those that are entrusted with disposal);
 - lack of classification of waste by nature and origin;
 - lack of regular and specific monitoring of the waste from production to disposal;
 - lack of effective penalties for offenders;
 - lack of application and enforcement of existing laws and regulations.

- Major problems are encountered in the application of economic instruments (mainly fines and taxes) e.g. inadequate and ineffectual administrative organization, non-payment of taxes, the human factor, very low fines and the inadequate follow-up.
- There is a lack of technical tools, means and expertise, at regional and national levels, necessary in order to focus and prioritize actions for a better management of coastal waste.
- There is very little and inconsistent information on quantities, flows, handlers of marine litter as well need for further information on the impacts of marine litter on humans and the ecosystem.
- There is a need for communication, transparency and coordinated action with the various economic sectors that are part of the marine litter problem in the Mediterranean in terms of the need to protect and preserve the marine environment from macro-waste.
- Awareness campaigns and educational programmes have been isolated and short-term efforts and have addressed in a non-integrated way the problem of marine litter in the Mediterranean.

But most importantly, there has not as of yet been a concerted regional response to the problem of marine litter in the Mediterranean through a harmonized regional coastal waste management scheme, taking into account national specificities, needs, opportunities and priorities.

Main legal and institutional frameworks affecting the Mediterranean

- Local Agendas 21
- National legislation on waste management and environmental protection
- The Mediterranean Strategy for Sustainable Development (MSSD)
- The Barcelona Convention, its Protocols, action plans and recommendations adopted by the Contracting Parties
- The EU Environmental Strategy for the Mediterranean and Horizon 2020
- The EU Marine Strategy Directive
- The EU Thematic Strategy on the Prevention and Recycling of Waste
- The international Maritime Organisation (IMO) Convention for the prevention of pollution from ships (MARPOL 73/78 – Annex V)
- The Global Programme of Action (GPA) for the Protection of the Marine environment from Land-based Activities; the Regional Seas programme
- The Basel Convention

Methodology/Approach

A medium term awareness and education campaign on how to effectively address marine litter in the Mediterranean is expected to succeed in:

Raising awareness about the issue so as to help individuals to acquire knowledge about the entirety of the environmental and socio-economic issues relating to marine litter, understanding the complexity and interconnectedness of problems such as environmental degradation, unsustainable production, wasteful consumption, etc.

Influencing behaviour, attitudes and values so as to help individuals acquire and strengthen values and feelings of concern for the marine environment, the related socio-economic concerns and the interdependent relationship between them, gain a variety of experiences and achieve the necessary motivation to be actively involved in the solutions to the problem.

Helping individuals to **acquire skills** such as critical thinking, reflection, communication skills, conflict management, etc. and learn how to take decisions and acting upon them, considering the long-term future of environment and society.

Strengthening participation so as to provide individuals with the opportunity to be actively involved at all levels and encourage them in working collectively and efficiently towards addressing marine litter problems and related issues of their community. In other words, encourage the process of developing the competencies that enable people to deal with a variety of issues affecting their lives, working at personal and group level, as well as act locally while thinking globally.

In light of the above, the awareness and education campaign proposed herewith encompasses targeting and approaching:

- the **major sectors** that have an important role to play in contributing to the reversal of current trends and adverse effects of marine litter in the Mediterranean
- the “**individual**”, the citizen

The major channels for appropriately and effectively targeting the “individual” are:

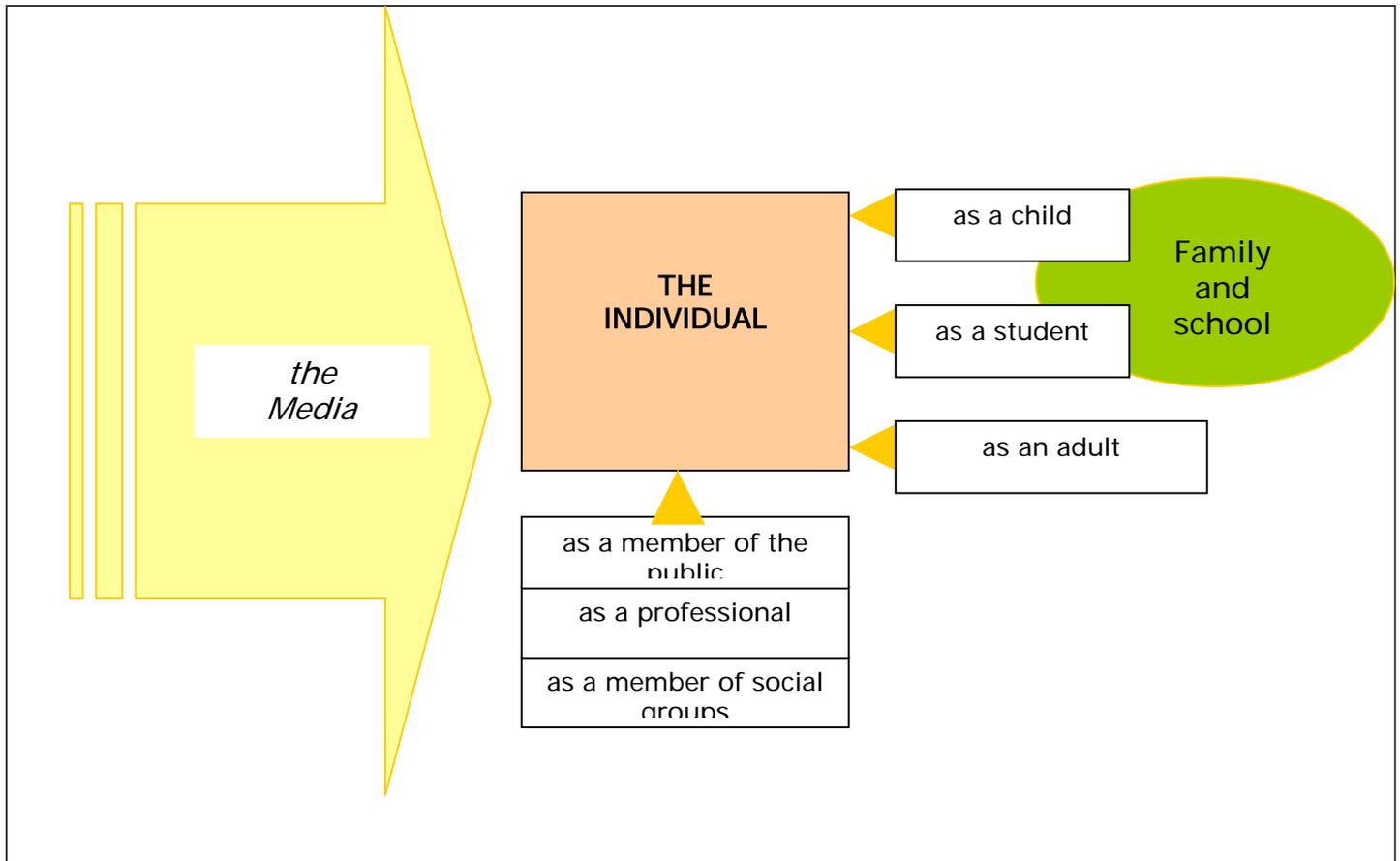
a) through education:

- as a child (via the family and formal, non formal and informal education)
- as a youth (student) (via formal, non formal and informal education, the family)
- as an adult (via training, etc.)

b) as a member of the general public (> through the media)
as a professional (> through cooperatives, unions, chambers, etc)
as a member of social groups (> through NGOs, associations, women’s groups, religious groups, etc.)

*the media plays
a constant role*

The major channels for appropriately and effectively targeting the “individual”



The role of education

The need to focus formal, non-formal and informal education on marine litter

The contemporary problems related to marine litter, particularly in the Mediterranean region call for the meaningful participation of the public and all concerned stakeholders. In order to achieve an effective participation, the public should be properly educated and empowered with the appropriate skills.

Education has been acknowledged worldwide as a fundamental tool for environmental protection and sustainable development. It is to this end that **formal educational systems** have integrated environmental education (EE) and, very recently, education for sustainable development (ESD) in the school curricula (basically primary and secondary school level). The modalities by which EE or ESD (in some European countries mainly) are implemented in schools varies from country to country depending on a number of social, economic and institutional factors. The need to ensure that marine litter and its interconnectedness is included as a specific topic within these environmental education programmes is an important first step.

This however cannot be done in a uniform way in the Mediterranean because EE and ESD programmes are implemented differently in each country. For instance, the model by which EE is implemented in primary schools in some Mediterranean countries (Greece, Spain, Jordan), is the one by which EE is included in the curriculum as a separate subject area. However, the “infusion” model is also used in primary schools in many countries, such as: Malta, Syria, Portugal, Italy, France and partially in Greece, by which EE, as a cross-curricular topic is embedded in the curriculum disciplines. The latter approach is prevalent in secondary schools. Another model based on transversal thematic modules (with topics such as: water, waste, energy, sustainable production and consumption, etc.) and implemented via interdisciplinary approaches is relatively new, not so frequently used, since it requires increased and efficient coordination, as well as a certain degree of expertise of the educators involved.

The **Mediterranean Strategy on Education for Sustainable Development (MSESD)** is currently being drafted at the initiative of Greece and the contribution of other Mediterranean countries, UNEP/MAP, MIO-ECSDE, etc. It is expected to be adopted in Cyprus in November 2007.

Therefore, the Ministries of Education of the Mediterranean countries must be urged to introduce or review existing EE and ESD programmes and effectively incorporate marine litter concerns.

Even if formal education systems directly or indirectly address the issue of marine litter e.g. through traditional disciplines such as science (e.g. by including in the curricula issues related to water and waste management, marine degradation, etc.), inadequate education has been provided to those who had the misfortune to not go to school or drop out. This is mainly a phenomenon of the rural and poorer parts of the Mediterranean region. To this end, non-formal education programmes need to be developed and implemented aiming to, *inter alia*, develop the appropriate knowledge and skills and empower the young people to address the problems revolving around marine litter. Non-formal education could contribute to enhancing people’s skills and willingness to behave and act more wisely, in the short and long-term, in the framework of sustainable development. The role of non-formal and informal education in achieving sustainable development has been recognised in all major conferences and documents (Agenda 21, UN Decade of Education for Sustainable Development, UNECE Strategy for Education for Sustainable Development).

Non-formal education takes place in a systematic way, out of the established formal educational system and sometimes, in parallel with mainstream systems of education and training and does not typically lead to formal certificates. Non-formal learning may be

provided through the activities of Non Governmental Organisations (NGOs) and other groups. It can also be provided through organizations or agencies, with specific objectives and specific target groups that have been set up to complement formal systems. Informal education takes place as a natural accompaniment of everyday life.

Unlike formal and non-formal, **informal learning** is not necessarily intentional learning, and as such may not even be recognised by individuals themselves as contributing to their knowledge and skills. It is “offered” or stimulated outside the schooling system and addresses the society at large or targeted groups other than students usually without any monitoring of its impact.

On the other hand, educators cannot assume that several years of formal education ensure that students will gain and retain all the knowledge and skills needed for **environmental literacy**. Non-formal education could provide students with the means to maintain and reinforce the knowledge and skills that they have learned during their school years on marine litter and therefore address the problem more effectively.

Environmental literacy is an individual's *knowledge* about and *attitudes* towards the environment and environmental issues, *skills and motivation* to work towards the environmental problems and *active involvement* in working toward the maintenance of a dynamic equilibrium between the quality of life and quality of the environment (Disinger & Roth, 1992).

Combined efforts need to be made by all three types of education (formal, non-formal and informal) in order to systematically cultivate environmental literacy.

Furthermore, as marine litter is a complex environmental issue and dependent on local and time related characteristics and conditions, non-formal education could provide opportunities and resources to help people retain and adapt their knowledge, skills and lifestyles.

The goal of non-formal and informal education focused on marine litter is not just the diffusion of related information; enhanced awareness, expressed interest and behavioural change are the initial signs of a successful process. It is when attitudinal changes towards marine litter occur that one of the most important objectives of such education has been achieved. Eventually, when an attitude based on a moral dimension is formed, then education has achieved its ultimate goal.

Education for the environment aims at the development of an informed attitude and behaviour towards the environment. It goes beyond the acquisition of skills and knowledge, and involves values and attitudes that affect behavior. It is concerned with the formation of attitudes that lead to a personal environmental ethic, in order for people to involve responsibly in actions for the sound management of the environment and the protection of natural resources.

Changing behaviors that lead to direct or indirect marine littering

It used to be widely acknowledged that a positive attitude towards the environment and the associated behaviour could be the result of increased environmental knowledge. However, research in environmental behaviour during the last two decades has provided evidence of a more complex relationship between behaviour and numerous variables. For example, not only in-depth knowledge about issues but knowledge and skills relating to the *intention to act* and the *locus of control*¹ were also identified as important parameters of environmental behaviour.

Considerable uncertainty still exists in the prediction of environmental behaviour because of the complexity of the process which is based on many factors.

In order for formal, non-formal and informal programmes and actions on marine litter to contribute to a responsible environmental behaviour they should be planned taking into consideration a number of factors as described below.

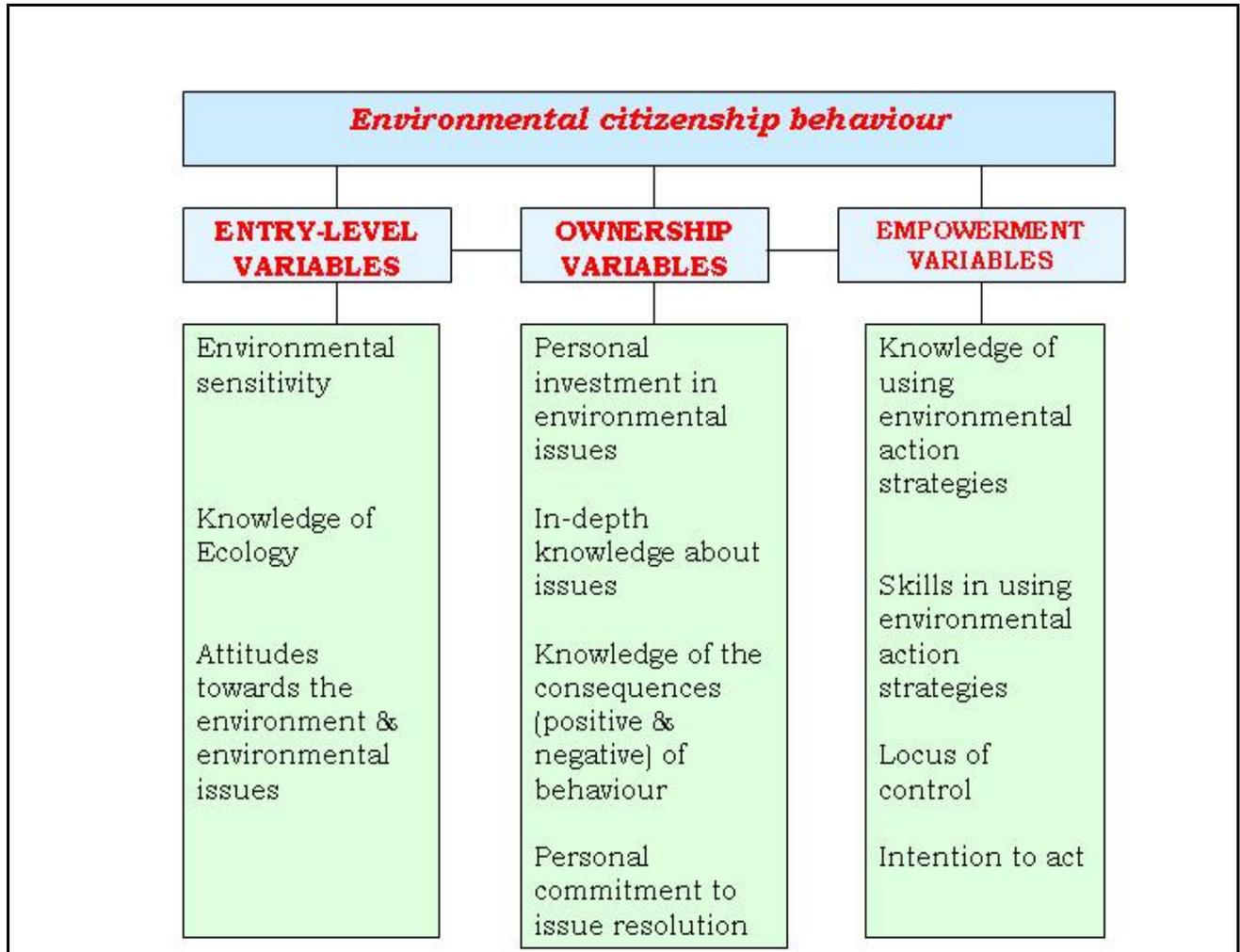
The now prevalent model for the prediction of responsible environmental behaviour was proposed by Hungerford and Volk in 1990 and it uses seven variables as key indicators.² These variables fall into three categories all of which contribute to shaping the individual's responsible environmental behaviour. "*Entry-level*" variables act as prerequisites for responsible environmental behaviour by providing the foundation for such an attitude. "*Ownership*" variables personalise environmental issues through expanded understanding and investment. "*Empowerment*" variables represent environmental problem-solving skills. According to the model, an individual who exhibits development of many of these variables is more likely to behave responsibly towards the environment.

Therefore, awareness and education programmes on marine litter that promote such characteristics are expected to contribute to fostering environmentally responsible behaviour. Furthermore, they should adequately address the economical, environmental and social dimensions of marine litter.

¹ *Locus of control* refers to an individual's belief in being reinforced for certain behaviour. In simple words, an individual who believes that he/she has good skills for dealing with a particular issue is more likely to express a relevant behaviour, because there is an expectation of success or reinforcement for such a behaviour (Franson & Garling, 1999; Anastasi & Urbina, 1997).

² Knapp D., Volk T. & Hungerford H. (1997)

The Evolution of the Behavioural Model



References for chapters “Methodology/Approach”, “The role of education” and “Changing behaviors that lead to direct or indirect marine littering”:

Anasatsi A. and S. Urbina (1997), “Psychological Testing, 7th Edition, Prentice Hall.

Franson N. and T. Garling (1999), “Environmental Concern: conceptual definitions, measurement methods and research findings”, *Journal of Environmental Psychology*, 1999, 19, pp 369-382.

Knapp D., Volk T. & Hungerford H. (1997), “The identification of empirically derived goals for programme development in environmental interpretation”, *The Journal of Environmental Education*, 1997, 28, 3, 24-34.

Scoullos M., Roniotes A. and V. Malotidi (2002), “Public Participation, Environmental Information & Awareness in the Mediterranean”, MIO-ECSDE, Athens.

Scoullos M. and V. Malotidi (2004), “Handbook on Methods used in Environmental Education and Education for Sustainable Development”, MIO-ECSDE, Athens.

The role of the media

The role of the media in addressing issues such as marine litter

Being the most important conveyor of information in today's world the media could (and therefore should) considerably contribute to raising the awareness of the wider public on environmental issues such as marine litter in the Mediterranean countries.

The media have an important role in modern democratic society as the main channel of communication. The population relies on the news media as the main source of information and on the basis of which they form their opinions and voting decisions. According to cultural selection theory, any selection of messages in the mass media will thus have a profound effect on the entire society.

Key players that should be involved

The **production of news** often goes through **several steps**: informants and sources, press agents, reporters, news agencies, journalists, and editors. Many media cite other media or opinion leaders so that the complete chain of information flow becomes quite long (Ericson et al. 1987, Howitt 1982). Since environmental issues are of global concern it is important that all stakeholders be involved in the decision-making and action-taking processes, in the media sector as much as in any other one, and especially the following key players:

- **Sources**: The sources of news may be public institutions, politicians, private companies, police, courts, interviewees, etc. These may have an interest in providing information that portray themselves in a positive light and withhold compromising information.

- **Journalists and editors**: Obviously, journalists do have the most important role to play in shaping the content of the message conveyed. However, the demand for economic efficiency and short time schedules nowadays means that journalists often have to print the messages from their sources with little or no editing. Therefore, it is necessary for any source to provide them with information in a format that is easy to use to make them gain time.

- **Owners**: The owners and shareholders of news media may have political opinions that shape their decisions, but with increasing professionalism they often prefer their media to be politically neutral in order to cover as large an audience as possible (Gaunt 1990). The present trend of concentration of business ownership means that many media owners also own other enterprises unrelated to news production. They may prevent their media from being too critical towards other firms that they own or towards business in general (Weis & Burke 1986).

- **Advertisers**: Newspapers get more than half of their revenues from advertisers, and most radio and TV stations get all their revenues from advertising and sponsoring (Weis & Burke 1986). Obviously, the advertisers have a strong influence on news contents. Such an influence is usually considered unethical, but is nevertheless difficult to avoid. In order to attract advertisers, the media often generate a "*buying mood*" by discussing topics of relevance to the advertised products and **avoiding any criticism of commercial products or of consumerism in general**.

The influence of advertisers may be even more direct, although clandestine. Occasionally, advertisers have imposed economic sanctions against newspapers that have criticized their products (Weis & Burke 1986, Bagdikian 1983).

- **Audience**: News media depend very much on their audience for economic reasons. They have to publish whatever makes people buy their newspapers, listen to their radio programs, or tune in to their TV shows and stay tuned through the commercial breaks. This is what newsworthiness really is about: catching the attention of the audience by presenting something spectacular, unusual, emotionally touching, and something that people can identify with. The concept of psychological buttons is really in place here. Topics like danger, food and sex make people pay attention. Keeping informed about dangers in the environment was of vital importance to our ancestors in primeval society, which is the reason

why we have a surveillance instinct that make us **hunger for news about possible dangers**. News about deviance, crime, and **disaster are particularly salient** (Gans 1980; Graber, D. 1980; Chermak 1995). The media have often been criticized for publishing too much bad news, but the fact is that the **audience actually pays more attention to stories about crime and disaster than to good news**.

Another pervasive psychological factor in the preferences of the audience is personal identification. A story is much more touching if presented in terms of personalities than if presented as abstract principles. A political conflict is perceived as much more interesting if it is framed as a personal battle between politicians than if framed as a clash between ideologies and a crime story is more touching if vulnerable victims voice their anger and grief.

How the media should be involved in conveying the message

As shown above, the media (or its key actors) have an enormous impact on public opinion, which gives them a great responsibility in contributing to raising the awareness of the general public but also to smaller audiences, accordingly, in environmental issues. Their involvement could take the following shapes:

- **General:**
 - taking part (esp. journalist staff) in stakeholder meetings and informational events, such as press conferences, on related issues in order to further disseminate the information;
 - adopting a CSR/ ethical attitude towards environmental issues, especially related to marine litter, waste recycling and safe disposal, etc.;
 - cooperating with concerned actors, scientific institutions as well as creative agencies to collect and “air” information in the most objective, accurate and exhaustive possible way and with a view to influence as much as possible the public’s attitude and behaviour.
- **Television/ radio channels:**
 - providing free time to interested businesses, NGOs and other organizations active in the field to “air” informational TV/ radio spots or at a discount rate in high audience time zones;
 - producing or broadcasting of relevant documentaries/ reportages in the news, especially in large audience time zones;
 - sponsoring TV/ radio emissions or other communication activities on the relevant subject;
 - providing technical support to the production of spots, documentaries, etc. realized by NGOs or other low budget actors.
- **Press:**
 - publishing inserts/ ads for free or at a very low rate, in privileged spaces (i.e. back-pages) in newspapers, magazines or reviews;
 - publishing advertorials or reportages of interested low budget organisations for free or at a privileged rate for other actors;
 - providing assistance in copy writing for articles or other journalistic support in relevant matters;
 - organizing seminars in environmental journalism;
 - sponsoring communication activities of active organisations on the relevant subject at local level.

Key issues to focus on

Issues to be dealt with by the media should be of interest to the large public, or the target audience addressed. Themes relating to marine/coastal litter that would have an appealing effect on most publics are:

- **human health risks represented by littered items and uncontrolled waste dumping** in rivers, seas and the shoreline;
- **marine pollution from litter and its impacts on marine wildlife** (mammals such as dolphins, seals; birds; sea turtles; etc.) **and eco-systems;**
- **degradation of bathing water quality due to inadequate waste disposal close to bathing areas**
- **aesthetic downgrading of tourism areas** from the presence of coastal/marine litter

Root problems could also be addressed in more educational emissions, such as documentaries, children's' emissions, reportages, etc. – e.g.:

- **unsustainable consumption and production patterns** and their impacts on the environment
- **minimizing, recycling, recovery and reuse of waste**

The scope of issues addressed should be relevant to the country or to the overall Mediterranean region so as to avoid the “NIMBY” effect and at the same time trigger solidarity among neighbours, since the marine litter issue is recognized as being largely “migratory”.

Common principles on raising awareness, educating and effectively mobilizing action in combating the problem of marine litter in the Mediterranean

- Change production and consumption patterns and advertise this as an individual, as an economic sector, as a business, as an administration, as a ship, as a cooperative, etc. **Reduce, Reuse, Recycle** and dispose **Responsibly**.
- Set an example to others and request the respect of others towards the marine and coastal environment.
- Exert appropriate targeted pressure to other co-responsible authorities and economic sectors.
- Join coordinated and systematic local, national and regional initiatives and get involved in awareness raising campaigns, in clean-up efforts, etc.
- Promote and perform systematic collection of information and data on marine litter based on the regional guidelines and methodologies.
- Be part of a regional network (or sub-network) on marine litter in the Mediterranean so as to receive systematic, coordinated information.
- Be informed, educate and train yourself about international, regional and national formal and non-formal educational programmes if you perform such services (civil servants, educators, NGOs, etc.).
- Inform, educate and train your staff (administrations, municipalities, economic sectors, etc.).
- Inform, educate and train your members (associations, cooperatives, unions, clubs, other organised groups).
- Integrate local action with any relevant regional and global priorities, programmes and strategies.
- Provide financial support for preventive actions.

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In the following chapters more detailed proposed actions are outlined specifically for the major economic sectors linked with the problem of marine litter in the Mediterranean as well as for the regional, national and local authorities and civil society.

The specific role of key Mediterranean sectors/actors in setting an example and raising awareness

The Maritime sector

Why the maritime community should contribute to addressing the problem of marine litter in the Mediterranean

Merchant shipping, ferries and cruise liners, fishing vessels and pleasure craft, boats and vessels of all kinds, are potential sources of marine litter. Depending on their size, smaller or larger amounts of garbage are generated on board. When garbage items, either intentionally or accidentally, end-up in the sea they contribute to the problem of marine litter.

Waste management plans are required by international law for larger vessels, while preparations for proper waste management should be made in advance also by those onboard smaller vessels and pleasure craft. Unfortunately, not all waste is stored onboard and discharged ashore in a proper reception facility or disposed of, in the case of large vessels, using the incinerator.

Marine litter produced by the maritime sector along with other types of pollutants such as oil from vessels, tarnish the image of global shipping deterring efforts of the industry to project its “green” credentials. It is a fact that a large segment of the public still associates marine litter primarily with shipping activities and therefore, it is in the major interest of the maritime community to address the problem of marine litter, not only in accordance with existing international legislative requirements, but going a step further seeking optimal solutions for solid waste management on board.

Recognizing that ships vary considerably in size, mission and capability, this chapter addresses not only the professional and commercial maritime community, but also non-commercial seafarers as they also constitute a significant source of marine litter pollution.

How boats and vessels of all types contribute to the problem of marine litter

Garbage may be intentionally thrown overboard due to indifference or limited space on board for storage. Garbage items may also accidentally fall or be blown/washed off vessels into the water under adverse weather conditions. Additionally, fishing nets and lines and other types of equipment may be lost at sea accidentally and become marine litter.

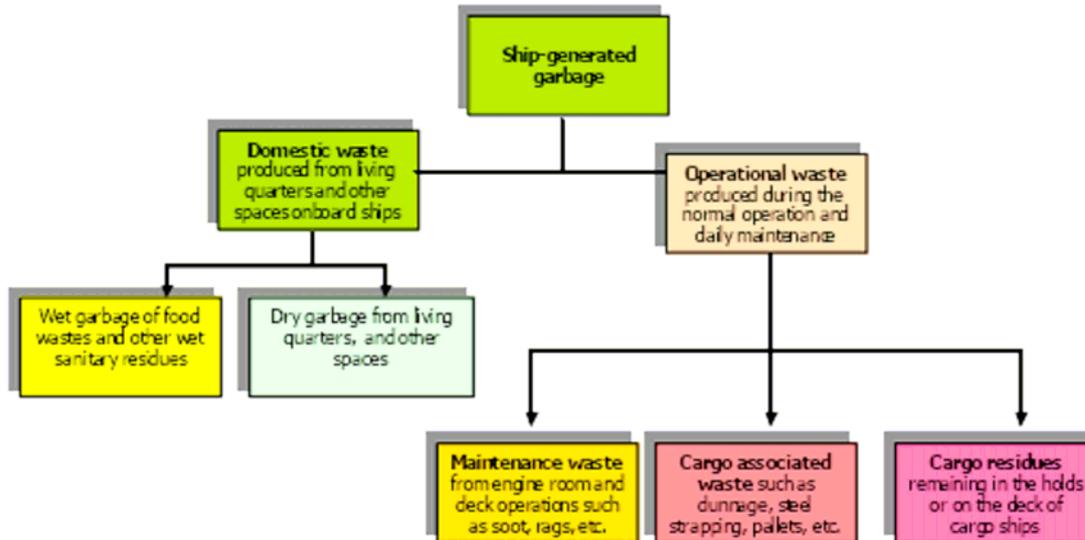
Marine litter is defined as any persistent, manufactured or processed solid material disposed of or abandoned in the marine and coastal environment. In this context, for the purpose of this chapter the term “garbage” is used for all kinds of domestic or operational waste generated during the normal operation of the ship, which may potentially end-up as marine litter.

In general terms, maritime activities that contribute to the marine litter problem can be categorized as follows:

- Shipping

According to MARPOL Annex V, the basic categories of ship-generated garbage are depicted in the diagram below.

Basic categories of ship-generated garbage



From the above, the following categories of solid wastes can be considered as potential marine litter:

A. Domestic waste (excluding food waste unless mixed with solid wastes)

Domestic wastes including wet and dry garbage represent all types of solid wastes generated in the living quarters of a ship, such as paper products, textiles, glass, rags, bottles, plastic items, etc. This category also includes all materials contaminated by food wastes generated in the galley and dining rooms and disposed of as solid materials and also of refuse produced in living spaces of crew and passengers including paper products, textiles, glass, rags, bottles, etc. Domestic waste can also originate from medical spaces including expired medicines, lining and packing material, sweepings, etc.

Usually about 1.5 – 2.5 kg of domestic waste is generated on a daily basis per person on a commercial cargo ship and about twice as much on a passenger ship. On average, 75% per weight and 10% per volume of domestic waste is food waste and the remaining 25% per weight and 90% per volume is refuse (EPE, 2004).

B. Operational waste

This category consists of cargo-associated wastes originated from cargo stowage and handling works in general and maintenance wastes collected by the engine department and the deck department while maintaining and operating the vessel.

With regards to cargo-associated waste, the largest source of shipboard solid waste in both volume and weight is waste due to break bulk cargo operations. Such waste consists of dunnage, pallets, paper and cardboard material, wire and steel strapping, etc.

A variety of works regularly carried out onboard ships, such as cleaning of boilers, tanks, decks and platforms result in the production of maintenance wastes. This category includes wastes such as machinery deposits, scraped paint, deck sweeping, wiping wastes, rags, etc., the quantity of which that can be accumulated on a large sea-going ship could exceed 20 kg daily (EPE, 2004).

- Fishing vessels

Depending on their size and type of activity, fishing vessels may also generate smaller or larger amounts of garbage. If not managed correctly, both domestic and operational wastes may end up in the sea as marine litter.

Domestic wastes from fishing vessels are much the same as those described previously in the shipping section, but their volume may vary depending on the number of the vessel's crew and time at sea.

Regarding the operation of fishing vessels, maintenance wastes can also be much the same as those described in the shipping section, again depending on the vessel's size and type of fishing activity.

However, it is the gear and equipment associated with the fishing activity that is considered a major problematic area with regards to marine litter. Materials used at sea by fishermen include synthetic materials, such as trawl and fishing nets, net fragments, bait gaskets, floats, synthetic rope, plastic sheeting and packaging, fiberglass and strapping bands.

In addition to the fact that fishing gear and equipment is largely made of synthetic material and is not biodegradable, "ghost fishing" (entrapment of marine life in discharged fishing gear) from lost nets kills thousands of fish and marine mammals that may become entangled in it.

- Pleasure craft

Pleasure craft activities have expanded considerably in the Mediterranean region and are now one of the key sectors of Mediterranean tourism. This has resulted in an additional source of income and in the creation of direct and indirect jobs. Thus, these activities play an important economic and social role.

However, the development of marinas and the increasing density of boats and yachts in some parts of the Mediterranean have led to a serious concern with respect to the potential harm it may cause to the marine environment.

The generation of garbage on pleasure craft that may end-up as marine litter is considered relatively smaller compared to other types of vessels, mainly due to their limited size. However, considering the large number of pleasure craft in the Mediterranean and their ability to approach unspoiled secluded beaches and islands, these are regarded as a significant contributor to the marine litter problem.

Domestic and maintenance wastes from pleasure craft are much the same as those described previously in the section on shipping, but their volume may vary depending on factors such as number of crew and passengers, boat size, time at sea, etc.

Paper products, aluminum cans, plastic containers, glass bottles, disposable eating utensils, fishing lines, etc., are just a few of the typical waste products used in pleasure craft that may result as marine litter if discarded overboard.

Two important factors that add to the problem of marine litter from pleasure craft are:

- (i) the often limited space on board pleasure craft for storage of garbage, and
- (ii) the lack of adequate facilities for the reception of garbage at most marinas.

How to raise awareness amongst maritime stakeholders on the marine litter issue

Although garbage may enter the marine environment accidentally from boats, most of the time it is thrown into the seas and oceans by seafaring people who are not aware of the problems this may cause. Therefore, an essential part of any action plan to address the problem of marine litter is the implementation of awareness raising campaigns by intergovernmental organizations, competent government agencies, the maritime industry itself and other stakeholders.

- Legislative framework

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) sets the international legislative framework for dealing with ship-generated marine pollution. It has been adopted by the International Maritime Organization (IMO), which is the UN's specialized agency responsible for improving maritime safety and preventing pollution from ships. Annex V of the Convention sets the requirements regarding the Prevention of Pollution by Garbage from Ships and designates a number of Special Areas where more stringent requirements exist.

Although the Mediterranean Sea has been designated a Special Area for the purpose of MARPOL Annex V, this provision has not yet entered into force due to the lack of adequate reception facilities.

There are two basic principles for the disposal of garbage at sea within special areas:

- Plastics are prohibited from disposal into the sea.
- No other garbage may be discharged, except for food waste (under certain conditions) within 12 nautical miles from the nearest land.

Specific garbage disposal requirements from ships within and outside Special Areas are presented in the Table below.

<i>Type of garbage</i>	Garbage Disposal from Ships	
	<i>Outside Special Areas</i>	<i>Within Special Areas</i>
Plastics, including synthetic ropes, fishing nets and plastic garbage bags.	Disposal Prohibited	Disposal Prohibited
Floating dunnage, lining and packing materials.	> 25 miles offshore	Disposal Prohibited
Paper, rags, glass, metal, bottles, crockery and similar refuse.	> 12 miles	Disposal Prohibited
All other garbage including paper, rags, glass, etc. comminuted or ground.	> 3 miles	Disposal Prohibited
Food waste not comminuted or ground.	>12 miles	>12 miles
Food waste comminuted or ground.	> 3 miles	> 12 miles
Mixed refuse types.	**	**

** When garbage is mixed with other harmful substances having different disposal or discharge requirements, the more stringent disposal requirements shall apply.

Annex V of MARPOL 73/78 also requires vessels over 400 tons, or ships certified to carry more than 15 persons, to develop and implement a *garbage management plan*, which contains procedures for collecting, storing, processing and disposal of garbage. Ships may also be fitted with appropriate garbage handling equipment, such as compactors or incinerators.

Such vessels need to enter details of every garbage management operation such as incineration or disposal in a garbage record book. The record book and any receipt for using a waste reception facility in port must be kept for two years and be available for inspection by authorities.

The IMO has recently initiated an on-going process for the review of Annex V to MARPOL 73/78, which is scheduled to be completed by October 2008. For this purpose, it has set up a Correspondence Group of Experts, who will make their recommendations to the Marine Environment Protection Committee (MEPC) of the Organization. Basic issues being discussed include, among other:

- Introducing a general concept to minimize the generation of garbage, including encouragement of ships to offload all garbage to reception facilities instead of discharging it into the marine environment;
- Assessment of the potentially harmful effects of residues of bulk cargoes, such as pet coke, fertilizers etc., which are currently allowed to be discharged at sea under certain conditions.
- Considering provisions that mitigate the loss of fishing gear, including the recording of accidental loss of fishing nets in the garbage record book and setting a general obligation to attempt to recover such nets;
- Assessment of sea-based sources of marine debris, as existing data is rare.

Regional Strategy for Prevention of and Response to Marine Pollution from Ships, adopted in November 2005 by the Contracting parties to the Barcelona Convention. It includes, among other, requirements regarding provision of port reception facilities for ships, delivery of ship-generated wastes and reduction of pollution from pleasure craft activities. The latter is a specific objective, upon which REMPEC is currently preparing Guidelines for pleasure craft, marinas and relevant facilities.

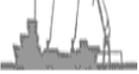
The Code of Conduct for Responsible Fisheries was adopted in 1995 by the Fishery Department of the UN Food and Agriculture Organization (FAO) with the aim of promoting sustainable development of responsible fisheries and contributing to food security.

Regarding garbage, the Management Objectives include that:

- Appropriate measures are taken to ensure that pollution, waste, discards, catch by lost or abandoned gear etc. are minimized through measures including the development and use of selective, environmentally safe and cost-effective fishing gear and techniques.
- Fishing gear, methods and practices, to the extent practicable, are sufficiently selective so as to minimize waste, discards, loss of fishing equipment, etc.
- States should take measures to protect the aquatic environment in accordance with the MARPOL 73/78 Convention, and owners, charterers and managers of fishing vessels should (i) consider fitting a shipboard compactor or incinerator to relevant classes of vessels in order to treat garbage and other shipboard wastes generated during the vessel's normal service, and (ii) minimize the taking aboard of potential garbage through proper provisioning practices.

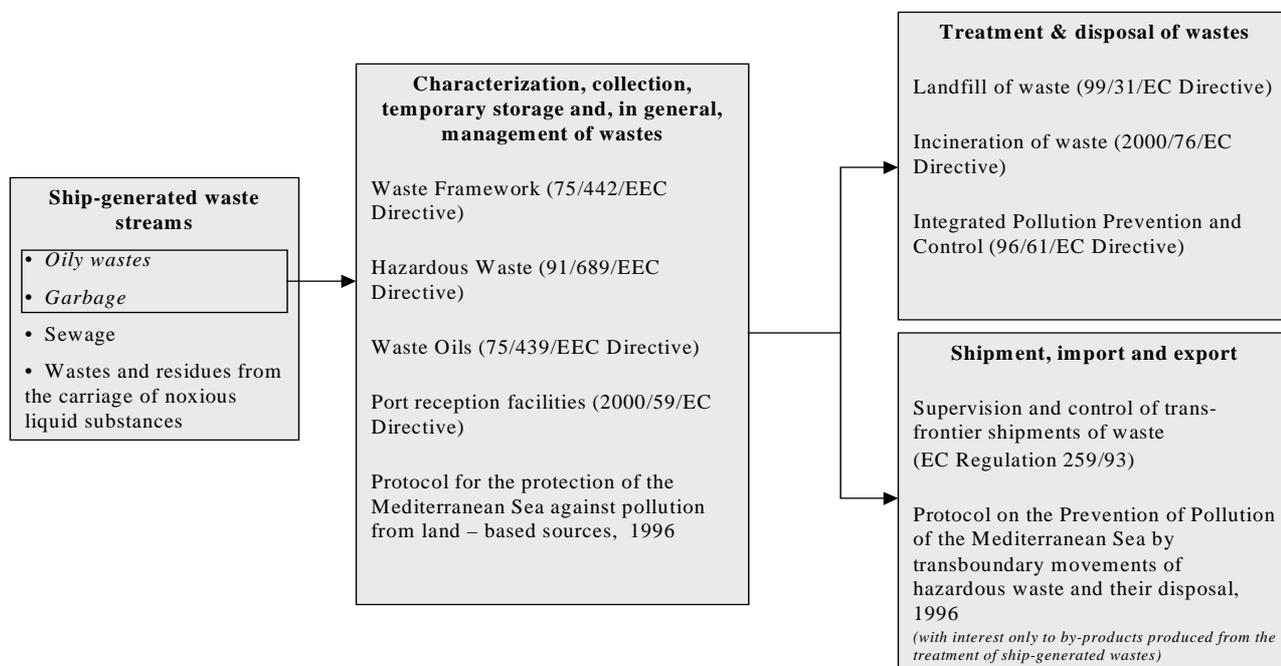
European Commission legislation (applicable to Mediterranean EU Member-States): A number of EU Directives and Regulations are related to prevention of marine litter from ships

and vessels of all types. These can be viewed in relation to the requirements of the Barcelona Convention in the diagram below.



PORT RECEPTION FACILITIES FOR COLLECTING SHIP GENERATED GARBAGE, BILGE WATER AND OILY WASTES

Overview of basic E.U. and Barcelona Convention legal framework related with waste management planning



Good practice example – Regional initiative

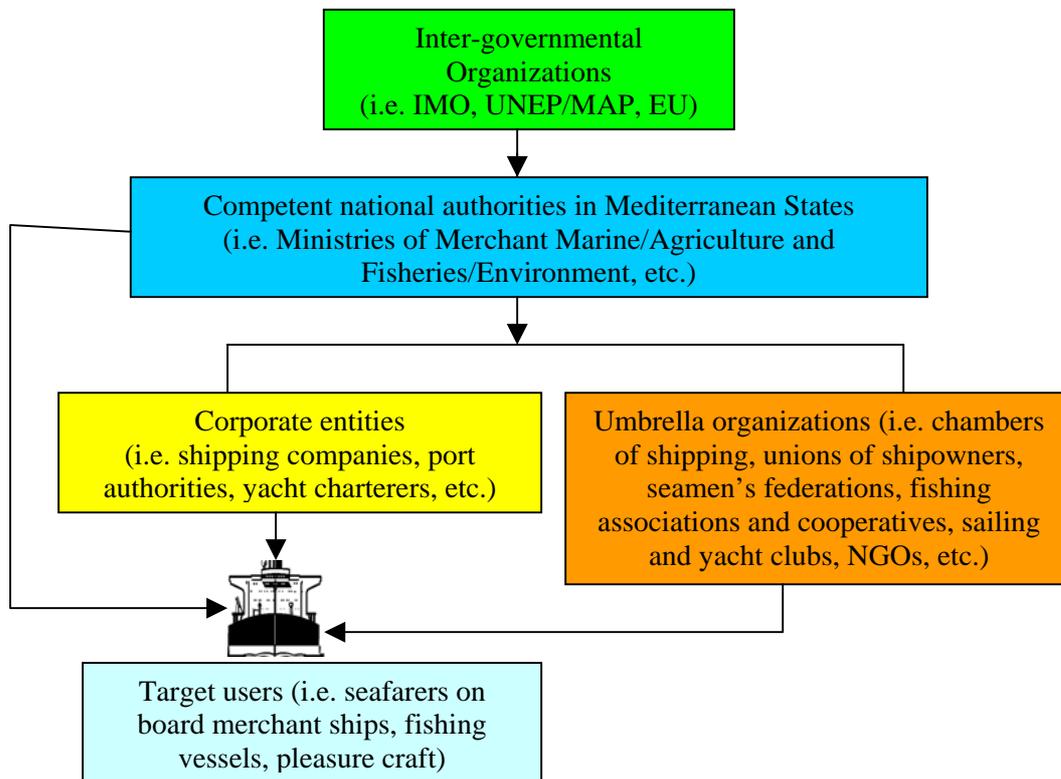
The *Save the North Sea Project* was established in 2002 as a result of growing concern and awareness that marine litter causes financial and environmental problems. It is collaboration between non-profit organizations, companies, political organizations and government agencies who are concerned about the rising levels of marine litter in the North Sea.

The project aims at contributing towards a sustainable development in the North Sea region by changing the attitudes to marine litter among the target groups who use the North Sea both commercially and recreationally. Thus, the main target groups are fishermen, seafarers, leisure boat owners, off-shore workers and people who spend time at the beach.

The *Save the North Sea* project has carried out a wide range of activities to influence these groups and to reduce marine littering in the long run, including fishermen bringing back to shore litter found in their nets and the Individual Blue Flag, a voluntary code of practice designed to encourage private pleasure craft owners to decrease marine litter.

- Information flow/channels

With regards to the maritime community, the diagram below depicts in general the various levels of actors/stakeholders in the Mediterranean and the information flow.



- Training, education and awareness raising

Common programs throughout the Mediterranean in the field of training and education can make a valuable contribution to raising the awareness of seafarers, thus leading to a reduction in the amount of ship-generated garbage.

Audiences should include recreational boaters and fishermen, port and terminal operators, coastal communities, ship supply industries, shipbuilders, waste management industries, plastic manufacturers and fabricators, trade associations, educators and competent government departments.

The subjects addressed in these programs are recommended to include the basic principles of sustainable development (economic, social and environmental interrelations); the responsibilities of citizens under national and international law; options for handling garbage at sea and upon return to shore; known sources and types of garbage; impacts of plastic debris on seabirds, fish, marine mammals and sea turtles; impacts on ship operations, coastal tourist trade; current action by governments and private organizations; sources of further information.

The development and implementation of such programs can prove much more efficient if conducted by umbrella organizations such as chambers, associations, NGOs and other industry stakeholders that possess a clear insight on the industry's workings and practicalities. In the occasion of a lack of such stakeholders in certain Mediterranean countries, government initiative in partnership with relevant regional bodies is even more crucial.

Professional seafarers

Competent government departments, umbrella organizations and other relevant stakeholders should develop and undertake training, education and public information programs suited for all seafaring communities under their jurisdiction.

Governments should amend their maritime certification examinations and requirements, as appropriate, to include a knowledge of duties imposed by national and international law regarding the control of pollution of the sea by garbage. Moreover, they should request from maritime colleges and technical institutes under their jurisdiction to develop or expand curricula to include both the legal duties and the technical options available to professional seafarers for handling ship-generated garbage. These should also include information on the environmental impacts of garbage and the principles of sustainable development. Suggested topics to be included in the curriculum are the following:

- i) garbage in the marine environment, sources, types and impacts;
- ii) national and international laws relating to shipboard waste management;
- iii) health and sanitation considerations related to the storage, handling and transfer of ship-generated garbage;
- iv) current technology for on-board and shoreside processing of ship-generated garbage;
- v) provisioning options, materials and procedures to minimize shipboard generation of garbage.

Professional associations and societies of ship officers, engineers, naval architects, shipowners, managers and seafarers are encouraged to ensure their members' competency regarding the handling of ship-generated waste.

Ship-managing companies and fishing vessel managers are encouraged to ensure that relevant placards are permanently posted in suitable areas of ships under their management, summarizing the prohibitions and restrictions for the disposal of garbage from ships under MARPOL Annex V and the penalties for failure to comply. These placards should be clearly visible, made of durable material and fixed in a conspicuous place in galley spaces, the mess deck, wardroom, bridge, main deck and other areas of the ship, as appropriate. The information contained should be in the language or languages understood by the crew and passengers.

An example of such a motivational placard is the one produced by the Hellenic Marine Environment Protection Association (HELMEPA), which is prominently placed on over 500 of the Association's member-vessels reminding crew and passengers on limitations regarding waste disposal.

HELLENIC MARINE ENVIRONMENT PROTECTION ASSOCIATION



ΕΛΛΗΝΙΚΗ ΕΝΩΣΗ ΠΡΟΣΤΑΣΙΑΣ ΘΑΛΑΣΣΙΟΥ ΠΕΡΙΒΑΛΛΟΝΤΟΣ

•HELMEPA•

HELMEPA REMINDS YOU

According to Regulations 3 and 5 of the International Convention MARPOL 73/78, Annex V, the following requirements of garbage discharge to the sea apply to ships.

GARBAGE TYPE	INSIDE SPECIAL AREAS*	OUTSIDE SPECIAL AREAS
Plastics, including synthetic ropes, fishing nets and plastic garbage bags	PROHIBITED	PROHIBITED
Floating debris, tiring and packing materials	PROHIBITED	MORE THAN 25 NAUTICAL MILES OFFSHORE
Paper, rags, glass, metal, bottles, crockery and similar refuse	PROHIBITED	MORE THAN 12 NAUTICAL MILES OFFSHORE
Paper, rags, glass, metal, bottles, crockery and similar refuse which is comminuted or ground	PROHIBITED	MORE THAN 3 NAUTICAL MILES OFFSHORE
Food wastes	MORE THAN 12 NAUTICAL MILES OFFSHORE	MORE THAN 12 NAUTICAL MILES OFFSHORE
Food wastes comminuted or ground	MORE THAN 12** NAUTICAL MILES OFFSHORE	MORE THAN 3 NAUTICAL MILES OFFSHORE
Liquid refuse types	THE MORE STRINGENT DISCHARGE REQUIREMENTS APPLY DEPENDING ON THEIR CONTENT	

* Special areas include: Mediterranean Sea, Baltic Sea, Black Sea, Red Sea.

Η HELMEPA ΣΑΣ ΥΠΕΝΘΥΜΙΖΕΙ

Σύμφωνα με τους Κανονισμούς 3 και 5 του Παραρτήματος V της Διεθνούς Σύμβασης ΜΑΡΡΟΛ 73/78, ισχύουν οι παρακάτω προϋποθέσεις διάθεσης απορριμμάτων στο Θάλασσο από πλοία.

ΤΥΠΟΣ - ΚΑΤΗΓΟΡΙΑ ΑΠΟΡΡΙΜΜΑΤΩΝ	ΜΕΤΑ ΤΗ ΕΙΔΙΚΕΣ ΠΕΡΙΟΧΕΣ*	ΕΚΤΟΣ ΕΙΔΙΚΩΝ ΠΕΡΙΟΧΩΝ
Πλαστικά, περιλαμβανομένων συνθετικών σχοινιών, ψαροαλιεμάτων, αλιευτικών δικτύων, βύσινων αλιείας και άλλων απορριμμάτων	ΑΠΑΓΟΡΕΥΕΤΑΙ	ΑΠΑΓΟΡΕΥΕΤΑΙ
Πλωστά ερείσματα, ελαστικά, υλικά και υλικά συσκευασίας	ΑΠΑΓΟΡΕΥΕΤΑΙ	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 25 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ
Χαρτί, ραβδιά, γυαλί, μεταλλικά, πλαστικά, κεραμικά και άλλα υλικά απορριμμάτων	ΑΠΑΓΟΡΕΥΕΤΑΙ	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 12 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ
Χαρτί, ραβδιά, γυαλί, μεταλλικά, πλαστικά, κεραμικά και άλλα υλικά απορριμμάτων που έχουν τεμαχιστεί ή αλεσθεί	ΑΠΑΓΟΡΕΥΕΤΑΙ	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 3 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ
Υπολείμματα τροφών	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 12 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 12 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ
Υπολείμματα τροφών που έχουν τεμαχιστεί ή αλεσθεί	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 12** ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ	ΣΕ ΑΠΟΣΤΑΣΗ ΜΕΓΑΛΥΤΕΡΗ ΤΩΝ 3 ΜΙΛΙΩΝ ΑΠΟ ΤΗΝ ΑΚΤΗ
Λiquida απόβλητα τύπων	ΑΝΑΛΟΓΑ ΜΕ ΤΟ ΠΕΡΙΕΧΟΜΕΝΟ ΤΟΥΣ ΙΣΧΥΟΥΝ ΟΙ ΑΥΤΗΡΧΟΤΕΡΕΣ ΠΕΡΙΘΕΣΕΙΣ ΑΠΟΡΡΙΨΗΣ	

* Οι ειδικές περιοχές περιλαμβάνουν: Μεσόγειο Θάλασσο, Βαλτικό Θάλασσο.

Vessel and port reception facilities' operators should establish awareness raising and training programs for personnel operating and maintaining garbage reception or processing equipment. These may include instructions on what constitutes garbage and the applicable regulations for handling and disposing of it. Such training should be revised annually.

Non-professional seafarers

It is crucial that the development of pleasure craft activities in the Mediterranean is accompanied by suitable measures to mitigate the impact these activities have on the environment and coastal areas.

Authorities should develop and implement within the framework of a region-wide awareness campaign and jointly with qualified NGOs training programs, targeting the personnel of their administrations or agencies involved in the management and monitoring of pleasure craft activities and the prevention of marine pollution. These programs should include sound knowledge on applicable international, regional or national regulations, including any sanctions incurred in case of violations. They should also clearly describe the various sources of pollution and environmental impacts that may originate from pleasure craft activities, applicable regulations as well as measures that users should implement in order to comply with the relevant requirements.

Potential means for delivering such information include:

- radio and television broadcasts,
- articles in periodicals and specialized journals,
- voluntary initiatives, such as beach cleanups and adopt-a-beach programs,
- public statements by high-ranking government officials and famous personalities,
- posters, brochures, leaflets, etc.
- conferences and symposia,
- educational material for schoolchildren, drawing contests, etc.

Good practice example – “Good Mate” clean boating program

This is a program developed by the Washington-based NGO *Ocean Conservancy* to raise awareness and promote environmentally responsible boating and marina operations. It provides recreational boaters and marina operators with the information they need in order to help them develop environmentally sound practices to reduce pollution, keep fish thriving and make boating pleasant and safe.

Good Mate information and educational materials have been incorporated nationally into the safe boating and environmental training programs of The U.S. Coast Guard Auxiliary and the U.S. Coast Guard Sea Partners Campaign.

Key elements on which awareness raising should focus

Awareness raising and education campaigns on the management of marine litter within the Mediterranean maritime sector should address ship and fishing vessel operators, masters and crews, non-professional seafarers and all other parties involved towards:

- (i) minimizing the taking aboard of potential garbage and on board generation of garbage,
- (ii) safe handling, processing and/or storage of garbage on board ships and boats, and
- (iii) environmentally sound disposal of garbage from ships, fishing vessels and pleasure craft.

- Minimizing the amount of potential marine litter

Domestic waste

Domestic wastes may be minimized through proper provisioning practices. Ship operators and competent government departments should encourage ships' suppliers and provisioners to consider their products in terms of the garbage they generate. Options available to decrease the amount of domestic waste aboard ships include the following:

- Bulk packaging of consumable items. However, factors such as expiry date once a container is opened must be considered to avoid increasing wastes.
- Reusable packaging and containers. Use of disposable cups, utensils, dishes, towels and rags and other convenience items must be limited and replaced by washable items when possible.
- Where practical options exist, provisions packaged in or made of materials other than disposable plastic should be selected to replenish ship supplies unless a reusable plastic alternative is available.

Operational waste

Operational waste generation is specific to individual ship activities and cargoes. Awareness raising initiatives should encourage manufacturers, ship operators and competent government departments to consider the garbage associated with various categories of cargoes and take all necessary action to minimize its generation. Such actions could include the following:

- Replacing disposable plastic sheeting used for cargo protection with permanent, reusable covering material.
- Use of stowage systems and methods that reuse coverings, dunnage, shoring, lining and packing materials.
- Dunnage, lining and packaging materials generated in port during cargo discharge should preferably be disposed of to the port reception facilities and not retained on board for discharge at sea.

Fishing gear

Awareness raising and education campaigns should encourage fishing vessel operators, their organizations and competent government departments to take all necessary measures to minimize the probability of loss and maximize the probability of recovery of fishing gear from the marine environment. Some techniques to achieve the above are:

- Fishing vessel operators and associations using untended, fixed or drifting gear should be encouraged to develop information exchanges with other ship traffic to minimize accidental encounters between ships and gear. Competent government departments should encourage the development of information systems.
- Fishery managers should consider the probability of encounters between ship traffic and fishing gear when establishing seasons, areas and gear-type regulations.
- Fishery managers, fishing vessel operators and associations should be encouraged to utilize gear identification systems which provide information such as vessel name, registration number and nationality etc. Such systems may be useful to promote reporting, recovery and return of lost gear.
- Fishing vessel operators should be encouraged to document positions and reasons for loss of their gear. To reduce the potential of entanglement and "ghost fishing", benthic traps, trawl and gill nets could be designed to have degradable panels or sections made of natural fiber twine, wood or wire.

Good practice example – Fishing for Litter

The *Fishing for Litter* project was originally started by the North Sea Directorate of the Dutch Government in co-operation with the Dutch Fisheries Association in March 2000. The aim of the project was to clear the North Sea from litter by bringing ashore the litter that is trawled up as part of fishing activities and disposing of it on land. This is achieved by informing stakeholders in the fishing industry and providing large hardwearing bags to the boats so that the waste can be easily collected and deposited on the quayside. The cooperation of the vessels and their crew was on a voluntary basis.

KIMO International, a local authorities' international environmental organization, extended the scheme to other ports around the North Sea in Sweden and the UK, as part of the EU co-funded Save the North Sea project. By the end of the three-year project in 2004 54 boats were involved in 4 countries and 450 tons of litter had been collected.

- Shipboard garbage handling and storage procedures

Compliance with the provisions of Annex V requires careful planning by the ship operator and proper implementation of procedures by crew members and other seafarers. The most appropriate procedures for handling and storing garbage on-board ships varies depending on factors such as type and size of the ship, distance from nearest land, shipboard garbage processing equipment and storage space, crew size, duration of voyage and existing regulations and reception facilities at ports of call. Taking into consideration the costs associated with the different ultimate disposal techniques, it may also be economically beneficial to keep garbage requiring special handling separate from other garbage. Proper handling and storage will minimize shipboard storage space requirements and enable efficient transfer of retained garbage to port reception facilities.

Garbage management plans should identify crew responsibilities (including an environmental control officer) and procedures encompassing all aspects of handling and storing garbage aboard the ship.

Besides legislative requirements, awareness raising and education campaigns should also encourage operators and seafarers on board smaller vessels and pleasure craft to make in advance all necessary preparations for proper waste management.

Collection

Garbage must be continuously collected where it is generated, separated accordingly and stored at suitable places until handed over to shore facilities. The implementation of awareness raising and education campaigns are of vital importance for promoting to crews and passengers the separation of garbage at source, thus reducing the need for its separation after collection and facilitating its transfer to port reception facilities and its subsequent management.

To reduce or avoid the need for sorting after collection, collecting containers of suitable sizes and designs should be provided to receive different types of garbage, such as plastic waste, food waste, paper, wood, glass, metal, oily solid waste, hazardous waste (e.g. batteries, fluorescent lamps) and other garbage, at the places where the garbage is generated.

These separate containers (e.g. cans, litter bins etc) will have clear waste description in English and any other language spoken on-board. Additionally, the containers can be color-coded to enable sorting/collection. Containers should be placed in appropriate spaces throughout the ship (e.g. the engine-room, mess deck, wardroom, galley and other living/working areas) and all crew members and passengers should be advised on a regular basis on what types of garbage should and should not be discarded in them.

Crew responsibilities should be assigned for collecting and emptying these receptacles at the appropriate processing or storage location. Such a system will facilitate subsequent shipboard processing and minimize the amount of garbage to be stored on board for return to the port.

Regarding the collection of recyclable items, such as glass, metal, plastics, paper etc., proper depositing of such items by crew members may also be encouraged by using funds from their return towards the crews' recreation.

Synthetic fishing net and line scraps generated by the repair or operation of fishing gear may not be discarded at sea and should be collected in a manner that avoids its loss overboard. Such material may be incinerated, compacted, stored along with other plastic waste or preferably kept separate, as it has great volume and strong odor.

Specific awareness raising campaigns should target seafarers to recover derelict fishing gear and other persistent garbage from the marine environment during their routine operations and retain it for disposal ashore.

If lost pots or traps are recovered and there is no space available on board for storage, fishermen and other seafarers should be encouraged to remove and transport any line and webbing to port for disposal and return the bare frames to the water, or alternatively to cut open the traps so they don't pose a threat to marine life.

Processing

Depending on factors such as type of ship, area of operation, crew size etc., ships may be equipped with treatment equipment, such as compactors, incinerators and other devices to reduce the volume and handling of solid waste. Users of such equipment should be made aware and regularly reminded that waste must not be treated or changed in such a manner that it will be impossible or economically not feasible to recycle by shore facilities.

Storage

Ship-generated garbage should be delivered to designated processing or storage locations. While stored on board the ship, it may require long-term storage depending on the length of the voyage or arrangements for off-loading (e.g. transferring garbage to an offshore vessel for incineration or subsequent transfer ashore). In all cases, garbage must be stored in a manner that avoids health and safety hazards.

Awareness raising and education campaigns should inform ship and fishing vessel operators, masters and crews, passengers and recreational boaters on the fact that a large part of garbage items that end-up in the sea as marine litter is accidentally swept or blown off the ship due to insufficient storage. It is of vital importance that trash cans, litter bins and on-deck storage areas are protected against seawater and the weather as far as possible.

- Disposal of garbage from ships, fishing vessels and pleasure craft

Although discharge at sea, except in Special Areas, of a wide range of ship-generated garbage is permitted outside specified distances from the nearest land, awareness raising and education campaigns should strongly encourage all maritime stakeholders to opt for disposal at shore reception facilities.

Such campaigns should also target ships' managing companies and fishing vessel operators highlighting the following issues with regards to the proper disposal of garbage that otherwise may end-up as marine litter:

- Most cargo-associated waste may be generated during the loading and unloading process, usually at dock side. It is recommended that every effort be made to deliver these wastes to the nearest port reception facility system prior to the ship's departure.
- Maintenance wastes are generated more or less steadily during the course of routine ship operations. In some cases, maintenance wastes may be contaminated with substances, such as oil or toxic chemicals, which are controlled under other MARPOL annexes or pollution control laws. In such cases, the more stringent disposal requirements take precedence.
- To ensure timely transfer of large quantities of ship-generated garbage to port reception facilities, it is essential for ships or their agents to make arrangements well in advance for garbage reception. At the same time, disposal needs should be identified in order to make arrangements for garbage requiring special handling or other necessary arrangements.

Besides international regulations and legislation, awareness raising and education campaigns should target all types of vessel operators and seafarers promoting the elimination of solid waste discharge into the marine environment. Garbage should be stored onboard and discharged ashore in a proper reception facility.

However, this requires the provision of reception facilities in all major ports, commercial and fishing harbors and marinas. It also calls for harmonized regional and global regulations to avoid that harbors/marinas are not adequately equipped to take care of the waste and/or that they cause ships undue delay in port. Also, ships should not be deterred from discharging waste to port reception facilities due to high costs, complicated procedures, unnecessary paperwork, excessive sanitary regulations, customs regulations, etc. Furthermore, coastal municipalities must make sure that the waste left in reception facilities is properly taken care of on land, in a manner that is optimal in terms of caring for the environment and human health.

It is essential that governments, the maritime industry and other stakeholders initiate and continuously implement research studies on reception facilities, treatment and disposal of garbage.

Benefits from the proactive involvement of the maritime community

Whether for work or for pleasure, a huge number of ships and boats of all types use the Mediterranean Sea for their activities. Maritime traffic in the Mediterranean is characterized by a large number of ports (over 300) and by a significant volume of traffic, which transits the Mediterranean without ships entering any of these ports.

With regards to merchant shipping, the volume of traffic in the Mediterranean, which represents less than 1% of the global ocean surface, is particularly high. It is estimated that about 30% of the international seaborne trade volume originates or is directed to the Mediterranean ports or passes through the Mediterranean. According to estimates provided by REMPEC, 200,000 merchant vessels of over 100 GRT cross the Mediterranean annually, while 2,000 such vessels are at sea at any moment.

Regarding fishing fleets in the Mediterranean, it is more difficult to acquire accurate data. However, the fact that there are over 40,000 fishing vessels in EU Mediterranean States, 33,000 of which are under 12 meters, indicates the huge number of fishing boats in the Mediterranean and portrays their small-scale artisanal characteristics (European Commission, 2007).

Economic and tourism development over the past two decades have resulted in the development of marinas and the increasing density of pleasure boats and yachts in parts of

the Mediterranean. There are no accurate numbers for this rapidly expanding fleet, but it is estimated that the volume of pleasure craft activity is considerably more intense in the North-West Mediterranean.

With regards to merchant shipping and the larger fishing vessels and pleasure craft, existing legislative requirements have provided the framework to address the problem and have set the basis for cooperation with shoreside waste reception facilities. However, this relationship still remains problematic due to the lack of port reception facilities in Mediterranean ports. This problem is even greater in the case of smaller fishing harbors and marinas.

As garbage management practices become second nature on board, it is necessary to harmonize vessel management practices with that of port reception facilities. The industry and competent authorities should cooperate on the implementation of specific pilot projects regarding the segregation of waste delivered ashore, so that ships and waste collectors in ports are clear on what needs to be segregated and how. This will facilitate the disposal of the waste from the ship and increase the potential to recycle the waste once on shore.

Information, education, outreach and public awareness are essential components of a medium-term regional strategy to prevent and reduce marine litter from all types of vessels and boats. These can contribute significantly to the efforts aiming at bringing a change in the behavior of all users.

It is in the major interest of the maritime community to address the problem of marine litter beyond legislative requirements, seeking the minimization of solid waste management on board through the application of Best Available Techniques. This way, the maritime and seafaring community may take the lead in this field constituting a prime example to land-based industries and communities and emphasizing its commitment to the principles of sustainable development.

The development and implementation of such programs can prove much more efficient if conducted by umbrella organizations such as chambers, associations, cooperatives, NGOs and other industry stakeholders that possess a clear insight on the industry's workings and practicalities. In the occasion of a lack of such stakeholders, government initiative is even more

crucial.

Stakeholders at each level have their own role and responsibilities in the implementation of a regional public awareness and education campaign for the management of marine litter in the Mediterranean. Intergovernmental organizations can provide the framework for and the vision of such a campaign providing it with the necessary trans-national dimension. The competent departments of national governments in the Mediterranean can act either individually or in cooperation with other Mediterranean governments and maritime stakeholders, such as associations, chambers, federations, NGOs, etc. in adapting to national specificities the content of the campaign and streamlining it to reach the end users i.e. seafarers of all kinds.

REFERENCES

Environmental Protection Engineering (2004): Port reception facilities for collecting ship-generated garbage, bilge water and oily wastes. Athens

European Commission (2007): *Commission proposes tailor-made action plan for sustainable fisheries in the Mediterranean*. http://ec.europa.eu/fisheries/press_corner/press_releases/archives/com02/com02_31_en.htm

European Environment Agency (1999): *State and pressures of the marine and coastal Mediterranean environment*. Environmental assessment series No. 5.

International Maritime Organization (2002): The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), Annex V – Regulations for the Prevention of Pollution by Garbage from Ships. pp. 383-396, IMO-520E (consolidated edition), London.

International Maritime Organization (1997): Guidelines for the Implementation of Annex V of MARPOL 73/78, IMO-656E, London.

Paul Topping, David Morantz and Glen Lang (1997): *Waste Disposal Practices of Fishing Vessels: Canada's East Coast, 1990-1991* from *Marine Debris – Sources, Impacts and Solutions*, Springer Publications.

REMPEC (2002): *Protecting the Mediterranean against Maritime Accidents and Illegal Discharges from Ships*.

UNEP (2005): Marine Litter, an analytical overview.

UNEP/MAP (2005): *Regional Strategy for Prevention of and Response to Marine Pollution from Ships*.

Useful websites

Coasts & Clean Seas Program: <http://www.nht.gov.au/nht1/programs/ccs/index/html>

Fishing for Litter: <http://www.kimointernational.org/Fishing-for-Litter-.asp>

Global Marine Litter Information Gateway: <http://marine-litter.gpa.unep.org>

Good Mate Program: www.oceanconservancy.org

International Maritime Organization (I.M.O.): www.imo.org

RAMOGE Agreement: www.ramoge.org

Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC): www.rempec.org

Save the North Sea Project: <http://www.savethenorthsea.com>

Industry

Why the industrial sector should contribute to addressing the marine litter issue in the Mediterranean

The industry/business sector is one of the main sources of pollutants released in the environment, either directly (i.e. release of industrial effluents and solid, hazardous etc. waste) or indirectly through the supply to the market of consumer products or services that will eventually end up in the natural environment as solid municipal waste (among which coastal and marine litter).

Therefore, it is not only necessary but indispensable to actively involve this sector, especially in preventive action and to raise its awareness on the issue of marine/coastal litter, as a component of solid waste management with all the aspects that this may imply (i.e. sustainable consumption and production patterns, integrated product policies, clean technologies, corporate social responsibility, etc.), in order to support society's efforts in this matter.

Marine litter, a case for “Corporate Social Responsibility” (CSR)

According to the World Business Council for Sustainable Development (WBCSD), *“Corporate Social Responsibility is the continuing commitment by business to **behave ethically** and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large”*. (Source: www.wbcsd.org)

Furthermore, the EU Commission defines CSR as a *“concept whereby companies integrate social and **environmental concerns** in their business operations and in their interaction with their stakeholders on a voluntary basis.”* (Source: ec.europa.eu/enterprise/csr/index_en.htm)

How industry contributes to the generation of marine litter

- **A tentative definition of industry-related marine litter**

Key-fact:

Plastic materials account for more than 90% of floating marine litter.

(Source: GPA, www.marine-litter.gpa.unep.org)

Although the types of wastes produced by humans are numerous - ranging from simple food residues to heavily toxic and radio-active wastes -, one should bear in mind that **marine litter³ originating from the industry/ manufacturing sector** in most of the cases consists of **solid household/ commercial waste** such as:

- **packaging residues** (plastics, paper & cardboard, aluminium cans, glass, etc.), but also
- **wastes from manufacturing processes** including: raw materials - such as wood, metals, agricultural products, containers for industrial purposes and chemical substances (varnishes, paints, solvents, coatings, etc.) and also sometimes
- **office equipment & stationery material** (paper, printer cartridges, electric and electronic equipment, etc.)
- **other wastes from human commercial activities** related to the marine environment (fisheries, shipping, tourism)

³ as defined in the present document, p.4

The above types of waste that end up in rivers, coasts and eventually in the sea are mainly generated through the following processes:

- **manufacturing process** (*inter alia* by-products, production wastes)
- **operations, maintenance & office management** (i.e. discarded office equipment, company administration and services, etc.)
- **other professional activities** (i.e. fishing gear, products for the shipping industry, agriculture, the tourism sector, etc.)
- and **industry output** (i.e. **products, packaging, services**) which eventually “lands” in the end-consumer’s hands (households, other companies, etc.) and is not adequately treated or disposed of at the end-of-life stage by the end-user.

Hence, the **key industry (manufacturing) sectors involved** and to be targeted in the prevention of marine litter are the following:

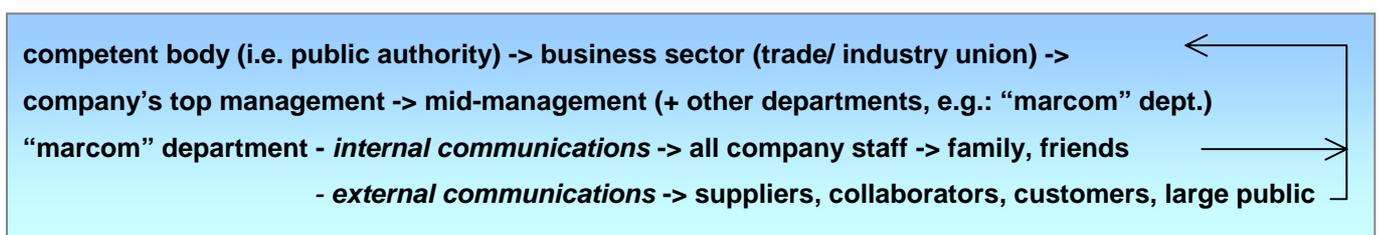
- The **consumer goods industry** – *inter alia* the food processing industry, plastics manufacturers, the wood processing & paper industry, the automotive industry, the electronic goods manufacturers, the pharmaceutical industry, etc.
- The **packaging industry** (especially plastics manufacturers, the paper industry, bottling and canning companies)
- The **chemicals industry** (except the plastics manufacturers): there are several other types of businesses, such as those producing solvents, paints, etc. that are responsible for the generation of marine litter
- And to a certain extent **manufacturers of goods & equipment** for other professional sectors (i.e. fisheries, shipping, tourism, etc.)

How to raise the awareness of the industry/business sector on the marine litter issue

▪ ***Roles and tasks of the different stakeholders of the sector***

Since it is crucial to involve the manufacturing sectors in order to address the marine litter issue, targeted communication, information and awareness raising activities should be developed specially for these actors of the society.

Schematically, communication/information to and among the industry sector flows as described in the figure below:



There is a need for given business sectors - esp. manufacturers located in coastal zones (i.e. plastic, paper manufacturers, packaging, food processing & bottling companies, etc.) but also the tourism sector, etc. - to be informed on problems caused by marine litter in their area and throughout the Mediterranean region as well as on issues (i.e. inappropriate solid waste management, lack of product life cycle analysis, over-exploitation of natural resources, waste of energy, etc.) connected to their operations.

This could be done by a range of bodies such as:

- **industrial/ trade unions** of the sector informed by public authorities on their impact, role and obligations,
- **competent authorities** in charge of solid waste management and coastal litter collection,

- **NGOs** active in related awareness raising events and clean-ups,
- other **public bodies** in charge of enforcing polluter-pays regulations or pollution control measures.

Collaborative or joint actions of these bodies are preferred as they are more likely to succeed.

a. The role of industry federations, chambers, trade unions, etc.

Industrial unions and **chambers of commerce**, *inter alia*, as umbrella organizations, are a key link between an industrial sector (or business more generally speaking), policy makers, and the general public. Therefore their involvement in the awareness raising process ought to constitute a major contribution to the improvement of the situation in the relevant area.

Their **role**, in cooperation with other bodies mentioned above, should be to:

- Improve awareness and understanding of major issues and the responsibility or role of the sector in the specific field;
- Maintain open and timely dialogue with regulators, politicians, scientists, NGOs, the media and other interested stakeholders;
- Ensure the industry sector contributes actively to any public, regulatory or scientific debate and provides balanced and objective science-based information to help answer questions about products manufacture or service offered, as relevant;
- Promote the best health, safety and environmental practices in the manufacturing process;

Once top management of concerned/ involved businesses has been briefed, either by the competent public body/ies or the industry union to which they belong, on the impact of their activities on the environment, thus made aware of their responsibility in the matter, and especially if they have adopted a Corporate Social Responsibility (CSR) policy/approach, they should elaborate a plan and budget for the improvement of their operations and output as well as, in turn, ensure awareness raising of their own staff, collaborators and naturally customers, including measures/ actions such as proposed below:

b. Corporate internal communications

➤ **at senior management level:**

Among the key issues to be dealt with at management level, through the briefing of shareholders & investors and the organisation of targeted seminars for the mid-management, should be themes such as: corporate social responsibility, integrated solid waste management, product life cycle analysis, clean technologies, sustainable consumption and production patterns, marine & coastal pollution, etc. as well as relevant international and national legal and regulatory frameworks and economic/financial issues as appropriate. Field visits, training and other informational activities would also be required to enhance the understanding of the issue at that level, according to the type and size of the manufacturing company and the cultural environment.

➤ **at human resources department level:**

The HR department should design & plan incentives for staff, based on legislative/ regulatory framework in force or imminent.

➤ **at marketing (incl. communications, PR) department level**

Especially the staff in charge of marketing and communications, where available, should develop external as well as internal information material and tools (i.e. green marketing & communications, advertising, etc.) to raise awareness of employees as well as shareholders, customers, collaborators, partners, suppliers, etc. on their role in addressing the marine litter issue and, to a certain extent, on issues relating to CSR, sustainable consumption, public health and the environment.

➤ ***at operations department level***

The operation's department needs improved awareness in matters relating to product life cycle management, waste reduction, reuse, recovery and recycling, clean technologies. This could be achieved through staff briefings, professional seminars, hands-on training, etc. Gathering the staff's feedback to close the information loop is also an important way to improve the overall corporate attitude.

➤ ***all company staff***

In general, however, sensitization on the impacts of: coastal/marine litter on the environment and human health, inappropriate waste disposal and unsustainable consumption patterns, should be directed at all the employees, who in turn ought to transmit the message to their own social circles (relatives, friends, collaborators, etc.).

c. External/marketing communications

Companies' outbound communications on the impact of marine litter and solid waste in general can take different shapes, on the one hand enhancing their corporate/brand image, and on the other, helping them to cut down production/operation costs through improved efficiency and savings of materials and energy. Communication activities should target the whole range of external stakeholders, especially:

➤ ***collaborators: suppliers, distributors, retailers (where appropriate)***

These target audiences should be briefed on issues like product life cycles, sustainable use of natural resources, reduction, reuse & recycling of wastes as well as on the company's CSR policy, whenever relevant. They should be informed on any new requirements of the company regarding its procurement and distribution policies, technical standards (BEPs, BATs, etc.) and receive incentives accordingly (especially retailers, supermarkets, suppliers).

➤ ***customers, end-users***

Customers are the largest target audience for a company and need to be addressed through broad public information and awareness campaigns involving mass media – TV, radio, press, according to budget available. Main issues to be dealt with are waste reduction, reuse & recycling, appropriate waste disposal, impacts of marine litter on people and environment, sustainable consumption patterns as well as the company's CSR policy and activities, which would enhance the corporate image in terms of the public all the more sensitive to fair trade and ethical company behaviour issues. Behavioural change among the customers – as wider public – could be encouraged through promotional incentives and advertising their own efforts.

Key issues on which awareness raising should focus

When dealing with awareness raising on coastal/marine litter issues, companies will very likely need to deepen their knowledge of resource efficiency and solid waste management – including important topics mentioned below - in order to **provide their audiences with a full understanding/vision** of the issues. The two most prevalent are the following, which present some similarities but are based on a different concept/approach.

▪ **The Product Life Cycle approach**

The life cycle approach is a **holistic approach** to solid waste management and more generally speaking to the **sustainable use of natural resources** (i.e. raw materials, energy, and water). Life cycle assessment can be defined as a *“method that studies the environmental aspects and potential impacts of a product or system from raw material extraction through production, use and disposal”*. The general categories of environmental impacts to be considered include **resource use, human health and ecological consequences**.

Life cycle analysis expresses the performance of the product's or the total system life cycle and single life cycle stages. It is now a recognised tool in decision-making within industry and public administration. In various countries and industry sectors (i.e. in the European Union), industry branch and company specific life cycle assessment databases have already been established to provide data efficiently. This is not the case for several Mediterranean countries where this type of analysis is not widely used yet, very often due to lack of data and also means for collecting such data.

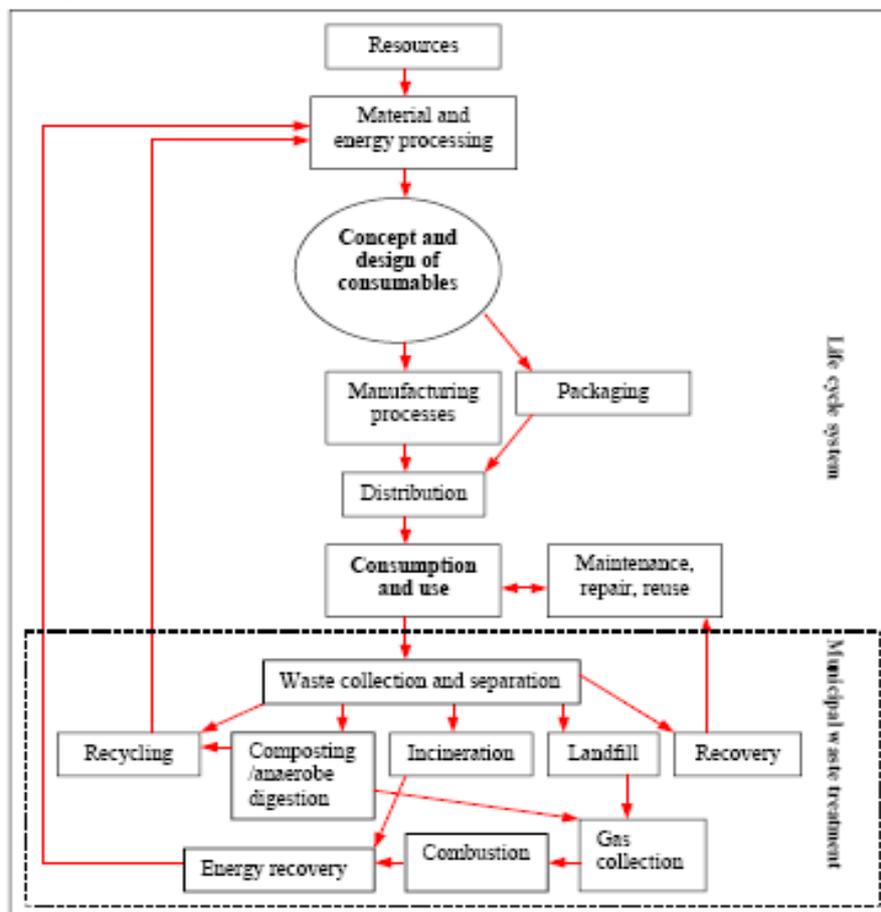


Figure 1: The life cycle approach (Source: The Nordic Council of Ministers, Finland)

As can be seen from Figure 1, the environmental impacts of **manufacturing goods** depend on **three different system characteristics**:

- **The concept and design of the products** that end up as waste have influence on the type and amount of material that the products consist of, life-time of the products, to what degree the products are recyclable and non-hazardous, and to what degree they can be dismantled into recyclable fractions. This concept is also related to that of resource efficiency or sound use of natural resources.
- **Consumption patterns** influence the municipal waste flow because it is the consumers who buy the consumables that flow through the system and who partly decide the lifetime of the consumables.
- **Municipal waste treatment** decides to what extent waste shall be distributed between the treatment alternatives and the technology and efficiency of the treatment options.

Industry has an active **role to play** and an obvious **economic interest** in integrating the life cycle approach in its production and waste management patterns. Since, when using fewer

raw materials and less energy for the products they manufacture (eco-design), businesses can realize important savings and decrease manufacturing costs.

Useful references:

- **UNEP's "Life-Cycle Initiative"** (Source: www.uneptie.org/PC/sustain/lcinitiative/home.htm, and lcinitiative.unep.fr/)
- **The EU "Integrated Product Policy"** (Source: ec.europa.eu/environment/ipp/)
 - Product life cycle integration
 - Life-cycle analysis/ assessments
 - Environmental Management Scheme (EMAS)
 - Intearated Pollution Prevention & Control (IPPC)

▪ **From waste prevention to disposal**

Solid waste management is often approached from a more "waste-centres" point of view, which is the "**Reduce – Reuse – Recycle**" (3R) approach. Similar to but less holistic than the product life cycle analysis, the '3R' approach aims basically to improve the management of solid waste flows through the **prevention, reuse and recycling of discarded materials**. It does not always take into consideration concerns such as sustainable consumption and production patterns, sound use of natural resources, since it is more focused on **technicalities** relating to solid waste management.

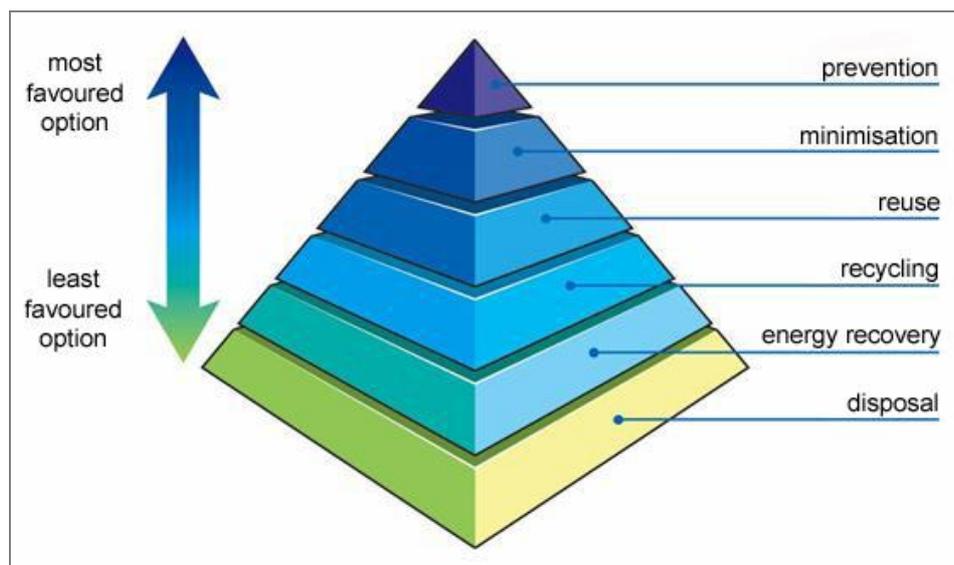


Figure 2: The waste hierarchy (Source: The Sligo County Council, Ireland)

➢ Waste prevention or reduction

Reduction of waste at source refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste. Source reduction also refers to the **reuse** of products or materials.

Waste reduction can help reduce waste disposal and handling costs, because it avoids the costs of recycling, municipal composting, land filling, and combustion. Source reduction also

conserves resources and reduces pollution, including greenhouse gases that contribute to global warming.

Waste is not just created when consumers throw items away. Throughout the life cycle of a product — from extraction of raw materials to transportation to processing and manufacturing facilities to manufacture and use — waste is generated. Reusing items or making them with less material decreases waste dramatically. Ultimately, fewer materials will need to be recycled or sent to landfills or waste combustion facilities, when not discarded in the natural environment.

Key aspects to waste prevention are:

- **Responsible buying & green procurement** – since quality products last longer, need less frequently renewal... including products marked with eco-labels, taking into account & transportation, energy consumption, sustainable consumption patterns, fair trade, etc.
- **Resource efficiency** or in other words the **rational use of natural resources** and raw materials through:
 - saving resources by using up a product (dissipative wastes)
 - maintenance & repairing instead of discarding...
 - packaging «minimisation» at all stages
- **Eco-conception/design** that tries to:
 - do more with less
 - substitute materials whenever appropriate
 - develop and apply new technologies for production process optimization

➤ Waste recovery, reuse and recycling

- The EU Commission defines **recovery** “as any waste management operation that diverts a waste material from the waste stream and which results in a certain product with a potential economic or ecological benefit”. Recovery mainly refers to the following operations:
 - *re-use of discarded items* as such or of their *materials* (see below).
 - *material recovery*, (i.e. see below: recycling)
 - *energy recovery*, mostly re-use of wastes as fuels through ‘**waste-to-energy**’ plants,
 - *biological recovery*, e.g. composting (see below),
- **Reuse** includes:
 - Reuse of raw material streams (non-dissipative wastes) in the production process
 - Diversified reuse of other items
 - Trading of used items (i.e. ‘second hand’ business, exporting less state-of-the-art technology vehicles or engines to countries in the developing process)
- The OECD’s definition of **recycling** is “any reprocessing of material in a production process that diverts it from the waste stream, except reuse as fuel. Both reprocessing as the same type of product and for different purposes should be included.” **Direct recycling** or reuse within **industrial plants** at the place of generation is an important aspect of recycling and should largely be taken into consideration by manufacturers in their efforts to reduce **waste flows – be it input or output wards**.
- **Composting** represents also a form of recycling. It is the controlled biological decomposition of organic matter, such as food and yard wastes, into humus, a soil-like material. Composting is nature's way of recycling organic waste into new soil. Composting is often less relevant to marine litter issues, since normally biodegradable wastes are less impacting on the marine environment and, hence, do not constitute such a serious issue for it. However, **large wood debris** released in the sea and circulating might harm human beings, marine animals and also cause damage to maritime transportation.

Best practices:

- “**Vacances propres**”, a private/public awareness campaign to reduce the use of plastic bags (France – Source: www.vacancespropres.com)
- **Plastics recycling in Europe** (Association of European Plastic Manufacturers – Source: www.plasticseurope.org/Content/Default.asp)

➤ **Waste disposal and treatment**

When the materials or items discarded have reached the final stage - the “end-of-life” phase - and their reuse or recycling is not feasible or viable, they must be disposed of in such a manner that they cause the least possible harm to the environment, and especially avoiding that they reach the aquatic and marine environment, which is even more sensitive. Depending on the wastes’ “nature”, different types of **final disposal or treatment** can be envisaged

- **Incineration:** Where possible, waste that cannot be recycled or reused should be safely incinerated, with landfill only used as a last resort.
- **Disposal in adequate controlled landfills**, and not in wild dumping sites, should be the last resort for waste flows that cannot be managed/treated in another way. The EU has recently approved a directive setting strict guidelines for landfill management.
- **Special treatment of hazardous wastes** is another important matter dealt with by international, regional and national legislation in most of the Mediterranean countries. Manufactured products such as **batteries, varnishes, solvents, pesticides, WEEE**, etc. need special attention from the producers and users handling them, since their release into the marine/coastal environment (and in the natural environment in general) is of particular harm for human beings, aquatic organisms and eco-systems.

NB: All above methods need close monitoring because of their potential for causing severe environmental damage.

Benefits from the proactive involvement of the industry sector

The industry/ business sector has a responsibility to effectively address the marine litter problem in the Mediterranean, jointly with other stakeholders (public authorities, civil society): either to **promote sound behaviour and rational use of the products** they market or in **integrating solid waste management policies and integrated product policies** in their corporate approach.

The benefits – and thus inherent stimuli - for a business to adopt a CSR approach (and related communication activities) in the field of marine litter are multiple, ranging from ethical to financial:

First of all, by adopting a CSR approach, jointly with cleaner production and waste management methods, a business will enjoy an enhanced corporate/ brand image among the customers; this would lead to competitive advantages.

Also, improved (internal) understanding among staff will ease the way to smoother production processes and enhanced solidarity and ownership. Furthermore, raw material and/or energy savings in the production process would result in the reduction of production costs.

Eventually, reduced pollution through less generation of solid waste could also reduce waste management costs for the local authorities translated into reduced amount of taxes or contributions required from the private sector for solid waste management. However, this issue would be more relevant for EU countries. Business would also risk fewer penalties as

polluters (according to “polluter pays principle”) in implementing sustainable waste management methods.

Un-sustainable consumption and production patterns in the Mediterranean

The term **sustainable consumption** is defined along the lines of the Brundtland definition for sustainable development as *“the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life-cycle, so as not to jeopardise the needs of future generations”* (Norwegian Ministry of Environment, 1994).

Studies, such as the Blue Plan’s *“Futures for the Mediterranean Basin”* (2005), show that **unsustainable consumption and production patterns** in the developed countries continue to spread. Even though there are still great disparities between Northern and Southern parts of the region (GDP per capita in purchasing power parity remaining 3 to 5 times lower in the Southern rim countries), **economic growth** taking place **throughout the Mediterranean**, is a **driving force** behind these patterns, since consumers seek to improve their “quality of life” as their income is rising and are enjoying a steadily **expanding range of low-priced mass-produced goods**, for the production of which **environmental costs** are seldom internalised (*Source: OECD, 2002 – www.oecd.org*). As a result, although waste recovery and recycling rates have increased, total household waste generation continues to grow, making it a priority concern.

Voluntary approaches on behalf of **industry** to produce in a more sustainable manner (i.e. through eco-design, cost internalisation, green procurement, clean technologies) are therefore needed in order to impact positively on households’ consumption behaviour downstream, jointly with regulatory frameworks and public awareness raising.

References (and further reading):

European Commission: Communication *“Taking sustainable use of resources forward: A Thematic Strategy on the prevention and recycling of waste”*, COM (2005)666 final, Brussels, 2005.

UNEP/ SETAC: *LC Initiative Brochure “Cooperation on approaches and best practice for a Life-Cycle Economy”*, UNEP Division of Technology, Industry & Economics, Production and Consumption Unit, Paris, 2003.

Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 *“Allowing Voluntary Participation by Organisations in a Community Eco-Management and Audit Scheme (EMAS)”*, 2001.

European Commission: Communication *“Implementing The Partnership For Growth And Jobs: Making Europe A Pole Of Excellence On Corporate Social Responsibility”*, COM (2006)136 Final, Brussels, 2006.

European Commission: Corporate Social Responsibility Green Paper *“Promoting A European Framework for Corporate Social Responsibility”*, COM (2001)366 Final, Brussels, 2001.

Watts, Ph., Lord Holme: *“Corporate Social Responsibility – Meeting changing Expectations”*, WBCSD Publications, ISBN No. 2-94-0240-03-5.

Poitou, I. : *“Les Macro-déchets : Une Gestion Publique Empirique. Etude du Littoral de la Région Provence-Alpes-Côte d’Azur”*, Thèse pour obtenir le grade de Docteur de l’Université De Droit, d’Economie et des Sciences d’Aix-Marseille, 2004.

European Commission DG XI: *“Integrated Product Policy - A study analysing national and international developments with regard to Integrated Product Policy in the environment field and providing elements for an EC policy in this area”*, by Ernst & Young, UK, March 1998.

European Commission: *“Buying green! A handbook on environmental public procurement”*, ISBN 92-894-8117-x, Luxembourg, 2004.

Bjarnadóttir, H. J., Friðriksson, G. B., Johnsen, T., Sletsen, H.: *“Guidelines for the use of LCA in*

the waste management sector", NT Techn. Report 517 (approved 2002-11), The Nordic Council of Ministers, Espoo, 2002.

OECD: *"Towards Sustainable Household Consumption? Trends and Policies in OECD Countries"*, OECD Publishing, [Paris, 2002](#), ISBN: 9789264175068.

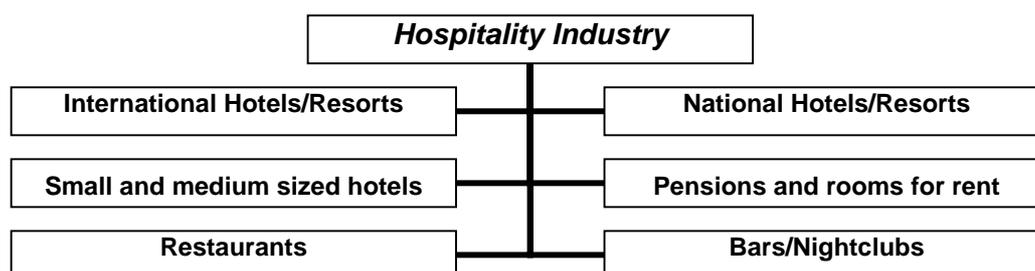
Websites:

- **The Global Marine Litter Information Gateway**
www.marine-litter.gpa.unep.org/
- **The UNEP Life-Cycle Initiative**
www.uneptie.org/PC/sustain/lcinitiative/home.htm
- **The EU Commission's web pages on Waste**
<http://ec.europa.eu/environment/waste/index.htm>
- **The European Topic Centre on Resource and Waste Management**
waste.eionet.europa.eu
- **The "WasteWise" EPA Programme**
www.epa.gov/wastewise/
- **The EU Commission's web pages on Integrated Product Policy (IPP)**
ec.europa.eu/environment/ipp/
- **The World Business Council for Sustainable Development**
www.wbcsd.org
- **The Association of European Plastic Manufacturers**
www.plasticseurope.org/Content/Default.asp
- **The OECD web page on Consumption, Production and the Environment**
www.oecd.org/about/0,2337,en_2649_34289_1_1_1_1_1,00.html
- **The Association "Vacances Propres"**
www.vacancespropres.com/htfr/frameset.htm

The Tourism sector

The Mediterranean is the world's leading tourist region. Tourism is a major industry and consists mainly of a seasonal seaside resort mode. In many of the major resorts in the Mediterranean area the population more than doubles during summer. Some 637 million tourists are expected in the region by 2025, which means an additional 270 million in comparison with 2000. The environment of many coastal areas in the Mediterranean has been adversely affected by unsustainable modes of tourism.

The huge amounts of litter produced in the Mediterranean due to tourism makes the sector (hospitality industry) one of the major targets for awareness and education campaigns so as to minimize the ensuing marine litter.



Although most of the international and national tourism industry chains in the Mediterranean have already adopted environment management systems like ISO 14001 (International standard for creating and testing an environment management system) or EMAS (Environmental Management and Audit Schemes), there is still a lack of environmental management schemes particularly for small and medium sized hotels.

How tourism can contribute to addressing the problem of marine litter in coastal areas in the Mediterranean

The key areas of the tourism business that generate marine litter are:

- Food and beverage departments
- Housekeeping departments
- Offices
- Stationary
- Garden areas
- Beach areas
- Tourists themselves

Basic litter management guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. These guidelines should integrate environmental action into business activity through identifying the specific procedures and technological improvements that need to be incorporated into existing practices and operations.

A preliminary status review requires a list of all waste generated by the business or activity:

- How much waste is generated under the main waste categories: paper, plastic, aluminum, organic (kitchen and garden), and hazardous, every month/year?
- Which departments/activities generate high volumes of waste?
- Have initiatives been taken to collect and separate waste?
- Is organic waste separated from other waste?
- Are there items in the waste stream that have never been used?
- What is the existing infrastructure for waste management in my area (recycling services, landfills, etc.)

This can then be used to identify products that can be either replaced with alternatives which avoid waste or generate less; reused for the same or another purpose; sorted and collected for recycling under municipal waste recycling schemes; used for longer; stored appropriately, etc.

A checklist on waste management for hospitality facilities follows the order of the waste management hierarchy:			
Avoid	Reduce	Reuse	Recycle

More specifically, litter management principles and guidelines should focus on:

Avoiding litter at source:

- Favor products with less packaging
- Invite suppliers to take back packaging, especially reusable boxes, crates and pallets
- Buy in bulk rather than small packs

Reducing litter:

- Use both sides of office paper before disposal
- Switch from disposable to reusable laundry bags
- Donate old furniture and linen to charity

Reuse options:

- Re-use packaging containers for holding and storing other materials
- Re-use glass/plastic bottles as toilet dams in cisterns
- Re-use old linen as cleaning rags and laundry bags

Recycling (Glass, Plastic, Paper, Aluminum, Batteries)

- Place separate waste containers in public areas and invite guests to use the containers as labeled;
- Install housekeeping carts with separate waste containers;
- Place separate waste containers in kitchens, other food and beverage outlets, housekeeping and administration areas
- Place bulk containers for separate waste in an appropriate back area
- Collect and store hazardous waste in separate, safe areas
- Contact local recycling authorities and dealers for support

If waste is to be successfully prepared and used for recycling, it must be uniformly sorted and cleaned, and free from bottle-caps, food, metal, plastic, etc. Compactors can be used to reduce waste volume. This lowers the space required to collect and store waste and increases its value as a recyclable material. But compactors can be expensive and are only worthwhile in large properties with significant waste volume. Plastic and paper waste usually needs to be baled and compacted before collection for recycling. Advice needs to be obtained from local and/or municipal waste collection and recycling schemes on the breakdown of litter by type, preparation of waste, use of compactors, baling specifications and the market price for recyclables. A survey sheet helps to overview quantities and results.

Purchasing practices are the first step towards litter prevention and should be undertaken in close collaboration with suppliers to ensure that the most cost-effective and environmentally-preferable alternative is selected. The hospitality industry is a large buyer of consumer goods and services and can, therefore, have a significant influence on suppliers and contractors. The use of environmentally-preferable products can be a valuable showcase for corporate environment commitment. Some purchasing preferences:

- Products made entirely or partly with recycled materials
- Products manufactured through cleaner production processes
- Products that are more durable and last longer;
- Products with reduced packaging
- Products with Eco labels

For tourism businesses, the revenue gains through the sale of reusable and recyclable wastes can greatly offset the costs of waste separation, baling and compacting.

How the tourism sector can contribute to raising awareness about proper litter management and therefore about marine litter

Awareness-raising, education and training programmes on marine litter and sustainable waste management should be one of the priorities in the hospitality industry and should target management, staff, tourists, suppliers, contractors, tour operators, local authorities and civil society. If related actions are implemented within a framework of a Mediterranean-wide campaign then the overall efforts will be more effective within this specific sector (i.e. if a tourist sees the same slogan, poster, logo, guidelines, etc. as he/she travels through the region his/her behavior is more likely to change accordingly).

If litter management programs within the tourism sector are to be successful, employees must be motivated and trained to integrate litter reduction into daily operating procedures. On-the-job training, supported by training instruction sheets in the case of complex technical work, is most suitable for integrating environment action into hospitality practices. Managers, supervisors, or external experts (consultants, NGOs, etc.) could conduct this training.

To support training efforts, informal seminars and poster displays could be organized. In tourism and hospitality, it is the employees who are in contact with the customer, who create the experience and who deliver the service. If they are well informed and motivated to achieve environment objectives, this will reflect in their working practices and improve service quality.

Senior management should show leadership. Small actions such as using both sides of office paper and separating waste are good ways to demonstrate that litter management is a serious effort and has company commitment. As the litter management program gets underway, employees should be kept informed of progress, with reports and monitoring sheets posted up, announced at staff meetings and featured in internal newsletters. This will help reinforce responsibility and motivation. Employee morale may increase as staff come to realize they are working for a business that is concerned about working comfort, safety and environmental improvement.

Participation in the litter management program should be a criterion for performance evaluation. 'Good environment ideas' and 'outstanding environment contributions' can be rewarded with prizes. The litter management team should include a representative from each department, with responsibility for ensuring that the litter management program is implemented in the respective department.

Establishing departmental environment performance targets facilitates delegation of responsibility, for example, food and beverage departments could be required to reduce packaging waste by 20%.

Employees are also the hospitality industry's biggest public relations instruments. They are

Objectives and targets must be realistic and achievable from a business and environment perspective. An over-ambitious target can discourage action and reduce enthusiasm and interest, while an under-ambitious one will not provide a sense of achievement and impetus for continuous improvement.

the best placed to inform visitors of the business's environment policies. This will in turn enhance corporate image and reputation. Well-trained employees can identify problem areas and suggest improvements more effectively than external consultants and managers. All new employees should undergo an environment training program as part of their induction.

Effective communication of messages to visitors and clients is critical to optimize the business efforts and benefits. There is no point in implementing a litter action plan (or any

environmental action plan, e.g. water or energy conservation) if clients are not properly informed and integrated in the concept. Awareness-raising among guests will multiply the results. Some basic steps in this direction are to:

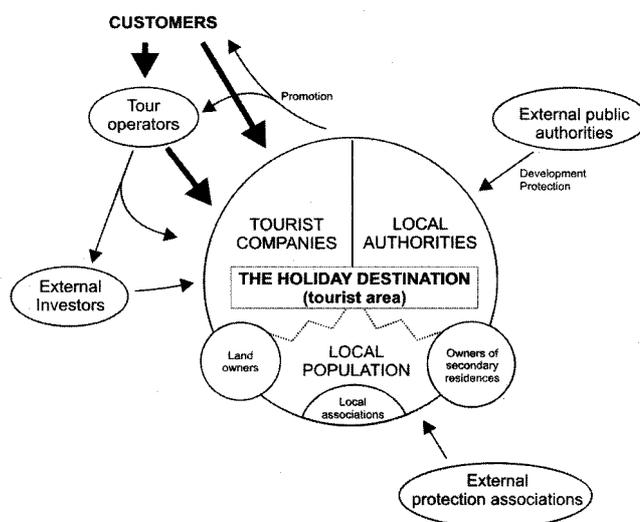
- Hang a framed copy of the environment policy statement at the reception
- Include the environment policy in the guest information package
- Place tent cards suggesting guests to support litter prevention
- Tell guests about the importance of reducing waste
- Inform guests about local environmental issues
- Integrate the issues in the entertainment of visitors (sketches, exhibitions, etc.)
- Invite guests to participate in local conservation efforts
- Invite guests to take part in related events: trash-art exhibitions, clean ups, etc.

The necessity of coordinated action with other stakeholders

All actors involved in the tourism and hospitality sector need to participate in joint, common actions in order to effectively contribute to raising awareness and effectively addressing the marine litter problem in the Mediterranean. The industry itself at regional level could design a framework Action Plan with guidelines on what the various components of the industry could do based on size, role in local economy, geographic location, etc. A common communication effort (posters, leaflets, actions) targeting the various actors and regular collaboration with the media will have a positive effect on everyone involved. Innovative partnership schemes and activities will have a profound effect as well.

Networking of information, initiatives, efforts and results is important at local, national, regional and international levels. The tourism industry should monitor international and regional initiatives on marine litter and be an active instigator and participant of local and national related programs. It should maintain a constructive collaboration with the competent authorities exerting pressure where necessary and being supportive when action in the right direction is taken; collaborate with other sectors of the industry (Tourism Organizations, Tour Operator Initiatives, etc.); collaborate closely with regional, national and local NGOs working on environmental issues and specifically on waste management, marine litter, Integrated Coastal Management (ICM) and sustainable development; build a corporate “Green Team” in order to be able to deliver all of the above, and apply for environmental performance certification and awards.

Tourism system in a specific territory: actors and operational levels



Source: Ph. Moisset, Blue Plan 98

Travel agencies should have litter prevention and management as one of the criteria when establishing contracts with tourism destinations.

Tour operators could promote, support and control litter prevention programs on site

Tourism cooperatives, federations, etc. should provide information and support to members, especially for small and medium sized businesses.

Tourism industry suppliers can jointly develop voluntary partnership agreements on waste management, eco-labeling schemes, etc.

The benefits of a proactive involvement of the tourism sector

It is clear that the necessary infrastructures and initiatives in order to promote waste reduction, re-use and recycling need to be strengthened and/or launched in the Mediterranean tourism related industry if marine litter levels are to be diminished. In parallel and complementary to this the promotion of production techniques covering the entire life-cycle of products as well as the identification and implementation of appropriate market mechanisms (incentives, etc.) for recovered products, reinforcement of national and local waste management capacity and promotion of pilot initiatives to systematically tackle waste from tourism-related activities are also necessary.

Tourists are increasingly demanding 'greener' services. The numerous tourism eco-labels and environmental performance awards are a strong indication of the growing response of tourists to environmentally responsible services. The benefits of incorporating responsible litter management practices within the tourism industry are enormous for the industry itself, particularly in the medium and long term, and for the Mediterranean natural and cultural wealth. More specifically, the Mediterranean sea and coastline will be a litter-free attraction for visitors, considerably enhancing thus the industry with a higher quality of tourism; the industry will be facilitated to comply with, and even exceed, overall environmental standards, regulations and voluntary initiatives; lower costs will be achieved by reducing resource use, improving operating efficiency, lowering waste output, etc.; hospitality venues, services, beaches and marinas will be more sanitary and attractive not only for visitors but also for employees and local residents essentially contributing to a strengthened local mentality towards sustainable development; the industry will be increasingly acknowledged for its environmental commitment which is a key factor in promoting the Mediterranean tourism industry at global level.

If a business works with travel agents and tour operators who have environment policies, and if competitors have begun to work on EMS (Environment Management Systems), it is likely that visitors will be receptive to environmentally responsible services. But even when environment action is not widespread, a business can enhance its corporate image by becoming a pioneer in environment action.

Voluntary tools for tourism businesses

Blue Flag International: an exclusive eco-label awarded to over 3200 beaches and marinas in 36 countries. The Blue Flag works towards sustainable development at beaches/marinas through strict criteria dealing with water quality, environmental education and information, environmental management, and safety and other services. The Blue Flag Programme includes environmental education and information for the public, decision makers and tourism operators. <http://www.blueflag.org>

European Eco-label for tourist accommodation service (EU Flower): Since 2003 the "European Flower" has been available to hotels, guesthouses, youth hostels and similar services and since 2004 the scheme has been extended to cover camping sites. Thus any accommodation service in Europe can apply for certification of its environmental performance. <http://www.eco-label-tourism.com>

Environmental and Audit Management Scheme (EMAS): EMAS is a voluntary management system for businesses and organizations that wish to improve their operational environmental protection measures on a continual basis beyond the practices called for by law. It goes beyond the ISO 14001, the international standard for environmental management in businesses. http://europa.eu.int/comm/environment/emas/index_en.htm

References

Greener Management for Hotels and Restaurants, DEHOGA, 1997
Tourism and Sustainable Development, UNEP, 2002
Mediterranean Strategy for Sustainable Development, UNEP/MAP, 2005
The Blue Plan's "Environment & Development Outlook", Guillaume Benoit & Aline Comeau, Earthscan, 2005

Websites

The VISIT association: <http://www.ecotrans.org>
Tour Operators Initiative: <http://www.toinitiative.org>
World Tourism and Travel Council: <http://www.wttc.org>
The International Eco Tourism Society: <http://www.ecotourism.org>
International Hotel and Restaurant Association: <http://www.ih-ra.com>

Agriculture

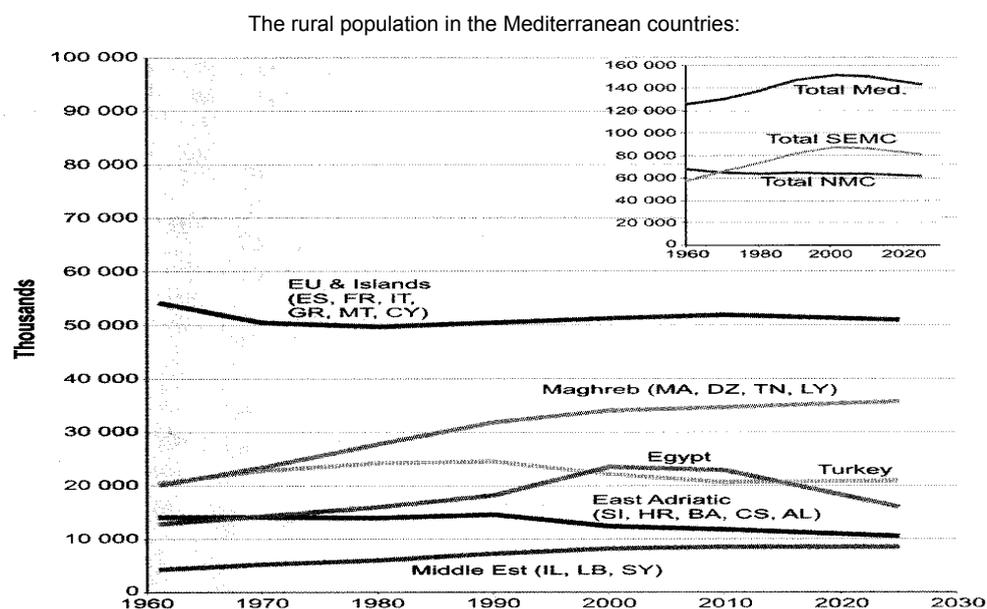
Why the agricultural sector should contribute to addressing the problem of marine litter in the Mediterranean

Agricultural waste and municipal solid waste are major problems rural communities face in both developed and developing countries. The wide variety of agricultural products and the considerable volumes of production make the agricultural sector a vital one for the national and regional economies of the Mediterranean basin. Combining rural traditions with modern technologies is a crucial step towards achieving sustainable rural development and within this process waste should be treated as a by-product.

The measures that need to be taken in order to limit agricultural litter that ends up in the marine environment must be taken on land before waste enters the sea.

The reuse, recycling and disposal of the large quantities of litter generated by coastal farming practices in the Mediterranean should be carefully planned in order to avoid or at least minimize the risk of causing environmental pollution including marine litter.

When considering the evolution of rural populations in the Mediterranean there is a considerable disparity between developed and developing countries. In the northern Mediterranean countries, the size of the rural population is expected to stabilize, whereas in southern and eastern Mediterranean countries an increase before an eventual tapering of rural population is still expected.

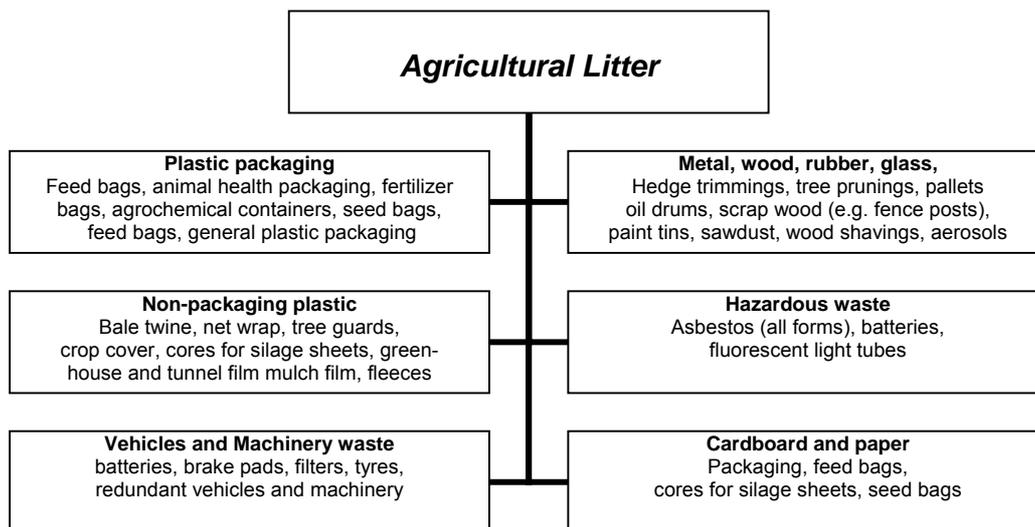


Source: Plan Bleu 2001

Farmers in the northern Mediterranean countries are increasingly becoming multifunctional with supplements from food processing and agro-tourism. In southern and eastern areas of the Mediterranean rural inhabitants have a lower educational level and most of the farm work is performed by rural women.

How agriculture contributes to the generation of marine litter

Farm litter is quite extensive and perhaps more so than in other industrial or domestic areas and therefore identification of farm litter should be the first step. Key areas in agriculture that generate marine litter are farm houses, stables, delivery areas, packaging areas, slaughter houses and green houses. All substances or objects from such premises, which are discarded by the holder, are subject to control as waste. This includes all non-organic and some organic waste materials. Examples of solid agricultural waste are:

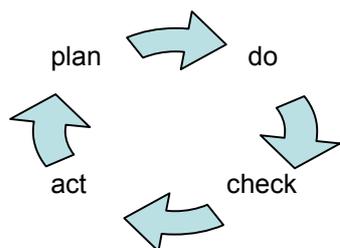


Empty drums and packaging of agrochemicals may pose soil, ground-water, health and safety risks. Agricultural plastic litter is unsightly and can be blown some distance, ending up in trees, hedges and water bodies. On getting into a waterway, it can cause blockades, often ending up hanging on riverbank vegetation or fences. Plastic waste or litter is also potentially lethal to livestock.

Solid waste represents a crisis for coastal rural areas because people often dump their waste illegally in water canals that end up in river deltas and the sea with all of the negative impacts this incurs. Of course it is very often the case that the competent authorities have not provided the appropriate landfill prerequisites to the local communities and land users.

Many farms own waste dumps which have been used over many years for redundant farm equipment and vehicles and a variety of scrap materials. These waste dumps are often untended, sited at the edge of a field, on the farm's boundary.

How agriculture can contribute to minimizing marine litter in the Mediterranean



There are opportunities for farmers, with the incentive of financial gain and a better quality of life, to help the environment through efficient use of resources and improved waste management. Litter minimization (the reduction of solid waste on site) should be fundamental to planning of farm management as it significantly reduces among others the risk of marine pollution from agricultural activities.

A waste management plan for the farm within a community framework and in cooperation with local authorities should be established. The litter management plan for the farm should include details on safe litter management and good farming practices. More specifically, it should consider the following measures:

- Reduce, re-use and recycle waste, wherever possible, by segregating materials.
- Waste must be separated and stored securely, ready for collection, to prevent harm to the environment and to human health. Monitoring of litter quantities of each type is also a very helpful indicator of progress made over time
- Adopt “good housekeeping” and waste minimization practices that aim to prevent pollution at source. Purchasing practices should be reconsidered
- Where possible, minimize packaging by using bulk delivery and re-usable packaging
- Use packaging which is biodegradable or can be returned to the supplier for reuse. However, many plastic crop covers that are biodegradable do not degrade sufficiently well to avoid a litter problem.
- Recycle metal and tyres. When a farmer no longer has a use for tyres, they are required to dispose of them appropriately. Tyre suppliers may take old tyres after fitting new ones to agricultural machinery.
- Where possible, reuse or recycle plastic materials on the farm as this will help to reduce the quantity of waste which has to be disposed of
- Containers for agricultural chemicals and other persistent toxic or harmful substances should not be put to an alternative use but stored in designated areas that are isolated from surface drains and when possible returned to the supplier for appropriate controlled disposal
- Care in the handling and use of plastics will increase its potential for reuse and/or recycling and its useful life expectancy. Dirty plastic costs the recycling industry more by being less efficient to recycle. It also costs farmers much more to dispose of, as a contaminated silage cover weighs roughly twice as much as it does when clean.
- To prevent stored plastic from blowing around the farmyard and to prevent it from becoming further contaminated, a storage system such as a cage, a silage trailer or other trailer with high sides or a recycling bin is recommended.
- Trees, trunks, logs, vegetable clippings, leaves, seeds, shells, rinds, garden waste, etc. can be used for composting.
- Old farm vehicles and machinery should be fenced until final disposal through local authorities.
- Farmlands should be kept clean and tidy and free from unsightly litter from farming activity, especially farm plastics, containers and scrap. Farmers who participate in agri-environment schemes must keep their farms free from litter and eyesores.

It is recommended to have a transfer station located in each community to separate the wastes, compact and transfer them to the nearest recycling centers. The transfer station consists of a sorting conveyer belt to sort valuable waste from organic waste which is compacted in a hydraulic press. The collected organic waste can be mixed with other rural waste for composting. However, the litter quality and quantity changes from one rural community to another and it is very difficult to establish recycling facilities in rural areas where the quantities are small and specificities vary.

Agricultural litter should not be

- Disposed of in a “farm dump”
- Disposed of in water canals
- Burned
- Disposed of in household bins

Agricultural litter should be

- Reduced and reused at source
- Recycled.
- Taken to licensed landfill sites for disposal. Recycling should always be the preferred management option as it helps to reduce resource use and the requirement for space and landfill sites.

Key elements on which awareness-raising efforts should focus

For all agricultural areas in the Mediterranean litter prevention is essential to reduce environmental, social and economic degradation. Awareness raising, stimulation of public opinion and redirecting or improving management policies should be a common regional goal with national and local adaptations.

Awareness initiatives should focus on waste reduction, re-use and recycling, including the promotion of production techniques covering the entire life-cycle of the product and promotion of pilot initiatives to systematically tackle waste from agriculture-related activities.

Based on the various involved stakeholders, their competencies and responsibilities the following are proposed:

Agricultural cooperatives, associations and unions, in partnership with local and regional authorities, competent NGOs, etc. should provide information, education and training possibilities to farmers regarding implementation of agricultural litter management. Farmers should be properly informed and encouraged to:

- Comply with current legislation
- Keep up to date with changes in legislation
- Subscribe to agricultural journals
- Ensure that all staff and contractors on the farm are knowledgeable of proper litter management practices
- Apply on the job training, supported by training instruction sheets

Farm owners themselves could play a significant role by setting examples and encouraging the local community to follow suit by way of being active in agricultural cooperatives and associations; collaborating with the competent authorities and exerting pressure for better performance on their part; joining local, national and regional initiatives including clean up efforts, awareness programs, etc.; encouraging staff and neighbors to get involved in actions; maintaining standing relations with local and national NGOs working on environment and sustainable development which in turn belong or monitor developments and initiatives at Mediterranean and global level.

The Ministry of Agriculture and other responsible central authorities, in coordinated efforts with regional (sub-national) and local authorities should review, strengthen or develop regulations, infrastructure, incentives and appropriate awareness raising and education programmes relevant to integrated waste management with specificities to minimizing marine litter. Subsidies for farmers should be connected to proper litter management and other environmental obligations and practices. Participation of rural communities in any type of management scheme needs to be enhanced through the setting up of appropriate related participatory mechanisms, public awareness campaigns and systematic targeted training community participation with respect to solid waste management (public hearings, radio and telephone help-lines, surveys, etc.

Cooperatives and associations play a very important role in the agricultural sector particularly in accessing small farm owners. They should provide information and support to members, organize training seminars on litter management and the relevance to marine litter, etc.

NGOs and particularly women's organizations could play a significant role particularly in southern and eastern Mediterranean countries, where as mentioned above the percentage of female farmers is high.

Producers and suppliers of the agriculture sector should develop related partnership agreements, promote eco labeling schemes, etc.

The local **media**, agricultural newspapers, television and radio stations could play a significant role for information dissemination, announcements, promotion of good examples, etc.

Benefits of the proactive involvement of the agricultural sector

As is the case for other economic sectors, and particularly if implemented in a regional (Mediterranean) framework, the benefits of incorporating responsible litter management practices in the agriculture sector are socioeconomic as well as environmental. More specifically, lower costs will be achieved by reducing resource use, improving operating efficiency, lowering waste output, etc.; farms, nearby beaches and marinas will be litter-free and attractive significantly contributing to and facilitating a more sustainable rural development; the sector will be increasingly acknowledged for its environmental commitment which is an integral aspect of the increasing trends towards more sustainable farming practices in the Mediterranean and the world over.

However, this can only be achieved within overall rural solid waste management schemes, providing the necessary infrastructures and initiatives to promote waste reduction, re-use and recycling in the Mediterranean countries. The promotion of production techniques covering the entire life-cycle of products as well as the identification and implementation of appropriate market mechanisms (incentives, etc.) for recovered products, reinforcement of national and local waste management capacity and promotion of pilot initiatives to systematically tackle waste from agriculture-related activities are also necessary. Only then will we be able to witness a reduction of marine litter in the Mediterranean.

References

Biodiversity and Conservation, M.J. Jeffries, Routledge, 1997
Environmental Engineering, G.Kiely, Irwin Mc Graw-Hill Publication, 1997
Mediterranean Strategy for Sustainable Development, UNEP/MAP, 2005
Good Agricultural Practice, Dr. Harry Gracey, Investors in People, 2006
Prevention of Environmental Pollution from Agricultural Activity,
Code of Good Practice, Scottish Executive Publications, 2005
The Blue Plan's "Environment & Development Outlook", Guillaume Benoit & Aline Comeau, Earthscan, 2005

Websites

European Environment Agency: <http://www.eea.eu.int>
International Agri-food Network: <http://www.agrifood.net>
International Federation of Agricultural Production: <http://www.ifap.org>
Food and Agriculture Organisation of the United Nations: <http://www.fao.org>
Mediterranean Environmental Technical Assistance Program: <http://www.metap.org>

The role of the regional, national and local authorities

The following reasons, *linked to information, awareness and stakeholder involvement*, can be identified as mostly responsible for the extent to which marine litter is a problem in the Mediterranean today and which have not been adequately addressed by the regional, national and local administrations of the region (see pp 5-6 for main institutional, technical, legislative and financial reasons):

- Quantitative data on quantities, qualities and flows of marine litter in the Mediterranean are lacking and inconsistent. This is a major problem which complicates setting priorities, goals (at regional and national level) and priorities for action both at the decision-making level and in implementation.
- Polluters (from individuals to economic sectors) lack incentives to change their behaviour. There is resistance to change, deficiencies in the provided information and a lack of comprehension of the dangers associated with their current practices.
- There is insufficient information on the environmental impacts of marine litter on humans and the ecosystem, which means that there is inadequate knowledge of the impact and challenges for Mediterranean fauna, flora, ecosystems and the human element. Moreover, the mechanical and physicochemical impacts of marine litter are little known and more studies are needed.
- The economic impact of marine litter is not well assessed or understood, which means that there is a lack of knowledge of the real costs of marine litter for the community, the Mediterranean countries or the region as a whole.
- Awareness campaigns have been isolated and short-term efforts and have addressed in a non-integrated way the problem of marine litter in the Mediterranean.
- Educational curricula of the Mediterranean do not consistently nor adequately cover the environmental, economic and social causes and effects of marine litter (or even solid waste management).

Regional level

At regional level the following must be promoted:

- A regional approach, i.e. a framework strategy on how to raise awareness on and educate about marine litter in the Mediterranean. It should include the identification of possible funding sources for the implementation of the actions and activities as well as performance indicators.
- Development and implementation of regional monitoring and assessment programs. Data on the quantity, composition and distribution of marine litter throughout the region must be collected and assessed, using specific methodologies based on the positive experience from other regions and adapted for the conditions of the Mediterranean. The economic costs of marine litter to shipping, fishing and other industries should also be documented. Such information will be useful for: identifying priorities; facilitating the decision-making process; informing and raising the awareness of all those generating waste; monitoring the associated environmental impacts, etc.

Good Practice

“Clean up the Mediterranean” is an initiative launched by “Clean up the World” in cooperation with UNEP (United Nations Environment Program) and supports clean up activities together with stakeholders and civil society in the Mediterranean for the protection of the Mediterranean Sea.
(www.cuw.org)

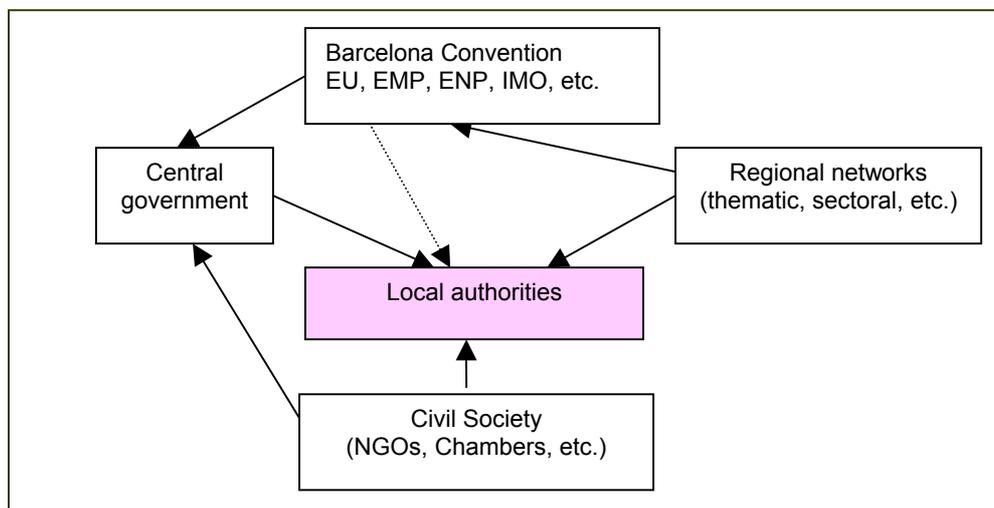
- Implementation of regional cooperation programs with the civil society (private sector, NGOs and academia) through developing partnerships, voluntary agreements and cooperation with the major stakeholders (e.g., shipping industry, tourism industry, fisheries, manufacturers of plastics, waste managers/services, local authorities, NGOs and the media).
- Development of innovative regional campaigns not only restricted to the cleaning and collecting of solid wastes that pollute coastal and marine areas as has been done in the majority of the campaigns to date, but with emphasis on the socio-economic costs and implications to the sustainable development of the region.
- Preparation and dissemination of communication material in different formats (reports, posters, CD-ROMs, websites, etc.) adapted to the various target stakeholders, countries, etc.
- Development of common educational materials on effectively combating the problem of marine litter in the Mediterranean through promoting the protection of the environment and sustainable development. Apart from the Ministries of Education and the Ministries for the Environment existing more flexible regional networks such as **MEdIES** should also be recruited.
- Demonstrations through regional awareness raising campaigns and educational programmes in selected areas and with selected stakeholders, particularly NGOs.
- Promotion of research and technology that contribute to the solution of the problems and sharing and exchanging such information and technology with other regional initiatives globally in the management of marine litter, through conferences, seminars and regional exhibits.
- Begin action immediately by maximising the use of the limited resources on hand by taking into consideration the opportunities for cooperation with the ongoing international and regional programs and building on synergies where possible, particularly with the private sector and regional bodies with local action (e.g. MEDCITIES).

MEdIES (Mediterranean Education Initiative for Environment & Sustainability with and emphasis on water and waste) is a Type II Initiative that aims to facilitate the educational community of the region (educators, students, NGOs, etc.) to contribute in a systematic and concrete way in the implementation of Agenda 21, the MDGs as well as the UN Decade for Education for Sustainable Development (ESD) (2005-2014) through the successful application of innovative educational programmes. It currently facilitates over 1000 members. Read more at www.medies.net

However, these actions need to be complemented by a number of parallel regional initiatives relating to the **proper management of marine litter at Mediterranean level**. These initiatives could be addressed within a regional Action Plan or a Framework Strategy closely linked to a regional scheme for integrated management of coastal solid waste, or they could be integrated in the many already existing action plans in the Mediterranean (SAPs, NAPs, NSSDs, ICM Protocol, Horizon 2020, etc.). Regional legal and administrative instruments must be enhanced and harmonised, potential funding sources for various components and activities of the regional Action Plan or Framework Strategy need to be identified and approached particularly for high cost initiatives (such as port reception facilities, landfills, fisheries, etc.). Common quantitative and qualitative indicators on marine litter should be developed and used by all the countries of the Mediterranean basin and should be included to in the Mediterranean Strategy for Sustainable Development (MSSD). Countries which have not done so should be encouraged and assisted to sign, ratify and enforce Annex V of the MARPOL73/78.

National and local level

Solid waste management is one of the biggest challenges for governments and local authorities around the world, and is particularly the case for the densely populated, often without planning, expanding cities of the Mediterranean coast.



In order to effectively enhance information, awareness, education and stakeholder involvement in relation to marine litter, national and local authorities of the Mediterranean countries should work in complementarity with each other to:

- Develop national strategies on how to raise awareness on and educate about marine litter in the Mediterranean in line with the regional strategy outlined above. Accordingly, possible funding sources for the implementation of national and local actions and activities as well as performance indicators need to be clearly defined.
- Implement national and local cooperation programs with the civil society (private sector, NGOs and academia) through developing partnerships, voluntary agreements and cooperation with the major stakeholders (e.g., shipping industry, tourism industry, fisheries, manufacturers of plastics, waste managers/services, local authorities, municipalities and communities, NGOs and the media).
- Promote and spread codes of responsible conduct of the users of the marine environment.
- Participate in the regional monitoring and assessment programs on marine litter. Data on the quantity, composition and distribution of marine litter countrywide must be collected and assessed based on the regionally specified consistent methodologies.
- Develop innovative campaigns not only restricted to the cleaning and collecting of solid wastes that pollute coastal and marine areas as has been done in the majority of the campaigns to date.
- Prepare and disseminate communication material in different formats (posters, CD-ROMs, websites, etc.) preferably based on similar materials produced for the region as a whole and in any case making appropriate reference to the ongoing regional framework of the effort.

- Adapt and integrate the regional educational materials on effectively combating the problem of marine litter in the Mediterranean through promoting the protection of the environment and sustainable development.
- Support non-formal education initiatives targeting youth, professionals, clubs, associations, other groups.
- Train administrative and operational staff within related ministries and municipal services and establish the necessary inter-ministerial and inter-departmental links and long-term networking for effective information exchange.
- Provide incentives for marine litter recovery by the various economic sectors (fisheries, tourism, maritime, etc.).
- Promote scientific research, technological applications, etc. relating to the sources, impacts and solutions of the problem of marine litter.
- Run demonstration awareness raising campaigns and educational programmes in selected areas and with selected stakeholders, particularly NGOs and the private sector.
- Practice the basic waste management principles in administration buildings and sites (e.g. provide the proper infrastructure and mechanisms to reduce, reuse, recycle waste) and advertise it!

The above should be integrated within the development of national and local strategies for the integrated management of solid waste, including what eventually becomes marine litter, according to the *regional* guidelines (Action Plan or Framework Strategy) for the proper management of coastal and marine litter. Prerequisite for this would be the review and enhancement of related national legal, technical and financial instruments; the development of strategies and approaches for better implementation and enforcement of MARPOL Annex V and for funding high cost initiatives (such as port reception facilities, landfills, fisheries, etc.); the allocation of legal responsibilities and financial resources to local authorities for regular and mandatory beach and river clean up operations, etc.

The role of civil society

Civil society and particularly Non-Governmental Organisations (NGOs) are nowadays recognised as legitimate partners essential in achieving sustainable development by contributing analysis, expertise and commitment from the inception and policy dialogue phase to the implementation phase at different operational or administrative levels (regionally, nationally and locally).

Specifically in the framework of the proposed medium-term awareness and education campaign on marine litter in the Mediterranean, NGO involvement at regional, national and local level is expected to contribute to:

- higher awareness level of the processes and results of the campaign,
- higher acceptance and ownership of the processes and their products
- strengthened stakeholder participation and partnership building
- increased quality of the outputs
- increased possibilities of the replication of activities and their results

The regional component and coordination of the campaign is necessary in order to secure a minimum of standards and prerequisites and to introduce a set of appropriate indicators for performance at regional and at national level.

Some indicative types of actions that NGOs could undertake are:

- Joint development of “responsible citizenship” guidelines for different sectors and target audiences, in particular: children, youth, tourists, municipal authorities and local communities, shipping companies, ship and smaller vessels crews; commercial and recreation fishing vessels, and other identified target groups (e.g. women);
- Public awareness campaigns through the preparation and production of thematic publications, brochures, leaflets, etc.
- Networking at regional, national and local levels specifically on marine litter. Important such networks already exist.
- Provide the public with simplified translations of difficult to understand policy and legal documents, terminology, etc.
- Inform the public about the progress of implementation of the regional and national strategies on marine litter and integrated solid waste management; role, responsibilities and tasks of authorities and economic sectors, etc. Also exert targeted pressure for better performance.
- Effectively engage the media in adequately addressing the problem of marine litter.
- Development and implementation of campaigns and demonstration actions such as beach clean-ups, recycling programmes, etc.
- Develop and/or implement formal, non-formal and informal education programmes in coherence with the regional initiatives.
- Participate in management bodies of regional, national and local strategies on marine litter and integrated solid waste management and effectively contribute in the outreach of the outcomes.

- Develop scheduled volunteer collaboration groups to reinforce activities implementation.
- Facilitating multi-stakeholder activities and events (round table discussions, engaging the public and private sector, etc.). In some cases an NGO can function as broker/mediator/facilitator among different stakeholders and government agencies
- Conducting/participating in monitoring and evaluation processes (independently or otherwise). Data on the quantity, composition and distribution of marine litter countrywide could be collected by NGOs and assessed based on the regionally specified consistent methodologies.
- Participate in processes defining selection criteria, programming, indicators, etc. of demonstration sites/projects, etc.
- Testing the feasibility and efficiency of innovative technologies and their applications.
- Contributing to the introduction, pilot use and evaluation of innovative financial instruments.
- Demonstrate practical ways of overcoming obstacles and barriers in adopting best practices.
- Participate in technical capacity building programmes relating to marine litter.
- Run, improve and broaden networks and coalitions.
- Formulating and conducting surveys, questionnaires, interviews, etc.
- Disseminating results through their networks and channels.

When designing a regional awareness campaign with national application, the level of maturity of civil society and NGOs specifically, needs to be considered. There is a wide variety on a country by country basis in the Mediterranean. Some issues that are raised are:

- Are there specialized NGOs (on waste, clean-ups, campaigns, education, etc.)?
- To what degree do they follow regional and international processes on marine litter?
- Are there associations and cooperatives of economic sectors? How are these structured in the country and what is the level of organisation?
- Is there existing previous experience? Do awareness and education efforts have to start from the beginning or from a more advanced stage?

Strong coordination of the awareness and education campaign on Marine litter at regional level is the only way to support the weaknesses, gaps and inadequacies of organized civil society in implementing actions at national level.

Clean up the MED Sea Action

Clean Up the Med is organized on annual basis by LEGAMBIENTE, the most widespread environmental NGO in Italy, and brings together organizations, schools, universities, municipalities, hotels, etc. in a common action of cleaning up beaches and coastlines in all of the Mediterranean countries.

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