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Agenda item 5: Updated Assessments of Dumping and Desalination Activities in the Mediterranean

Issue Paper on Management of Dredged Materials

UNEP/MAP
Athens, 2017

List of Abbreviations / Acronyms

BOD	Biochemical Oxygen Demand
COP	Conference of the Parties
GES	Good Environmental Status
LBS Protocol	Land-Based Sources Protocol
NALs	National Action Levels
PCB	Polychlorinated biphenyl
SPA/BD Protocol	Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean
UN Environment	United Nations Environment
UTV	Upper Threshold Values

1. Introduction

1. Dredging operations in ports and navigation ways are a vital necessity for the maintenance and development of their activity (safety of navigation, development work etc.) and consequently of maritime and inland waterway traffic. Dredged materials can be integrated, under certain conditions and subject to the existence of a local market, in processing particularly in building materials. They can also be used for beach nourishment in the fight against the coastal erosion.

2. The contamination of sediments, mainly from land-based sources, may originate on the one hand from "upstream" activities whose flows are transported by rivers and, on the other hand, from local activities, carried out close to or in the port areas.

3. Dredging operations may result in the re-mobilization of these buried pollutants and their suspension, which may, at certain levels, have an adverse impact on the environment, either at sea during dredging or clapping when these sediments are submerged, or on land when these sediments are stored. Dredging may also cause hydromorphological and hydrographic changes in the dredged areas and have a greater impact on disposal or onshore sites.

4. The problem of dredging and fate of contaminated sediments is at the interface of several issues that may have a negative impact on the achievement and/or maintenance of Good Environmental Status (GES) of the Mediterranean Sea and Coast.

5. Dredging activities are currently regulated under different instruments at regional and global levels. These instruments provide strong ground to the Contracting Parties to the Barcelona Convention to take the necessary national measures, in line with their provisions, to reduce the adverse impacts of contaminated dredged materials on public health and marine ecosystems of the Mediterranean. In this respect, it should be underlined that the updated Guidelines on dredged material in the framework of the Barcelona Convention Dumping Protocol are based on the concept that dumping or re-suspension of dredging sediments in the coastal zone of the Mediterranean is undesirable and should be avoided as much as possible to achieve and/or maintain GES and meet related Operational Objectives and targets. However there is a need, in case that dumping could not be avoided, to consider an additional and complementary approach to the updated Guidelines in order to better ensure that GES is maintained.

6. Therefore the purpose of this issue paper is to describe the existing regional and global approaches and highlight some issues in view of considering potential additional measures/ regulations/ approaches at regional and national levels with the aim to prevent and further reduce the adverse impacts on marine environment from dredging activities.

7. The potential new approaches to be considered in order to achieve or maintain GES, and related targets, include the development of regional Upper Threshold Value(s) (UTVs) and National Action Levels (NALs) for contaminants in dredged materials.

2. Existing regulations related to dredging operations

A. UN Environment/Mediterranean Action Plan - Barcelona Convention and its Protocols

8. The Contracting Parties to the Barcelona Convention have adopted the Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft (adopted in 1976, amended in 1995 – amendments not yet in force). The approach followed by the amended Dumping Protocol is the prohibition of the dumping of all substances with some exceptions regulated by the Protocol. Exceptions for which dumping is subject to obtaining an authorization by a competent national authority are provided for 4 categories including dredged materials. For each category, Guidelines have been adopted by the Contracting Parties regulating the permitting system and the dumping operations. With regards to the dumping of dredged materials, Guidelines have been adopted

by COP11, in Malta, in 1999. In 2013, the Contracting Parties to the Barcelona Convention adopted the Decision IG.21/3 on the Ecosystem Approach including definitions of Good Environmental Status (GES), and targets in line with Operational Objectives. A table listing the indicators, GES and targets for the Operational Objectives that are relevant to dredging activities (5.1, 5.2, 5.3, 7.1, 7.2, 7.3, 8.1, 9.1, 9.2, 9.3, 9.4, 9.5, 10.1, 10.2) can be found in Annex I.

B. London Convention and Protocol

9. The London Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, that was adopted in 1996 to further elaborate and update the provisions set out in the 1972 London Convention on Prevention, regulates the dumping activities at global level. The London Protocol provides for a general prohibition of dumping, with the exemption of a limited number of material, included in its Annex 1, for which a specific permit is required, including dredged material. In the framework of the London Convention and Protocol specific guidelines have been developed for the wastes of Annex 1, in addition to the "Generic Guidelines" addressing all dumping activities. With regards to dumping of dredged material, revised specific Guidelines were adopted in 2013 under the London Convention and Protocol.

C. European Union legal framework

10. The European Union has established a comprehensive legal framework for the protection of marine and coastal environment. In this framework, three legal instruments, namely the Waste Framework Directive, the Marine Strategy Framework Directive and the Water Framework Directive are relevant to the regulation of dredging operations and their potential impacts on marine and coastal environment, as indicated below:

(a) Waste Framework Directive 2008/98/EC[1] excluded from its scope "Sediment displaced within surface waters for the purpose of watercourses, waterways, flood prevention, mitigation or droughts or land reclamation are excluded from the scope of this Directive, if it is proved that these sediments are not dangerous "(see Article 2 of the Directive). As a consequence, hazardous sediments are considered to be within the meaning of that Directive.

(b) The Marine Strategy Framework Directive 2008/56/EC[2] of 17 June 2008 sets objectives of achieving the good environmental status of the marine environment by 2020. This good environmental status is defined by 11 qualitative descriptors (Annex I to the Directive), many of which relate to the potential impacts of Dredging, including:

- descriptor 6: sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and that benthic ecosystems, particular, are not adversely affected;
- descriptor 7: permanent alteration of hydrographic conditions does not adversely affect marine ecosystems;
- descriptor 8: concentration of contaminants are at levels not giving rise to pollution effects.
- descriptor 9: contaminants in fish and other seafood intended for human consumption do not exceed levels established by the Community legislation or other relevant standards;
- descriptor 10: properties and quantities of marine litter do not cause harm to the coastal and marine environment.

[1] DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives

2 DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive

(c) The Water Framework Directive 2000/60 / EC[3] defines a good chemical status, good ecological status, and non-degradation of the quality of water bodies for 2015. It sets out in this framework a list of 41 substances for which Quality standards are set at Community level and Chemicals that support biological quality.

3. Potential complementary approach to reduce sediment pollution from dredged material

11. This complementary approach would provide for measures to be implemented in case a dumping permit of dredged material is to be issued. It consists of adopting regional threshold level(s) called **Upper Threshold Values (UTVs)** and an **Action List of contaminants** including selected trace metals and persistent organics for dredged materials subject to re-suspension, dumping, and relocation, with associated **National Action Levels (NALs)** of concentration.

12. Upper Threshold Values (UTVs) are levels of contaminants that are used to identify and assess the level of regional environmental concern for certain contaminants. On the basis on these regional threshold values, the Contracting Parties may define National Action Levels, establishing national thresholds for a list of contaminants relevant to dredging operations.

13. The National Action Levels should respect the regional Upper Threshold Values, as a minimum requirement, and cannot go beyond the regional levels.

14. The National Action Levels may therefore provide a basis for determining whether dredged materials can be disposed of at sea. More specifically, they can support and guide the competent authorities in identifying: (i) dredged material that could be dumped at sea because the risk for adverse effects is low and acceptable, (ii) those that may not be dumped without treatment, considering that the beneficial uses is not possible, because the risks for adverse effects would be considered too high, or finally (iii) cases where additional information may be required to make a sound judgment about the potential for the dredged material to cause adverse effects.

15. As an example, several Europeans Countries, among them two Mediterranean countries, adopted national levels for a number of contaminants in dredged materials as follows:

	Germany	Belgium	Spain	France	Netherlands
Arsenic mg/kg	30 - 150	36 - 100	80 - 200	25 - 50	29 - 29
Cadmium mg/kg	2,5 - 12,5	3 - 7	1 - 5	1,2 - 2,4	0,8 - 4
Chromium mg/kg	150 - 750	66 - 220	200 - 1 000	90 - 180	100 - 120
Copper mg/kg	40 - 200	65 - 91	100 - 400	45 - 90	36 - 60
Mercury mg/kg	1 - 5	4 - 7	0,6 - 3	0,4 - 0,8	0,3 - 1,2
Lead mg/kg	100 - 500	400 - 600	120 - 600	100 - 200	85 - 110
Nickel mg/kg	50 - 250	190 - 280	100 - 400	37 - 74	35 - 45
Zinc mg/kg	350 - 1750	360 - 500	500 - 3000	276 - 552	140 - 365
PCB mg/kg	20 - 60			0,5 - 1	

16. If this approach is agreed, there is a need to develop baseline values for the UTVs. In that view, the following steps may be considered before a decision is taken:

[3] DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy

Step 1

(a) Collection of existing data on levels of contaminants in dredged materials in areas under the national jurisdiction of the Contracting Parties;
(b) Establishment of an Action List of Contaminants;
(c) Setting of baseline values, based on data availability;
(d) Establishment of Regional UTVs.

Step 2

Testing, on voluntary basis, of Action List of contaminants and associated National Action Levels developed based on the outcomes of step 1, for 5 years

Step 3

In cases where no data on levels of contaminants are available under Phase 1, a "hypothetical" action list of contaminants and associated National Action Levels may be considered

Step 4

Findings and lessons learnt and follow-up actions

Annex I
List of Operational Objectives, Indicators, GES and targets related to dredging activities

Annex I. List of Operational Objectives, Indicators, GES and targets related to dredging activities

Operational objective	Indicator	GES	Targets
5.1 Human introduction of nutrients in the marine environment is not conducive to eutrophication	5.1.1 Concentration of key nutrients in the water column	Concentrations of nutrients in the euphotic layer are in line with prevailing physiographic, geographic and climate conditions	**State** 1. Reference nutrients concentrations according to the local hydrological, chemical and morphological characteristics of the un-impacted marine region [4] 2. Decreasing trend of nutrients concentrations in water column of human impacted areas, statistically defined
			Pressure 1. Reduction of BOD emissions from land based sources 2. Reduction of nutrients emissions from land based sources
	5.1.2. Nutrient ratios (silica, nitrogen and phosphorus) where appropriate	Natural ratios of nutrients are kept	
5.2 Direct effects of nutrient over-enrichment are prevented	5.2.1 Chlorophyll-a concentration in the water column	Natural levels of algal biomass in line with prevailing physiographic, geographic and weather conditions[5]	**State** Chl-a concentrations in high-risk areas below thresholds[6] Decreasing trend in chl-a concentrations in high risk areas affected by human activities
	5.2.2 Water transparency where relevant	Water transparency in line with prevailing physiographic, geographic and climate conditions.	**State** 1. Index of turbidity behind threshold in high risk areas

[4] Thresholds to be set, subject to decision of Contracting Parties by COP19.
[5] Thresholds to be determined by COP19.
[6] Thresholds to be set in the future, feasibility to be addressed, subject to decision of Contracting Parties by COP19.

Operational objective	Indicator	GES	Targets
			2. Increasing trend of transparency in areas impacted by human activities
5.3 Indirect effects of nutrient over-enrichment are prevented	5.3.1 Dissolved oxygen near the bottom, i.e. changes due to increased organic matter decomposition, and size of the area concerned[7]	Bottom water fully oxygenated in line with prevailing physiographic, geographic and climate conditions	**State** 1. Dissolved oxygen concentrations in high-risk areas above local threshold[8] 2. Increasing trend in dissolved oxygen concentrations in areas impacted by human activities

[7] Monitoring to be carried out where appropriate.
[8] Thresholds to be set, subject to decision of Contracting Parties by COP19.

Operational objective	Indicator	GES	Targets
7.1 Impacts to the marine and coastal ecosystem induced by climate variability and/or climate change are minimized	7.1.1 Large scale changes in circulation patterns, temperature, pH, and salinity distribution	Ecosystems are resilient enough to adapt to climate change.	Anthropogenic impacts which may alter ecosystems' adaptive capacity are reduced.
	7.1.2 Long term changes in sea level		
7.2 Alterations due to permanent constructions on the coast and watersheds, marine installations and seafloor anchored structures are minimized	7.2.1 Impact on the circulation caused by the presence of structures	With new structures in place, near shore wave- and current patterns maintain as natural as possible.	Marine and shore based new structures planned, constructed and operated in a way to maintain the natural wave and current pattern as much as possible
	7.2.2 Location and extent of the habitats impacted directly by the alterations and/or the circulation changes induced by them: footprints of impacting structures	Negative impacts due to new structure are minimal with no influence on the larger scale coastal and marine system	Planning of new structures takes into account all possible mitigation measures in order to minimize the impact on coastal and marine ecosystem and its services integrity and cultural/historic assets. Where possible, promote ecosystem health.
7.3 Impacts of alterations due to changes in freshwater flow from watersheds, seawater inundation and coastal intrusion, brine input from desalination plants and seawater intake and outlet are minimized	7.3.3 Changes in key species distribution due to the effects of seawater intake and outlet	Water circulation in coastal and marine habitats, and changes in the levels of salinity and temperature are within thresholds, to maintain natural/ecological processes	Site specific tolerable limits of key species in immediate proximity of seawater intake and outlet structures are considered while planning, constructing and operating such infrastructure

Operational objective	Indicator	GES	Targets
8.1 The natural dynamic nature of coastlines is respected and coastal areas are in good condition	8.1.1 Areal extent of coastal erosion and coastline instability	Coastal resilience maintained and improved; and coastal uses made adaptable to coastal erosion	Impacts of coastal erosion caused by man made factors anticipated and prevented through coastal erosion management allowing for natural fluctuation of the coast and minimizing coastal erosion risk
	8.1.2 Changes in sediment dynamics along the coastline	Long term sediment dynamics is within natural patterns[9]	Disturbance in sediment inflows reduced through improved Integrated River Basin Management and coastal sand management practices
	8.1.4 Length of coastline subject to physical disturbance due to the influence of manmade structures	Physical disturbance to sandy coastal areas induced by human activities should be minimized	Negative impacts of human activities on sandy coastal areas are minimized through appropriate management measures
9.1 Concentration of priority[10] contaminants is kept within acceptable limits and does not increase	9.1.1 Concentration of key harmful contaminants[11] in biota, sediment or water	Level of pollution is below a determined threshold defined for the area and species	**State** Concentrations of specific contaminants below EACs or below reference concentrations[12] No deterioration trend in contaminants concentrations in sediment and biota from human impacted areas, statistically defined. **Pressure** Reduction of contaminants emissions from land based sources[13]

[9]The feasibility of this GES should be further elaborated by COP19
[10] Priority contaminants as listed under the Barcelona Convention and LBS Protocol.
[11] Use for further work on reference conditions ERL for sediments taking into account specifics of the Mediterranean.
[12] Thresholds to be set by COP19.
[13] Reduction programmes are already in place through the Protocols of the Barcelona Convention and the Marine Litter Regional Strategy.

Operational objective	Indicator	GES	Targets
9.2 Effects of released contaminants are minimized	9.2.1 Level of pollution effects of key contaminants where a cause and effect relationship has been established	Concentrations of contaminants are not giving rise to acute pollution events	**State** Contaminants effects below threshold[14] Decreasing trend in the operational releases of oil and other contaminants from coastal, maritime and off-shore activities.
9.3 Acute pollution events are prevented and their impacts are minimized	9.3.1 Occurrence, origin (where possible), extent of significant acute pollution events (e.g. slicks from oil, oil products and hazardous substances) and their impact on biota affected by this pollution	Occurrence of acute pollution events are reduced to the minimum.	**Pressure** 1. Decreasing trend in the occurrences of acute pollution events
9.4 Levels of known harmful contaminants in major types of seafood do not exceed established standards	9.4.1 Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood[15]	Concentrations of contaminants are within the regulatory limits for consumption by humans	**State** Concentrations of contaminants are within the regulatory limits set by legislation
	9.4.2 Frequency that regulatory levels of contaminants are exceeded	No regulatory levels of contaminants in seafood are exceeded	**State** Decreasing trend in the frequency of cases of seafood samples above regulatory limits for contaminants

[14] Thresholds to be set by COP19.
[15] Traceability of the origin of seafood sampled should be ensured.

Operational objective	Indicator	GES	Targets
9.5 Water quality in bathing waters and other recreational areas does not undermine human health	9.5.1 Percentage of intestinal enterococci concentration measurements within established standards	Concentrations of intestinal enterococci are within established standards	**State** Increasing trend in the percentage of intestinal enterococci concentration measurements within established standards
10.1 The impacts related to properties and quantities of marine litter in the marine and coastal environment are minimized[16]	10.1.1 Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source	Number/amount of marine litter items on the coastline do not have negative impacts on human health, marine life and ecosystem services	**State** Decreasing trend in the number of/amount of marine litter (items) deposited on the coast
	10.1.2 Trends in amounts of litter in the water column, including micro-plastics, and on the seafloor	Number/amount of marine litter items in the water surface and the seafloor do not have negative impacts on human health, marine life, ecosystem services and do not create risk to navigation	**State** Decreasing trend in the number/amount of marine litter items in the water surface and the seafloor
10.2 Impacts of litter on marine life are controlled to the maximum extent practicable	10.2.1 Trends in the amount of litter ingested by or entangling marine organisms, especially mammals, marine birds and turtles[17]		Decreasing trend in the cases of entanglement or/and a decreasing trend in the stomach content of the sentinel species.

[16] Baseline is needed to be developed in line with the Marine Litter Regional Plan by COP19
[17] Marine mammals, marine birds and turtles included in the regional action plans of the SPA/BD Protocol.