

Development of Policies and implementation of measures to control pollution from large coastal cities in the Mediterranean Region

**Développement de politiques publiques et mise en
oeuvre de mesures pour limiter la pollution provenant
des métropoles côtières méditerranéennes**

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Abstract

MED POL is assisting the Mediterranean countries to implement programmes and measures to assess and eliminate pollution in the Mediterranean Sea. In the frame of the Strategic Action Programme, special attention has been given to pollution derived from coastal cities, which are responsible of a large pollution load emitted from urban as well as industrial sources. Specific measures have been proposed for the elimination or control of priority land-based target groups of substances and activities that are of global concern, following a specific timetable and using funds provided by national and international funding organisations.

Résumé

MED POL assiste les pays méditerranéens pour réaliser des programmes et mettre en œuvre des mesures pour évaluer et éliminer la pollution de la Méditerranée. Dans le contexte du Programme d'Action Stratégique, la pollution provenant des villes côtières est spécialement ciblée, à cause des quantités importantes de polluants que ces villes déversent dans le milieu marin côtier par le biais des rejets urbains et industriels. Des mesures spécifiques ont été proposées pour l'élimination et le contrôle des substances prioritaires et pour des activités d'intérêt global, suivant un calendrier spécifique et en utilisant des fonds nationaux et internationaux.

THE MEDPOL PROGRAMME

The Programme for the Assessment and Control of Marine Pollution (MED POL) is the scientific and technical component of the UNEP/MAP¹. It assists the Mediterranean countries to implement programmes and measures to assess and eliminate pollution, as part of the implementation of the Barcelona Convention and its Protocols. In particular, the MED POL Programme is in charge of the following up of the implementation of the Land Based sources Protocol, the Dumping Protocol and the Hazardous Wastes Protocol. During Phase I (1975- 980) and II (1981-1995), MED POL was mainly coordinating a pollution monitoring and research programme, concentrating its efforts on capacity building and on collection and analysis of sources, levels, pathways, trends and effects of pollutants relevant to the Mediterranean Sea. During MED POL Phase III (1996-2005), pollution control was made the new focus of the programme, while it retained the assessment of pollution and provision of support to national institutions (i.e., capacity building). MED POL Phase IV (2006 – 2013) is actually underway, having as objectives:

- to facilitate the implementation of the Convention and its Protocols by the Contracting Parties in matters of its competence, in particular in the reduction and elimination of pollution from land-based sources and activities and dumping activities;
- to assess all point and diffuse sources and load of pollution reaching the Mediterranean, and the magnitude of the problems caused by the effects of contaminants on living and non-living resources, including human health
- to assess status and trends in the quality of the marine and coastal environment;
- to assist countries, including capacity building, for the implementation of national action plans for the gradual elimination of pollution, for the mitigation of impacts caused by pollution and for the restoration of systems already damaged;
- to monitor the implementation of the action plans, programmes and measures for the control of pollution and assess their effectiveness;
- to contribute, in cooperation with other MAP components, to the application of the ecosystem approach to the management of human activities.

To combat more efficiently land-based pollution, the Contracting Parties to the Barcelona Convention set up a Strategic Action Programme (SAP) in 1997. In the frame of the SAP the Mediterranean countries are implementing specific measures for the elimination or control of priority land-based target groups of substances and activities that are of global concern, following a specific timetable (until 2025).

The operational long-term output of the SAP was the implementation of country specific National Action Plans (NAPs) to combat pollution from land-based activities. All 21 Mediterranean countries have prepared NAPs, which have been

¹ United Nations Environment Programme – Mediterranean Action Plan

formally approved by the competent national authorities. The NAPs, with the lists of priority actions for the year 2010, have also received political endorsement by the Contracting Parties to the Barcelona Convention at their Meeting in Porto Roz (Slovenia) in November 2005. The implementation of the NAPs is an ongoing process, which will be revised in 2011. Also a discussion is underway on the application of a temporal differentiation mechanism for the implementation of regional emission values (ELVs), based on BAT, and for the development of regional and/or sub-regional -as appropriate - Environmental Quality Objectives (EQOs) for the marine environment.

POLLUTANTS FROM LARGE MEDITERRANEAN COASTAL CITIES

After the entry into force of the LBS protocol in June 2008, action plans and programmes containing legally binding measures and timetables required by Art. 15 of the Protocol are under discussion. Reduction of organic load from municipal wastewater is among the priorities which are already under preparation because of the importance of coastal cities, as pollution sources. Out of 131 “pollution hot spots”, which have been identified by the countries in the frame of the Strategic Action Programme (SAP), 82 % are urban centres, which discharge urban or combined urban/industrial effluents, leading to the degradation of the quality of the marine environment in many certain coastal areas, while the impact on the open Mediterranean Sea environment is still uncertain. The permanent population in the Mediterranean coast is at the order of 150 million inhabitants, but is doubled during the summer period, as the area is one of the most frequented tourist destination of the world. Along the Mediterranean coast, there are 1,699 cities with population above 2,000 inhabitants (Fig. 1 and Fig. 2) having a total resident population of 75 million (UNEP/MAP/MEDPOL, 2004 and UNEP/MAP/MEDPOL, 2008).



Figure 1. Mediterranean coastal cities (Red dots pop. >100,000, blue dots 10,000-100,000)

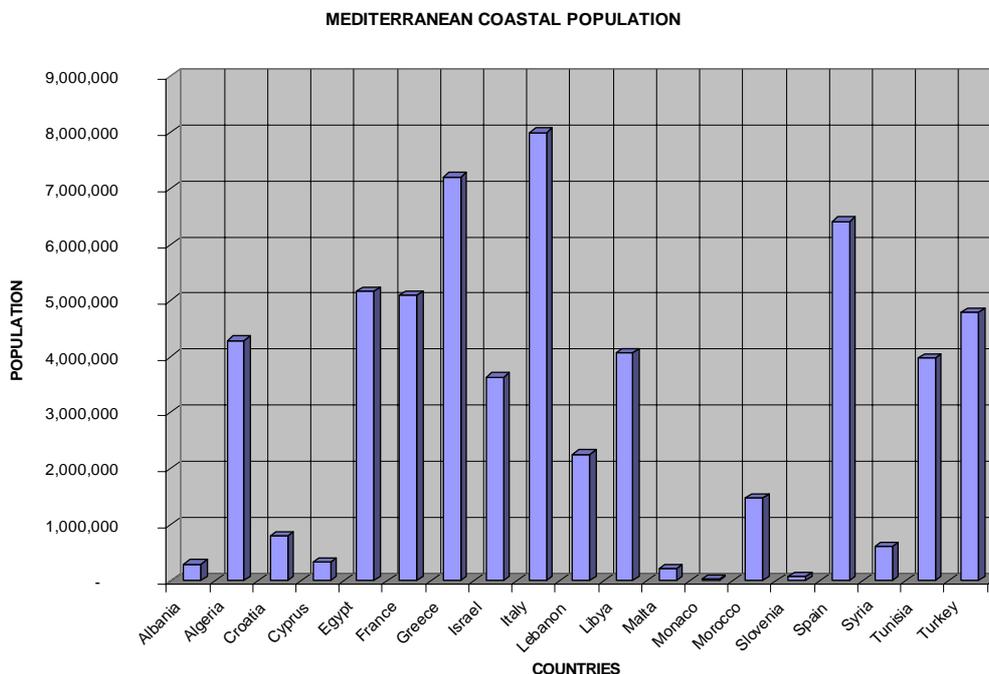


Figure 2. Mediterranean coastal population

Wastewater treatment plants (WWTP) are in operation in 60% of these cities, using mainly secondary treatment (75%), but also primary (20%) and tertiary treatment (4%), (Table 1).

Number of cities >2,000	Total population	Number of cities >2,000 served by WWTP	Permanent population served by WWTP
1699	74,854,000	1026	60,893,000

Table 1: Municipal wastewater treatment facilities in Mediterranean coastal cities > 2,000

In addition, MEDPOL developed, in 2003, an inventory of point sources of industrial effluents, mostly located in or on the skirts of urban coastal centres, which could reach, directly or indirectly, the marine environment. The inventory covers about 80 different substances or groups of substances and parameters and the database contains 6,700 entries and covers a large numbers of pollutants such as nutrients, metals and organics which are released from industrial point sources. The majority of data have been reported by northern Mediterranean countries (77% of records), while eastern and southern countries accounts for 12% and 11% of records, respectively (Fig. 3). Differences in the number of records can be related with the size and level of industrial development in each country, the regional and sectoral scope of the inventory, the availability of data, and the level of detail that each country operates its inventories. General parameters or non hazardous

substances (such as BOD5, nutrients, VOC) accounts for the majority of records in the NBB database (68%), while substances of concern (such as heavy metals, chlorinated hydrocarbons and polyaromatic hydrocarbons) accounts for 32% of total records, although they represent 68% of the substances considered. This is not surprising, as general parameters like BOD or nutrients are commonly emitted and reported by many different sectors and countries, while substances of concern are more sector specific, and difficult to measure and report. Within the group of “substances of concern”, more information (i.e., number of records) exists for metals, dioxins and phenols, than for PAHs and benzenes, and much less for organohalogenes, for which very few records have been reported.

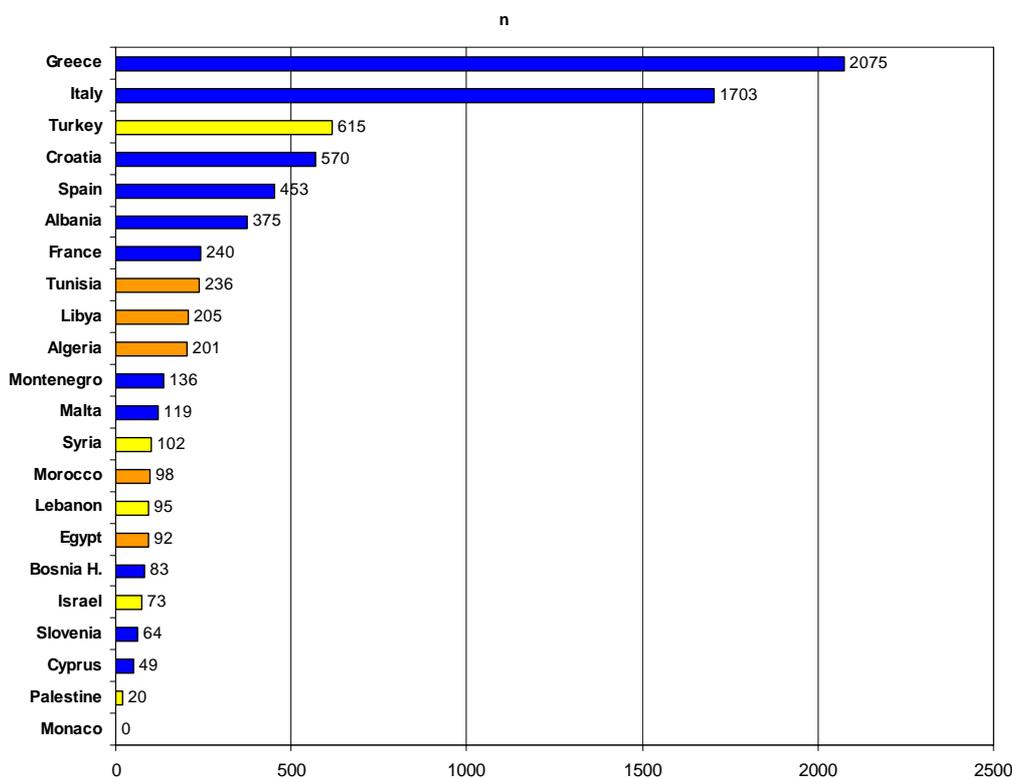


Figure 3. Number of data entries for pollutants discharged into the Mediterranean

To control pollution from urban centres, European Union countries, as well as some non EU countries, have in general, already established extended sewerage networks and WWTPs (secondary treatment) for most coastal cities. However, a very important part of urban effluents generated in the cities of North Africa, Eastern Mediterranean and East Adriatic coasts are still not treated before being discharged to the sea or surface waters. Only a part of the coastal population of these areas is connected to mainly primary treatment units (and few secondary treatment plants), but the largest part of the generated urban effluents are discharged untreated into the coastal marine environment. The rate of sewerage connection varies, and may reach impressively high rates (more than 70 percent) in some cities of these areas, but this should not be interpreted as an indicator of

successful performance, since treatment plants are often inadequately operated and/or maintained. Furthermore, high urban population growth in the region has not only increased pressure on water resources, but it has also created a tremendous additional demand for urban water and sanitation infrastructure. Efforts by public utilities to increase their performance were usually unsuccessful, often because of the constraints to which public utilities are subjected, such as restrictions on tariff setting, (salary, and staffing. Although reuse of treated municipal wastewater is recognised by all countries in the region as a potential solution to both water shortage and wastewater management, in most countries of Middle East (with the exception of Israel), North Africa and Eastern Adriatic, the share of reused wastewater in the water balance is still low. However, a notable progress has been achieved recently in treated wastewater recycling, especially in water scarce countries, by integrating wastewater reuse into their national water schemes with emphasis on recycling industrial cooling water and reuse of treated municipal liquid waste for irrigation purposes.

In the framework of SAP, the proposed targets for urban effluents were to dispose all municipal waste water (sewage) in conformity with the provisions of the LBS Protocol by the year 2025. Meanwhile (by the year 2010), countries have to dispose sewage from cities and urban agglomerations exceeding 100.000 inhabitants and areas of concern, in conformity with the provisions of the Protocol. To that goal, the construction and/or upgrading of WWTPs, is included as a priority to most countries' NAPs. In the frame of the NAPs, at least 108 Wastewater Treatment Plants (WWTPs) are proposed to be built along the Mediterranean coastline and many more plants is planned to be upgraded (more advanced treatment, increase of treatment capacity, updating of equipment and process, etc). It is expected that the implementation of the NAPs will lead to an important reduction of the pollution load from these sources. However, there are important differences in priorities between countries. European Union (EU) countries have already established extended sewerage networks and WWTPs (secondary treatment) according to the EU Directives, for most coastal cities with population above 100,000. Furthermore, many smaller coastal towns with population above 2,000 are already connected to such treatment units. Out of the 108+ proposed new WWTPs in all the Mediterranean, only 15 are located in EU countries, serving in most cases towns with relatively small population (< 100,000). Also, the financing of the proposed actions seems assured in these cases and it is expected that the EU countries will have no problem to satisfy the SAP targets in the sector of Urban Sewage for the year 2010. On the other hand, a very important part of urban effluents generated in the cities of North Africa, Eastern Mediterranean and East Adriatic coasts is not treated before being released to the sea or surface waters. A part of the coastal population of these areas is connected to primary treatment units but very few secondary treatment plants are in operation.

The financing of these infrastructures is already under consideration. As an example, the Mediterranean Hot Spot Investment Programme (MeHSIP) of the European Investment Bank, using as background information the NAPs project priority lists, has identified 25 potentially bankable projects for the management of urban effluents (out of 44 total projects in the programme), with a preliminary estimated investment of 1.6 billion Euros.

REFERENCES

UNEP/MAP/MEDPOL/WHO, 2004. Municipal wastewater treatment plants in Mediterranean cities (II). MAP Technical Report Series, 157, pp.81.

UNEP/MAP/MEDPOL, 2008. Municipal wastewater treatment plants in Mediterranean coastal cities: Inventory of treatment plants in cities of between 2,000 and 10,000 inhabitants. MAP Technical Reports Series, No. 169, www.unepmap.org.

