INTERNATIONAL LEGAL APPROACHES TO WASTE WATER DISCHARGES

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ABSTRACT

This paper is devoted to the study of the different legal approaches followed in International Law on waste water discharges. It begins analyzing the initial fragmentary legal approaches on waste water discharges, mainly in Antarctica and the Southern Ocean, some regional seas (specially the Mediterranean) and the particular case of discharges of sewage from ships. Nevertheless, the main part of this paper is devoted to the global approach on this subject initiated in 1995 and to its global, regional and national legal implementation.

THE INITIAL FRAGMENTARY LEGAL APPROACHES ON WASTE WATER DISCHARGES

The international legal approaches to waste water discharges are highly disappointing. There is no single international convention dealing with waste water as such. It seems that the management and treatment of waste water has not originated the environmental concern of the international community, who has preferred to leave this problem mainly for the exclusive regulation by the domestic law of each State. Hence, the result is that most States in the World has not an appropriate domestic legislation concerning the management and treatment of waste water and, in cases where this legislation does exist, the differences from one State to another are even bigger than the coincidences. This situation is highly critical, as every State in the World generate waste water and its management and treatment can very well be considered as a global concern, both for Human health and for the environment, mainly for the marine environment near coastal areas, calling for international norms.

Only one aspect related to waste water has received a very small, partial and fragmentary attention by International Law and this aspect concerns the discharges of waste water. However, discharges of waste water into the seas, rivers or lakes are only dealt with by International Law as far as they may have transboundary polluting effects, that is, when at least two States are involved. Therefore, in cases where discharges of waste water take place in internal seas, such as the Marmara Sea, or in lakes or rivers belonging exclusively to one State, no international norm applies. The obvious result of these premises is that we can only find enforceable international norms when discharges of waste water take place in the open oceans or in regional seas with at least two coastal States, and in international rivers and lakes, which are considered as international water courses. The only exception to this statement is the Antarctic Treaty system. Although the question of national sovereignties in Antarctica remains controversial and it is a problem not solved, but frozen, by the 1959 Antarctic Treaty, the environmental fragility of the Antarctic Continent and the Southern Ocean has determined the adoption of international particular strict environmental norms for this area, included the question of discharges of waste water on land or into the surrounding seas, with full independence of whatever transboundary polluting effect that they might have.

Discharges of waste water in Antarctica are regulated by the Protocol on Environmental Protection to the Antarctic Treaty (hereinafter quoted as PEPAT), adopted in Madrid on 3 October 1991. This Protocol and its Annexes applied provisionally since the date of its adoption and it finally entered into force on 14 January 1998. Annex III to PEPAT is entitled "Waste Disposal and Waste Management". The main objective of Annex III is that "the amount of wastes produced or disposed of in the Antarctic area shall be reduced as far as practicable so as to minimize impact on the Antarctic environment and to minimize interference with the natural values of Antarctica, with scientific research and with other uses of Antarctica which are consistent with the Antarctic Treaty" (Art. 1.2). Developing this objective, Annex III to PEPAT establishes a list of prohibited products to be

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introduced in Antarctica and provides for several procedures on waste removal and waste disposal in Antarctica and the Southern Ocean [1].

In order to implement the general obligation to remove waste from Antarctica, Art. 2 of Annex III to PEPAT lists the different kinds of waste to be removed, and it expressly mentions that liquid wastes, sewage and domestic liquid wastes have to be removed from Antarctica to the maximum extent practicable by the generator of such wastes. This provision causes some practical problems, due mainly to the remoteness of Antarctica from the rest of the world, as it is not possible to ensure regular voyages in order to remove waste from there. As it becomes necessary to wait for the arrival of resupply ships, Annex III to PEPAT does not establish any deadlines for carrying out this duty. However, as a caution, it establishes that all waste to be removed from the Antarctic area shall be stored in such a way as to prevent its dispersal into the environment.

As for the disposal of waste that is not going to be removed from the Antarctic area, Annex III to PEPAT only allows three procedures: waste disposal by incineration, on land and into the sea. In the three cases, the disposal of waste is not free at all, but it is subject to strict conditions and limits.

Regarding waste disposal by incineration, Annex III to PEPAT provides for that open burning shall be phased out "as soon as practicable, but by no later than the end of the 1998/1999 season". Therefore, nowadays incineration of waste is fully forbidden in the Antarctic area.

The second procedure that is allowed is waste disposal on land but, in fact, the possibilities of using this method are very low. There is an absolute prohibition, with no exception, on the disposal of all kind of waste in ice-free areas or in fresh water systems and it must be remembered that most scientific stations are located in these areas. For the rest of Antarctica, special protection is provided against waste disposal on land, as it is stated that: "Sewage, domestic liquid wastes and other liquid wastes not removed from the Antarctic Treaty area ... shall, to the maximum extent practicable, not be disposed of onto sea ice, ice shelves or the grounded ice-sheet ..." (Art. 4.-2 of Annex III to PEPAT).

Nevertheless, an exception to this provision is ruled when waste is generated by stations located inland on ice shelves or on the grounded ice-sheet. In these cases, waste may be disposed of in deep ice pits where such disposal is the only practicable option. The location of such pits on known ice-flow lines which terminate at ice-free areas or in areas of high ablation is forbidden. Noting the exceptional character of the provision allowing for the disposal of waste in deep ice pits, a different solution has been established for waste generated at field camps. In this case, waste shall, to the maximum extent practicable, be removed by the generator of such waste to supporting stations or ships for their disposal in accordance with Annex III to PEPAT.

The third and last allowed procedure is for the disposal of waste into the sea. Although this waste disposal procedure is not forbidden in Antarctic seas, it must be noted that Annex III to PEPAT has reduced the number of substances that previously were recommended for disposal of at sea and that some environmental criteria have also been established. In particular, Art. 5 of Annex III to PEPAT states the following: "1. Sewage and domestic liquid wastes may be discharged directly into the sea, taking into account the assimilative capacity of the receiving marine environment and provided that: (a) such discharge is located, wherever practicable, where conditions exist for initial dilution and rapid dispersal; and (b) large quantities of such wastes (generated in a station where the average weekly occupancy over the austral summer is approximately 30 individuals or more) shall be treated at least by maceration. 2.- The by-product of sewage treatment by the Rotary Biological Contactor process or similar processes may be disposed of into the sea provided that such disposal does not adversely affect the local environment, and provided also that any such disposal at sea shall be in accordance with Annex IV to the Protocol".

Waste disposal into the Southern Ocean has been considered to be inadequate for the Antarctic environment, In the opinion of ASOC, an environmental NGO: "Sewage and domestic liquid wastes are yet to be adequately addressed. The Annex continues to promote maceration as a sufficient means to handle sewage and domestic liquids. Maceration, however, does not address the actual content of the effluent, such as heavy metals, bacteria and viruses, chemicals and other contaminants. Heavy metal contamination also suggests that the effluent is not composed of only sewage and domestic wastes. ASOC strongly recommends at least biological treatment for sewage which is compatible to the Antarctic environment, coupled with measures to safeguard the effluent from

contamination. We also urge that the sludge from sewage treatment (e.g. the Rotary Biological Contactor process) be retrograded from Antarctica, and not dumped at sea" [2]. Nevertheless, the cross reference to Annex IV to PEPAT reduces the possibility of using this procedure. Article 14 of Annex IV establishes that with respect to those Parties which are also Parties to MARPOL 73/78 Convention, nothing in this Annex shall derogate from the specific rights and obligations thereunder. On 16 November 1990, an amendment to MARPOL 73/78 Convention was passed in which the Antarctic area was designated as an special area under Annexes I and V of MARPOL 73/78 Convention and severe environmental measures were adopted (Res. MEPC.42(30), 16 November 1990). Among them, this amendment establishes that "all wastes are to be removed from the Antarctic area due to the ecological importance of the fragile ecosystems of the area" and that "in respect of the Antarctic area, any discharge into the soil of oil or oily mixture from any ship shall be prohibited".

For the rest of the World and although most of waste water is originated on land and discharged either into the sea (open seas, regional seas) or in international water courses, there is no international treaty of world-wide scope of application dealing in detail with this environmental and sanitarian problem.

On the one hand, only for the hypothesis of waste water originated on land and discharged into the sea or in international water courses flowing into the sea, there are very general provisions on this topic in the 1982 United Nations Convention on the Law of the Sea. According to its Article 194, States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights. These measures shall include, inter alias, those designed to minimize to the fullest possible extent the release of toxic, harmful or noxious substances, specially those who are persistent, from land-based sources. However, until now these very broad and general provisions have not been implemented at global level and only in some regional seas (most notably, although not exclusively, the North-East Atlantic, the Baltic and the Mediterranean Seas) regional cooperation has resulted in the adoption of international norms dealing with marine pollution from land-based sources which cover the question of marine discharges of waste water.

If we take as an example the Mediterranean system, which is without any doubt the first and most developed regional system adopted under the framework of the United Nations Environment Program's (UNEP) Regional Seas Program, we find that the need to improve the legal protection of the marine environment from land-based sources and activities, responsible of more than 80% of the pollution existing in the Mediterranean Sea, was the main reason for adopting the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources (Athens, 17 May 1980). This Protocol is a binding international convention which entered into force on 17 June 1983. According to it, the Contracting Parties shall take all appropriate measures to prevent, abate, combat and control pollution of the Mediterranean Sea Area caused by discharges from rivers, coastal establishments or outfalls, or emanating from any other land-based sources within their territories (Art. 1). For reaching this aim, this Protocol distinguished between pollution from land-based sources caused by substances listed in its Annex I, which were mainly selected on the basis of their toxicity, persistence and bioaccumulation (known as the "black list" of substances), and pollution from land-based sources caused by substances or sources listed in its Annex II, which were mainly selected on the basis of criteria used for its Annex I, while taking into account the fact that they are generally less noxious or are more readily rendered harmless by natural processes and therefore generally affect more limited coastal areas (known as the "grey list" of substances). While pollution from land-based sources caused by substances listed in its Annex I ought to be fully eliminated (Art. 5), pollution from land-based sources caused by substances or sources listed in its Annex II had to be strictly limited (Art. 6), but without needing to be fully eliminated. In fact, discharges of this second kind of substances were allowed under the condition of getting a previous authorization granted by the competent national authority taking due account of the environmental standards provided for in its Annex III.

This legal action was accompanied by the political will of the Mediterranean States to make real progress on this topic. During the Fourth Ordinary Meeting of the Contracting Parties to the Barcelona Convention and its related Protocols (Genoa, 9-13 September 1985), the Mediterranean States and the European Commission

adopted the Genoa Declaration on the Second Mediterranean Decade. At the Genoa Declaration they committed themselves to the achievement of a number of environmental targets during the second decade of operation (1986-1995) of the Mediterranean Action Plan (MAP). These targets included the establishment as a matter of priority of sewage treatment plants in all cities around the Mediterranean with more than 100.000 inhabitants, and appropriate outfalls and/or appropriate treatment plants for all towns with more than 10.000 inhabitants. This political target has only been partially achieved, but the general situation has improved considerably in a number of Mediterranean areas through the establishment of new sewage treatment plants and the construction of submarine outfall structures, as a result of which a certain proportion of wastewater is no longer being discharged in the immediate coastal zones [3].

In order to implement the 1980 LBS Protocol and to accomplish the political target of the Genoa Declaration, the Mediterranean States, by the end of 1996, had adopted fifteen Mediterranean recommendations concerning common measures for the control of land-based sources of pollution. These common measures covered: environmental quality criteria for bathing waters, for mercury and for shellfish waters, as well as measures for control of pollution by mercury, used lubricants oils, cadmium and cadmium compounds, organotin compounds, organohalogen compounds, organophosphorus compounds, persistent synthetic materials, radioactive pollution, pathogenic micro-organisms, carcinogenic, teratogenic and mutagenic substances, zinc, copper and their compounds and by detergents [4].

As an additional measure for the further strengthening of the 1980 LBS Protocol, the long-term Program of Pollution Monitoring and Research in the Mediterranean Sea (MED POL Phase II) has been gradually refocusing on problems of direct relevance to the prevention and elimination of pollution from land-based activities and, for example, has identified 100 hot spots of this kind of pollution in the Mediterranean Sea area. As a result of this approach, in 1996 both the second survey on pollutants from land-based sources in the Mediterranean was finally carried out [5] and Guidelines for authorizations for the discharge of liquid wastes into the Mediterranean Sea were approved [6]. These Guidelines, prepared in collaboration with the World Health Organization (WHO), were designed primarily to provide national and local authorities with relevant information, both general and specific, on requirements and conditions attached to the issue of authorizations for the discharge of liquid wastes (both industrial and municipal) into the coastal marine environment in terms of national legislation enacted in conformity with the provisions of the 1980 LBS Protocol and in accordance with the common measures adopted for its implementation.

The main legal problem of the regional action followed in the Mediterranean from 1980 to 1996 was that both the 15 common measures adopted for the implementation of the 1980 LBS Protocol and the Guidelines for authorizations to discharge liquid wastes are international legal instruments of "soft law", that is, instruments that lack any binding or mandatory character as they only pretend to incentive State action pursuant with their contents, but without creating any legal obligation for them. This situation began to change after 1996. In 1995, during the twentieth anniversary of the MAP, a full revision of all the Mediterranean legal instruments took place in order to be updated in conformity with the new environmental trends that appeared after the 1992 United Nations Conference on Environment and Development [7].

As a result of this revision process, two events must be highlighted. First, the adoption of the Priority Fields of Activities for the Environment and Development in the Mediterranean Basin (1996-2005), which is the program of activities that has substituted the 1985 Genoa Declaration of the Second Mediterranean Decade. In this political program for the Third Decade of Mediterranean Environmental Cooperation, at least there are 12 priority objectives related to marine pollution resulting from land-based sources. These objectives, though they are very different in scope, are the following: (1) to promote appropriate treatment and reuse of waste water and saline water; (2) to encourage the installation of infrastructures for the treatment of urban sewage of 100 Mediterranean coastal cities corresponding to a pollutant load of approximately 10 million people; (3) to prepare and adopt national programs on the environmental management of urban wastes on the basis of methodology guidelines for a rational environmental management; (4) to encourage the installation of controlled discharges or treatment plants in coastal towns of over 100.000 inhabitants; (5) to encourage the installation of at least one secure depot and, where necessary, a treatment plant for hazardous wastes in each Mediterranean country; (6) to

stimulate actions for the control of marine and coastal litter, especially persistent synthetic materials; (7) to encourage the preparation of national and regional strategies in the Mediterranean based on controlled, appropriate and rational use of seeds, fertilizers and pesticides; (8) to identify the best available and environmental sound techniques and best environmental practices, prioritizing the aspects of availability, accessibility, cost and effectiveness; (9) to promote the development and application of programs for the transfer, adaptation of and expertise in appropriate technology, prioritizing clean and safe technologies and taking into account the additional costs involved; (10) to develop and implement programs to reduce polluting emissions and monitor industrial residues; (11) to assess, on the basis of agreed methodologies, the inputs of pollutants in the sea from water courses, the atmosphere and diffuse sources, and to evaluate in each country the major sources of marine pollution; and (12) to promote the reduction of the amount of pollution carried into the marine environment, particularly by strengthening capabilities for implementing the 15 specific common measures already adopted pursuant to the 1980 LBS Protocol.

Second, in order to reach those objectives, the 1980 LBS Protocol was fully amended the following year and the new Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities was adopted in Syracuse (Italy) on 8 March 1996 [8]. This new Protocol, which was drafted in conformity with the 1995 Global Program of Action for the Protection of the Marine Environment from Land-based Activities, is expected to enter into force by the end of 2002. Its new features are that it expands the Protocol area to cover the "hydrological basin" or the catchment area of the Mediterranean; that it gives priority attention to substances that are toxic, persistent and liable to bioaccumulate, including persistent organic pollutants (POPs); it establishes the mandatory application of the precautionary principle and the polluter pays-principle; the obligation to use the best available techniques (BAT) and the best environmental practices (BEP); and that, for the first time in the history of the MAP, the Regional and National Programs of action on land-based activities will contain not only binding and mandatory measures (international legal instruments of "hard law"), but also timetables for their implementation. Although the new LBS Protocol has not entered into force yet, its implementation has already begun. On 21 November 1997, the Mediterranean States adopted the Regional Strategic Action Program to Address Pollution from Land-Based Activities. This Program contains a full section on municipal sewage and its proposed targets are: (a) by the year 2005, to dispose all municipal wastewater (sewage) in conformity with the provisions of the new LBS Protocol; and (b) by the year 2005, to dispose sewage from cities and urban agglomerations exceeding 100.000 inhabitants and areas of concern in conformity with the provisions of the new Protocol. It also describes the regional and national mandatory measures and activities to be carried out before the year 2005 [9]. Hence, in the Mediterranean there is a legal trend to substitute the former international measures of "soft law" on marine discharges of waste water with new international measures of "hard law".

On the other hand, and although with a lesser intensity, waste water is also sometimes originated at sea and discharged into the seas. This second hypothesis takes place in two different cases. First, with sewage resulting from the operation of ships. Second, with produced water originated from oil exploration and exploitation activities carried out in offshore installations. For sewage resulting from the operation of ships, the International Convention for the Prevention of Pollution from Ships (London, 2 November 1973), as modified by the Protocol Relating to the International Convention for the Prevention of Pollution from Ships (London, 17 February 1978), known as MARPOL 73/78 Convention, and updated by subsequent amendments adopted through the years, is the main international convention facing prevention of pollution of the marine environment by ships from operational and accidental causes, covering pollution by oil, chemicals, harmful substances in packaged form, sewage and garbage. It is worth mention that its Annex IV is entitled "Prevention of Pollution by Sewage from Ships" and it provides for a very detailed set of international norms on sewage discharges into the seas. According to this Annex IV, "sewage" from ships means: (a) drainage and other wastes from any form of toilets urinals, and WC scuppers; (b) drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises; (c) drainage from spaces containing living animals; or (d) other waste waters when mixed with the drainages defined in the other indents (Regulation 1). This Annex provides for two general exceptions for discharging sewage from ships: (a) when it is necessary for the purpose of

securing the safety of a ship and those ou board or saving life at sea; or (b) when it results from damage to a ship or its equipment if all reasonable precautions have been taken before and after the occurrence of the damage, for the purpose of preventing or minimizing the discharge. Leaving aside these tow general exceptions, the general rule is that discharges of sewage into the sea is prohibited. However, this general rule has the following three special exceptions:

(a) when the ship is discharging comminuted and disinfected sewage using a sewage treatment plant equipped on board that meets the operational requirements based on standards and the test methods developed by the International Maritime Organization (IMO), at a distance of more than four nautical miles from the nearest land, or sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land, provided that in any case, the sewage that has been stored in holding tanks shall not be discharged instantaneously but at a moderate rate when the ship is *en route* and proceeding at not less than 4 knots; thc rate of discharge shall be approved by the flag State based upon standards developed by IMO; or

(b) when the ship has in operation an approved sewage treatment plant which has been certified by the flag State to meet the same operational requirements as described in the above indent, and

(i) the test results of the plant are laid down in the ship's International Sewage Pollution Prevention Certificate (1973);

(ii) additionally, the effluent shall not produce visible floating solids in, nor cause the discoloration of the surrounding water; or

(c) when the ship is situated in the waters under the jurisdiction of a State and is discharging sewage in accordance with such less stringent requirements as may be imposed by the domestic legislation of such State.

In cases when the sewage is mixed with wastes or waste water having different discharge requirements, as a guarantee the MARPOL 73/78 Convention provides that the more stringent requirements shall then apply (Regulation 8). This set of provisions is complemented with the undertaking of every Contracting Party to MARPOL 73/78 Convention to ensure the provision of facilities at ports and terminals for the reception of sewage, without causing undue delay to ships, adequate to meet the needs of the ships using them (Regulation 10).

In this case, discharges of sewage from ships into the seas are regulated by an international convention, that is, by an international legal instrument of "hard law" which is binding and mandatory for its Contracting Parties. Therefore, in deep contrast with the legal situation of marine discharges of waste water originated on land, the international community in 1973 was able to agree on a set of international norms of world-wide scope of application for marine discharges of sewage resulting from ships. But neither in this case the legal situation is as optimistic as it may seem at first glance. The entry into force of Annex IV to MARPOL 763/78 Convention will take place 12 months after being ratified by 15 States whose combined fleets of merchant shipping constitute at least 50% of the world fleet. The current situation is that this Annex has been accepted by 75 States whose fleets represent only 43.11 percent of world tonnage. Therefore, thirty years after the adoption of Annex IV to MARPOL 73/78 Convention, this Annex has not entered into force yet.

In the second case, the legal situation is even worse. For produced water resulting from offshore oil activities, there is no international norm of world-wide scope of application, neither of "hard law" (i.e. international conventions) nor of "soft law" (such as recommendations, declarations of principles, action plans, ...) dealing with this source of marine pollution. As far as no international norm limits the sovereign power of States to discharge produced water from offshore oil installations into the seas, this is an activity that remains free, without any legal restriction on it. At regional level, the legal situation is not much better. There is no regional convention providing for a detailed regulation for marine discharges of produced water into the seas. Only in one marine region, the North-East Atlantic, a Recommendation, that is, a "soft law" instrument which is neither binding nor mandatory for Contracting Parties, has very recently been passed [10].

GLOBAL APPROACHES: MUNICIPAL WASTEWATER

It must be pointed out that, at global level, some political and legal efforts are being carried out on this topic. It must be recalled that 108 States and the European Commission participated in the Intergovernmental

Conference to Adopt a Global Program of Action for the Protection of the Marine Environment from Land-based Activities that was held in Washington, DC, from 23 October to 3 November 1995. This Intergovernmental Conference adopted on 3 November 1995 both the Washington Declaration on the Protection of the Marine Environment from Land-based Activities and the Global Program of Action for the Protection of the Marine Environment from Land-based Activities (hereinafter quoted as GPA) [11].

On the one hand, in the Washington Declaration the representatives of the participating Governments and the European Commission declared their commitment to protect and preserve the marine environment from the impact of land-based activities by, among other things:

(a) setting as their common goal sustained and effective action to deal with all land-based impacts upon the marine environment, specifically those resulting from sewage, persistent organic pollutants, radioactive substances, heavy metals, oils (hydrocarbons), nutrients, sediment mobilization, litter, and physical alteration and destruction of habitat (point 1);

(b) giving priority to the treatment and management of waste water and industrial effluents, as part of the overall management of water resources, especially through the installation of environmentally and economically appropriate sewage systems, including studying mechanisms to channel additional resources for this purpose expeditiously to States in need of assistance (point 15); and

(c) requesting the Executive Director of UNEP, in close partnership with WHO, the United Nations Centre for Humans Settlements (UNCHS Habitat), the United Nations Development Program (UNDP) and other relevant organizations, to prepare proposals for a plan to address the global nature of the problem of inadequate management and treatment of waste water and its consequences for human health and the environment, and to promote the transfer of appropriate and affordable technology drawn from the best available techniques (point 16).

On the other hand, the GPA aims at preventing the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment. It was designed to assist States in taking actions individually or jointly within their respective policies, priorities and resources, which will lead to the prevention, reduction, control and/or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities. The GPA, therefore, was designed to be a source of conceptual and practical guidance to be drawn upon by national and/or regional authorities in devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land-based activities. Achievement of the aims of the GPA will contribute to maintaining and, where appropriate, restoring the productive capacity and biodiversity of the marine environment, ensuring the protection of human health, as well as promoting the conservation and sustainable use of marine living resources.

Chapter Five of the GPA was entitled "Recommended Approaches by Sources". This Chapter provided guidance as to the actions that States should consider at national, regional and global levels, in accordance with their national capacities, priorities and available resources, and with the cooperation of the United Nations and other relevant organizations, as appropriate. In the light of the differences between regions and States and their national priorities, each State and each regional grouping should develop its own program of action. This may or may not be a separate document but it should include specific targets and a clear timetable showing the dates by which the State or States involved commit themselves at a political level to achieve these targets. In addition, it also recognized that action will be needed on certain matters at the global level, either to address global effects or to facilitate action at the national or regional levels. Specific targets for these matters were set out in this Chapter Five.

Section A of Chapter Five of the GPA was devoted to sewage. This Section began by declaring that environmental effects associated with domestic waste-water discharges are generally local with transboundary implications in certain geographic areas (effects such as: (a) pathogens that may result in human health problems through exposure via bathing waters or through contaminated shellfish; (b) suspended solids; (c) significant nutrient inputs; (d) biochemical oxygen demand; (e) cultural issues such as taboos in some areas; (f) plastics and other marine debris; (g) ecosystem population effects; and (h) heavy metals and other toxic

substances, e.g. hydrocarbons, in those cases where industrial sources may have discharged effluent to municipal collection systems). The commonality of sewage-related problems throughout coastal areas of the world is significant. Consequently, the GPA considered domestic wastewater discharges as "one of the most significant threats to coastal environments worldwide".

However it is curious enough to note that no new objective or target on sewage was introduced by the GPA. In fact, it limited itself to reiterate the objectives and targets on sewage established by paragraph 21.29 of Agenda 21, which was adopted at the 1992 United Nations Conference on Environment and Development. Pursuant to it, Governments, according to their capacities and available resources and with the cooperation of the United Nations and other relevant organizations, as appropriate, should:

(a) By the year 2000, establish waste treatment and disposal quality criteria, objectives and standards based on the nature and assimilative capacity of the receiving environment;

(b) By the year 2000, establish sufficient capacity to undertake waste-related pollution impact monitoring and conduct regular surveillance, including epidemiological surveillance, where appropriate;

(c) By the year 1995, in industrialized States, and by the year 2005, in developing States, ensure that at least 50 per cent of all sewage, waste waters and solid wastes are treated or disposed of in conformity with national or international environmental and health quality guidelines;

(d) By the year 2025, dispose of all sewage, waste waters and solid wastes in conformity with national or international environmental quality guidelines.

Those were, in fact, very ambitious objectives and targets, difficult to comply with them. In order to reach these objectives and targets, the GPA scheduled different activities to be carry out at national, regional and international levels.

First, the actions, policies and measures that should be adopted by States according to their national capacities included:

(a) Identification of major sewage sources and areas where sewage poses major environmental and health-related hazards;

(b) Development of national programs of action for the installation of appropriate and environmentally sound sewage facilities, and to this end ensure:

(i) Incorporation of sewage concerns when formulating or reviewing coastal-development and land-use plans, including human-settlements plans;

(ii) Building and maintenance of sewer systems and sewage-treatment facilities or other appropriate systems, in accordance with national policies and capacities and international cooperation available;

(iii) Location of coastal outfalls so as to obtain or maintain agreed environmental quality criteria and to avoid exposing shell fisheries, water intakes, and bathing areas to pathogens and to avoid the exposure of sensitive environments (such as lagoons, coral reefs, sea grass beds, mangroves, etc.) to excess nutrient loads;

(iv) Promotion of the reuse of treated effluents for the conservation of water resources. To this end, infrastructure measures, treatment at source and segregation of industrial effluents, shall be encouraged, as well as:

a) Encouragement of the beneficial reuses of sewage effluents and sludges by the appropriate design of treatment plants and processes and controls of the quality of influent waste waters;

b) Ensuring the environmentally sound treatment when domestic and compatible industrial effluents are treated together;

(v) Promotion of primary, secondary and, where appropriate and feasible, tertiary treatment of municipal sewage discharged to rivers, estuaries and the sea;

(vi) Reduction and beneficial use of sewage or other solutions appropriate to specific sites such as no-water and low-water solutions;

(vii) Establishment and improvement of local and national regulatory and monitoring programs to control and assess effluent discharge, using minimum sewage effluent guidelines and water quality criteria and giving due consideration to the characteristics of receiving bodies and the volume and type of pollutants;

(viii) Identification of the availability and sustainability of productive uses of sewage sludge, such

as land-spreading, composting, etc.;

(ix) Establishment of research programs to identify, validate and develop waste-water treatment technologies;

(c) Provision of sufficient training and education for local administrations to plan, build and run adequate sewage treatment facilities;

(d) Formulation and implementation of awareness campaigns for the general public to gain general recognition for the need for the installation of appropriate and environmentally sound sewage facilities (para. 97).

Second, at the regional level, the regional actions that should be adopted were much more briefly and broadly described, as they were limited to:

(a) Promotion and implementation of regional cooperation for the establishment and implementation of programs and priority measures for sewage, particularly in case of transboundary effects; and

(b) Development of regional programs for sharing and exchanging technical information and advice regarding environmentally sound sewage treatment and facilities (para. 98).

Third and last, the international actions that should be adopted included:

(a) Participation in a clearing-house on environmentally sound sewage technology and practices;

(b) Facilitation of transfer of environmentally sound sewage technology;

(c) Scientific, technical and financial cooperation with States in need of assistance, in developing, installing, operating and monitoring appropriate and environmentally sound sewage facilities (para 99).

These last statements were complemented by Section D of Chapter Four, which was devoted to International Cooperation concerning waste water and persistent organic pollutants. On waste water, States agreed that planning for pollution prevention, including cleaner-production approaches and best-practice urban design, and the treatment and management of urban waste water, including urban storm-water and separation of industrial effluent, were priorities in the fulfillment of the objectives of this GPA and of Agenda 21, especially its Chapters 17 and 18. Mechanisms should be studied to expeditiously channel additional resources for this purpose to States in need of assistance. Moreover, the Executive Director of UNEP, in close partnership with WHO, UNDP, UNCHS (Habitat) and other relevant organizations, was called upon to prepare a proposal setting forth a specific plan for addressing the global nature of the problems related to the inadequate management and treatment of waste water. This should take account of work already in progress in WHO and other competent international organizations, including the Noordwijk Action Program. This plan will enable the issue to be addressed in an expeditious and efficient manner in the follow-up to the GPA at the international level.

THE GLOBAL IMPLEMENTATION OF THE GPA PROVISIONS ON MUNICIPAL WASTE WATER

Immediately after the adoption of the GPA, its implementation began. In order to keep under control the process of its implementation, in its decision 20/19 B of 5 February 1999, the Governing Council of UNEP decided to undertake the first intergovernmental review of the status of implementation of the GPA in 2001. Subsequently, the Governing Council of UNEP, in its decision 21/10 of February 2001, requested the Executive Director to organize the intergovernmental review meeting in November 2001. In pursuance of this decision, representatives from 98 States, including Ministers and other high-level officials, with the contribution of numerous United Nations bodies, intergovernmental organizations and non-governmental organizations, convened in Montreal, Canada, from 26 to 30 November 2001, not only to review the implementation of the 1995 GPA, but also to chart the way forward, as this Meeting even endorsed the GPA Coordination Office's 2002-2006 program of work with indicative costs. Much of the ideas summarized in this Section have been obtained from the working documents of this Meeting, and also from its final Report [12].

This Meeting concluded by noting steady, albeit slow, progress in the implementation of the GPA at global, regional and national levels. In general, the main conclusions that can be obtained from State practice during the years 1995-2001 can be summarized as follows:

(a) The GPA has gained considerable impetus over the last five years, particularly since the establishment and full staffing of the GPA Coordination Office in The Hague. Progress has been achieved to

varying degrees in the various areas. If we were to make a fair assessment of the progress achieved, we should note that implementing the GPA is an iterativc process in which each stcp builds upon the one before and in which the guidance provided by the GPA is continuously revisited and refined, leading to incremental action to protect coastal and marine environments from land-based sources of pollution and resource degradation.

(b) In the implementation of the GPA, particular progress has been achieved in identifying problems and the action required to address them at both the national and regional levels, and in furthering the objectives of regional cooperation. These objectives includes the identification and assessment of problems; establishment of priorities for action; identification of management approaches; and identification of strategies to mitigate and remedy adverse impacts of land-based activities. Also, considerable progress has been achieved in developing legally binding agreements on land-based activities at the regional level in two regions.

(c) There has been somewhat less progress in mobilizing financial resources, and in capacity-building at the national level. Progress was weaker yet in the areas of mobilizing activities, exchanging experience and expertise at the national and regional levels, and in developing the necessary institutional arrangements, particularly arrangements for coordination between sectors and sectorial institutions at the national level.

(d) In ranking the priorities assigned to the various GPA marine pollution source categories, it is obvious that most States have given top priority to the source category "sewage", followed by "nutrients," "oils", "heavy metals" and "litter" in that order. This is in accordance with the priorities identified in regional workshops of Government-designated experts held between 1996 and 2000 under the auspices of the Coordination Office and within the context of the UNEP Regional Seas Program. States have provided little information about achievements in the area of physical alterations to and destruction of habitats, though this source category was singled out for priority action at the regional workshops.

(e) Many of the challenges which the GPA has met since its inception have been faced by almost all Governments that provided information on barriers to effective implementation. Such barriers include limited public and political awareness of the degradation of the marine environment attributable to land-based activities; a lack of appropriate legislation and enforcement mechanisms; inadequate capacity at all levels of government; and a lack of financial resources.

(f) All States developed new instruments for environmental protection. These varied from general environmental legislation to specific regulations controlling discharges and introducing environmental taxes, environmental quality criteria and emission standards. An increase in the use of environmental impact assessments and in reliance on coastal management practices is also evident in State practice. Practically all land-based activities are targeted to varying degrees by these new instruments. Among the most targeted sectors of land-based activities are "chemical industry" and "water management", followed by "urban development" and "agriculture". However, very little information has been provided as to the effectiveness and the efficiency with which land-based activities were addressed by those various instruments.

(g) A number of experiences in the area of municipal wastewater management showed that public-private partnerships and voluntary agreements involving the private sector can improve the quality of sanitation services while protecting the coastal and marine environment from pollution from domestic and urban wastewater discharges. Public-private partnerships also proved to be useful, in some cases, in effectively mobilizing new and additional resources and in advancing government action in the field of policy formulation, including regulation and legislation and the setting of goals and targets.

(h) Funding for projects in all areas pertaining to the GPA remains the main barrier to implementing it. Very little progress was reported on new and additional funding or on the use of innovative or non-conventional ways and means to fund implementation at the national and regional levels. Financial arrangements with international financing institutions for protecting the marine environment from land-based activities have been used effectively in a number of cases to enhance Governments' efforts in implementing the GPA at the national and regional levels. However, support for the GPA has not been mainstreamed in the program of work in the World Bank port folio, nor has it been made an explicit part of the funding requirements: the objectives and approaches of the GPA have not been taken into consideration in the allocation of funds. This may be indicative of a lack of mainstreaming of the objectives of the GPA in the work programs of other financial institutions

also.

(i) The legal and policy barriers for the implementation of the GAP are attributable mainly to the relatively low priority given by some States to environmental conventions, treaties or framework agreements: Governments are either not convinced of the need for legally binding instruments to address land-based activities, or their commitment to tackling pollution from those activities is more or less inadequate. In some other States, even where environmental legislation and regulations exist a major barrier is poor or absent enforcement, which makes them largely ineffective. In some cases, the legislation on land-based activities was either too general or too outdated to address specific or current problems from those activities [13].

But if we focus our attention in problems related to municipal wastewater management and treatment, then the situation is a little better, due mainly to the incentive role played by the GAP Coordination Office. Among the work carried out by this Office until now, two global legal instruments of "soft law" deserve a special mention: the GPA's Strategic Action Plan on Municipal Wastewater and the Guidance on Municipal Wastewater.

In response to the priority for action on sewage identified by the GPA, the GPA's Coordination Office, in cooperation with WHO, UNCHS (Habitat) and the Water Supply and Sanitation Collaborative Council (WSSCC) developed the GPA's Strategic Action Plan on Municipal Wastewater [14]. The Strategic Action Plan on Municipal Wastewater was prepared to further develop the guidance given on sewage in the GPA, and to promote concrete action at the local and national levels aimed at addressing sewage as one of the major source categories impacting the coastal and marine environment, particularly by: promoting the use of alternative solutions, including low cost technologies, appropriate financial mechanisms and partnerships; and creating an enabling environment for action. The Strategic Action Plan on Municipal Wastewater aims to accomplish this by:

(a) Promoting global consensus on best practices and procedures to address municipal wastewater, thus setting the standard in the approach to municipal wastewater management (the normative component);

(b) Distributing up-to-date knowledge on best practices and procedures and promoting their replication (the demonstration component);

(c) Supporting the efforts of municipalities and States to address the serious public health problems, economic losses and the degradation of coastal ecosystems that result from the disposal in coastal areas of inadequately treated municipal wastewater (the capacity-building component).

Limiting ourselves to the normative component of the Strategic Action Plan, we must underline that it comprises the development of a globally accepted Guide for local and national decision-makers and professionals and describes steps to take to assign a high priority for action to the handling, treatment and management of municipal wastewater and how to make solutions financially affordable by describing sustainable systems for water management. The Guide on Municipal Wastewater supports the implementation of international conventions and protocols adopted under the UNEP Regional Seas Program for dealing with municipal wastewater and it seeks to distribute up-to-date knowledge on best practices and procedures and promote their replication. The envisaged Guide on Municipal Wastewater is made up of three parts, each having its interlinked process for development and adoption: key principles, annotated checklists on recommended practices and procedures, and regional annexes. The key principles and the annotated checklists on recommended practices and procedures in addressing the demand for wastewater handling, treatment and management are meant to manage wastewater sustainably by conserving water resources, eliminating pollution at the source, using water efficiently, maintaining acceptable water quality for various uses and functions, and to respond effectively to demands from society. The Guide on Municipal Wastewater is backed by a Global Knowledge Base.

First, the key principles highlight approaches in wastewater management, which are recommended to be adopted and where global consensus is needed to set the standard in the approach to municipal wastewater management. The key principles in addressing municipal wastewater that have been identified until now are the following:

(a) Political will and financial affordability are prerequisites for adequate wastewater management;

(b) Environment, health and economy are important indicators for action;

(c) Stepwise implementation of measures is essential to reach long term management goals;

(d) Demand-driven analyses and prognoses are to be adopted to ensure effective investments;

(e) National and local governments are to take their responsibility in creating and enabling environment for sustainable solutions;

(f) Commitment and involvement of all stakeholders are to be assured from the start;

(g) "Water User Pays" and "Polluter Pays" are basic principles to consider;

(h) Public Private Partnerships and other new financial mechanisms are to be explored;

(i) Linking municipal wastewater management systems to other sectors, for example water supply or tourism, ensures better opportunities for adequate cost-recovery. Rates are to be established solidarity-wise and at social equity;

(j) Sustainable solutions for wastewater management build upon pollution prevention at the source, efficient water use and best available technologies, addressing economic aspects and low-costs alternatives when appropriate; and

(k) Innovative alternatives and integrated solutions are to be fully explored before final decisions on action are taken.

Second, the annotated checklists detail different approaches, infrastructures and tools available to practitioners and decision makers. The checklists address, among others:

(a) Integrated and stepwise approaches, including supply and demand driven approaches, consideration of environmental requirements and social and economic needs of the population, combined water supply and sewage handling, catchments based on planning, storm water and sludge;

(b) Enabling environment and sustainability, including regulations, legislation, operation and maintenance, responsibilities and accountability, enacting emission limits, standards, quality control, surveillances and enforcement, wastewater management criteria and evaluation;

(c) Institutional arrangements, including the structure of the administrative system, public participation and information, stakeholder involvement, role of private and non-profit sectors, voluntary initiatives;

(d) Appropriate financial mechanisms, including domestic resource mobilization, international resource mobilization to supplement the domestic resources, public-private partnerships and other new and additional financial instruments, cost recovery, water service user and water polluter-pays principles; and

(e) Innovative technologies, including cleaner production and best practices to minimize wastewater production at the source, on-site treatment, wastewater collection infrastructure, low cost treatment techniques including natural self-purification capacity and natural attenuation, ecological engineering, lagoons, options for re-use and waste valorization, dry sanitation.

Third, the regional annexes provide a subset of the annotated checklists, selected by the regions as being of particular relevance to their areas. They translate and complement the global guideline, addressing the specific priorities and needs of particular regions. The regional annexes which currently are in progress are those related with the following regions: Wider Caribbean, Eastern Africa, Latin America, East Asia and the North-West Pacific, the South Pacific and Western Asia. These are the results of the Consultative Meetings held during 2001 by the GPA Coordination Office with six UNEP Regional Seas Programs [15]. Two other regional meetings are scheduled for Western Africa and the Black Sea area.

Finally, the Global Knowledge Base details the information contained in the Guide on Municipal Wastewater management. The Global Knowledge Base comprises technical information and review of existing experiences. It must be noted that existing knowledge and a number of source documents and databases in the field of wastewater management were reviewed and evaluated by the GPA Coordination Office together with the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE, The Netherlands), which became the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Water Education in November 2001. As a consequence of this work [16], the Global Knowledge Base emerged. It is linked directly to the Sanitation Connection database www.sanicon.net and other relevant sources of information. Sanicon is in partnership with the GPA Coordination Office, WHO, the International Water

Association (IWA), the World Bank/Water and Sanitation Program for South Asia (WSP) and WSSCC. It provides a range of services, including information on policies, legal and regulatory frameworks, institutions, finance and economics, social and health aspects and technical issues; and an interactive help desk.

The Global Knowledge Base is accessible through the GPA clearing-house mechanism and is regularly updated [17]. The key principles and annotated checklists are distilled from the Global Knowledge Base, and further developed through expert meetings and regional consultations. The regional annexes are the results of consultations with national and local experts, private sector, international financial institutions, potential donors, non-governmental organizations and other stakeholders, within the appropriate regional context.

As a consequence of these review processes, the Guide on Municipal Wastewater evolves continuously [18]. Following the guidance of the Intergovernmental Review Meeting, and further to consultations with regional and national partners, the final revised version of the Guide will be submitted to the UNEP Governing Council at its twenty-first session for endorsement.

To sum up, during the period 2000-2001, the implementation of the GPA's Strategic Action Plan on Municipal Wastewater has involved the preparation of draft guidance documents, the development of a Global Knowledge Base and the holding of six regional workshops. Activities during the period 2002-2006 are scheduled to include production of a globally agreed guidance document, the effective sharing of experience and expertise and, most importantly, capacity-building [19].

THE REGIONAL AND NATIONAL IMPLEMENTATION OF THE GPA PROVISIONS ON MUNICIPAL WASTE WATER

These global instruments of "soft law" have exerted from 1995 onwards a strong legal influence on State practice, both at regional (the 17 Regional Seas regions) and national levels. Hence, some progress has been achieved at these levels in applying both binding and non-binding agreements in order to implement the GPA, specially its provisions on municipal wastewater management [20].

First, binding agreements ("hard law") at the national and regional levels. The development and adoption of legally binding agreements at both the regional (regional conventions and protocols) and the national levels (national legislation, administrative rules and standards and so on) are important elements in the process of environmental protection. Binding agreements reflect the commitment of Governments to adopting policies and taking the necessary steps to address the issue of land-based activities, and increase the likelihood of enforcement and compliance.

At the national level, it must be highlighted that almost all States that attended the Intergovernmental Review Meeting on the Implementation of the GPA have provided details on one or more legally binding agreements at the national level, such as national legislation or regulations, or standards used as management tools. These instruments deal with land-based activities and control emissions or effluents that impact the marine environment and associated water bodies in a particular State. Some States have also passed Coastal Area Management legislation to control future or ongoing development activities in coastal areas and to ensure the sustainable and wise use of coastal areas and resources.

At the regional level, an important achievement in connection with the GPA was the successful development and negotiation of three legally binding agreements. The first of these, the revised Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources and Activities to the Barcelona Convention for the Protection of the Mediterranean Sea, was adopted in 1996. The second, the Protocol Concerning Pollution from Land-based Sources and Activities to the Cartagena Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region, was adopted in 1999. The third, the draft Convention for the Protection and Sustainable Management of the Marine and Coastal Environment of the Northeast Pacific, was endorsed by high-level, Government-designated experts in August 2001 and is expected to be adopted at a Conference of Plenipotentiaries in early 2002.

Seven Regional Seas are now covered by legally binding protocols or detailed regional legal regimes on land-based sources or activities: Wider Caribbean, Mediterranean, South East Asia Pacific, Black Sea, Kuwait, North East Atlantic and Baltic.

The Stockholm Convention on Persistent Organic Pollutants (POPs), adopted by the Conference of Plenipotentiaries in May 2001, is a positive development for the GPA. The POPs Convention directly addresses one of the nine source categories by seeking to prevent the adverse effects of the various POPs at all stages of their life cycle. Similarly, the 1998 Rotterdam Convention on Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in International Trade is an important step towards implementing the actions at the global level recommended in Chapter IV of the GPA. Although these two Conventions are not directly related to municipal wastewater, they are however relevant, as some of the most toxic, persistent and bioaccumulative pollutants are not going to be produced any more and, therefore, will not be discharged into the marine environment through wastewater.

Second, non-binding agreements at the national and regional levels. The introduction of non-binding agreements at the national level (such as national strategies or national programs of action) or at the regional level (for example, through marine regional programs of action) is as important as binding agreements for promoting regulatory policies and protective measures, including those taken by local Governments and communities, and for enhancing the capacity to carry out such policies and sustain such measures.

Since the adoption of the GPA in 1995, UNEP and its GPA Coordination Office, in association with other partners, have been supporting or initiating regional efforts to implement the GPA at the regional level. In the beginning those support activities consisted in convening and following-up a series of regional workshops of Government-designated experts and in preparing regional programs of action, in the form of non-binding agreements, to address land-based activities. Varying degrees of progress have been achieved through these regional efforts [21].

The GPA requests States, in accordance with their policies, priorities and resources, to develop or review national programs of action within a few years. To date, at least 13 States (including Sates in Africa, Asia, North America, South America, and West Asia) have developed or are in the course of developing national programs of action. The available information shows that additional cross-sectorial and intersectorial action in the coming years will be needed to fulfill the objectives of Chapter II of the GPA, which require action at the national level.

At the regional level, regional programs of action are important implementation tools, supporting States' compliance with and fulfillment of their obligations under regional agreements or protocols on land-based activities. Although some progress have already taken place [22], further support action will be required to facilitate the preparation of regional programs of action in regions that wish to establish and adopt them.

A third level of implementation of the GPA provisions on municipal wastewater management consists in the adoption of voluntary agreements and the involvement of the private sector. Voluntary action may take the form of commitments by individual companies or groups of private entities, particularly in the industrial sector. Examples include codes of conduct adopted unilaterally at the national or international level, agreements between stakeholders on environmental performance targets and the establishment of effective self-regulatory mechanisms. Voluntary initiatives of this kind support existing regulatory measures and environmental policy instruments, they do not replace them. Voluntary initiatives by the private sector have proven effective in facilitating the implementation of environmental policies and management practices.

Several national and regional reports submitted to the GPA Coordination Office showed that noteworthy progress had been achieved. In the East Asian Seas Region, the role of the private sector in the area of municipal wastewater treatment has been growing, with some indications of success. Several States have chosen to transfer the provision of sanitation services to private operators. For Governments, this is an alternative to a State-managed system and a response to the problems of meeting urgent needs and keeping up with the rapid pace of urban, industrial and commercial development. In many East Asian States, private enterprises are obliged to build facilities to treat effluent to a required standard before discharging it into public sewers. Industries with similar needs are encouraged to build common facilities for wastewater treatment. The State is required to monitor the performance of these enterprises.

Similarly, in the South Asian Seas Region, a new partnership, the Public-Private Infrastructure Advisory Facility, has attracted wide support from the public, and also financial support from the Asian Development Bank. It is one of the largest regional initiatives for promoting public-private partnerships.

Within the context of MAP, the Mediterranean Commission on Sustainable Development has set up a working group on industry in an effort to develop a dialogue with key industrial associations in the region. The aim is to encourage industries in the Mediterranean States to adopt pollution prevention and eco-efficiency approaches and to circulate information to their members in support of the Mediterranean Strategic Action Program to Address Pollution from Land-Based Activities.

In the Arctic Region, following the development and adoption of the Russian National Program of Action for the Arctic, good prospects exist for private sector/business involvement through a Partnership Conference. The implementation of this National Program of Action is being supported by the Arctic council's program for the Protection of the Arctic Marine Environment (PAME) and the Advisory Committee on Protection of the Seas (ACOPS) through the provision of technical, scientific and financial assistance. The Global Environment Facility (GEF) is financing the first phase of implementation and partnership-building.

At the national level, a project in Sri Lanka for the relocation and modernization of tanneries is a unique socio-economic partnership with the private sector promoted by Government (Ministry of Industries). The Government, the private sector and the donor community are jointly funding the project. Amongst the results of the project will be the construction of treatment facilities in the form of a common effluent plant that meets all discharge standards; the re-use of the treated effluent; and the establishment of a safe landfill for the solid waste.

Several projects to implement the GPA at the regional level have been reviewed and the lessons to be learned have been distilled, particularly with regard to political structure or form of convention; the methodological approaches required, such as strategic action planning, setting regional emission standards, and identifying hot-spots; and the need for stakeholder involvement. In addition, these regional projects were assessed on how well they instigated effective national action to address land-based activities [23].

Finally, it should be noted that building national and regional capacities is crucial to the successful, effective implementation of the GPA. Several examples of useful and promising initiatives in this area have taken place from 1995 onwards. To mention only one example, it must be noted that the capacity-building initiatives at regional level undertaken in the interests of the Strategic Action Program of the MAP are exemplary, providing for regional "Training of Trainers" activities in the area of technical information and advice on the environmentally sound operation of sewage treatment facilities. In these training sessions, modern training techniques were employed and a training package was given to the trainees at the end of each session. The experience gained from the first series of sessions will be used in a second regional training course for practitioners from Mediterranean States. Also, a number of national training courses for operators of sewage treatment plants are planned for 2001-2003. These national training courses are to be given by staff trained at the regional courses.

Activities using the same "training of trainers" approach are planned in the areas of best environmental practices and clean production techniques for priority target industries in the Mediterranean region. Through the Clean Production Regional Activity Centre, based in Barcelona, Spain, the MAP is currently assisting businesses in applying cleaner production techniques, with priority to pollution prevention at source and the minimization of waste flows.

Through the MAP, UNEP is also pursuing an innovative initiative to build regional capacities in the area of compliance with and enforcement of legislation for the control of land-based pollution. This is being undertaken in cooperation with WHO and the International Network for Environmental Compliance and Enforcement with the aim of establishing an informal regional network for exchanging information on regional environmental protection and on networks of professionals involved in compliance issues.

FINAL CONSIDERATIONS

During many years International Law has paid no attention to the environmental problem of waste water management and treatment. Only one aspect related to waste water, that is, marine discharges of waste water, received initially a very fragmentary regulation in International Law during the period from 1970 to 1995.

The celebration of the Intergovernmental Conference to Adopt a Global Program of Action for the Protection of the Marine Environment from Land-based Activities in Washington, DC, from 23 October to 3 November

1995, marked a major turning point on this subject. The adoption at this Conference of the Global Program of Action for the Protection of the Marine Environment from Land-based Activities represented the beginning of a new era of global, regional and national collaboration all over the world to deal with all aspects implying waste water. As a consequence, new and numerous legal tools at all levels are emerging all over the world. During the next years, the phenomenon of new legal tools on waste water is expected to further increase and develop. But its implementation in practice, the building of national and local capacities and the training of specialized experts on waste water in all countries calls for additional funding. Maybe the next Earth Summit to be held in Johannesburg on September 2002 will be the appropriate international forum to allocate new additional funds for this healthy and environmental problem.

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[7] See BOU FRANCH, V., (1996), Hacia la integración del medio ambiente y el desarrollo sostenible en la región mediterránea, Anuario de Derecho Internacional, 12, pp. 201-251.

[8] See UNEP (1997), Mediterranean Action Plan and the Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean and its Protocols, Athens, 166 pp. See also BOU FRANCH, V., (2002) New Trends for Eliminating Land-Based Pollution in the Mediterranean Seas. In: G. Cataldi (ed.), La méditerranée et le droit de la mer à l'aube du 21ème siècle, Bruylant, pp. 275-303.

[9] See UNEP (1998), Strategic Action Program to Address Pollution from Land-Based Activities, MAP Technical Reports Series No. 119, 179 pp.

[10] On this question, see my paper presented in this Meeting entitled "Marine Discharges of Offshore Produced Water: The North-East Atlantic Management Strategy".

[11] See the documents UNEP(OCA)/LBA/IG.2/L.4 (2-XI-1995): Washington Declaration on the Protection of the Marine Environment from Land-based Activities, 8 pp.; and UNEP(OCA)/LBA/IG.2/7 (5-XII-1995): Global Program of Action for the Protection of the Marine Environment from Land-based Activities, 60 pp.

[12] All these documents are available on the GPA clearing house Web site: www.gpa.unep.org.

[13] See the document UNEP/GPA/IGR.1/2 (12-IX-2001): Review of Accomplishments in the Implementation of the GAP, 1995-2001, 11 pp.; and UNEP/GPA/IGR.1/INF/10: States Reports on the Implementation of the GAP.

[14] See its first draft in the document UNEP/GPA (7-XI-2000): GPA Strategic Action Plan on Municipal Wastewater as a Major Land-based Pollutant Affecting Coastal Zones and Marine Ecosystems, 5 pp. See the amended final version in UNEP/GPA/IGR.1/4 (26-VIII-2001): The GPA's Strategic Action Plan on Municipal Wastewater, 9 pp.

[15] See the following documents: UNEP/GPA/IGR.1/INF/3a (27-II-2001): Final Report of the Consultative Meeting on Municipal Wastewater. Region: Wider Caribbean, Ocho Ríos, Jamaica, 19-21-II-2001, 9 pp.; UNEP/GPA/IGR.1/INF/3b (21-X-2001): Final Report of the Consultative Meeting on Municipal Wastewater. Region: Eastern Africa, Dar es Salaam, Tanzania, 11-15-VI-2001, 16 pp.; UNEP/GPA/IGR.1/INF/3c (21-X-

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[16] See the document entitled "Strategy Options for Sewage Management to Protect the Marine Environment", by IHE, commissioned by UNEP/GPA, November 2000, 102 pp.

[17] See the document UNEP/GPA/IGR.1/INF/9: The GPA Clearing House Mechanism: A Progress Report and Possible Way Forward.

[18] See the first version of the Guide on Municipal Wastewater in the UNEP Draft Working Document entitled "Recommendations for Decision-making on Municipal Wastewater. Practical Policy Guidance for Implementing the GPA on Sewage", developed in collaboration with WHO, UNCHS-Habitat and WSSCC, 10-XI-2000, 73 pp. The second version is included in UNEP/GPA/IGR.1/INF.4: Draft Working Document. Version 2, 21-X-2001: Guidance on Municipal Wastewater, 37 pp.

[19] See the document UNEP/GPA/IGR.1/6 (12-IX-2001): Proposed 2002-2006 Work Program of the GPA Coordination Office and Partner Organizations, with Indicative Costs, 49 pp.

[20] See the document UNEP/GAP/IGR.1/2, op. cit., pp. 5 et seq.

[21] See the document UNEP/GPA/IGR.1/INF/2: (15-X-2001): A review of binding and non-binding regional agreements relating to the implementation of the GPA for the protection of the marine environment from land-based activities, 28 pp.

[22] Details of the development and implementation of regional programs of action in 12 out of 17 regions are given in the document UNEP/GPA/IGR.1/3: (12-IX-2001): Progress Report on the Activities of the UNEP GPA Coordination Office during the period 1996-2001, 17 pp. For the remaining five Regional Seas, States have still to decide whether they wish to establish regional programs of action or to proceed with addressing land-based activities on the basis of existing legal and institutional arrangements.

[23] Regional approaches to implementing the objectives of the GPA are described in the document UNEP/GPA/IGR.1/9, Annex III (22-XII-2001): Outline Information on Regional Seas Activities, pp. 35-40.