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COMMITTEE ON THE PEACEFUL USES OF THE SEA-BED AND THE OCEAN FLOOR BEYOND THE LIMITS OF NATIONAL JURISDICTION
SUB-COMMITTEE III

7. Canada: working paper on preservation of the marine environment

I. PURPOSE OF THE WORKING PAPER

- To focus the work of the working group on marine pollution;
- To provide a general outline of a comprehensive approach to the preservation of the marine environment and the prevention and control of marine pollution and related measures;
- To outline basic principles for draft treaty articles for consideration by the Conference on the Law of the Sea.

II. ELEMENTS OF A COMPREHENSIVE APPROACH

1. Comprehensive approach defined

A comprehensive approach to the preservation of the marine environment would involve a concerted attack on all sources of marine pollution, whether land-based or marine-based. This requires:

- A broad range of national and international measures (with the national measures relating to such problem areas as land-based sources of marine pollution and pollution hazards from continental shelf resource exploitation), each appropriate to the problem to be resolved and based upon an interdisciplinary approach which takes into account all the relevant scientific, economic, legal and other considerations;

- The harmonization of such national and international measures taking into account the indivisibility of the marine environment and its relationship to the biosphere as a whole,

- The assignment and co-ordination of functions among national and international institutions so as to ensure the effective implementation of the above-noted measures.

2. Comprehensive approach applied

The implementation of a comprehensive approach to the preservation of the marine environment by the Conference on the Law of the Sea does not necessarily imply the elaboration of a single treaty instrument dealing with all aspects of marine pollution. Nor does it imply that specialized agencies such as the Inter-Governmental Maritime Consultative Organization (IMCO) do not have an important role in the elaboration of technically-oriented standards and measures for the prevention of marine pollution. What is essential is that whatever the number of particular instruments, they should together constitute a coherent, uniform and all-embracing treaty system.

The Conference on the Law of the Sea could lay down the keystone for such a system by elaborating a "master" or "umbrella" treaty in the form of fundamental legal principles which would:

- Establish general objectives and the general rights and obligations of States in respect of the preservation of the marine environment;

- Affirm a general commitment to the elaboration of and adherence to particular specialized treaties intended to achieve these general objectives;

- Give a common direction and impetus to the further development of national and international measures for the preservation of the marine environment, and provide an organic link, in terms of both substance and implementation, between such measures (whether existing or envisaged);

- Fix uniform rules for certain problems common to such instruments, e.g. enforcement, compensation, etc.

3. Comprehensive approach: land-based sources

Although a comprehensive approach to the preservation of the marine environment necessarily includes measures to deal with land-based sources of marine pollution (especially those finding their way into the sea via the atmosphere), the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction and the Conference on the Law of the Sea are not necessarily the best forums for the elaboration of such measures. The law of the sea regulates activities at sea and relations between States with respect to those activities. The regulation of land-based activities, even though they may have an important impact on the marine environment (and indeed represent by far the most important source of marine pollution) obviously raises problems of a different order, especially in jurisdictional terms. Any attempt to have the law of the sea reach inland at this point in time would only add to the already

long list of issues to be negotiated and hence jeopardize the possibility of their successful resolution. Leadership in the harmonization of national measures and the development of international measures for the abatement of land-based sources of marine pollution should perhaps come from the environmental secretariat established at Stockholm. Nevertheless, the law of the sea can and should lay down principles which would have immediate consequential implications for the regulation of land-based sources of marine pollution (e.g. the duty to preserve the marine environment and to take measures to prevent its pollution).

4. Comprehensive approach: marine-based sources

The major marine-based sources of marine pollution, whether accidental or deliberate, are ships, fixed platforms, and exploitation of sea-bed mineral resources and other uses of the sea-bed. These broad categories can be further subdivided but nevertheless represent the essential marine pollution problems to which the Conference on the Law of the Sea should address itself, in tandem with the work of various specialized agencies. A number of international treaties - multilateral, regional and bilateral - already exist which deal directly or indirectly with various aspects of these problems, as does the national legislation of various countries. This paper does not deal exhaustively with national measures or bilateral and regional arrangements but concentrates on broader multilateral agreements. The most difficult issues which have arisen in connexion with this broad range of measures have related to the jurisdictional authority to prescribe measures and the jurisdictional authority to enforce them. This paper, taking into account recent trends and developments, posits a new approach to these basic issues which seeks to resolve the old conflict between coastal and flag State jurisdiction by emphasizing a sharing of authority on the basis of mutually agreed principles rather than retaining the old mutually exclusive categories. This approach is extensively developed in later sections of this paper. The immediately following sections give a brief review of what has already been done by way of national and international measures in the marine pollution field, of what is being done, and of what remains to be done.

A. What has been done

(i) 1958 Geneva Convention on the High Seas

Article 24 of this Convention provides as follows:

"Every State shall draw up regulations to prevent pollution of the seas by the discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the sea-bed and its subsoil, taking account of existing treaty provisions on the subject."

Article 25 provides as follows:

1. "Every State shall take measures to prevent pollution of the seas from the dumping of radio-active waste, taking into account any standards and regulations which may be formulated by the competent international organizations.

2. All States shall co-operate with the competent international organizations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities with radio-active materials or other harmful agents."

These two articles provide a useful beginning in that they lay down in general terms the obligations of States with respect to pollution of the sea by the discharge of oil, the exploitation of the sea-bed, and the dumping of radio-active wastes. They do not, however, make any detailed or specific provision for the discharge of these obligations. (Article 24 was drafted having in mind the 1954 Convention for the Prevention of Pollution of the Sea by Oil but it does not oblige States to adhere to that Convention or to enact regulations similar to those thereby established.) Finally, neither article attempts to deal with such questions as enforcement jurisdiction or compensation.

(ii) 1958 Geneva Convention on the Continental Shelf

Article 5, paragraph 7, of this Convention provides as follows:

"The coastal State is obliged to undertake, in the safety zones, all appropriate measures for the protection of the living resources of the sea from harmful agents."

This article states an important principle but is incomplete in being restricted to measures to be taken within safety zones established for purposes of exploiting the continental shelf, in referring only to living resources (rather than the broader category of "marine organisms"), and in containing no provisions for the implementation of the coastal State's obligations. Like the Convention on the High Seas, it also does not deal with questions of compensation for damage done to other States or their nationals. And finally, it deals only with the continental shelf and not with pollution emanating from exploitation of the sea-bed beyond the limits of national jurisdiction.

(iii) 1954 International Convention for the Prevention of Pollution of the Sea by Oil (amended in 1962 and 1969)

This Convention, as amended, prohibits the intentional discharge of oil and oily mixtures into the sea by ships beyond a negligible permissible limit as regards certain classes of vessels and certain areas. However, the Convention has not yet resulted in the complete elimination of such intentional discharges of oil. Prosecution for offences is left to the exclusive discretion of the flag State and no provision is made for compensation for damages suffered.

(iv) 1957 International Convention relating to the Limitation of the Liability of Owners of Seagoing Ships

This Convention limits the liability of shipowners for damages caused by their vessels, in the absence of actual fault or privity on their part, to a maximum of approximately $7 million. It does not deal with questions of State responsibility, nor is it designed to deal specifically with pollution damage.

(v) 1962 Convention on the Liability of Operators of Nuclear Ships

This convention (which is not yet in force) makes provision for a régime of strict liability of the operators of nuclear ships and sets the limits of that liability at $100 million. It makes no provision for preventive measures although it implicitly recognizes the right of the coastal State to exclude nuclear ships from its waters and ports.

(vi) 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water

While more often viewed as a disarmament measure, this treaty also represents by its express terms a very important environmental protection agreement. It prohibits States parties from carrying out nuclear explosions in any environment if such explosion causes radio-active débris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted.

(vii) 1969 International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties

This convention (which is not yet in force) provides for the right of the coastal State to take such measures on the high seas (without any limitation as to distance) as may be necessary to protect its coastline or related interests from pollution of the sea by oil, following upon a maritime casualty which may be reasonably expected to result in major harmful consequences. The convention makes no provision for a similar right of intervention in pollution casualties not involving oil-carrying vessels. It is essentially oriented to remedial rather than preventive measures, that is to action which may be taken after an accident has occurred rather than to action which should be taken to prevent such accidents.

(viii) 1969 International Convention on Civil Liability for Oil Pollution Damage

This convention (which is not yet in force) imposes strict liability (exception being made for acts of war or natural catastrophes, intentional acts of a third party, or negligence on the part of those responsible for the maintenance of navigational aids) on the owner of any oil-tankers from which oil has escaped after an incident at sea and which has caused damage in the territory or territorial waters of a contracting State. (No provision is made for compensation for damage to coastal resources or other coastal interests in any "economic zone" beyond the territorial sea.) It sets the limit of such liability at approximately $14 million per incident. In addition to being restricted to one form only of marine pollution damage, it does not deal with questions of State responsibility. Nor does it remove procedural difficulties in the way of satisfying pollution claims.

(ix) 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage

This convention (which is not yet in force) relieves shipowners from the "additional financial burden" imposed by the 1969 Convention on Civil Liability and provides additional compensation for oil pollution victims (to a limit of $30 million). It represents a special compensation régime for damage from a special

class of vessels (i.e. tankers), but even in this sense is incomplete in that it does not provide compensation for damage caused by intentional discharges of oil not connected with a maritime incident and excludes compensation for damage resulting from an act of war or from oil escaping from a warship or other government-operated vessels on non-commercial service. Finally, it does not provide compensation for pollution damage to coastal resources and other coastal interests in any "economic zone" beyond the territorial sea, nor does it help to resolve procedural difficulties in satisfying claims over and above the $30 million limit.

(x) 1972 (Oslo) Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft

This Convention establishes an absolute prohibition against the dumping of certain highly toxic substances and regulates the dumping of all other substances in the region of the North Sea and North Atlantic.

B. What is being done

(i) Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction (General Assembly resolution 2749 (XXV))

Principles 11 and 13 (b) touch on the question of pollution from sea-bed resources exploitation activities beyond the limits of national jurisdiction.

(ii) Declaration of the United Nations Conference on the Human Environment 1/

The Stockholm Declaration represents a widely-accepted statement of principles which may be considered to lay down the foundation for the future development of international environment law. The principles of that Declaration which are of particular relevance to marine pollution are: Principle 7, which posits the duty of States to prevent marine pollution; Principle 21, which reflects the responsibility of States to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction; and Principle 22, which calls upon States to co-operate in the further development of international law regarding liability and compensation for the victims of pollution and other environmental damage.

(iii) Statement of Objectives concerning the marine environment

This statement (elaborated by the Ottawa session of the Intergovernmental Working Group on Marine Pollution (IWGMP) and endorsed by the Stockholm Conference) recognizes the particular interests of coastal States with respect to the management of coastal area resources; it recognizes that there are limits to the assimilative and regenerative capacities of the sea; and it states the consequential conclusion that it is necessary to apply management concepts to the marine environment, to marine resources and to the prevention of marine pollution.

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(iv) Marine pollution principles

The 23 principles on marine pollution, elaborated by the Ottawa session of IWGMP and endorsed by the Stockholm Conference, provide the guidelines and general framework for a comprehensive and interdisciplinary approach to all aspects of the marine pollution problem, including land-based sources. They represent the first step towards the application of management concepts, through both national and international measures, to the preservation of the marine environment. They elaborate in some detail the duties of States (and especially coastal States) in this regard but they do not fully deal with the consequential rights of States.

(v) Principles on rights of coastal States

Three principles on the rights of coastal States (submitted by the delegation of Canada) were considered at the Ottawa session of IWGMP but neither endorsed nor rejected by that Group. The Stockholm Conference took note of these three principles and referred them to the 1973 IMCO Conference for information and to the Conference on the Law of the Sea for appropriate action. These principles deal respectively with: the right of the coastal State to exercise special environmental preservation authority in areas of the sea adjacent to its territorial waters; the right of the coastal State to prohibit the entry of vessels into waters under its environmental protection authority; and the need for these rights of the coastal State to be exercised on the basis of internationally agreed rules and standards and subject to appropriate dispute-settlement procedures.

(vi) Draft articles and annexes on ocean dumping

The draft articles and annexes contained in the reports of the intergovernmental meetings in Reykjavik and London earlier this year (which have now been referred to the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction for information and comment and to an intergovernmental conference to be convened before November 1972 for further consideration and final adoption) represent an attempt to deal with the problem of ocean dumping on a global scale. They adopt the black list-grey list approach taken by the drafters of the 1972 Oslo Convention (discussed above), which forbids dumping of certain highly toxic substances and restricts the dumping of other substances under a regulated system. On the question of enforcement jurisdiction, the draft articles leave this for final decision by the Conference on the Law of the Sea without closing any options.

(vii) 1973 IMCO Marine Pollution Convention

The draft convention under preparation under IMCO auspices (which is to be considered at a conference to be convened by IMCO in the fall of 1973) is intended to achieve the complete elimination of pollution of the sea by oil and other noxious substances and the minimization of accidental spills. In other words, it is intended to provide for the prevention of all forms of ship-generated pollution whether accidental or deliberate. According to a report submitted to the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction by IMCO (A/AC.138/SC.III/L.15):

"The draft Convention consists of articles covering all aspects of the prevention of marine pollution from ships (with the exception of ocean dumping of shore-generated waste) and the technical annexes in respect of:

- The prevention of pollution by oil discharged from ships.

- The prevention of pollution by bulk-liquid or dry noxious substances other than oil discharged from ships (excluding the disposal of shore-generated wastes into the sea).

- The prevention of pollution relative to the design, construction and equipment of ships carrying oil.

- The prevention of pollution relative to the design, construction and equipment of ships carrying noxious substances in bulk.

- The prevention of pollution by noxious substances carried in packages or containers.

- The prevention of pollution by ship-operated sewage.

- The prevention of pollution by ship-generated garbage.

The draft IMCO Convention in its present form does not deal with pollution arising directly from sea-bed operations, nor does it deal with the general questions of State responsibility or compensation for damage. As regards enforcement, the present draft retains traditional flag-State jurisdiction and does not yet provide for effective coastal State rights in this regard.

(viii) Other developments

A number of important developments with implications for the preservation of the marine environment have been reflected in documents submitted to the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction at its July-August 1972 sessions, namely:

Document A/AC.138/80 of 26 July 1972 (giving the text of the Declaration of Santo Domingo approved by the meeting of Ministers of the Specialized Conference of the Caribbean Countries on Problems of the Sea held on 7 June 1972); document A/AC.138/79 of 21 July 1972 (giving the text of the conclusions in the general report of the African States' Regional Seminar on the Law of the Sea, held at Yaoundé from 20 to 30 June 1972); and the proposal of Kenya for an economic zone, submitted as document A/AC.138/SC.II/L.10 dated 7 August 1972.

These documents reflect a growing trend towards a possible accommodation on the problems of the law of the sea based on two elements:

On the one part, acceptance by the coastal States of a relatively narrow territorial sea, beyond which they would assert only certain forms of limited and specialized jurisdiction, distinct from and falling short of complete sovereignty and allowing, for example, freedom of passage and

freedom of overflight in the broader area subject to their jurisdiction; and, on the other part, acquiescence by the major maritime Powers in these assertions of limited forms of jurisdiction by the coastal States in question.

It now appears to be generally agreed that there is an intimate interrelationship between environmental management and the management of mineral and living resources. The functional jurisdiction of the coastal State already includes, in so far as many States are concerned, a form of anti-pollution jurisdiction in areas adjacent to the territorial sea. All coastal States exercise authority over pollution hazards arising from the exploitation of continental shelf resources; many States have promulgated rules for the protection of the living resources of the marine environment in their fishing zones. To cite two other examples of State practice, Canada has adopted special legislation for the preservation of the marine environment of the Arctic and in certain semi-enclosed areas, and the United Kingdom has adopted legislation allowing it to intervene beyond the limits of the territorial sea in cases of oil pollution casualties on the high seas. This should not be taken to imply a necessary conflict with the jurisdiction of the flag State over its vessels in coastal areas. As already noted, the more likely basis for an accommodation appears to lie in replacing the old notion of exclusive flag-State jurisdiction with a new form of shared or concurrent jurisdiction whereby both flag and coastal States would be able to discharge their responsibilities for the protection of the marine environment on the basis of internationally agreed standards and procedures.

C. What remains to be done

It will be evident from the above review of what has been done with respect to the prevention of marine pollution that existing international conventions, even taken together, do not constitute a comprehensive approach to the preservation of the marine environment. These existing conventions deal with only a few particular forms of marine pollution, and even in respect of these forms do not fully settle such important issues as enforcement jurisdiction, State responsibility and compensation for damage. Guidelines for a comprehensive approach which would fill these gaps are provided by the Declaration of the United Nations Conference on the Human Environment, the Statement of Objectives and the 23 Principles on Marine Pollution elaborated at Ottawa and endorsed by the Stockholm Conference, and the three principles on coastal States' rights discussed at the Ottawa session of IWGMP and referred to the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction and the Conference on the Law of the Sea for appropriate action. The draft dumping convention represents a further step in the actual realization of a comprehensive approach in that it deals with the general problem of marine dumping; the draft 1973 IMCO convention would complete the range of measures required to eliminate ship-generated pollution provided that it offers an effective solution to jurisdictional problems or at least does not prejudice the elaboration of such a solution. An accommodation on these jurisdictional problems remains the key to agreement on comprehensive measures for the preservation of the marine environment. Beyond the limits of national jurisdiction, however determined, there will also remain the greatest part of the high seas of the world for which the traditional legal order must be reformulated on the basis of environmental considerations, with whatever new institutional arrangements this may imply. More specifically, action is required under the following headings:

(i) Establishment by treaty of the fundamental legal obligation of all States to preserve the marine environment and protect it from pollution.

(ii) Application of management concepts to the preservation of the marine environment.

(iii) Development of an effective system for monitoring changes in the marine environment and the effects of various activities within that environment.

(iv) Adoption and improvement of internationally-agreed criteria, technical rules and standards to ensure the prevention of pollution (e.g., with respect to international traffic lanes, navigational aids, qualification of ship's personnel, and ship design, construction and equipment standards).

(v) Resolution of jurisdictional issues arising in connexion with the preservation of the marine environment in coastal areas and on the high seas, including in particular the elaboration of effective provisions for the enforcement of international conventions.

(vi) Further elaboration of a régime for compensation for victims of marine pollution damage, including clarification of State responsibility in this regard.

(vii) Development of internationally-agreed measures for the prevention and control of pollution arising from exploration and exploitation of sea-bed mineral resources both within and beyond the limits of national jurisdiction.

(viii) Provision of assistance to developing countries to strengthen their ability to discharge their obligations for the preservation of the marine environment.

III. BASIC PRINCIPLES FOR DRAFT TREATY ARTICLES FOR CONSIDERATION BY THE CONFERENCE ON THE LAW OF THE SEA

Against the background of the above discussion of what remains to be done to ensure the protection of the marine environment from marine-based sources of marine pollution, this section attempts to outline the basic principles which should be reflected in treaty articles to be elaborated by the Conference on the Law of the Sea. As previously noted, it is not proposed that the Conference should attempt to establish a régime for the control of land-based sources of marine pollution, but nevertheless some of the principles discussed below would have obvious consequential implications for such sources and should in time lead to the development of further conventions.

(i) Obligation to preserve the marine environment

There exists no treaty provision explicitly laying down the general obligation of States to preserve the marine environment and to prevent its

pollution from all sources, although articles 24 and 25 of the Convention on the High Seas and article 5, paragraph 7, of the Convention on the Continental Shelf represent specific applications of this fundamental principle. The first expression of a more general formulation, albeit in a limited context, is found in article 1 of the draft dumping convention. The importance of such a general formulation in a general or master treaty on the preservation of the marine environment cannot be over-emphasized; it would be the binding element or organic link between the general treaty and particular treaties or national measures dealing with individual aspects of marine pollution, and would help to establish a general commitment to the elaboration of and adherence to such particular treaties. In addition it would provide a new environmentally-oriented basis for the work of such specialized agencies as IMCO in this field. Guidelines for the formulation of the general obligation of States to preserve the marine environment are provided by Principles 7 and 21 of the Declaration of the United Nations Conference on the Human Environment, and by the Principles on the Marine Environment endorsed at Stockholm (Principles 1, 2, 3, 5 and 17). The texts of these various principles are given below, together with a commentary on each. Some consolidation of these principles will no doubt be necessary for the purpose of translating them into draft treaty articles for consideration by the Conference on the Law of the Sea.

- Principle 7 of the Declaration of the United Nations Conference on the Human Environment reads as follows:

> "States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea."

This principle reflects not only the duty of States to protect the marine environment but also in effect a definition of marine pollution based on that adopted by the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). It is very close to article 1 of the Oslo dumping convention (but stated in more mandatory terms) and also similar to the definition of marine pollution agreed upon by the Ottawa session of IWGMP.

- Principle 21 of the Declaration of the United Nations Conference on the Human Environment reads as follows:

> "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction."

The first element in this principle, concerning the right of States to exploit their own resources, may not be strictly relevant to a draft treaty relating solely to the preservation of the marine environment. The second element, concerning the responsibility to avoid damage to the environment of other States or of areas beyond the limits of national jursidiction, is of fundamental importance in terms of ensuring the protection of coastal interests as well as the shared resources of the high seas. The responsibility not to damage the environment of other States has

been recognized by the landmark decision of the Trail Smelter case. A broader injunction against extra-territorial damage has also been embodied in the 1963 nuclear test ban treaty (although it should be noted that this convention is not adhered to by all testing States and accordingly that the Conference on the Law of the Sea may wish to consider this problem). This existing rule of customary international law should be the starting point for the work of the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jursidiction in developing a régime for the protection of the marine environment, including in particular coastal areas or "economic zones". It has, of course, important implications for the broad range of issues of the law of the sea since it necessarily affects the rights of both coastal and flag States in territorial waters and fishing zones, in international straits, on the continental shelves, and perhaps above all on the high seas (where the environmental limitations on the rights of States must apply with even greater force than within State territory and where the question of an international regulatory authority is particularly relevant).

- Principle 1 of the Principles on the Marine Environment reads as follows:

> "Every State has a duty to protect and preserve the marine environment and, in particular, to prevent pollution that may affect areas where an internationally shared resource is located."

This principle represents a particular application to the marine environment of Principle 21 of the Declaration of the United Nations Conference on the Human Environment. Its emphasis on the duty not to pollute areas where an internationally shared resource is located brings out clearly the need for the law of the sea to protect community interests as well as to accommodate national interests. The injunction to protect such resources applies, of course, to both coastal and flag or distant-water States.

- Principle 2 on the Marine Environment reads as follows:

> "Every State should adopt appropriate measures for the prevention of marine pollution, whether acting individually or in conjunction with other States under agreed international arrangements."

This principle recognizes the need for both national and international measures for the prevention of marine pollution in implementation of the duty of each State to protect and preserve the marine environment. National measures do not, of course, necessarily imply "unilateral action" in the sense in which the latter term is sometimes read. What is implied is that both flag and coastal States must take measures, individually or jointly as appropriate, to discharge their obligation to preserve the marine environment. In other words, this principle does not prejudge jurisdictional issues.

- Principle 3 on the Marine Environment reads as follows:

> "States should use the best practicable means available to them to minimize the discharge of potentially hazardous substances into the sea by all routes, including land-based sources such as rivers, outfalls and pipelines within national jurisdiction, as well as dumping by or from ships, aircraft and platforms."

This principle recognizes that marine pollution problems are part of a vastly complex overlapping set of problems of the human environment as a whole. Marine pollution problems have their peculiar characteristics and can best be dealt with in the context of the law of the sea, while taking into account, however, the totality of environmental problems. As to what might be characterized as a marine pollution problem for the purpose of selecting the forum in which to deal with it, the most appropriate test might be the extent to which a particular form of pollution is directly caused by some direct use of the sea itself. Where marine pollution is brought about by substances entering the sea via the atmosphere or continental run-off as a result of land-based activities, this problem might best be dealt with through a combination of national action and international co-operation in other forums.

- Principle 5 on the Marine Environment reads as follows:

> "States should assume joint responsibility for the preservation of the marine environment beyond the limits of national jurisdiction."

This principle affirms the shared responsibility of all States (in addition to their individual responsibility expressed above) in respect of the preservation of the marine environment beyond the limits of national jurisdiction, without specifying what those limits are in relation to marine pollution or prejudicing that question in any way. With respect to the implementation of this principle, consideration will have to be given to the problems arising from the present lack of any institutional authority capable of dealing effectively and comprehensively with environmental preservation questions and the enforcement of protection measures on the high seas beyond the limits of national jurisdiction however described.

- Principle 17 on the Marine Environment reads as follows:

> "In addition to its responsibility for environmental protection within the limits of its territorial sea, a coastal State also has responsibility to protect adjacent areas of the environment from damage that may result from activities within its territory."

This principle represents a particular application of the rule against extra-territorial damage resulting from activities within the territory of a State. It also reflects the particular interest of the coastal State in the management of coastal area resources as enunciated in the Statement of Objectives. Although Principle 17 is limited to the responsibilities of coastal States, the prohibition against extra-territorial damage should apply with equal or greater force to the vessels of flag States operating on the high seas or within the territorial waters or zones of resource jurisdiction of other States.

(ii) Application of management concepts

The acceptance of the fundamental legal obligation to preserve the marine environment reflects an important departure from the traditional freedom of the high seas. It necessarily implies a system of regulation of the area of the high seas for the purpose of environmental protection. Such a regulatory system should rest on management concepts founded on scientific principles. This approach was recognized in the Statement of Objectives elaborated at Ottawa and endorsed by the Stockholm Conference.

- The Statement of Objectives reads as follows:

> "The marine environment and all the living organisms which it supports are of vital importance to humanity, and all people have an interest in assuring that this environment is so managed that its quality and resources are not impaired. This applies especially to coastal area resources. The capacity of the sea to assimilate wastes and render them harmless and its ability to regenerate natural resources are not unlimited. Proper management is required and measures to prevent and control marine pollution must be regarded as an essential element in this management of the oceans and seas and their natural resources."

The importance of this statement cannot be over-emphasized. With respect to marine pollution, existing law is based on laissez-faire concepts and does not recognize the need for regulation based on scientific principles. The Statement of Objectives, on the other hand, recognizes that there are limits to the assimilative and regenerative capacities of the sea and the inevitable consequential conclusion that it is necessary to apply management concepts to the marine environment, to marine resources, and to the preservation of the marine environment.

- Principle 10 on the Marine Environment reads as follows:

> "International guidelines and criteria should be developed, both by national governments and through intergovernmental agencies, to provide the policy framework for control measures. A comprehensive plan for the protection of the marine environment should provide for the identification of critical pollutants and their pathways and sources, determination of exposures to these pollutants and assessment of the risks they pose, timely detection of undesirable trends, and development of detection and monitoring systems."

This principle emphasizes that the development of international guidelines and criteria is a matter of national responsibility as well as one for international agencies. While the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction and the Conference on the Law of the Sea have the primary responsibility to provide the policy or over-all legal framework for marine pollution control measures at the international level, this principle also recognizes that a multidisciplinary and multi-agency approach is required for a comprehensive plan for the protection of the marine environment. Thus, for instance, the identification of critical pollutants and their pathways and sources will require the co-operation of national Governments and of such agencies as the World Health Organization, the Intergovernmental Oceanographic Commission, the Food and Agriculture Organization of the United Nations, IMCO, and others including in particular the newly-established environmental secretariat.

- Principle 13 on the Marine Environment reads as follows:

> "Action to prevent and control marine pollution (particularly direct prohibitions and specific release limits) must guard against the effect of simply transferring damage or hazard from one part of the environment to another."

This principle reflects the concern of many States that effective provision must be made to guard against what might be called the export of pollution problems. It points out the importance of ensuring that national and regional measures for the prevention of marine pollution are complemented by and consistent with global measures. Thus a regional dumping arrangement which required dumping of substances near the limits of the region would not be satisfactory in a global sense. This harmonization of measures is, of course, basic to the management approach.

- Principle 22 on the Marine Environment reads as follows:

> "Where there is a need for action by or through international agencies for the prevention, control or study of marine pollution, existing bodies, both within and outside the United Nations system, should be utilized as far as possible."

This principle simply reflects a widely-shared concern to avoid an unnecessary proliferation of international agencies and to ensure that existing agencies are utilized to the maximum advantage with respect to the problems of the preservation of the marine environment. It is, of course, an obvious example of sound management theory. An outstanding exception to this principle is the new secretariat for the environment endorsed at the Stockholm Conference which is a most valuable institution that was urgently needed to deal effectively with environmental problems. This principle will be of particular relevance in considering the possible need for an international authority dealing with environmental preservation questions on the high seas beyond the limits of national jurisdiction.

(iii) Development of a monitoring system

As already noted, management concepts for the preservation of the marine environment rest on scientific principles. Hence, scientific knowledge and research and monitoring systems are needed to provide the basis for the development of management policies which will ensure that the quality and resources of the marine environment are not impaired. This was recognized in the following principles elaborated at Ottawa and endorsed by the Stockholm Conference:

- Principle 15 on the Marine Environment reads as follows:

> "Every State should co-operate with other States and with competent international organizations with a view to the development of marine environmental research and survey programmes and systems and means for monitoring changes in the marine environment, including studies of the present state of the oceans, the trends of pollution effects and the exchange of data and scientific information on the marine environment. There should be similar co-operation in the exchange of technological information on means of preventing marine pollution including pollution that may arise from offshore resource exploration and exploitation."

This principle recognizes that the problems of marine pollution cannot be resolved by the development of international law alone but necessitate co-operative action among States and international organizations in the scientific and technological fields. In dealing with the preservation of the marine environment, it is essential to take into account this need for a multidisciplinary approach

and for the extra-legal expertise which other fora must bring to problems of the law of the sea such as marine pollution, scientific research and fisheries. While the legal strategy is essential, it cannot alone resolve all the issues in this new and complex field. It may be necessary for the Conference on the Law of the Sea to consider a treaty article on international monitoring arrangements; consideration may also have to be given to the choice of agency to be responsible for monitoring questions on a global scale.

- Principle 16 on the Marine Environment reads as follows:

> "International guidelines should also be developed to facilitate comparability in methods of detection and measurement of pollutants and their effects."

This principle represents a further development of Principle 15. It also highlights the importance of co-ordinating national action.

(iv) Improvement of technical rules and standards

A comprehensive management system for the preservation of the marine environment based on national and international measures requires the adoption of internationally agreed criteria, technical rules and standards such as those incorporated in the draft dumping convention and now being developed for the 1973 IMCO Convention with respect to ship design, construction, equipment and manning. Such technical measures are necessary as concrete steps in the implementation of the obligation to protect the marine environment; international agreement on such measures is necessary to achieve an effective global approach taking into account local and regional variations. Such agreement is also crucial to the resolution of jurisdictional and enforcement issues as discussed later in this paper. The following principles are relevant in this field:

- Principle 8 on the Marine Environment reads as follows:

> "Every State should co-operate with other States and competent international organizations with regard to the elaboration and implementation of internationally agreed rules, standards and procedures for the prevention of marine pollution on global, regional and national levels."

The development of internationally agreed rules and standards is fundamental not only to the prevention of marine pollution but to the broad range of issues of the law of the sea and goes hand in hand with the question of the rights and interests of the coastal State. Marine pollution can effectively be attacked only by a combination of global, regional and national rules and standards, with the global ones fixing at least the minimum provision to be made for the preservation of the marine environment, and the regional and national ones laying down particular and perhaps stricter provisions as may be required to deal with special situations prevailing in certain areas such as the Arctic or semi-enclosed bodies of water.

- Principle 9 on the Marine Environment reads as follows:

> "States should join together regionally to concert their policies and adopt measures in common to prevent the pollution of areas which, for geographical and ecological reasons, form a natural entity and an integrated whole."

This principle represents a further development of Principle 8 and recognizes important geographical and ecological realities without detracting in any way from a comprehensive approach to the problems of marine pollution.

- Principle 11 on the Marine Environment reads as follows:

> "Internationally agreed criteria and standards should provide for regional and local variations in the effects of pollution and in the evaluation of these effects. Such variables should also include the ecology of sea areas, economic and social conditions, and amenities, recreational facilities and other uses of the seas."

This principle is closely related to Principles 8 and 9 just discussed. Such an approach is of particular importance to developing countries which may not be able to establish the same standards as highly developed States.

- Principle 12 on the Marine Environment reads as follows:

> "Primary protection standards and derived working levels - especially codes of practice and effluent standards - may usefully be established at national levels, and in some instances, on a regional or global basis."

This principle, too, represents a further development of Principles 8 and 9 from the scientific and technical point of view. It, too, may be of particular relevance to the needs of developing countries.

- Principle 14 on the Marine Environment reads as follows:

> "The development and implementation of control should be sufficiently flexible to reflect increasing knowledge of the marine ecosystem, pollution effects, and improvements in technological means for pollution control and to take into account the fact that a number of new and hitherto unsuspected pollutants are bound to be brought to light."

This principle reflects the importance of establishing review mechanisms at the national, regional and global levels to ensure that new threats to the marine environment can be promptly identified and that national legislation or multilateral agreements can be conveniently and speedily amended (for instance by the use of annexes) to provide against such new dangers. Such review mechanisms are particularly important with respect to such agreements as the 1954 Convention for the Prevention of Pollution of the Sea by Oil and the draft dumping articles.

(v) Resolution of jurisdictional and enforcement issues

The two most basic and most difficult issues which have arisen in connexion with efforts to promote international co-operation in the preservation of the marine environment have been:

(i) The determination of the appropriate jurisdictional authority to prescribe necessary measures;

(ii) The determination of the appropriate authority to enforce such measures.

However, if agreement is reached on the obligation of all States to preserve the marine environment and on the need for internationally agreed criteria, technical rules and standards for the implementation of their obligation, these jurisdictional issues can be viewed from a new perspective. With respect to jurisdiction to prescribe measures, the adoption of internationally agreed criteria, technical rules and standards narrows the issue to one of determining the latitude to be allowed for regional and local variations to the internationally agreed provisions. With respect to jurisdiction to enforce, the adoption of internationally agreed criteria, technical rules and standards again removes an important source of potential conflict. In other words, it becomes easier to adopt a more flexible attitude to the choice of enforcement authority, when agreement has been reached on the measures to be enforced.

These enforcement and jurisdictional issues arise with respect to all the existing conventions dealing with the preservation of the marine environment. It is of vital importance that they be resolved by the "master treaty" to be adopted by the Conference on the Law of the Sea. In this connexion it seems evident that a greater accommodation will have to be made for the rights of coastal States. At the same time it also seems evident that the responsibility of the flag State for its vessels should not be unduly interfered with, and indeed should be strengthened in some respects. With respect to the jurisdiction to prescribe, the coastal State should have a residual authority to promulgate rules in cases where international rules do not yet exist or where special circumstances prevail. With respect to the jurisdiction to enforce, the coastal State should have a similar residual authority to enforce internationally agreed rules against foreign vessels beyond the limits of its territorial sea or to enforce its own rules against such vessels in these areas in cases where international rules do not yet exist or where it has promulgated special rules to meet special circumstances.

Such a concept of residual authority in the coastal State would be similar to and a logical extension of the principle inherent in the right of intervention on the high seas as recognized in the 1969 IMCO Brussels Convention. A similar concept is also reflected in the draft articles on ocean dumping. These draft articles do not beg any questions of jurisdiction, leaving them for final decision by the Conference on the Law of the Sea without closing any options. However, the draft articles in their present form lay a basis for an accommodation of interests which may have implications going far beyond the question of ocean dumping. The articles, while not abandoning the concept of flag-State jurisdiction, would not be enforceable only by flag States against their own ships. They would by their terms be enforceable also by coastal States parties against ships "under their jurisdiction". This reflects the kind of accommodation whereby jurisdictional problems could be resolved by an approach somewhat analogous to the universal jurisdiction approach accepted by all States with regard to slavery and piracy, i.e. enforcement by both coastal and flag States on the basis of internationally agreed rules. The ambit of this dual enforcement approach to the dumping articles was further expanded by the inclusion in the Stockholm action proposal of a reference to enforcement by States against ships in areas under their jurisdiction (as well as by ships under their jurisdiction).

Some guidance for the development of the law on jurisdictional and enforcement issues is provided by the Statement of Objectives and the Principles on the Marine Environment elaborated at Ottawa and endorsed by the Stockholm Conference. More fully developed formulations are given in the three principles on the rights of

coastal States discussed at the Ottawa session of IWGMP but neither endorsed nor rejected by that group, which have now been referred to IMCO for information and to the Committee on the Peaceful Uses of the Sea-Bed and the Ocean Floor beyond the Limits of National Jurisdiction for appropriate action. The Statement of Objectives has already been discussed above. The other relevant principles appear below:

- Principle 20 on the Marine Environment reads as follows:

> "All States should ensure that vessels under their registration comply with internationally agreed rules and standards relating to ship design and construction, operating procedures and other relevant factors. States should co-operate in the development of such rules, standards and procedures, in the appropriate international bodies."

In providing for the responsibilities of flag States with respect to the operation of their vessels on the high seas and elsewhere this principle represents an essential first step in tempering the traditional freedom of navigation with concern for the protection of the marine environment in general and the coastal environment in particular. While this principle should be reflected in the treaty to be adopted by the Conference on the Law of the Sea, the actual development of internationally agreed rules and standards relating to ship design and construction and operating procedures (including traffic routing schemes) falls more appropriately within the competence of IMCO, which indeed is in the process of developing these at the present time, especially in connexion with the conference it is to convene in 1973.

- Principle 4 on the Marine Environment reads as follows:

> "States should ensure that their national legislation provides adequate sanctions against those who infringe existing regulations on marine pollution."

While States naturally tend to enforce their own national regulations, they do not always necessarily show the same vigour in enforcing internationally agreed regulations, as is indicated by the experience of States in relation to such agreements as the 1954 Convention for the Prevention of Pollution of the Sea by Oil. This principle emphasizes the duty to enforce all regulations alike and, while self-evident, is none the less important, and will require elaboration in any treaty developed at the Conference on the Law of the Sea, with respect to responsibilities of both flag and coastal States.

- Principle 21 on the Marine Environment reads as follows:

> "Following an accident on the high seas which may be expected to result in major deleterious consequences from pollution or threat of pollution of the sea, a coastal State facing grave and imminent danger to its coastline and related interests may take appropriate measures as may be necessary to prevent, mitigate or eliminate such danger, in accordance with internationally agreed rules and standards."

The 1969 IMCO Brussels Convention provides for such a right of intervention but in respect of oil pollution casualties only. It remains for the Conference on the Law of the Sea to incorporate the more general statement of the right in

treaty language. However, while this right of intervention is an extremely important one, its value is of course limited by the fact that provides only for action that can be taken by the coastal State after a maritime incident has occurred. Nevertheless, it represents a particular manifestation of the more general residual authority envisaged for the coastal State in areas adjacent to its territorial sea, although the principle does not incorporate any distance limitation. An analogous concept is reflected in Principle 13 (b) of the Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction, and the relationship between that principle and Principle 21 on the Marine Environment.

- The first of the three principles discussed at the Ottawa session of the IWGMP reads as follows:

> "A State may exercise special authority in areas of the sea adjacent to its territorial waters where functional controls of a continuing nature are necessary for the effective prevention of pollution which could cause damage or injury to the land or marine environment under its exclusive or sovereign authority."

This principle represents the logical extension of the particular interests of the coastal State recognized in the Statement of Objectives discussed earlier in this paper. In positing coastal State authority it represents the logical corollary of the heavy emphasis on the obligations of coastal States which is found in most of the 23 agreed principles on marine pollution. If it is recognized that rights must be balanced with responsibilities, then surely it must also be recognized that responsibilities must be balanced with the necessary rights and powers. In practical terms this principle signifies that coastal States have the right to exercise specialized jurisdiction in areas adjacent to their territorial sea for the prevention of pollution of the coastal environment and the marine environment in general. While this principle would imply a limited attenuation of the exclusive authority of the flag State over its vessels in such areas, it does not in any way imply an abandonment of the general authority of the flag State. Rather, what is involved is a specific and limited exercise of residual authority by the coastal State to ensure compliance with internationally agreed standards or with special local standards.

- The second of the principles discussed at Ottawa reads as follows:

> "A coastal State may prohibit any vessel which does not comply with internationally agreed rules and standards or, in their absence, with reasonable national rules and standards of the coastal State in question, from entering waters under its environmental protection authority."

As already noted, one of the principles actually endorsed by the Stockholm Conference provides that all States should ensure that their vessels comply with internationally agreed rules and standards relating to ship design and construction, operating procedures and other relevant factors. To give practical effect to this agreed principle, it seems essential that the coastal State should have the right to prohibit vessels not complying with internationally agreed rules and standards from entering areas where it exercises jurisdiction for the protection of the environment. Measures will, of course, have to be worked out to solve the problems of inspection, but these would be considerably simplified by a system of international certificates of sea-worthiness worked out in the appropriate forum. Similarly, where internationally agreed rules and standards have not been

established, the coastal State must have the right to enforce its own reasonable national rules and standards against all vessels in the areas in question. There remains, however, the possible need for an international authority to ensure compliance with internationally agreed rules and standards on the high seas beyond the limits of national jurisdiction: this is a matter which will have to be considered by the Conference on the Law of the Sea.

- The third principle discussed at Ottawa reads as follows:

> "The basis on which a State should exercise rights or powers, in addition to its sovereign rights or powers, pursuant to its special authority in areas adjacent to its territorial waters, is that such rights or powers should be deemed to be delegated to that State by the world community on behalf of humanity as a whole. The rights and powers exercised must be consistent with the coastal State's primary responsibility for marine environmental protection in the areas concerned: they should be subject to international rules and standards and to review before an appropriate international tribunal."

This principle, of course, reflects the general Canadian approach to the whole range of problems of the law of the sea and to marine pollution in particular. However, no particular importance attaches to terminology for its own sake. Such terms as "delegation of powers" should not be thought of as suitable for draft treaty articles, but rather as illustrations of a conceptual approach whereby flag States would delegate to coastal States in a multilateral treaty the right to enforce internationally agreed rules and standards against their vessels. The necessary recognition of the rights of coastal States should also make adequate provision for the interests of all States and of the international community as a whole and, to attain this end, the rights in question should be exercised on the basis of internationally agreed rules and standards and subject to appropriate dispute-settlement procedures.

(iv) Régime for compensation and clarification of State responsibility

It is a necessary consequence of the principle that States must ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction (Principle 21 of the Declaration of the United Nations Conference on the Human Environment) that compensation should be available to the victims of pollution damage in these circumstances. While the elaboration of an effective system of pollution prevention should be the most important element in international arrangements to preserve the marine environment, the development of an appropriate compensation régime would also be of fundamental importance. The need for the development of such a régime is recognized in the following Stockholm principles:

- Principle 22 of the Declaration of the United Nations Conference on the Human Environment, which reads as follows:

> "States shall co-operate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction."

- Principle 7 of the Principles on the Marine Environment, which reads as follows:

> "States should discharge, in accordance with the principles of international law, their obligations towards other States where damage arises from pollution caused by their own activities or by organizations or individuals under their jurisdiction and should co-operate in developing procedures for dealing with such damage and the settlement of disputes."

While the right to compensation for pollution damage undoubtedly exists, difficult questions arise in relation to the satisfaction of that right, especially with regard to compensation for damage suffered in areas under the resource jurisdiction of the coastal State and in areas beyond the limits of national jurisdiction. A variety of means could be devised for ensuring such compensation, ranging from international compensation funds or insurance schemes, to private rights of action established under the laws of each State in accordance with internationally agreed obligations, and, in the appropriate circumstances, to direct compensation by the responsible State. What is important is that compensation be readily available and adequate to cover the damage suffered. It is encouraging that some important maritime Powers have indicated a willingness to accept strict liability for environmental damage which might be caused by their flag vessels in passing through international straits. There would appear to be no grounds for limiting this principle to the territorial sea in international straits, as distinct from applying it to the territorial sea in general. In addition, consideration must be given to compensation for damage to coastal resources beyond the limits of the territorial sea, and to compensation for damage from the many sources other than ships (e.g. sea-bed exploitation). The role of the Conference on the Law of the Sea in the development of comprehensive compensation arrangements should no doubt be limited to the enunciation of general legal principles. Other forums such as IMCO should be called upon to develop systems for the practical implementation of these principles and the establishment of procedures to settle disputed cases. It seems clear that the development of such arrangements will also demand bilateral and regional co-operation.

(vii) Sea-bed exploration and exploitation

International law has not dealt extensively with environmental issues arising from exploration and exploitation of sea-bed resources in areas within or beyond the limits of national jurisdiction, although national regulations have been developed with respect to activities within national jurisdiction. Guidance for the further development of the law in this respect is provided by the following principles:

- Principle 18 on the Marine Environment, which reads as follows:

> "Coastal States should ensure that adequate and appropriate resources are available to deal with pollution incidents resulting from the exploration and exploitation of sea-bed resources in areas within the limits of their national jurisdiction."

Bearing in mind the fundamental obligation of all States to preserve the marine environment, it will be necessary to establish internationally agreed standards with respect to the anti-pollution measures which coastal States would be obliged to undertake in respect of sea-bed resource exploitation even within the limits

of their national jurisdiction. Such national measures have already been developed by a number of States and should be of assistance in working out an agreement on safety measures for the exploitation of sea-bed resources beyond the limits of national jurisdiction. So far as the Conference on the Law of the Sea is concerned, its role in the development of the law in this field should be restricted to the enunciation of general principles. More detailed technical measures will require bilateral and regional agreements, taking into account the measures to be developed for the international sea-bed area as discussed below.

- Principle 19 on the Marine Environment reads as follows:

> "States should co-operate in the appropriate international forum to ensure that activities related to the exploration and exploitation of the sea-bed and ocean floor beyond the limits of national jurisdiction shall not result in pollution of the marine environment."

Principle 11 of the Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction (resolution 2749 (XXV)) reads as follows:

> "With respect to activities in the area and acting in conformity with the international régime to be established, States shall take appropriate measures for and shall co-operate in the adoption and implementation of international rules, standards and procedures for, inter alia:
>
> (a) The prevention of pollution and contamination, and other hazards to the marine environment, including the coastline, and of interference with the ecological balance of the marine environment;
>
> (b) The protection and conservation of the natural resources of the area and the prevention of damage to the flora and fauna of the marine environment."

- Principle 13 (b) of the Declaration reads as follows:

> "Nothing herein shall affect:
>
> ...
>
> (b) The rights of coastal States with respect to measures to prevent, mitigate or eliminate grave and imminent danger to their coastline or related interests from pollution or threat thereof or from other hazardous occurrences resulting from or caused by any activities in the area, subject to the international régime to be established."

As already noted, the development of anti-pollution measures in respect of sea-bed resource exploitation could and should proceed in a co-ordinated way as regards areas within the limits of national jurisdiction and areas beyond those limits. The measures developed for the international sea-bed area should represent the minimum measures to be adopted by States in areas within their national jurisdiction. The international sea-bed treaty to be negotiated at the Conference on the Law of the Sea should lay down general principles with respect to protection of the marine environment from the exploitation of international sea-bed resources, while perhaps leaving it to the future international sea-bed machinery to elaborate more detailed technical measures in consultation with coastal States and other agencies having the necessary expertise in this field.

(viii) Technical assistance

One important method of ensuring that all States are able to carry out their obligation to preserve the marine environment is the provision of technical assistance to developing countries. The need for such assistance was recognized in Principle 6 on the Marine Environment.

Principle 6 on the Marine Environment reads as follows:

> "The States at higher levels of technological and scientific development should assist those nations which request it, for example by undertaking programmes either directly or through competent agencies intended to provide adequate training of the technical and scientific personnel of those countries, as well as by providing the equipment and facilities needed in areas such as research, administration, monitoring or surveillance, information, waste disposal, and others, which would improve their ability to discharge their duties consisting of protecting the marine environment."

The law of the sea can provide useful policy guidance with respect to the application of this principle, but it seems evident that further action in other forums will be required for its full elaboration and implementation. While technical assistance is of special importance to developing countries, situations also arise where States at any level of development require assistance in dealing with problems affecting the marine environment. This was taken into account by Principle 23 on the Marine Environment, which reads as follows:

> "States should assist one another to the best of their ability, in action against marine pollution of whatever origin."

This general principle should be reflected in the treaty to be adopted by the Conference on the Law of the Sea. Its practical implementation, however, will require the elaboration of bilateral and regional arrangements, such as joint contingency plans for maritime areas of common interest.

IV. FURTHER MEASURES IN RESPECT OF LAND-BASED SOURCES OF MARINE POLLUTION FOR THE CONFERENCE ON THE LAW OF THE SEA

Marine-based sources constitute considerably less than half of the total sources of pollution of the marine environment. The measures contemplated for adoption by the Conference on the Law of the Sea accordingly cannot and should not be viewed as ensuring the preservation of the marine environment but rather as the first steps in this direction. It is becoming increasingly urgent to adopt internationally agreed measures on such problems as continental run-off, river run-off, pipelines and atmospheric pollution. As previously noted, however, these exceed the scope of what might be achieved at an early Conference on the Law of the Sea. They are nevertheless of fundamental importance in any long-range comprehensive approach to the protection of the marine environment.